CREDIT

The Determinants of Institutional Quality. More on the Debate

by

José Antonio Alonso and Carlos Garcimartín

Abstract

This paper provides new evidences about the determinants of institutional quality. Given the shortcomings of governance indicators, we first discuss the criteria employed to judge institutional quality. Then, we identify the factors that, according to these criteria, shape the quality of institutions. The results of this empirical research show that the main determinants of the quality of the institutions of a given country are its income per head and its income distribution, the efficiency of its tax system and the educational level of its population. Interestingly, some of the variables identified in previous literature (location, ethnolinguistic fragmentation, the origin of the legal system or colonial origin) either do not have any impact on institutional quality or they impact indirectly through the variables previously mentioned.

The Determinants of Institutional Quality. More on the Debate

by

José Antonio Alonso and Carlos Garcimartín

Outline

The Authors

José Antonio Alonso: University Complutense of Madrid and Director of Institute of Foreign Affairs (ICEI). Email: j.alonso@ccee.ucm.es

Carlos Garcimartín: Rey Juan Carlos I University and Complutense Institute of Foreign Affairs (ICEI). Email: carlos.garcimartin@urjc.es

1.   Introduction

Economists tend to identify the causes of development on the grounds of resource endowment and technology. In essence, modern growth theory responds to this notion. Unlike this vision, a new perspective, not necessarily incompatible, has emerged in last decades. This perspective insists on the relevancy that normative framework and institutions have on fostering development. The institutional structure defines incentives and penalties, shapes social behaviour and articulates collective action, thus conditioning development. In last years, a myriad of empirical studies has supported this relationship between institutional quality and development; and, though less conclusively, the one between institutional quality and growth (Aron, 2000). The positive impact of institutional quality on development has been pointed out by crossed section analyses (Hall and Jones, 1999; Acemoglu et al., 2002; Rodrik et al., 2002; or Easterly and Levine) as well as case studies (for example, Rodrik, 2003).

However, from an economic policy viewpoint it is not sufficient to acknowledge that institutions do matter. It is also necessary to identify the determinants of institutional quality. This is a crucial task in order to implement policies aimed at building better institutions. Nevertheless, empirical research is scarcer in this area and its conclusions are less tenable. This is partly due to the difficulties faced by empirical work. More precisely, it faces i) deficient institutional quality indicators; ii) problems stemming from endogenous variables; iii) collinearity among the potentially explanatory variables preventing them from being considered independent factors; and iv) the possible presence of omitted variables that can bias the parameters estimated.

The simplifying conception that economists have been assuming on institutions in their modelling also hinders empirical research. Institutions are often considered to be efficient responses to transaction costs. It is supposed that agents operate exclusively driven by rational optimization criteria, that social dynamics get rid of inefficient institutions and that the existing ones improve social welfare. As a consequence, there is no problem whatsoever in defining "ideal institutions" - the ones of the successful countries - and in transplanting them to other nations. These premises have inspired a good part of international donors' institutional reform programs.

Nevertheless, the failures shown by these institutional "transplant" policies indicate that institutions do not work if they are not capable of shaping agents behaviour in an effective manner. This proposition underlines the relevance of legitimacy (or credibility) of institutions and their highly specific nature regarding the particular context in which they operate. Therefore, the fact that an institution prevails does not mean that it promotes socially efficient behaviours. Institutions are also structures of power that articulate and reflect hierarchical relations. Far from being always efficient social options, institutions are often interest-driven creations used by those who have the power to establish rules (North, 1993).

In spite of these difficulties, some studies have identified variables determining institutional quality. Some of these determinants are out of the reach of economic policy, such as country geographical location, colonial origin, legal system tradition, ethno-linguistic fragmentation or natural resources endowment. Yet, these variables often lose significance when they are controlled for level of development. Some other studies have explained institutional quality in terms of determinants more directly related to economic and social options, such as income distribution, international openness or education.

This paper provides new evidences about the determinants of institutional quality. Prior to implementing our empirical research, we discuss the criteria that should be used to judge the quality of institutions. Then, we identify the factors that, according to these criteria, determine institutional quality. The results obtained in the estimated model enable to draw some interesting conclusions. First of all, as it was expected, development level determines institutional quality: the highest the former, the highest the latter. Secondly, income distribution seems to condition institutional quality. A certain degree of social cohesion is needed to provide institutional predictability and legitimacy. Thirdly, a sound tax system is positively associated with institutional quality improvement. Taxes provide the necessary revenue to generate quality institutions, while creating a narrower and more demanding relation between State and citizens. Finally, education improves institutional quality. It determines the innovation capacity and the dynamic efficiency of institutions. On the contrary, some of the variables identified in the literature either they do not seem to determine institutional quality or their effects are indirect, through the aforementioned variables.

The remainder of paper is organized as follows. In section two, institutional quality criteria are discussed. Section three identifies the variables that are supposed to explain institutional quality. In section four we develop our empirical analysis for a wide sample of countries, identifying the determinants of institutional quality. In section five each determinant contribution is computed. Section six tests the results found by using alternative institutional quality indicators, confirming that they are acceptably robust relationships. Finally, the main conclusions are considered in last section.

2.   Criteria of institutional quality

In last two decades, a myriad of studies have explored the role of institutions in development. To make this possible, a considerable number of institutional quality indicators have been elaborated by multilateral organisations, risk-rating agencies, academic institutions and non-governmental organizations. Given the extent of the available repertoire, it is not surprising that their characteristics and quality levels greatly differ among indicators. Nevertheless, most of them lack a theoretical framework linking the indicator to previously defined institutional quality criteria. What does it define the quality of an institution? To respond to this question, we must consider the functions an institution fulfils.

As Greif (2006) argued, institutions might be defined as a set of social factors, rules, beliefs, values and organizations that jointly motivate regularity in individual and social behaviour. Thus, institutions can be seen as an inter-temporary contract that shapes behaviours; or seeking out another simile (Aoki, 2000) as a system of shared beliefs about the equilibrium of a game played repeatedly. Therefore, good institutions will be those that stimulate agents' activities with a high social return. Thus, they will draw together private and social returns, assuring a more efficient collective effort allocation. On the other hand, deficient institutions are those that stimulate socially useless or unproductive behaviours.

Since institutions do not really work if they are not capable of shaping behaviours, in order to evaluate them, it is important to analyze not only the rules that institutions define, but also the individuals' motivations to fulfil them. Therefore, so relevant it is to

4

study the incentives framework in which the agents operate as why they behave according to them. It is necessary to know why some rules are observed while some others are not. Hence, the legitimacy of institutions becomes a basic feature conditioning its efficiency.

Institutions respond to problems that social interaction rises up in an uncertain world. In this context, institutions constitute a mechanism to reduce discretional behaviours and to limit opportunism. In addition, since they shape social behaviours, institutions foster social interaction and collective action, reducing coordination costs. Yet, it would be mistaken to suppose that institutions always endure a rational response to social transaction costs. They are also a mechanism through which social actors express their strategies. Hence, a society does not have necessarily all institutions it needs nor are the existing ones necessarily optimal.

According to this approach, institutions have two economic basic functions: on the one hand, reducing transaction costs, granting certainty and predictability to social interaction; on the other hand, easing economic agents' coordination. If these functions are kept in mind, institutional quality must be defined by four basic criteria.

· **Static efficiency**: the institution capacity to be *incentive-compatible*. In other words, it is the capacity to promote behaviours that reduce social costs.

· **Credibility (or legitimacy):** the institution capacity to define inter-temporary credible contracts. That is to say, it is the institution's ability to generate a normative framework that truly determines agents' conduct.

· **Security (or predictability):** an institution fulfils its function if it reduces the uncertainty associated with human interaction. In fact, one of the institutional functions is to grant a higher level of safety and stability to social relations by diminishing transaction costs.

· **Adaptability (or dynamic efficiency):** This is to say, institutional ability to be able to anticipate social changes or at least to generate the incentives that facilitate agents' adjustment to these changes.

These criteria can inspire analytical exploration and empirical work seeking out variables that determine institutional quality. In the following sections, a model will be constructed and estimated by incorporating variables related to the four criteria previously defined.

3.   Determinants of institutional quality

As mentioned, the study of institutions faces the limited reliability of the available institutional quality indicators (Arndt and Oman, 2006). Broadly speaking, institutional quality indicators show five main shortcomings. First, most of them are based on subjective opinions from firm managers, international bureaucrats or scholars; and the sample is not always representative. Second, indicators often contain value judgements that are not made explicit. For example, institutional quality is frequently linked to market flexibility, thus leaving apart risk aversion as a potential social value. Third, institutional quality indicators do not always distinguish between institutions and policies. Four, in the case of composite indicators, the aggregation method is not always well conducted. Finally, the quality of the data used to build the indicators is unlikely to be homogenous across countries.

As a result of theses shortcomings, the available indicators only capture imperfectly the true quality of institutions, which compels us to be cautious in the interpretation of the results stemming from empirical research. The World Bank Governance Indicators average (GIs) may be the best available proxy for institutional quality, not only for greater accuracy but also for the wider geographical coverage[1]. The results obtained in using the composite index as the dependent variable are tested against employing separately the six components of the GIs and alternative indicators.

As far as the explanatory variables are concerned, these were selected on the basis of their relation to those institutional quality criteria previously defined: static efficiency, dynamic efficiency, predictability and legitimacy. According to these criteria,

---

[1] See Kaufman et al. (2006) for a methodological description of the Governance Indicators. For a discussion of their shortcomings, see Arndt and Oman (2006)

development level is identified, as one of the first clearer explanatory variables, which operates on institutional quality through both supply and demand. Firstly, it determines the availability of resources to build good institutions. Secondly, it generates a larger demand for quality institutions. It is a determinant related to the static efficiency of institutions. In addition, the positive relationship between both variables has been confirmed by previous research (Chong and Zanforlinm 2000, Islam and Montenegro, 2002, or Rigobon and Rodrik, 2004, among others).

Income distribution is the second variable considered. It allegedly affects both institutional predictability and legitimacy. Firstly, because a strong inequality causes divergent interests among different social groups, which, in turn, leads to conflicts, socio-political instability and insecurity. Secondly, inequality facilitates that institutions remain captured by groups of power, whose actions are orientated to particular interests rather than to the common good. Thirdly, it diminishes social agents' disposition to cooperative action and favours corruption and rent-seeking activities. Also this relationship is supported by previous studies (Alesina and Rodrik, 1993; Alesina and Perotti, 1996; or Easterly, 2001); though in some cases the results depend on the inclusion of regional *dummies* (for example, in Islam and Montenegro, 2002, the relationship disappears once Latin America and Sub-Saharan Africa regional dummies are incorporated in the model estimated). In addition, Engerman and Sokoloff (1997, 2002, 2005 and 2006) argue that a very unequal income distribution encourage institutions that, in turn, tend to perpetuate inequality, thus generating a vicious circle between inequality and low institutional quality.

International openness is the third factor that can encourage institutional quality. It is related to the dynamic efficiency of institutions. Firstly, it creates a more dynamic, sophisticated and demanding environment, which fuels a larger demand for good institutions. Secondly, international openness encourages a more competitive environment; therefore it can hinder rent-seeking activities, corruption and nepotism. Finally, openness can facilitate learning processes and good practices imitation from other countries experience. References to this variable are abundant, though with not totally coincidental results. For example, Rodrik et al. (2002) confirm that openness has a positive impact on institutional quality, but their estimates do not control for development level. Rigobon and Rodrik (2004) find a positive relationship, though

weak, between trade openness and the rule of law, but the relationship becomes negative in case of democracy. The authors interpret this paradoxical result in terms of distributive tensions generated by economic openness. Also Islam and Montenegro (2002) state that, when controlling for development level, openness affects some institutional quality variables but not others. Finally, the work of Knack and Azfar (2000), referred to corruption, shows that the results are very sensitive to the country sample used.

Education is the fourth factor considered as a determinant of institutional quality. It is a variable related to institutions dynamic efficiency. A more educated population demands more transparent and dynamic institutions and permits to build them. This is a variable seldom considered in empirical research. As an exception, the work of Alesina and Perotti (1996), which confirms the positive impact of education on institutional quality, must be pointed out. Also, in the literature on corruption, the education effect has been detected in works as those of Glaeser and Sacks (2006) or Evans and Rauch (2000).

Finally, the fifth determinant of institutional quality has not been, to our knowledge, taken into account by previous studies. Yet, it is a crucial variable that affects both the static efficiency and the legitimacy of institutions: taxes. A sound tax system not only provides the necessary resources to build high quality institutions, but also enables the consolidation of a social contract that gives rise to a more demanding relationship between state and citizens. As a result, there will be higher transparency and accountability, which leads to better institutional quality (Tilly, 1992; Moore, 2002). This may not happen with public revenues collected from other sources such as state-owned companies or natural resources.

In addition to the aforementioned variables, we have also taken into account some other determinants traditionally considered in the literature related to countries' "historical" features. In particular, several authors have noted that ethno-linguistic fragmentation can influence negatively on institutional quality. Greater heterogeneity may fuel tensions and conflicts between different groups, reduce social cooperation and generate a mismatch between formal and informal institutions. Easterly and Levine (1997), Alesina et al. (2003) or Easterly et al. (2006) found evidence supporting this hypothesis.

However, when controlling for development level, this relationship largely lost its significance, as revealed by Alesina et al. (2003) or Islam and Montenegro (2002).

A country's legal system origin is another element that has been identified as a potential determinant of institutional quality. It is argued that the British origin system and to a lesser extent German or Scandinavian systems, is based on a greater recognition of economic freedom, which limits the state intervention in the economy. On the contrary, the French origin legal system and even more the Soviet system were designed to determine the state's ability to organize economic and social life, leading to a weaker recognition of property rights and individual freedom. Accordingly, British and Nordic legal traditions are expected to be associated with higher institutional quality. Authors such as La Porta et al. (1999), Glaeser and Shleifer (2002), Chong and Zanforlin (2000) or Easterly and Levine (2003) find empirical support for this hypothesis. In the latter case, however, they do not control for development level.

Some authors suggest that for former colonies, the ways of colonization may have been influenced their institutional quality. While the arguments provided are not always consistent, it is assumed that UK colonization has been less noxious than others, since it has favoured the emergence of an institutionalism better prepared to undertake a market economy. This approach precludes that fact that even a single metropolis could have pursued different models of dominance in its various colonies, for example, the UK in the United States, India or Nigeria. It is, however, a controversial relationship, confirmed by some authors (Acemoglu et al., 2001; or, in case of corruption, Treisman, 2000) but denied by others (Alonso, 2007).

Institutional quality can also be influenced by geographical conditions. It is considered that a country location in the tropics, lack of access to the sea, or soil fertility may have influenced the development of strong quality institutions. This argument is supported by Gallup et al. (1998) or Easterly and Levine (2003), among others.

Finally, valuable natural resources can also affect institutional quality. They can negatively affect institutions by fostering rent seeking activities and replacing tax revenues by other revenue sources less transparent and less subject to accountability.

Sachs and Warner (1997) and Easterly and Levine (2003) confirmed this relationship, although in the latter case they did not control for development level.

4. The Model

4.1. Endogeneity

Some of the determinants previously outlined are clearly exogenous, while others are potentially endogenous. In that case, instrumental variables methodology must be used. It should be noted that the analysis that follows is not designed to provide a full analytical explanation of the different variables, but only to test if they are endogenous and if so, to identify the potential instruments to be used[2].

Thus, per capita income was estimated by applying a traditional convergence equation where the dependent variable is 2004 per capita GDP. The explanatory variables are its lagged value in 1990 and institutional quality, controlling further for potential regional specificities (Table 1). As shown, institutional quality was found to be positive and significant, indicating that per capita income should be treated as an endogenous variable. As instruments for it, we decided to use its lagged value in 1990 and the East Asia dummy, which also turned out to be significant (at 90% probability).

Table 1. Determinants of per capita income		
Variable	Value	t-ratio
Constant	1,33	4.49
Per capita GDP (1990)	0,86	24.48
Institutional Quality (GIs average 2006)	0,26	4.48
East Asia	0.21	2.18
Instrumental Variables. Endogenous: GIs average 2006. Instrument: GIs average 1998		
Adjusted R^2: 0.91. Observations: 160. Robust Estimate		

Income distribution is also a potentially endogenous variable. The higher the institutional quality, the more equitable income distribution is. To study this possibility, we estimated an equation where the Gini index was made dependent on per capita GDP, its square value, institutional quality, ethnic fragmentation and regional dummies (Table

---

[2] See Appendix I for a description of the variables used in this paper.

2). A nonlinear relationship between income distribution and per capita income was found. Middle-income countries have more unequal distributions than low and high income countries, thus corroborating the Kuznets hypothesis. It was also found that the greater ethnic fragmentation, the most unequal income distribution is. In addition, three regional dummies were significant: Europe and Central Asia (negative) and Sub-Saharan Africa and Latin America (positive).

With respect to institutional quality, while the corresponding parameter shows the expected sign, it is not significant. Since this result may mask the existence of collinearity between institutional quality and per capita income, we estimated the same equation but dropping this last variable (column b, Table 2). The results show that institutional quality is significant. Given this result, we decided to consider income distribution as an endogenous variable, selecting as instruments per capita income, its square value in 1990, ethnic fragmentation and three regional dummies.

Table 2. Determinants of Gini Index

Variable	(a)		(b)	
	Value	t-ratio	Value	t-ratio
Constant	-1,90	1.51	3.6	147.28
Per capita GDP	1,26	4,22		
(Per capita GDP)^2	-0,07	3,99		
Institutional Quality	-0.05	0,93	-0.04	2.16
Ethnic Fragmentation	0,01	2,62	0.01	1.99
Europe & Central Asia	-0,16	3,94	-0.15	3.43
Latin America	0,28	7,00	0.35	9.85
Sub-Saharan Africa	0,34	5,74	0.21	4.09
Adjusted R^2	0,60		0.54	
Nº Observations	121		126	
Endogenous	Institutional Quality 2006, per capita GDP 2004, (per capita GDP 2004)^2		Institutional Quality 2006	
Instruments	Institutional Quality 1998, per capita GDP 1990, (Per capita GDP 1990)^2		Institutional Quality 1998	

(a) Per capita GDP is included. (b) Per capita GDP is excluded.
Instrumental Variables. Robust Estimates

Tax revenue is another variable that can be potentially endogenous, for institutional quality may influence the underlying fiscal contract. To investigate this possibility, it was considered that tax revenue depends on per capita income, available natural resources and institutional quality. Firstly, a higher level of development increases both

the demand for public expenditure and the capacity to pay taxes. Secondly, the existence of valuable natural resources represents an alternative source of public revenue, thus decreasing taxes. Finally, better institutions can increase tax revenue because they lead to a better tax system design and improve tax administration capabilities. According to our estimates, per capita income and institutional quality, though showing the expected sign, are not significant when both variables are introduced simultaneously into the equation (Table 3, column a). However, they are individually significant when the other is removed from the equation (columns b and c). Since this suggests collinearity problems, we decided to consider taxes as an endogenous variable. As instruments for tax revenue, fuel exports and two regional dummies, Latin America and South Asia, were selected.

Table 3. Determinants of tax revenue

	(a)		(b)		(c)	
Variable	Value	t-ratio	Value	t-ratio	Value	t-ratio
Constant	2,10	1.92	2.99	70.53	0.63	1.69
Per capita GDP	0.10	0.80			0.27	6.48
Institutional Quality	0.24	1.62	0.34	8.79		
Fuel	-0,02	1.55	-0.01	1.02	-0.03	1.71
Latin America	-0,16	1,72	-0.14	1.82	-0.22	2.92
South Asia	-0,49	3,45	-0.45	3.80	-0.55	3.66
Adjusted R^2	0,37		0.38		0.32	
Nº Observations	120		124		120	
Endogenous	Institutional Quality 2006, per capita GDP 2004		Institutional Quality 2006		per capita GDP 2004	
Instruments	Institutional Quality 1998, per capita GDP 1990		Quality Institutional 1998		per capita GDP 1990	

(a) Per capita GDP is included. (b) Per capita GDP is excluded. (c) Institutional Quality is excluded.
Instrumental Variables. Robust Estimates

Also international openness may be an endogenous variable associated with institutional quality. As its determinants, we considered per capita GDP, with a positive expected sign, population (negative) and institutional quality. According to the results, the corresponding parameters of per capita income and institutional quality, though showing the expected sign, were not significant (Table 4, column a). Since this may be due to collinearity, the same equation was estimated by dropping one of these two

variables (columns b and c). In this case, both were significant and showed the expected signs. Therefore, openness rate was considered as an endogenous variable, selecting as instruments population and regional dummies for East Asia and Europe and Central Asia.

Table 4. Determinants of openness rate

Variable	(a) Value	(a) t-ratio	(b) Value	(b) t-ratio	(c) Value	(c) t-ratio
Constant	6,08	11.81	6.58	21.71	5.94	8.60
Per capita GDP	0.07	1.28			0.08	2.50
Institutional quality	0.03	0.33	0.14	2.82		
Population	-0,16	8,61	-0.15	7.70	-0.15	8.60
Eur. & Central Asia	0,28	3,62	0.28	4.03	0.28	3.78
East Asia	0,34	2,59	0.08	0.36	0.34	2.67
Adjusted R^2	0,45		0.36		0.43	
Nº Observations	158		178		159	
Endogenous	Institutional Quality 2006, per capita GDP 2004		Institutional Quality 2006		per capita GDP 2004	
Instruments	Institutional Quality 1998, per capita GDP 1990		Institutional Quality 1998		per capita GDP 1990	

(a) Per capita GDP is included. (b) Per capita GDP is excluded. (c) Institutional Quality is excluded.
Instrumental Variables. Robust Estimates

Education could also be an endogenous variable associated with institutional quality. Replicating previous procedures, it was considered to be dependant on per capita income and institutional quality. According to our estimates, while the former showed the expected sign and it was significant, the latter was not, and it showed a "negative" sign (table 5, column a). However, faced with possible collinearity problems, the equation was re-estimated by eliminating per capita income. In this case, institutional quality was significant and showed a positive sign. Given this ambiguity, we decided to investigate the determinants of institutional quality considering education both as an endogenous and an exogenous variable.

Table 5. Determinants of education

Variable	(a)		(b)	
	Value	t-ratio	Value	t-ratio
Constant	-2,94	3.81	1.65	38.26
Per capita GDP	0,53	6.06		
Institutional Quality	-0.15	1,55	0.45	11.51
Adjusted R^2	0,71		0.47	
Nº Observations	105		122	
Endogenous	Institutional Quality 2006, per capita GDP 2004		Institutional Quality 2006	
Instruments	Institutional Quality 1998, per capita GDP 1990		Institutional Quality 1998	

((a) Per capita GDP is included. (b) Per capita GDP is excluded.
Instrumental Variables. Robust Estimates

The rest of the variables taken into account, ethnic fragmentation, legal system, colonial origin, geographical location or natural resources were considered exogenous.

4.2   The estimated model. Results

The econometric analysis of institutional quality faces the problem stemming from an extensive list of potential explanatory factors and possible colinearity among some of them. Therefore, the variables were separated into two groups. On the one hand, those variables responding to "historical" features of countries, which are hardly malleable by government action. On the other hand, those variables directly related to the previously defined quality institutional criteria: efficiency (static and dynamic), predictability and legitimacy. Regarding the first group, the estimated equation would be as follows:

$$IQ = \alpha + \beta_1 Y + \beta_2 EF + \beta_3 LS + \beta_4 CO + \beta_5 GL + \beta_6 NR + Di, \qquad (1)$$

where, for each country, IQ stands for institutional quality; Y for development level; EF represents ethnic fragmentation; LS is the legal system tradition; CO stands for colonial origin; GL is geographic location; NR is natural resource endowment; and Di represents regional dummies. As previously indicated, we used the World Bank Governance Indicators average as a proxy for institutional quality. Development level was defined as (log) PPP per capita income; ethnic fragmentation has been approached by an indicator constructed by Alesina et al. (2003); legal system origin, through dummies; colonial

origin is taken from Laporta et al. (1999); geographic location is measured by countries distance to the tropics, and natural resources by the share of fuel in total exports.

Contrary to other studies, ethnic fragmentation, legal system origin and natural resource endowments were found not to be significant (Table 6). Although, this can partly be due to differences in the indicators and sample employed, it should be pointed out that the existing empirical evidence regarding these variables is not too conclusive. Parameters use to lose significance when estimations are controlled for per capita income. Secondly, colonial origin is only significant (at 90%) for former Spanish colonies. However, this result can cover up Latin America peculiarity concerning income distribution, which is a variable that crucially affects institutional quality, as it shall be seen later. Thirdly, a country's geographical location is the only factor within the so-called "historical" ones that is significant. Finally, Middle East and North Africa and Europe and Central Asia were the only regions showing institutional peculiarities (negative)[3].

Table 6. Determinants of institutional quality (I)		
Variable	Value	t- ratio
Constant	-4.58	9.43
per capita GDP	0.50	7.82
Ethnic fragmentation	0.01	1.12
Former British colonies	0.18	1.63
Former Spanish colonies	-0.22	1.65
Former French colonies	0.05	0.33
British legal system	-0.09	0.86
Geographic Location	1.43	3.52
Fuel	-0.11	0.64
Middle East & North. Afr.	-0.71	4.00
Europe & Central Asia	-0.59	4.35
Adjusted R^2	0.77	
Nº Observations	127	
Endogenous: Per capita GDP 2004. Instruments: pc GDP 1990		
Instrumental Variables. Robust Estimates. Exactly Identified Equation		

---

[3] It was tested to separate this region into Europe, on the one hand and Central Asia, on the other. Both dummies were negative and significant, albeit the latter showed a slightly higher absolute value. It also must be noted that for clear outliers were identified: Zimbawe and Algeria (a lower institutional quality than estimated) and Bostwana and Chile (higher). Yet, results do not change if these countries are removed from the sample.

The second estimated model directly responds to determinants related to the previously defined institutional quality criteria. In particular, the estimated equation is:

$$IQ = \alpha + \beta_1 Y + \beta_2 G + \beta_3 T + \beta_4 Ed + \beta_5 OR + Di \quad (2)$$

where IQ stands for institutional quality; Y for development level; G is income distribution, measured by the Gini index; T represents tax revenues as a percentage of GDP; Ed is education; OR is openness rate; and Di are regional dummies. All explanatory variables, except for dummies, were transformed into logs to soften potential collinearity problems. The equation was estimated by instrumental variables, using as proxies those detailed in the previous section. Regarding education, it was considered both an exogenous and an endogenous variable.

In the first case, the most relevant results are as follows (table 7, column a). Firstly, the equation estimated shows a relatively high R^2 (0.80), which implies that the variables chosen explain a large proportion of institutional quality differences across countries. Secondly, under and over-identification tests indicate that the instruments used are appropriate. The Kleibergen-Paap statistic is above the critical value of the corresponding $\chi 2$, while the J statistic falls under it. Thirdly, all variables show the expected sign and are significant, except openness rate. Finally, Middle East and North Africa and Europe and Central Asia were again the only regions to show institutional peculiarities (negative). Therefore, the results suggest that a higher development level leads to higher institutional quality. As the latter also promotes economic development, this implies that these two variables interact and may lead to vicious or virtuous circles of institutional quality and growth.

The Gini index significance implies that a more equitable income distribution improves a country institutional quality. Reversely, a context of high social inequality leads to bad institutions. As indicated above, Islam and Montenegro (2002) considered that the Gini index significance disappears after introducing dummies for Latin America and Sub-Saharan Africa. Our results do not confirm this result, although the two regions have reported significant dummies in the Gini index estimate. These dummies are used as instruments in the institutional quality estimation.

A sound tax system promotes institutional quality, since it provides the necessary public revenue to build good institutions, and it creates a more direct relationship between citizens and state. As stated above, it is a crucial variable, as confirmed by our estimates, that has not been addressed previously in the literature. Regarding education, it impacts positively on institutional quality. This is another important variable that has hardly been taken into account. Finally, openness is the only variable that, though showing the right sign, is not significant. This result differs partly from other empirical research findings. However, the evidence is not entirely conclusive once controlling for development.

If education is considered exogenous (table 7, column b), results are very similar, except that this variable and per capita income become significant at 90% instead of 95 %.

Table 7. Determinants of institutional quality (II)				
	(a)		(b)	
Variable	Value	t-ratio	Value	t-ratio
Constant	-2,63	1.70	-2.64	1.76
Per capita GDP	0.26	2.12	0.27	1.96
Gini Index	-0.75	2.40	-0.76	2.47
Taxes	0.73	2.76	0.72	2.83
Education	0,33	2.03	0,32	1.70
Openness rate	0.12	1,04	0.12	1,04
Middle East. & N. Afr.	-0.59	2.49	-0.59	2.49
Europe & Central Asia	-0.69	4.81	-0.69	4.73
Adjusted R^2	0,80		0.80	
Nº Observations	78		78	
Infra-identification test: statistic Kleibergen-Paap ($\chi2$ value (6))	14.88 (12.59)		14.00 (12.59)	
Statistic J ($\chi2$ value (5))		10.82 (11.07)	10.89 (11.07)	
Endogenous	Per capita GDP 2004, Gini Index, taxes and openness rate		Per capita GDP 2004, Gini Index, taxes, education and openness rate	
Instruments	Per capita GDP 1990, (Per capita GDP 1990)^2, fuel exports, ethnic fragmentation, population and regional dummies		Per capita GDP 1990, (Per capita GDP 1990)^2, fuel exports, education 1990, ethnic fragmentation, population and regional dummies	
(a) Education is considered as exogenous (b) Education is considered as enogenous Instrumental Variables. Robust Estimates				

In sum, empirical evidence suggests that institutional quality is determined by those variables more directly related to aforementioned four criteria. They are the criteria that define the quality of institutions. By contrast, "historical" origin factors either seem to have no effect or their influence is indirectly exerted. Thus, institutional quality seems to be uncorrelated with the legal system origin or with the colonial origin[4]. Ethnic fragmentation affects institutional quality, but through income distribution, while natural resource endowment does it through its negative impact on tax revenue. Something similar happens with regional dummies. Middle East and North Africa and Europe and Central Asia are the only two regions to show a peculiarity in their institutions (negative). This does not mean, however, that there are no other regional specificities. They are manifested through the determinants of institutional quality, income distribution in Latin America and Sub-Saharan Africa or low tax collection in South Asia.

5.   The impact of institutional quality determinants

It is possible to compute the impact of each institutional quality determinant by using the estimates of the previous section. Table 8 shows in the first two columns the real and estimated GIs average for different groups of countries classified according to their income level. As shown, estimated values are more accurate for high and low income countries. The other four columns and first four rows reflect the contribution of each explanatory variable to the IGs averages. They are calculated by multiplying the estimated parameters by the value of the correspondent variable[5]. After adding up the constant, the (non-significant) openness rate and regional dummies contributions, these values coincide with the estimated indicator. As shown, the contribution of each factor decreases as it does income level. This is not the case for the Gini index, since middle-income countries, particularly lower-middle income countries, show worse results than lower income countries.

---

[4] The colonial Spanish origin and geographical location were no longer significant if introduced into equation (2). In fact, the first of these variables seems to mask Latin American income distribution peculiarity, while the second seems to have an impact on per capita income. We also tested if religion, another institutional quality determinant proposed in the literature, had any explanatory power. Yet, we found no relationship whatsoever.
[5] All calculations have been made by using Table 7 estimates.

For all groups, education is the variable that has the lowest impact on institutional quality. In rich countries per capita income is the most relevant single factor, while for the rest, especially low income countries, is the Gini index. When analyzing the causes of institutional quality differences between developed and developing countries, interesting results emerge (last three rows of Table 8)[6]. In middle income countries, taxes are the variable with the largest contribution to this difference, followed by income, Gini index, and education. In low income countries, per capita GDP and taxes are also by far the most important variables, followed by education and finally income distribution.

Table 8. Weight of institutional quality determinants

Income Level	GI	GIe	Contribution to GIe			
			Pc GDP	Gini	Taxes	Education
High	1.34	1.34	2.70	-2.61	2.64	0.74
Upper Middle	0.17	0.28	2.44	-2.83	2.27	0.67
Lower Middle	-0.28	-0.38	2.25	-2.87	2.06	0.57
Low	-0.65	-0.65	1.98	-2.81	1.94	0.40
Contribution to differences with respect to high income countries (%)						
Upper Middle			22.05	18.31	31.73	6.21
Lower Middle			27.66	15.75	36.01	10.47
Low			36.18	9.69	35.34	17.54
GI- Governance Indicators average. GIe – Estimated average						

Income distribution is the most powerful explanatory variable in all regions if performing the same empirical exercise by geographical regions in developing countries. It is followed by per capita income in three regions (East Asia and Pacific, Latin America & Caribbean and South Asia) and taxes in the other three (table 9). Comparing institutional quality differences between rich and developing countries, per capita income turns out to be the most influential variable in only one region, Sub-Saharan Africa, where it is responsible of 36.8% of this difference, followed by taxes with 30.3%. The latter is the most important variable in three regions, East Asia and Pacific, Latin America & Caribbean and South Asia, explaining 47.3%, 39.7% and 45.6%, respectively, of the differences with high-income countries. For Europe and Central Asia and the Middle East and North Africa, the most relevant variable is their institutional particularity, captured by regional dummies. In the first case it explains 66.9% of that difference, while in the second it represents 35.5%.

---

[6] Total sum is under 100% because regional dummies and openness rate are not included.

Table 9. Weight of institutional quality determinants

Geographic Location	GI	GIe	Contribution to GIe					
			Pc GDP	Gini	Taxes	Education	ECA	MENA
EAP	-0.26	-0.37	2.25	-2.86	1.89	0.56		
ECA	0.30	0.30	2.46	-2.60	2.53	0.71	-0.69	
LAC	-0.21	-0.21	2.29	-2.96	2.03	0.58		
MENA	-0.33	-0.33	2.27	-2.73	2.31	0.55		-0.69
SA	-0.74	-0.68	2.04	-2.68	1.70	0.39		
SAf	-0.38	-0.36	2.07	-2.92	2.12	0.49		
Contribution to differences with respect to high income countries (%)								
AOP			28.17	15.45	47.35	11.51		
ECA			23.08	-1.58	11.30	2.94	66.93	
LAC			26.14	22.69	39.72	10.38		
MENA			25.96	6.84	20.37	11.64		35.54
SA			31.57	3.00	45.63	17.16		
SAf			36.82	18.00	30.37	15.04		

GI- Governance Indicators average. GIe – Estimated average

EAP (East Asia & Pacific), ECA (Europe & Central Asia), LAC (Latin America & Caribbean), MENA (Middle East & North Africa), SA (South Asia) and SAf (Sub-Saharan Africa)

Since the dependent variable is expressed in levels and the independent ones are in logs, the estimated parameters are not elasticities. In fact, elasticities are not constant, but depend (negatively) on each country institutional quality. That is, since.

$$dIQ = \beta_i \frac{dX_i}{X_i} \tag{3}$$

where Xi stands for variable i and βi represents its corresponding parameter, each variable elasticity is $\frac{\beta_i}{IQ}$. This value decreases as institutional quality rises. According to the parameters estimated, the highest elasticity is that of the Gini index for all income groups. It ranges from -0.42 in the poorest countries to -0.19 in the richest (Table 10). Closely to Gini elasticities are tax revenue elasticities, followed by those of education and finally per capita income.

Table 10. Elasticities of institutional quality determinants (I)

Income Level	pc GDP	Gini	Taxes	Education
High	0.070	-0.199	0.192	0.088
Upper Middle	0.100	-0.285	0.275	0.126
Lower Middle	0.127	-0.363	0.349	0.160
Low	0.151	-0.431	0.415	0.190

The elasticities' order is not altered by considering different regions: Gini, taxes, education and per capita GDP (Table 11). Regarding regions, the largest elasticities belong to South Asia and Middle East and North Africa, and the lowest by far to Europe and Central Asia. Since these elasticities vary across countries, measures aimed at improving institutional quality would have different impacts according to each country current institutional quality level.

Table 11. Elasticities of institutional quality determinants (II)				
Geographic Location	pc GDP	Gini I.	Taxes	Education
East Asia & Pacific	0.128	-0.363	0.350	0.161
Europe & Central Asia	0.066	-0.187	0.180	0.083
Latin America & Caribbean	0.093	-0.265	0.255	0.117
Middle East & North Africa	0.130	-0.371	0.357	0.164
South Asia	0.133	-0.379	0.365	0.167
Sub-Saharan Africa	0.114	-0.325	0.313	0.143

6.   Alternative institutional quality indicators

In order to analyze the robustness of the results found, the same estimation has been carried out. We have done it by using as dependent variable the six GIs components and four alternative institutional quality indicators. In the first case, taxes are always significant, although in one case at 90% probability. Per capita income is significant at least at 95% probability in five out of six indicators. The Gini index is significant in four of them. Education is only significant at 95% probability in one case and in two cases at 90%, but only if it is considered an exogenous variable (Table 12). Openness rate is never significant. Middle East and North Africa and Europe and Central Asia dummies are significant in four cases, though in two of them at 90% probability for the first region. It is important to point out that two specific indicators (Corruption and Government Effectiveness) show infra-identification problems at 95% probability, but not at 90%, while the Voice and Accountability estimation shows over-identification at 95%.

Table 12. Gobernance Indicators Components									
	(1)	(2)		(3)		(4)	(5)		(6)
Variable		(a)	(b)	(a)	(b)	(b)	(a)	(b)	
GDP per capita	0.32	0.38	0.41	0.37	0.41	0.32			0.41
	(**)	(***)	(***)	(***)	(***)	(**)			(***)
Gini	-0.92	-1.16	-1.13	-1.42	-1.40				-0.74
	(**)	(***)	(***)	(***)	(***)				(**)
Taxes	0.90	0.57	0.58	0.49	0.50	1.13	1.18	1.10	0.64
	(***)	(**)	(**)	(*)	(*)	(**)	(***)	(***)	(**)
Education		0.35		0.35			0,49	0,58	
		(*)		(*)			(***)	(***)	
Openness									
Middle East & N. Afr.	-0.50	-0.43	-0.43				-1.39	-1.39	-0.46
	(*)	(*)	(*)				(***)	(***)	(*)
Europe & Central Asia	-1.11	-0.80	-0.78	-0.96	-0.94				-0.31
	(***)	(***)	(***)	(***)	(***)				(**)
Adjusted R^2	0,76	0.79	0,77	0.77	0.77	0.38	0,70	0.72	0,67
N° Observations	72	79	88	79	79	120	84	84	100
Kleibergen-Paap statistic	12.58	12.58	12.58	15.47	15.45	18.44 [c]	22.09 [c]	21.14 [c]	15.74
($\chi 2$ (6) value)	(12.59)	(12.59)	(12.59)	(12.59)	(11.07)	(9.49)	(9.49)	(9.49)	(12.59)
J statistic ($\chi 2$ (5) value)	5.17	8.50	8.88	7.35	7.60	3.66 [d]	8.00 [d]	7.48 [d]	7.66
	(11.07)	(11.07)	(11.07)	(11.07)	(9.49)	(7.81)	(7.81)	(7.81)	(11.07)

(1) Corruption. (2) Government Effectiveness. (3) Rule of Law. (4) Political Stability. (5) Voice and Accountability. (6) Regulatory Quality.
(a) Education is considered exogenous (b) Education is considered endogenous. When education is not significant is removed from the estimations
(***),(**) and (*), **(***),(**) and (*), significant at 99%, 95% and 90% probability, respectively**
(c) 4 degrees of freedom (d) 3 degrees of freedom

As alternative institutional quality indicators, the Global Competitiveness Index (GCI) (component Institutions), the Objective Governance Indicators (OGI), the Corruption Perception Index (CPI) and the Doing Business Indicators (DBI) were employed. Both per capita income and Gini index are significant in all of them at least at 95%; taxes are significant in two (GCI and CPI); education is only significant in DBI, and only at 90% probability if it is considered exogenous; openness rate is never significant (Table 13). Europe and Central Asia dummy are significant in all estimations, and the Middle East and North Africa dummy in two (CPI and DBI). As previously, we did not find any other regional specificity.

Table 13. Determinants of institutional quality (alternative indicators)					
	GCI	OGI	CPI	DBI	
Variable				(a)	(b)
Per capita GDP	0.27 $^{(**)}$	0.35 $^{(***)}$	0.71 $^{(***)}$	-18.01 $^{(***)}$	-20.30 $^{(***)}$
Gini Index	-0.96 $^{(**)}$	-0.63 $^{(***)}$	-2.06 $^{(***)}$	57.80 $^{(**)}$	55.44 $^{(**)}$
Taxes	0.81 $^{(**)}$		2.62 $^{(***)}$		
Education				-19.02 $^{(**)}$	-14.43 $^{(*)}$
Openness rate					
Middle East & N. Afr.			-1.13 $^{(*)}$	37.42 $^{(**)}$	36.78 $^{(**)}$
Eur. & Central Asia	-0.79 $^{(***)}$	-0.53 $^{(***)}$	-1.85 $^{(***)}$	37.32 $^{(***)}$	35.71 $^{(***)}$
Adjusted R^2	0,58	0.61	0.66	0.61	0.61
Nº Observations	92	118	100	88	88
Kleibergen-Paap Statistic (χ^2 value(5))	15.37 $^{(c)}$ (12.59)	37.65 (11.07)	16.28 $^{(c)}$ (12.59)	26.00 (11.07)	29.28 (11.07)
J Statistic (v χ^2 value(4))	5.92 $^{(d)}$ (11.07)	4.98 (9.49)	5.70 $^{(d)}$ (11.07)	1.59 (9.49)	1.55 (9.49)

GCI: Global Competitiveness Index 2006 (Institutions). OGI: Objective Governance Indicators (2002). CPI: Corruption Perception Index 2006. DBI: Doing Business Indicators 2006 (rank)
(a) Education is considered exogenous (b) Educación is considered endogenous. When education is not significant is removed from the estimations
$^{(***)}$, $^{(**)}$ and $^{(*)}$, significant at 99%, 95% & 90% probability, respectively.
$^{(c)}$ 6 degrees of freedom. $^{(d)}$ 5 degrees of freedom.

In sum, per capita income, income distribution and tax revenue seem to be robust determinants of institutional quality. Education, by contrast, seems a less robust variable. Openness does not seem to contribute significantly to institutional quality. In addition, Europe and Central Asia and the Middle East and North Africa appear to be the only regions showing institutional particularities (negative).

Conclusions

In this paper, we have singled out the four characteristics that, in our opinion, define institutional quality: static efficiency, dynamic efficiency, credibility and predictability. Subsequently, we investigated the determinants of institutional quality. The determinants under analysis were separated into two groups. One the one hand, those variables responding to "historical" features of countries, which are hardly malleable by government action such as colonial origin, geographic location, or legal tradition. On the other hand, those factors directly related to the aforementioned quality institutional characteristics. Our empirical research suggests that the quality of institutions depends essentially on development level, income distribution, tax revenue and education. Development fosters good institutions, thus creating a virtuous circle between growth and institutional quality. In addition, high-quality institutions are expected to develop in equitable societies, with a strong fiscal contract an educated population. If these conditions are met, then it is possible to build efficient, credible and predictable institutions.

On the contrary, "historical" features either they do not seem to determine institutional quality or their effects are indirect, through the variables previously mentioned. Thus, according to our results, variables such as legal tradition or colonial origin do not have any impact on institutions. Variables, as ethnic fragmentation or natural resource endowment do, but their impact is indirect; the former by affecting income distribution, the latter by decreasing tax revenue.

In sum, our results suggest that the determinants leading to institutional quality are not out of the reach of governments. Although it is not an easy task, there is room for policies aimed at improving the quality of institutions.

References

Acemoglu, D., S. Johnson and J.A. Robinson (2001): "The colonial origins of comparative development: An empirical investigation", *American Economic Review*, vol 91, No. 5 (December), pp. 1369-401.

Acemoglu, D., S. Johnson and J.A. Robinson (2002): "Reversal of fortunes: Geography and institutions in the making of the modern world income distribution", *Quarterly Journal of Economics*, vol 117, No. 4 (November), pp. 1231-94.

Alesina, A., A.. Devleeschauwer, W. Easterly and S. Kurlat (2003): "Fractionalization", *Journal of Economic Growth*, vol. 8, No. 2, pp. 155-94

Alesina, A. and R. Perotti (1996): "Income distribution, political instability and investment", *European Economic Review*, vol. 40, No. 6, pp. 1203-1228.

Alesina, A. and D. Rodrik (1993): "Income distribution and economic growth: A simple theory and some empirical evidence", en *The political economy of business cycles and growth*, Alex Cukierman, Zvi Hercovitz and Leonardo Leiderman (eds.), MIT Press, Cambridge MA.

Alonso J. A. (2007) "Desigualdad, instituciones y progreso: un debate entre la historia y el presente". *Revista de la CEPAL* nº 93. pp. 53-84.

Aoki, M. (2001) *Towards a Comparative Institutional Analysis*, MIT Press, Cambridge.

Arndt, C. and C. Oman (2006): *Uses and Abuses of Governance Indicators.* OECD, Paris

Aron, J. (2000): "Growth and Institutions: A Review of the Evidence", The World Bank Research observer" 15 (1). 1203-1228.

Barro, R. J. and J. W. Lee (2000): "International Data on Educational Attainment: Updates and Implications". *CID Working Paper* No. 42, April

G. Bertocchi and F. Canova (2002): "Did colonization matter for growth? An empirical exploration into the historical causes of Africa´s underdevelopment", E*uropean Economic Review*, 46, 1851-71.

Chong, A. and L. Zanforlin (2000): "Law tradition and institutional quality: some empirical evidence", *Journal of International Development*, vol. 12 (8), pp. 1057-1068.

Easterly, W. (2001): "The Middle Class Consensus and Economic Development", *Journal of Economic Growth*, vol. 6 (4), pp. 317-335.

Easterly, W. and R. Levine (1997): "Africa's Growth Tragedy: Policies and Ethnic Divisions", *Quarterly Journal of Economics*, vol. 112 (4), pp. 1203-50.

Easterly, W. and R. Levine (2003): "Tropics, germs, and crops: how endowment influence economic development", *Journal of Monetary Economics*, 50 (1): 3-39.

Easterly, W., J. Ritzan and M. Woolcock (2006): "Social Cohesion, Institutions, and Growth", *Center for Global Development*, Working Paper 94.

Engerman, S. L. and K. L. Sokoloff (1997): "Factor endowments: institutions and differential paths of growth among new world economies. A view from economic historians of the United States," en S. Haber, *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico, 1800-1914*, Stanford, Stanford University Press.

Engerman, S.K. and K.L. Sokolof (2002): "Factor Endowments, Inequality, and Paths of Development Among the New World Economies", *NBER Working Paper,* No. 9259, Cambridge, Massachusetts, National Bureau of Economic Research.

Engerman, S.K. and K.L. Sokolof (2005): "Colonialism, Inequality, and Long-run Paths of Development", *NBER Working Paper,* No. 11057*,* Cambridge, Massachusetts, National Bureau of Economic Research.

Engerman, S.K. and K.L. Sokolof (2006): "Colonialism, inequality, and long-run paths of development", en A.V. Banerjee, R. Bénabou and D. Mookherjee (eds.), *Understanding Poverty*, Oxford, Oxford University Press.

Evans, P. and Rauch, P. (2000): "Bureaucratic Structure and Bureaucratic Performance in Less Developed Countries". *Journal of Public Economics* 75, 49–71.

Gallup, J.L., J. Sachs and A. Mellinger (1998): *Geography and Economic Development*, NBER Working Paper, No. 6849, Cambridge, Massachusetts, National Bureau of Economic Research.

Gómez Sabaini, J. C. (2005): "Evolución y situación tributaria actual en AL: Una serie de temas para la discusión". CEPAL

Greif (2006): *Institutions and the Path to Modern Economy*. Lessons from Medieval Trade, Cambridge, Cambridge University Press.

Hall, R.E. and Ch. I. Jones (1999): "Why do Some Countries Produce so Much More Output per Worker Than Others?" *Quarterly Journal of Economics*, vol 114, pp. 83-116

Islam, R. and C. Montenegro (2002): "What Determines the Quality of Institutions?" documento elaborado para el *World Development Report: Building Institutions for Markets*, Washington.

Kaufmann, D., A. Kraay and M. Mastruzzi (2006): *Governance Matters V: Aggregate and Individual Governance Indicators for 1996-2005*, The World Bank.

Knack, S. and O. Azfar. (2003): "Trade Intensity, Country Size and Corruption. *Economic Governnace* 4(1), 1–18

La Porta, R., F. López de Silanes, A. Shleifer and R. W. Vishny (1999): "The quality of government", *Journal of Law, Economics and Organization,* vol 15 (March), pp. 222-79.

Moore, M. (1998) "Death without Taxes: Democracy, State Capacity, and Aid Dependency in the Fourth World", en White G. and Robinson M. (eds.): *Towards a Democratic Developmental State*. Oxford University Press

North, D.C. (1993): "The new institutional economics and development", *WUSTL Economic Working Paper Achive*.

Reynolds, T. H. and A. A. Flores (1989): *Foreign Law: Current Sources of Codes and Basic Legislation in Jurisdictions of the World*. Rothman, Littleton, CO.

Rigobon, R. and D. Rodrik (2004): "Rule of Law, Democracy, Openness, and Income: Estimating the Interrelationships", *NBER Working Paper* n.º 10750.

Rodrik, D., A. Subramanian and F. Trebbi (2002): "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development", *IMF Working Paper* 02/189, Washington.

Rodrik, D. (2003): "What do We Learn from Country Narratives?" en D. Rodrik (ed), *In search of prosperity. Analytic narratives on economic growth*, Princeton, Princeton University Press.

Sachs, J. and A. Warner. (1997): "Sources of Slow Growth in African Economies," *Journal of African Economies*, Vol. 6, pp. 335-76.

Tilly, C. (1992): *Coercion, Capital and European States*, AD 990-1992. Oxford: Blackwell

Treisman, D. (2000): "The causes of corruption: A cross-national study". *Journal of Public Economics*

Appendix I. Data sources and description of variables

Institutional Quality: 2006 World Bank Governance Indicators average

Per capita Income: constant PPP per capita GDP. 2004 and 1990. Source: World Bank

Gini Index: Latest year available. Source: World Bank.

Education: Average years of school for the population aged over 25 years. Source: Barro and Lee (2000):

Taxes: The main source of homogeneous information on tax revenue is provided by the IMF through Government Finance Statistics, which, in turn, is used by the World Bank in World Development Indicators. However, both sources face two serious problems. On the one hand, the series are incomplete for many developing countries. On the other, data usually refer to central governments, which is inaccurate information in highly decentralized countries. Therefore, to overcome these problems several sources have been used. For Latin America, Gomez Sabaini (2005) has been employed, except for Venezuela, whose data corresponds to the World Bank. For the OECD countries, we used the data provided by this organization. For the rest of countries, two sources have been used. Firstly, the World Bank in countries for which data is available and reliable. The WB provides data from income tax excluding social security. Also, it provides separately data for the latter. Therefore, it has been proceeded to add them up. The University of Michigan World Tax Database is the second source used in countries for which the WB has no data (http://www.bus.umich.edu/OTPR/otpr/) or is not reliable. Data year is 2000. Yet, in some cases, data was not available for that year, and we selected the closest year available, with a maximum difference of three years.

Openness rate: exports plus imports as a percentage of GDP. 2004. Source: World Bank
Ethnic Fragmentation. Source: Alesina et al. (2003)

Population: 2004. Source: World Bank

Fuel: Percentage of fuel exports on total exports. 2004. Source: World Bank

Geographic location: Latitude in absolute value of each country's capital, divided by 90. Source: Central Intelligence Agency, The World Factbook 2007

Legal System: Origin of the legal system, English or French. Source: Reynolds and Flores (1989).

Colonial Origin: own elaboration based on Bertocchi and Canova (2002)