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Institutions, Corruption and Sustainable Development

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Abstract

This paper aims to analyze the relationship between institutional quality, corruption level, and economic development. The methodology makes use of cross-national data developed by the World Bank on perceived levels of corruption, institutional framework quality and economic development to test various hypotheses. The added value of this paper is thus to investigate the impact of both institutional framework quality and corruption on economic development. A significant addition to the literature is made by using genuine wealth growth per capita as a proxy for economic development, rather than GDP growth per capita (Ehrlich, Lui, 1999). One other original contribution is the application of the rarely used PLS (Partial Least Squares) structural equation modelling to evaluate the proposed scheme. This empirical research supports the 'sand in the wheel' school of thought in relation to the effects of corruption on economic development.

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1. Introduction

On one level, corruption appears to be at odds with the prospect of economic development (Mauro, 1995; Rose-Ackerman, 1999). However, some authors have perhaps controversially posited the opposite view. One pre-eminent supporter of the notion that corruption can have a positive effect on development was Leff (1964), who contended that where the institutional framework is not appropriate (in his case, where there are bureaucratic restrictions), corruption facilitates trade that would not occur without it. Various authors have responded to this assumption, with both theoretical and empirical studies. For example, Mauro (1995) was one of the first to demonstrate a significant negative correlation between corruption and private investment; in this way corruption reduces economic growth. Academic debate seems to be divided between supporters of the positive effect of corruption on economic development, who could be termed the "grease-in-the-wheel" school, and proponents of the negative effect, namely the "sand-in-the-wheel" school (Kaufman, Wei, 1999).
Rather than simply opposing either of these two schools of thought, it is important to understand the marginal effect of corruption on economic development, while considering at the same time the influence of governance (Méon, Sekkat, 2005). The aim of the present paper is to analyze the relationship between institutional quality (synonymous with governance herein), corruption level, and economic development. The present research uses cross-national data developed by the World Bank and related to perceived levels of corruption, institutional framework quality and economic development, in order to test the various hypotheses. One particular feature of this paper is thus to investigate the impact of both institutional framework quality and corruption on economic development. Furthermore, a significant addition to the literature is the use of genuine wealth growth per capita as a proxy for economic development, rather than GDP growth per capita (Ehrlich, Lui, 1999). The use of this measure is in line with increasing concerns related to sustainable development (Arrow et al., 2004; Dasgupta, 2001; Aidt, 2009, 2011). One other original contribution made here is the application of the rarely used PLS (Partial Least Squares) structural equation modeling to evaluate the proposed scheme. This empirical research supports the 'sand-in-the-wheel' perspective.

2. The grease- / sand-in-the-wheel analysis

Many economists have studied the relationship between corruption and economic development. As a matter of fact, the usual definition of corruption as *"sale of government property for private gain"* (Shleifer, Vishny, 1993) could lead to the intuitive conclusion that corruption has a negative influence on economic growth. When civil servants make decisions based purely on their own personal interests, their decisions are not likely to be of benefit to society. However, rather than there being general agreement on this matter, two opposing views have developed, which diverge on the question of whether or not corruption is harmful to an economy.

To use an expression first coined by Kaufman and Wei (1999), some scholars contend that corruption is "grease in the wheel of commerce". The view that corruption can be *"efficiency-enhancing"* is an old strand in the economic literature (Aidt, 2003). In the 1960s, Leff (1964)

provocatively stated that bureaucratic corruption helps economic development. To support this view, various authors have provided both theoretical arguments (Lui, 1985; Acemoglu, Verdier, 2000) and empirical evidence (Egger, Winner, 2005). Three main explanations have been given for the potential positive influence of corruption on economic development. First it has been suggested that bribes attract a better quality of civil servant. In a developing country where civil servants are poorly paid, bribes constitute a supplementary salary that makes it possible to recruit better civil servants (Leys, 1964). Civil servants of a higher 'caliber' can make better economic decisions and accelerate bureaucratic processes, helping to break down barriers to investment for entrepreneurs and hence leading to more economic development. Second, corruption could allow bureaucratic procedures to be speeded up. For example, Lui developed a model showing that corruption could shorten the length of time spent in queues (1985). Bribes could thus be an incentive for civil servants to accelerate an administrative system in which performance is generally poor (Lui, 1985). Corruption could also be necessary to bypass regulatory and bureaucratic constraints (Leff, 1964; Leys, 1965; Huntington, 1968). Finally, corruption could introduce an element of competition for government resources, and such competition could lead to government services being offered more efficiently than without it (Beck, Maher, 1986 ; Aidt, 2003). In general terms, the central argument of the grease-in-the-wheel view is that corruption allows economic agents to overcome bad policy, complicated regulations, or inefficient bureaucracy.

The opposite school of thought has argued that corruption limits economic development through the "sand-in-the-wheel" of economic development (Buchanan, Tullock, 1962; Ades, Di Tella, 1997; Rose-Ackerman, 1999). For example, Frie and Vishny described the "grabbing hand" of government consisting of a large number of substantially independent bureaucrats pursuing their own agendas, taking bribes, and causing economic decline (1997).

The arguments in favour of the sand-in-the-wheel view are that corruption implies the poor allocation of resources, an increase in economic restrictions or less investment, and therefore economic decline. On the one hand, the most important loss in economic growth linked to corruption is due to the inefficient allocation of resources (Svensson, 2005). Corruption, of course, distorts the decision-making processes of officials (Ministers or civil servants), who may be more likely to support investments associated with higher bribes than those associated with higher economic output. For example, a civil servant may select a project to build a highway that is unnecessary for a given region and not linked with any form of economic growth, just because (s)he will receive a larger bribe from some of the economic agents involved. In such situations, corruption results in the poor allocation of resources and therefore slower economic development. Tanzi and Davoodi showed that higher corruption is associated with higher public investment in less productive areas (1997), leading to economic decline.

On the other hand, the possibility of a bribe may be an incentive to create restrictions to economic development (Kurer, 1993). Such restrictions are not exogenous to the system but rather *"part of the built-in corrupt practices of a patron-client political system"* (Bardhan, 1997). A civil servant may create distortions in order to have an opportunity to extort a bribe (Myrdal, 1968).

Furthermore, corruption could imply less private investment, and therefore slower economic growth (Mauro, 1995). Mo (2001) found that corruption reduces the level of human capital and private investment. Corruption could be a barrier to investors, with less investment leading to slower economic growth. Murphy et al. (1993) pointed out that entrepreneurs may invest less in a country where bribery is rife. This argument is especially pertinent here, because entrepreneurs need investors to sustain their risky projects and are thus vulnerable targets for dishonest predators (Murphy et al. 1993). Similarly, a high level of corruption negatively affects foreign direct investment (Wei, 2000; Javorcik, Wei, 2009) and consequently also has a detrimental effect on economic development. Wei showed that economic agents accustomed to operating in transparent environments find it difficult to overcome the administrative complexities of corrupt environments, and may therefore avoid investing in highly corrupt countries (2006). Hines (1985) showed that US FDI (Foreign, Direct Investment) is mostly directed to less corrupt countries (1985).

Rather than opposing either of the two foregoing perspectives, Ehrlich and Lui (1999) questioned whether the relationship between corruption and growth is causal, or whether it is the result of a third factor. Indeed, an implicit hypothesis of the proponents of the grease-in-the-wheel view concerns the contingent circumstances of the relationship between corruption and economic growth. Leff (1964) argued that increased corruption leads to faster economic growth when regulation and bureaucratic restrictions exist. The grease-in-the-wheel view states that corruption is only beneficial when various aspects of governance are missing (Aidt, 2009). The 'grease- vs. sand-in-the-wheel' debate is therefore not just about the link between corruption and economic growth. Indeed, scholarly discussion should question whether corruption has a positive or negative influence on investment when the quality of the governance is poor (Méon, Sekkat, 2005; Aidt, 2009). Therefore, to test the hypotheses of grease vs. sand, it is necessary to examine the connections between the quality of governance, corruption and economic growth (Méon, Sekkat, 2005). Herein, governance and institutional framework are taken to be synonymous. Institutions are defined as *"the humanly defined constraints that structure political, economic and social interactions"* (North, 1991). The institutional environment or framework is then a set of relevant institutions. An example of the way in which institutions influence corruption is via regulation. A given country could have a low quality of institutional framework when it has ineffective administration or cumbersome bureaucracy. Mo (2001) showed that the impact of corruption on economic growth is insignificant when various control variables such as political rights are taken into account. Following this line of argument, Méon and Sekkat (2005) demonstrated that the marginal effect of corruption on economic growth is conditional on the quality of governance. The present argument is that a poorer institutional quality increases the level of corruption, which in turn has a negative influence on economic growth. Furthermore, the quality of the institutional framework also has a direct influence on economic development.

3. Model and Data

From the foregoing theoretical development, the model is:
Corruption = $\alpha' + \alpha'2$ Institutions $+ \mu'$

and Economic Development = α + α1 Corruption + α2 Institutions +μ
Where :
"Economic Development" is the growth of an economy (a discussion of this concept follows).
"Corruption" is the importance of perceived corruption in a country,
"Institutions" refer to the quality of the institutions in a country,
μ and μ' are error terms.

The hypotheses are then:
H1: the higher the quality of the institutional framework, the less corruption there is in a country,
H2: the higher the quality of the institutional framework, the higher the economic development in a country,
H3: the less corruption there is, the higher the economic development in a country.

To test these hypotheses, we used data from 4 different years: 1998, 2001, 2004 and 2007. The years were selected to cover a period of a decade, using cross-national data collected by the World Bank from various countries with low and high quality institutions. We used year dummies in our analyses. Because the year of observation had no effect on the results, we decided not to use the year dummies in the tables included here. Originally, the number of countries surveyed varied for the different years because there were some missing values for certain countries in different years. Various methods may be used as part of a structural equation modeling approach to deal with missing values. In the present study, any missing values were suppressed, yielding a total of 120 countries in the final sample, as listed in Table 1.

Many authors have researched the link between corruption and economic development, using GDP per capita to measure economic growth (Mauro, 1995; Ehrlich, Lui, 1999; Tanzi, Davoodi, 2001). However, as stated by Aidt (2009) *"economic development is about sustainable improvements in human welfare and GDP per capita is not a measure of this"*. Since the publication of the findings of the Brundtland Commission in 1987, various authors have highlighted the importance of sustainable development (Dasgupta, 2001; Hamilton, 2002; Arrow et al., 2003). Sustainable development has been defined as *"development that meets the needs of the present without compromising the ability of the future generations to meet their own needs"* (Arrow et al. 2004: 150). Hamilton stressed that indicators of sustainable development should include all forms of capital (not just produced capital) and used then the term "genuine" (1994). Measures of genuine savings are broader measures than net savings by taking into account the changes in natural resources base and environmental quality (Hamilton, Clemens, 1999). Genuine investment (or genuine savings in this article) is expressed in a simplistic way as the sum of the values of investments or disinvestments in each of capital assets (the value of each investment being the product of the change in the quantity of the asset times the shadow value or accounting price of that asset)(Arrow, et al. 2004). The World Bank (WB) publishes a measure of genuine investment (called the Adjusted Net Savings). According to the WB, "Adjusted net savings are derived from standard national accounting measures of gross national savings by making four types of adjustments. First, estimates of capital consumption of produced assets are deducted to obtain

net national savings. Then current expenditures on education are added to net domestic savings as an appropriate value of investments in human capital. Next, estimates of the depletion of a variety of natural resources are deducted to reflect the decline in asset values associated with their extraction and harvest. Finally, pollution damages are deducted. WB estimates health damages due to urban air pollution. As for global pollution damages, the estimates include damages from carbon dioxide emissions".

Critical appraisals of the genuine savings as an indicator of sustainable development could be found in Neumayer (1999 / 2010), Arrow et al. (2004) or Dietz et al. (2006).

A first weakness of this measure is to consider the population as constant. One can envisage a situation in which the genuine investment is positive, but if population is growing at an even faster rate, then per capita wealth will actually be decreasing (Dasgupta, 2001; Hamilton, 2002, Dietz, Neumayer, 2006). A second issue concerns the fact that a wide array of capital assets is missing in national accounts such as human capital and natural capital. Considering both weaknesses, Arrow (2003, 2004) has proposed to transform the estimation of genuine investment as a growth in genuine wealth per capita by dividing by the gross national income (GNI), multiplying by a wealth ration (0.2 for industrialized countries or 0.15 for developing and oil-rich countries) and after removing the population growth.

Following the indications of Arrow et al. (2004) and following the work of Aidt (2009, 2011), we thus measure genuine economic development: ED = (ANS x WR) - PG

Where ED is a measure of Economic Development calculated using:

- ANS, the growth in genuine wealth per capita = (Adjusted net savings, excluding particulate emission damage, % of GNI) (NY.ADJ.SVNX.GN.ZS),
- WR, the Wealth Ratio (0.2 for industrialized countries or 0.15 for developing and oil-rich countries),

and PG, Population Growth (in %) (SP.POP.GROW).

Another challenge for our research is to obtain reliable empirical measurements for corruption (Bardhan, 1997; Kaufman, 1998). Difficulties with empirical data have kept the subject of corruption out of economic research for some time (Ades, Di Tella, 1999). Many economists use indices that measure corruption by asking respondents to score a country according to the likelihood of civil servants being willing to accept bribes (Mauro, 1995; Aidt, 2009). Despite the weaknesses of such types of perception index, they are widely used. Herein, corruption is measured using the inverse of the control of corruption index developed by the World Bank (Kaufmann et al. 2005).

Various measures of the quality of the institutional framework have been proposed in the economic literature, including law enforcement quality (Becker, Stigler, 1974), central government quality (Schleifer, Vishny, 1993), regulation quality (Johnson, Kaufmann, Zoido-Lobaton, 1998) and political freedom (Méndez, Sepùlveda, 2006). We use the 'governance indicators' of the World Bank. Among these, the 'voice and accountability' indicator measures the extent to which a country's citizens can participate in the selection of their government, in addition to freedom of expression, freedom of association, and a free media. The 'political stability and absence of violence/terrorism' indicator measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means,

including domestic violence and terrorism. 'Government effectiveness' measures the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. 'Regulatory quality' is used to assess the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. The final governance indicator 'rule of law' evaluates the extent to which economic agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, the police, and the courts; this indicator also measures the likelihood of crime and violence. Due to their recognisable quality, these World Bank indicators are widely used in the economic literature on corruption. Aidt (2009) thus used various indicators such as the Voice and Accountability Index to evaluate the quality of institutions (2009); Méon and Sekkat used all of them (2005). In view of North's (1991) definition of institutions, it is clear that the concept of institutions encompasses various components including the "Rule of Law" or "Government effectiveness".

As a consequence, institutional quality is measured herein using a combination of the five governance indicators discussed above. Rather than using them separately, PLS structural equation modeling makes it possible to combine them into a single measure of the quality of the institutional framework. The quality of the Institutional framework is then considered as a latent variable, built from 5 different governance indicators. We divided our 120 countries into two subsamples using an average of the 5 governance indicators for each country for a given year. Countries with an average governance indicator of less than zero were classified as countries with poor quality institutions, while those with an average governance indicator above zero were classified as countries with high quality institutions.

4. Data analysis

To test the model, we use the Structural Equation Modelling technique known as PLS, or Partial Least Squares, which was first developed by Wold (1982, 1985). PLS is based on an iterative combination of principal component analysis and regression. Usually, structural equation modelling (SEM) is used to test complex theoretical models where many variables have various correlations (Hershberger et al. 2003 ; Tenenhaus et al., 2005). Models tested with SEM should be theoretical models. Thus in our case, we have built a model to be tested on a strong theoretical literature review. The aim of using PLS is to explain the variance of the constructs in the model (Chin, 1998; Tenenhaus, 2008; Barclay, Higgins, Thompson, 1995). PLS has rarely been previously employed in the economic literature to study corruption, and its use represents an important contribution of this paper. The use of PLS in this survey has numerous advantages (Chin, 1998; Marcoulides, Schumacker, 1996), one of which is its ability to test relationships among all the variables involved. It makes it possible to estimate the relationships between the exogenous and endogenous variables (Tenenhaus et al., 2005). The technique is most useful for explaining and predicting the endogenous latent variables (Ringle, Sarsted, Straub, 2012). Secondly, PLS requires no assumptions to be made regarding multivariate normality (Hulland, 1999). Thirdly, PLS may be used with relatively small samples (Chin, Newsted, 1999). However, over a certain threshold, Chin et al. (2003)

demonstrated that the increase of the sample size doesn't significantly modify the SEM's results (2003). Fourthly, SEM is especially effective in testing models that include latent constructs that are being measured with multiple indicators, such as the latent variable 'Institutions' is this paper. Instead of OLS, the PLS method has then been chosen since it allows to estimate a network of causal relationships, defined according to a theoretical model, linking variables including some latent complex concepts. For example, a latent complex concept is the quality of the institutions, a latent concept measured by 5 governance indicators. In this paper, the software XLSTAT version 2010 was used to perform the PLS analysis.

A PLS model must be analyzed in 2 stages. Firstly, the adequacy of the measures is assessed by paying attention to the reliability of the individual measures and the discriminant validity of the constructs (Hulland, 1999). The construct 'Institutions' is built using 5 indicators. PLS provides statistics to evaluate the reliability and validity of the constructs using various indicators. The reliability of each item is controlled by studying the loadings of the measures on their corresponding construct. Each item loading of scales measuring the construct 'Institutions' is greater than 0.663, the maximum being 0.969 (Carmines, Zeller, 1979; See Table 4). As shown in Table 5, the construct 'Institutions' has a Cronbach's alpha greater than the threshold of 0.77 suggested in the literature. Here, the minimum value of Cronbach's alpha is 0.818. Construct reliability is also evaluated using Dillon-Goldstein's rho. Here, rho is higher than 0.875 (See Table 5). This indicates a high degree of reliability of individual items. In addition, both an exploratory and a confirmatory factor analysis (EFA) were performed across the 5 items. The high level of convergent validity (well above 50%) confirms the validity of incorporating all 5 items into one measure of the quality of the institutions. Moreover, a discriminant validity test indicates that the latent dimension labeled "Institutions" shares more variance with its respective indicators than with the two other variables with which it is correlated. This proves that discriminant validity is achieved (Fornell, Larcker, 1981).

The next step is to evaluate the structural model. The model is evaluated on the basis of the strength of the indicator loadings, R^2 values and the significance of the structural path (Chin, 1998). In addition, permutation tests attest that for the 2 samples (countries with low or high quality institutions) the measurement variable loadings remain invariant, lending support to the overall stability and validity of the proposed model.
A particular emphasis is made in the evaluation of a structural model on the R^2. Indeed, the ability of the model to explain the endogenous variable is estimated by the coefficient of determination R^2. The R^2 shows the % of the variance explained by the model. It is important to give the R^2 for each dependent variable and also the % of contribution to the overall R^2 (Chin, 1998).
Furthermore, the evaluation of the model requires looking at the standardized regression coefficients (i.e., path coefficients). The path coefficients are the estimated values for path relationships in the structural model and should be evaluated in terms of sign, magnitude, and significance. The path coefficients can be interpreted as standardized beta coefficients of ordinary least squares regressions. Structural paths, whose sign is in keeping with a priori

postulated algebraic signs, provide a partial empirical validation of the theoretically assumed relationships between latent variables (Chin, 1998)(Tennenhaus, et al. 2005).
Furthermore, it is important to look at the predictive relevance of the structural equation model. Indeed, the predictive relevance of the model could be assessed using the Stone-Geisser's Q^2, known as the cross-validated redundancy index (Stone, 1974 ; Geisser, 1974 ; Tenenhaus et al., 2005). For the different samples (countries with low quality institutions, high quality institutions, and all countries), the Q^2 was always superior to 0 (See tables 6 and 7). This indicates the predictive relevance of the model (Stone, 1974 ; Geisser, 1974 ; Wold, 1982). In addition, a global criterion of goodness of fit (Gof) has been developed (Tennenhaus et al., 2005 ; Vinzi, 2010). The Gof index is a measure for the overall prediction performance of the model (equal to the geometric mean of the average communality index and the average R^2 value) (Vinzi et al., 2010). In our model, all the Gof indexes are superior to 0.713, which shows a very good prediction performance of our model (See table 7).

Cross-correlations of all variables used in this research are given in Tables 2 and 3 for the two samples of the analysis (countries with low and high quality institutions). The cross-correlation matrices provide support for the hypotheses. For all samples, the various measures of institutions are negatively and significantly correlated with the level of corruption. The various measures of the institutional framework are also significantly and positively correlated with economic development. Finally, the level of corruption is negatively and significantly correlated with economic development.

The results of the PLS analysis are shown in Tables 6 and 7. Regardless of the sample (countries with low or high quality institutions, or all countries), all the hypotheses are supported. The first hypothesis concerns the link between the quality of the institutions and the level of corruption. R^2 is very high, with a minimum of 0.543, which means that more than 50% of the variance of the variable 'Institutions' is explained by the variation of the variable 'Corruption'. The path coefficient is always negative ($p>.05$) and very high, with a minimum of -0.728. Hypothesis H1 is then supported. Thus, a higher quality of institutional framework implies a lower level of corruption. This negative correlation is higher for countries with high quality institutions than for countries with low quality institutions.

The second hypothesis relates to the influence of the institutional framework on the level of economic development. Hypothesis H2 is supported with a path coefficient of at least 0.175 ($p>.05$). A higher quality of institutional framework implies more economic development. It should be noted that the effect of the quality of institution on economic development is higher when the country has a low quality of institutions than when the country has a high quality of institutions.

The final hypothesis H3 concerns the link between corruption and economic development, and is supported. The path coefficient between the two variables is at least -0.146 ($p>.05$), and R^2 ranges from 0.102 to 0.249. In countries with low quality institutions, both the institutional quality and the corruption level explain nearly 25% of the variance of the economic development. The PLS approach also provides a contribution to the R^2 from all the variables in the model. In terms of contribution to R^2, the institutional framework and the influence of

corruption are similar to that of economic development. The contribution to R^2 is around 50% for the quality of the institutional framework (49.7% in countries with low quality institutions and 55.3% in countries with high quality institutions) and around 40% for corruption (46.9% in countries with low quality institutions and 38.7% in countries with high quality institutions). In countries with both lower and higher qualities of institutions, the quality of the institutions and the level of corruption influence economic development. However, the effect is higher in countries with low quality institutions. Improving the quality of institutions and reducing corruption have more effect on economic development in countries with lower quality institutions than in countries with higher quality ones. These results therefore support the sand-in-the-wheel perspective.

5. Conclusions

The question of the effect of corruption on economic growth is of considerable importance. Some authors have proposed a view of corruption as grease in the wheel of economic development (Leff, 1964; Huntington, 1968). Fraudulent behaviour such as corruption is then cynically seen to be of benefit to an economy. At the same time, theoretical and empirical papers have demonstrated the harmful effect of corruption on economic development. However, econometric results have not always been that robust, and have sometimes been contradictory. If some empirical studies have given opposite results, it is because the research has not considered an important element in studying the relationship between corruption and economic development, namely the institutional framework quality (Méon, Sekkat, 2005; Aidt, 2009). We contend that supporters of the grease-in-the-wheel view only consider the beneficial effect of corruption on economic development when institutions are of low quality, such as when regulation restricts trade. Following this view, the present paper has assessed the effect of both corruption and institutions on economic development. Using a PLS structural equation modeling method, our cross-national data lend support to the sand-in-the-wheel theory, in that both corruption and institutional framework quality negatively affect economic development. One key finding is that institutions affect development both directly and indirectly through their influence on corruption. One limitation of this paper is to consider all types of institutions altogether. Following the hierarchy of institutions hypothesis, a future research should look at the relationship between the various types of institutions (such as economic / political institutions), corruption and sustainable development (Acemoglu et al., 2005; Aidt, 2011, Flachaire et al. 2013). Furthermore, one interesting aspect of this paper is its support of this theory, using a measure of sustainable economic development. Indeed, taking advantage of research on sustainable development (Dasgupta, 2001; Hamilton, 2002; Arrow, Dasgupta, Mäler, 2003), and contrary to other research that uses GDP growth per capita (Mauro, 1995; Méon, Sekkat, 2005), this empirical research uses genuine wealth per capita as a measure of economic development. As claimed by Aidt, development involves sustainable improvements in human welfare, and the commonly used economic measure (GDP per capita) is not appropriate (2009); in the end all that matters is that the development is sustainable.

6. References

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Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bhutan, Bolivia, Botswana, Brazil, Bulgaria, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Congo Dem. Rep., Costa Rica, Côte d'Ivoire, Czech Republic, Denmark, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana Greece, Guatemala, Guinea, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Italy, Japan, Jordan, Kazakhstan, Kenya, South Korea, Kyrgyzstan, Laos, Latvia, Lebanon, Lithuania, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, Nicaragua, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Rwanda, Senegal, Seychelles, Sierra Leone, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Syria, Tajikistan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Zambia.

Table 1. List of the 120 countries.

Variables	Corruption	Voice	Pol	Gov	Reg	Rule	Economic Development
Corruption	**1.000**						
Voice	-0.394	**1.000**					
Pol	-0.414	0.308	**1.000**				
Gov	-0.758	0.517	0.372	**1.000**			
Reg	-0.533	0.644	0.295	0.744	**1.000**		
Rule	-0.810	0.470	0.486	0.807	0.630	**1.000**	
Economic Development	-0.451	0.331	0.197	0.485	0.411	0.433	**1.000**

Table 2. Cross-correlations between the variables for countries with low quality institutions. Number of observations = 284.

Variables	Corruption	Voice	Pol	Gov	Reg	Rule	Economic Development
Corruption	**1.000**						
Voice	-0.717	**1.000**					
Pol	-0.662	0.632	**1.000**				
Gov	-0.946	0.741	0.617	**1.000**			
Reg	-0.806	0.743	0.484	0.875	**1.000**		
Rule	-0.954	0.756	0.706	0.945	0.818	**1.000**	
Economic Development	-0.271	0.230	0.388	0.291	0.273	0.309	**1.000**

Table 3. Cross-correlations between the variables for countries with high quality institutions. Number of observations = 196.

Sample	**Countries with Low Quality Institutions**			**Countries with High Quality Institutions**		
Number of observations	284			196		
Variables	Mean	S.D.	Cross-loadings	Mean	S.D.	Cross-loadings
Corruption	0.699	0.407	1	-0.921	0.844	1
Voice and accountability	-0.693	0.570	0.724	0.907	0.552	0.843
Political stability and absence of violence	-0.725	0.718	0.663	0.706	0.458	0.724
Government effectiveness	-0.630	0.437	0.862	0.984	0.718	0.969
Regulatory quality	-0.564	0.535	0.829	0.922	0.613	0.902
Rule of law	-0.740	0.445	0.858	0.889	0.685	0.968
Economic Development	-1.084	2.950	1	1.405	1.469	1

Table 4. Description of the variables.

Construct	**Number of items**	**Cronbach's alpha**	**Rho of Dillon-Goldstein**
Counties with low quality institutions	5	0.818	0.875
Counties with high quality institutions	5	0.932	0.958
All countries	5	0.966	0.974

Table 5. Composite reliability of the variable "Institutions".

	Countries with Low Quality Institutions	Countries with High Quality Institutions	All Countries
R^2 =	0.543	0.887	0.890
Q^2 =	0.538	0.869	0.890
Path Coefficient β (between Institutions and Corruption (H1) =	-0.728	-0.944	-0.943
Contribution to R^2 =	98.5%	100%	99.9%

Table 6. Results of Partial Least Squares Analysis concerning the link between the quality of the institutions and the level of corruption. $P < 0.05$

	Countries with Low Quality Institutions	Countries with High Quality Institutions	All Countries
R^2 =	0.249	0.102	0.299
Q^2 =	0.241	0.083	0.295
Gof =	0.752	0.713	0.795
Path Coefficient β (between Corruption and Economic Development)(H2) =	0.267	0.175	0.288
Contribution to R^2 of the variable corruption =	49.7%	55.3%	53.7%
Path Coefficient β (between Institutions and Economic Development)(H3) =	-0.259	-0.146	-0.266
Contribution to R^2 of the variable institutions =	46.9%	38.7%	45.9%

Table 7. Results of Partial Least Squares Analysis concerning the link between the quality of the institutions, the level of corruption and the economic development. $P < 0.05$