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Abstract: In this paper we construct a theoretical framework linking governance practiced by some countries to some of their economical, financial, social and environmental variables. To achieve this goal, we selected a sample of data composed of variables from 55 countries, available at the World Bank website. On the other hand, we measured the countries' level of governance by the indicator promoted by Transparency International. The period considered in this research was 8 years, from 2000 to 2008. We used the method of linear regression with panel data, in order to investigate statistical relationships among governance and the other variables. We applied the method of simultaneous equations in order to make a robustness test on the first results and findings. The results of the two models converged and showed the existence of a statistical significant relationship between governance and several of the variables investigated. This allows us to infer that the development of the countries governance is closely linked with the long-term sustainable development.

Keywords: governance, sustainable development, linear regressions, structural equations

Introduction

Economic, financial, social, institutional and environmental development are the larger goals desired by any modern society. However, it is noticed that the links among the dimensions mentioned, take place in a very heterogeneous global macro environment. Governance practices can range from an ethical and responsible perspective to the opposite extreme.

In terms of sustainable development and long term trends, it is noticed that the agents involved in these relations-countries, institutions and organizations-are adopting more efficient and ethical attitudes and practices to achieve their long-term and strategic goals. Thus, we can relate the concept of governance in the countries, with the improvement of their economic, financial, institutional, social and environmental conditions.

In this context, we decided to investigate as the central question of our research whether for a heterogeneous group of countries their governance practices are related to some of their

relevant economic, financial, social and environmental indicators.

Thus, in Section 2 we develop a theoretical framework where we seek to conceptualize what we mean by governance, linking it to economic, financial, social and environmental indicators, in order to investigate possible relationships among these variables.

In Section 3 we develop the methodology that allowed us to link the governance indicators to the variables of sustainable development, so as to make possible the acquisition of knowledge about these possible relationships.

In Section 4 we present the results. In Section 5 we analyze the results and obtain our conclusions.

Theoretical Review

In our view, unethical conduct is the opening door for personal or organizational actions whose goal is to gain unfair advantages in view of the existing rules. This may lead to the degradation of the relations between individuals and organizations and possibly lead to corrupt conduct.

So we can understand that the corrupt acts stem from a state of degradation of values, judgments and behaviors that represent, albeit simplified, a way of thinking and acting of a part of society. In this sense, the exercise of trying to measure the levels of ethical conduct and corruption of a society presupposes the construction of a reductionist model that allows us to understand, at least in some depth, this complex phenomenon.

In a simplified manner, Transparency International created an index that enables the measurement of corruption levels throughout the world. To construct this index, research was done with executives gathered in events promoted by the World Economic Forum. These executives evaluate the governance practices of their own country. The results of these evaluations are compiled and presented on the Transparency International website.

According to the concepts of this organization, large-scale corruption in public projects is creating, all around the world, serious obstacles to sustainable development, resulting in a significant diversion and loss of public funds needed for education, health and social programs, both in emerging and in developed countries.

The index constructed by Transparency International ranges from 0 to 10 points, where the value 0 (zero) indicates the absence of governance practices and the value of ten (10) indicate the

highest level of such practices.

Thus, the corrupt act that was only seen as a moral hazard has become even more relevant because of the costs it imposes on several areas of the State (social, economic, institutional and policy). From that perspective, the ways to reduce the incidence of corruption cases can be: (1) to adopt legislation contrary to the practices of illicit persuasion; and (2) the implementation of good governance rules and codes of best compliance in the organizational structure of the countries.

Corruption perceived by this method of measurement involves the following dimensions: (1) the constituted authorities of the State and its audit systems; (2) payments of benefits or premiums for some classes of civil servants; and (3) the weakness of civil institutions and the existence of distorted relationships between the State and the private sector. So, it is possible to perceive that the problem of corruption only portrays a symptom of a mismatch of society in its development process.

Governance practices can have significant impact on the corruption problems, because they focus on four key concepts: (1) equitable treatment given to institutions, individuals, and organizations; (2) transparency of entrepreneurs, agents, and supervisory actions; (3) assumed responsibility for the tasks and achieving goals; and (4) compliance with laws, rules and forms of conduct accepted by society, according to La Porta, Lopez-de-Silanes, and Shleifer (1999).

Therefore, we see that many suggestions for reducing the level of corruption and for improving the ethical level of business, directly or indirectly involve concepts related to governance best practices. Thus, it is necessary to define the concept of countries' governance, and what impacts it can promote in sustainable and long term development of these societies.

According to Kaufmann (2005a), traditionally, over the past decades, the challenges associated with countries' governance practices and corruption have been linked to poorer countries, taking the richest countries as benchmarks. In general, the assessment criteria are linked to a legal framework and the quality of the performance of institutions, which are in most cases, institutions of a public nature. Still, we should note that there is no direct link between security problems and local governance with global problems or long-term trends related to sustainable development.

In this sense, Kaufmann (2005b) also showed that governance is a variable of great

complexity, which includes numerous perspectives, and allows a wide range of measurements and indicators.

With respect to the measurement of the countries' governance, Kaufmann, Kraay, and Mastruzzi (2005) expanded the concept of Kaufmann, Kraay, and Zoido-Lobaton (1999a & 1999b), regarding the definition of the components that should be measured and analyzed in order to construct a governance index. So, they list the following groups of issues to research and construct the indicator of governance in each country:

(1) Voice and accountability—include indicators that measure aspects of the political process, civil liberties and political rights. Thus, the authors intend to ascertain to what extent citizens participate in the selection of their rulers and exercise their citizenship;

(2) Political stability and absence of violence—this aspect inserts several indicators that demonstrate the possibilities to destabilized or to remove the local government from power by unconstitutional or violent actions which also can be relate to a possible civil war or terrorism;

(3) Implementation of governance (Government Effectiveness)—this group contains a range of questions about the quality of public services, the bureaucracy, the competence of the civil servant, the civil servant's independence in relation to political pressures, and his commitment to public service;

(4) Regulatory quality—this item contains assessments of the possibility of practices contrary to the proper functioning of the market such as: a. imposing price controls; b. poor supervision of the banking system; or c. the over-regulation, for example, in areas like foreign trade or financial institutions;

(5) Enforcement (Rule of Law)—in this item are included several indicators related to the credibility and trust in the laws. For this, we included indicators that measure the perceptions of the incidence of crime, efficiency and predictability of the judiciary, and the ease of enforcing contracts;

(6) Control of corruption—this group includes indicators that measure the perceived level of corruption defined as the exercise of public power to obtain private gain. Two principal indicators are used. The first indicator measures the frequency of additional payments (bribes or undue advantage) for the collection of overdue invoices, or contracts with significant impairment of the public purse. The second indicator allows the evaluation of the degree that the state is captured by

oligarchies, military, ethnic groups and corrupt politicians, for example.

According to Kaufmann, Kraay, and Mastruzzi (2006), the capture of the state also may be related to the creation of obstacles to reform and modernize the State, and its consequent adjustment to the current and dynamic scenario of the global economy that demands greater efficiency of the public economic agent. Moreover, the degrees of transparency and competitiveness, besides the structural formation of the state, determine the dividing line that separates the lobby actions from those of corruption.

In general, the elites capture the State through: (1) buying the votes of lawmakers in decisions related to their interests; (2) buying the decisions of the executive and the judiciary; (3) influencing the regulation of the financial and political process; and (4) through illegal financing of election campaigns.

Using the indicator mentioned before, and relating it to various indicators of several nations, Kaufmann, Kraay, and Mastruzzi (2002) concluded that there is not a link that joins the good governance practices to rich countries or bad practices to poor countries.

Likewise, they also observed that one can't say that obedience to legal standards is an appropriate way of measuring the quality of the governance practices of the country. Concerning this point, the authors mention that the countries' elite captures the states "to dictate the rules of the game" which gives to the facts apparently illegal, the appearance of manifestations of "legal acts of corruption" instead of "illegal acts of corruption".

Thus, based on empirical data generated from the survey research, generated from the views of executives from different countries and collected at events held by the World Economic Forum, Kaufmann et al. (2006) found that the perception of executives from rich countries highlights the deterioration of control levels of corruption issues involving the judiciary, and that the perception of executives in emerging countries is that there is an improvement in the control over these problems.

Soon, we realize that the global business environment pointed to an increase in the importance of some aspects like ethics, corruption and governance practices concerns. In this context, it is important to highlight that the process of globalization has promoted the emergence of a network of links between economic, political, institutional, social, cultural and environmental realities, with development variables, in many different countries.

Thus, there is no way to delete the aspects related to business ethics, governance mechanisms and forms of corruption, from the list of relevant and critical issues that are inserted in the process of globalization. Similarly, no one can refute that there is a strong conceptual relationship between these variables and the long-term sustainable development.

In this direction, Huther and Shah (2005) listed several empirical evidences of anti-corruption programs around the world including references to academic studies, shown in Table 1.

Wei (2005) observed that the inclusion of each of the questions mentioned may reasonably measure the countries' level of governance. However, he concludes that, in countries where corruption is not endemic, there is an improvement of the governance levels with the creation of anti-corruption programs. The opposite is also true in countries where corruption levels reached very high levels, and consequently, the corruption is endemic, and this situation compromised the entire business base.

Thus, Wei (2005) noted that successfully anti-corruption programs had a concern with the elimination of any small possibility of failures in control systems and governance. This conduct was put in practice in order to prevent failures that could be transformed in opportunities to obtain benefits or could become new mechanisms of corruption.

In relation to sustainable growth, and in accordance with the definition given by the Brundtland Commission report, in World Commission on Environment and Development of 1987, this is conceptually the growth that meets the needs of present generations without compromising the ability of future generations to meet future needs.

Table 1

Empirical Evidence and Academic Programs of Anti-Corruption in the World

Program	Evidences: Empirical and academic
Anti-corruption agencies	According to Segal (1999) and the publication of the World Bank (2000), experience with this type of institution were successful in Chile, Hong Kong, New Zealand, Austrália, and Singapore. However, according to Kaufmann (1997), developed countries do not see these agencies as an effective instrument to curb endemic corruption practices.
Public opinion polls	Increase awareness about issues related to corruption, especially in countries with endemic problems.
Increases in public sector salaries	Treisman (1999) and Swamy et al. (1999) found no significant statistic relationship between wage increases and lower corruption. Impacts were observed for small problems, however, without economic relevance.
Downsizing the public sector	Tanzi and Davoodi (1998) showed that the reduction of the size of the public sector is related to the diminishing of the corruption. However, privatization, in some countries (e.g., Russia), has increased the occurrence of corruption. The existence of efficient government controls is the main instrument for diminishing corruption.
Fiscal and financial accountability	Gurgur and Shah (2000) found an insignificant statistical relationship regarding this issue.
Media independence	Brunetti and Weder (1998) found that press freedom is negatively related to the level of corruption.

Independence of the judiciary	Gurgur and Shah (2000) found a significant statistical relationship between greater judicial independence and reduced corruption levels.
Citizen participation	Gurgur and Shah (2000) found a significant statistical relationship between increasing citizen participation in society and low levels of corruption.
Decentralization of power	Gurgur and Shah (2000) also found a significant statistical relationship between greater decentralization of power and falling levels of corruption.
Kind of bureaucratic culture	Gurgur and Shah (2000) also found that there is a significant statistical relationship between the type of command, the existing controls, and the level of corruption. Thus, greater decentralization and more efficient controls lead to low levels of corruption.

Notes. Hutler and Shah (2005). Anti-corruption policies and programs: A framework for evaluation.

As DETR (1999) has done, we can extend the relationship between governance and sustainable development for a long-term trend. To Detr (1999), only sustainable development can promote the finding of a higher quality of life at the moment and in the future.

Regarding the CO₂ emissions, the Kyoto Protocol, signed in 1997 by 39 countries, established that emissions of carbon dioxide, methane, nitrous oxide, hydro-fluorocarbons, per-fluorocarbons and sulfur hexafluoride were to be controlled. Since then, the secondary market of carbon has grown very much, and a great number of countries joined the Protocol. Thus, we believe that we could insert into our research, the concept developed by Bengochea-Morancho, Higon-Tamarit, and Martinez-Zarzosa (2001), that the CO₂ emissions are related to the growth of the gross domestic product of countries. We observed that the CO₂ emission is negatively related to economic growth. So, as this growth is related to the level of country's governance, we assume that the level of governance should be negatively correlated with CO₂ emissions.

The other indicator used to measure the improvement of the life quality, in each country, was the growth of energy consumption per capita. Furthermore, we include the number of users, as a proxy to measure the number of electric consumers in society. This last variable was used to control the relationship among energy consumption per capita and the governance indicator.

With respect to social development, we take digital inclusion represented by the number of internet users and life expectancy as proxies to measure the social development in the period studied.

With respect to economic development, we include GDP growth and income per capita, which are directly related to the growth of wealth of the nation and its citizens, as variables that represent the countries' development. We also included the gross capital formation with regard to the potential infrastructure that the society has, to serve as a support for future projects, and to implement sustainable economic growth.

The volume of foreign trade, the inflation rate, and the market value of publicly traded companies represent, respectively, relevant indicators of the countries' insertion in the world trade, the control and adjustment of public accounts, and the capacity of the private sector to grow in each country, according to Dornbusch and Fischer (1991).

Thus, in this article we try to associate the governance variables, to some proxies of sustainable development. Then, we elaborate the hypotheses to be tested in this research:

H1: We believe that there is a negative relationship between higher countries' levels of governance and indicators of better environmental behavior, explained by low CO₂ emissions. The expectation of the authors is that the existence of better management structures and better institutions can be associated with the ability to develop better processes of production and can be aligned with best standards of sustainable development.

H2: There should be a positive relationship between higher levels of governance and better social indicators evidenced by the number of internet users, higher energy consumption and greater life expectancy. The authors considered that fairer and more equitable societies, besides the existence of tighter controls and more efficient state management, must be associated with higher life expectancies and greater access to energy consumption. Likewise, governance should also be positively related to greater access to information through the internet.

H3: There should be a positive relationship between higher levels of governance and better economic and financial indicators of the countries. Better governance, better performance, lower risks and higher asset values of publicly traded companies are associated. Likewise, the authors believe that such associations should be present in relationships involving countries' governance indicators.

Methodology

Our research is of an exploratory nature. We seek to understand the relationship between the countries' levels of governance, and the economic, social and environmental variables of these nations. Therefore, initially, we collected the secondary data from the sites of the World Bank and Transparency International for our empirical investigations. The research period ranges from 2000 to 2008.

The universe is composed of 228 countries. We included a set of 55 countries in the sample investigated. Countries and the data, in the year of 2005, of the variables used in the

survey, are shown in Table 2.

To construct this sample, we selected the countries that have available more than 70% of the data surveyed in the years under investigation. Aiming to verify whether there are relationships between countries' levels of governance and the economic, social and environmental variables of these countries, we used the method of linear regressions with panel data, shown below:

$$CPI = \beta_0 + \beta_1 * CO_2 + \beta_2 * eletpowcons + \beta_3 * enerusers + \beta_4 * gcf + \beta_5 * lg (gdpgrowth) + \beta_6 * lg (gnipcphp) + \beta_7 * inf + \beta_8 * intusers + \beta_9 * lifeexp + \beta_{10} * markcap + \beta_{11} * merchtrade + \xi \quad (1)$$

where, *CPI* = Level of governance of each country;

β_0 = Linear coefficient of the linear regression;

β_i = Coefficients of the variables, where $1 \leq i \leq 11$;

CO2 = CO2 emissions (tons. per capita);

eletpowcons = Electric power consumption (KWh per capita);

eneruse = Use of energy (Kg of oil per capita);

gcf = Gross capital formation (billions of dollars);

gdpgrowth = Annual internal product growth(%);

gnipcphp = Income per capita (parity purchase power—US dollars per year);

inf = Annual inflation rate(%);

intusers = Internet users (percentage);

lifeexp = Life expectancy (measured in years);

markcap = Market value of public companies traded in stock exchanges (billions of US dollars);

merchtrade = Merchandise trades (billions of US dollars);

ξ = Error term of the equation.

Table 2

Countries of the Sample and the Values of 2005 of Their Economic, Financial, Social and Environmental Data

	<i>CO2</i>	<i>eletpowcons</i>	<i>eneruse</i>	<i>gcf</i>	<i>gdpgrowth</i>	<i>gnipcphp</i>	<i>inf</i>	<i>intusers</i>	<i>lifeexp</i>	<i>markcap</i>	<i>merchtrade</i>
Angola	1	135	586	9	21	2,610	34	1	46	-	106
Argentina	4	2,418	9	9	4	1,900	18	75	34	38	1
Australia	18	1,1265	5,920	26	3	29,680	4	62	81	119	34
Austria	9	7,886	4,135	21	2	32,760	2	55	79	41	83
Belgium	10	8,510	5,889	20	2	31,310	3	58	79	77	174

Brazil	2	2,016	1,164	17	3	7,880	7	21	72	54	22
Canada	17	17,314	8,469	21	3	32,140	3	68	80	131	60
Chile	4	3,074	1,813	20	6	10,360	8	22	78	115	63
China	4	1,783	1,319	43	10	3,590	31	4	9	73	35
Colombia	1	934	667	20	6	6,460	6	11	72	32	29
Czech Republic	12	6,342	4,418	28	6	18,220	0	32	76	31	124
Denmark	9	6,665	3,636	20	2	32,470	3	77	78	69	62
Egypt	2	1,235	794	17	4	4,080	6	12	70	89	39
Ecuador	2	714	789	23	6	5,860	7	7	75	9	55
USA	20	13,701	7,861	3	3	39,880	3	70	78	137	21
Finland	10	16,120	6,554	19	3	30,110	0	73	79	107	64
France	6	7,945	4,537	20	2	29,440	2	43	80	82	45
Georgia	1	1,672	714	32	10	3,130	8	6	71	6	52
Germany	10	7,113	4,187	17	1	30,110	1	65	79	44	63
Greece	9	5,242	2,794	25	4	23,810	3	22	79	59	29
Hong Kong	6	5,878	2,653	22	7	33,000	0	52	82	390	333
Hungary	6	3,771	2,757	26	4	15,400	2	37	73	30	118
India	1	476	492	32	9	1,990	4	4	64	68	30
Indonesia	2	512	799	24	6	2,620	14	4	70	28	57
Ireland	11	6,234	3,456	25	6	31,170	2	38	79	57	88
Iceland	7	27,987	12,179	23	7	32,390	3	85	81	171	50
Israel	9	6,568	2,953	18	5	22,850	1	24	80	89	67
Italy	8	5,669	3,120	21	1	27,250	2	34	81	45	43
Japan	10	8,201	4,061	23	2	29,590	-1	67	82	104	24
Malaysia	7	3,177	2,546	23	5	10,440	5	49	74	131	185
Morocco	2	630	430	29	3	3,270	1	15	70	46	54
Mexico	4	1,968	1,699	25	3	11,480	4	19	74	28	53
Mozambique	0	444	408	19	8	600	9	1	48	-	64
Netherlands	11	6,988	4,827	2	2	34,080	2	79	79	93	121
Nigeria	1	127	744	-	5	1,450	20	4	47	17	63
Norway	13	25,083	6,109	20	3	42,320	9	80	80	63	53
New Zealand	7	9,679	3,966	25	3	22,710	2	62	80	40	44
Pakistan	1	455	484	17	8	2,060	7	7	66	42	38
Paraguay	1	848	671	21	3	3,660	8	6	71	3	72
Peru	1	831	490	18	7	5,500	3	17	72	45	38
Poland	8	3,437	2,420	20	4	12,590	3	35	75	31	63
Portugal	6	4,663	2,506	23	1	18,870	3	32	78	36	54
United Kingdom	9	6,252	3,698	17	2	32,160	2	66	79	134	39
Russia	11	5,785	4,550	21	6	10,510	19	15	65	72	48
South Africa	0	900	4,735	18	3	7,780	5	8	52	233	47
South Korea	10	7,804	4,370	30	4	21,690	1	71	78	85	65
Spain	8	6,147	3,268	28	4	25,610	4	44	80	85	43
Sweden	6	15,440	5,714	16	3	32,000	1	82	81	110	66
Switzerland	6	8,305	3,474	21	3	37,320	0	68	81	252	69

Notes. The data are collected from World Bank and Transparency International Websites.

We use the software E-views, version 5.0, to apply the method of linear regressions.

A robustness test of the results was made by running the method of structural equations,

using the software AMOS, version 17.0. We constructed the equations based on the idea that the country's level of governance can have an endogenous relationship with all the other variables of the research. The schematic summary of the equations is shown below:

$$CPI = f\left(\begin{matrix} CO_2, eletpowcons, enerusers, gcf, lggdpgrowth, lggnipcphp, inf, intusers, \\ lifeexp, markcap, merchtrade \end{matrix}\right) \quad (2)$$

where, $CO_2 = f(CPI)$;

$$eletpowcons = f(CPI);$$

$$gcf = f(CPI);$$

$$enerusers = f(CPI);$$

$$lggdpgrowth = f(CPI);$$

$$lggnipcphp = f(CPI);$$

$$inf = f(CPI);$$

$$intusers = f(CPI);$$

$$lifeexp = f(CPI);$$

$$markcap = f(CPI);$$

$$merchtrade = f(CPI);$$

Results

To utilize the linear regression using ordinary least squares, we first need to apply normality and heteroscedasticity tests. We employed the Jarque-Bera (J-B) test to check the normality of the variables. Only the variables for internal product growth and per capita income needed to be transformed. The logarithmic function was used to transform them. We used as confirmation tests of normality the Lilefors, Cramer-von-Mises, Watson, Anderson-Darling and Maximum Likelihood tests.

Subsequently we ran the equality test of variances, using the Bartlet, Levene and Brown-Forsythe methods. After constructing the panel data, with all the necessary adjusts, we applied the method of linear regression using the OLS. Table 3 shows the results of normality and homoscedasticity tests.

Table 3

Results of J-B Normality and Homoscedasticity Tests

	Average	J-B	Bartlet	Levene	Brown-Forsythe
<i>CPI*</i> (<i>n</i> = 486)	5.4198	42.9871 (0.0000)	29.8393 (0.0000)	11.7717 (0.0000)	10.1098 (0.0000)

<i>CO₂</i> (357)	6.2325	38.6954 (0.0000)	N.A.	12.9702 (0.0000)	6.9702 (0.0000)
<i>lifeexp</i> (n = 442)	71.7149	2166.614 (0.0000)	228.0713 (0.0000)	36.0632 (0.0000)	33.8545 (0.0000)
<i>intusers</i> (n = 472)	31.7911	41.9760 (0.0000)	11.6868 (0.0198)	3.3275 (0.0106)	3.0253 (0.0176)
<i>eletpowcons</i> (485)	5,532.7010	968.7987 (0.0000)	7.9021 (0.0481)	7.8477 (0.0000)	5.7297 (0.0000)
<i>enerusers</i> (n = 411)	2,969.8613	227.8709 (0.0000)	11.9275 (0.0076)	10.2207 (0.0000)	11.7402 (0.0000)
<i>gcf</i> (n = 456)	22.2713	232.5915 (0.0000)	28.6040 (0.0000)	9.6094 (0.0000)	6.5059 (0.0000)
<i>lgdpgrowth</i> (n = 477)	0.57519	6.1962 (0.0451)	35.1094 (0.0000)	6.8157 (0.0000)	6.1925 (0.0004)
<i>lggnipcopp</i> (n = 485)	4.0353	42.2967 (0.0000)	101.9964 (0.0000)	33.6972 (0.0000)	20.0150 (0.0000)
<i>inf</i> (n = 482)	8.1511	130.7413 (0.0000)	39.2343 (0.0000)	3.9016 (0.0090)	2.0345 (0.1082)
<i>markcap**</i> (n = 455)	71.2462	2,999.119 (0.0000)	4.8850 (0.0869)	3.0894 (0.0464)	2.7151 (0.0672)
<i>merchtrade</i> (n = 486)	65.4856	3,304.807 (0.0000)	23.1126 (0.0000)	11.2616 (0.0000)	8.0419 (0.0000)

Note. Data were presented with their p-values. The symbols * and ** identify which tests of homoscedasticity were performed with fewer degrees of freedom, respectively 5 and 2 degrees.

In Table 3, we can observe the results of J-B normality and homoscedasticity tests mentioned above.

After the adjustments, we tested whether there is evidence of multicollinearity among the variables of the sample, through the VIF test. The results of all variables, in all models, were less than 2.0, indicating the absence of multicollinearity for the data investigated. Therefore, after performing all the aforementioned tests, we applied the method of linear regression and we obtained the results presented in Table 4.

Subsequently we conducted residuals tests of normality and homoscedasticity. The results are shown in Table 5.

Table 4
Results of Linear Regression With Panel Data

Dependent variable	Results of linear regression
<i>CO₂</i>	- 0.0489* (0.0551)
<i>intusers</i>	0.0232**** (0.0000)
<i>lifeexp</i>	-0.0178 (0.1073)
<i>eletpowcons</i>	0.0001**** (0.0000)
<i>enerusers</i>	- 0.0001 (0.1681)
<i>gcf</i>	- 0.0305* (0.0970)
<i>lgdpgrowth</i>	- 0.6238** (0.0443)

<i>lgnipcPPP</i>	3.1690**** (0.0000)
<i>inf</i>	- 0.0431**** (0.0004)
<i>markcap</i>	0.0054**** (0.0001)
<i>merchtrade</i>	- 0.0022 (0.1781)
C	- 5.9000**** (0.0000)
Numbers of observations	275
R^2	0.8210
R^2 adjusted	0.8236
Dw	2.0743
Log likelihood	-408.3868

Note. Results of linear regression with panel data with their respective p-values. The symbols *, **, ***, **** indicate, respectively, values statistical significant at 10%, 5%, 1% and 0.1%.

Table 5

Results of Residuals Tests of Normality and Homoscedasticity

Residuals tests	Normality (J-B)	Homocedasticity (Bartlet)	Homocedasticity (Levene)	Homocedasticity (Brown-Forsythe)
Dependent variable (<i>CPI</i>)	4.6000 (0.1002)	17.1606 (0.0007)	5.7606 (0.0008)	5.7001 (0.0008)

Notes. Results of linear regression with panel data with their respective p-values in parentheses.

We used the Wald test to check the existence of *nil* values for the coefficients. The hypothesis was rejected at a significance level of 0.01%.

We performed a robustness test of the results obtained. We applied the method of structural equations to confirm the previous results. The model shows reasonably acceptable due to three reasons: (1) the statistical significance of the general adjusted statistic; (2) the mean square error of approximation is close to the benchmark of 0.10; and (3) these measures reported are statistically significant. The results are presented in Table 6.

Table 6

Results of a Robustness Test

Model of structural equations	Factors	Co variances (p-values)
<i>CPI-gcp</i>	- 0.047	- 0.494 (0.101)
<i>CPI-gnipcPPP</i>	0.702	17,752.700**** (0.000)
<i>CPI-inf</i>	- 0.083	- 3.492* (0.003)
<i>CPI-eletpowcons</i>	0.183	2,034.486**** (0.000)
<i>CPI-CO₂</i>	- 0.045	- 0.396 (0.158)
<i>CPI-merchtrade</i>	- 0.045	- 4.184 (0.103)
<i>CPI-markcap</i>	0.168	22.736**** (0.000)

<i>CPI-lifeexp</i>	0.062	1.604** (0.033)
<i>CPI-intusers</i>	0.270	13.497**** (0.000)
<i>CPI-enerusers</i>	0.043	194.289 (0.148)
<i>CMIN</i>	2,910.24 (0.000)	
<i>RMSEA</i>	0.324 (0.000)	
df	56	
Number of observations	486	

Notes. Results of linear regression with panel data with their respective p-values in parentheses. The symbols *, **, ***, **** indicate values statistically significant at 10%, 5%, 1% and 0.1% respectively.

Analysis of the Results and Conclusions

Initially it is important to report that the income per capita was, in average, \$17,811.19 per year, and the average GDP growth in the investigated sample was 3.76% per year. The governance index average within the period investigated, was 5.42 and ranged from 5.33 to 5.51. It increased in almost all the period, and the value of 2008 was 5.47. So, the data show the possibility to improve the good practices of governance in the countries throughout the world.

Analyzing the results of the relationships found with the method of the linear regressions with panel data, we conclude that higher levels of governance are associated with lower CO₂ emissions, larger number of Internet users, higher electricity consumption, higher income per capita, lower rates of inflation and higher market value of companies listed in stock exchanges, as we initially expected.

We also found that higher levels of governance are associated with smaller internal product growth rates. Concerning this finding, we can draw an analogy with the fact that larger companies have better financial conditions and can expend resources in order to improve their governance practices. However, they are less capable to generate higher rates of return on equity, because of the large volume of funds they manage. Thus, countries with higher internal products tend to have lower growth rates than countries with smaller internal products. The potential of emerging countries and the existence of great deficiencies in meeting the needs of their populations should be the main reason for this phenomenon.

Another important observation was that, in the period investigated, higher levels of governance were associated with decreasing amounts of gross fixed capital, which may be linked to the consumption growth in developed countries that resulted in the recent economic and financial crisis that we face.

Thus, we believe that growth in the level of governance, which we can say that is a secure and increasing tendency in the period analyzed, should be accompanied by a reduction in CO₂ emissions; an increase in internet usage and the consequent access to information and knowledge. There is a need to increase the number of projects with lower emissions of polluting gases, and countries should pay attention to the development of secondary markets for securities linked to CO₂ emissions. We know that countries have growing needs in increasing their energy supplies. Since it is unlikely that there will be observed an increase in the supply of fossil fuels in the future, even at very high prices, we will need to exploit alternative energy sources as a solution to this growing demand.

We also observed that higher levels of governance were associated with lower annual inflation rates and higher market values of companies listed in the stock exchange. This indicates that the improvement of governance practices can make a big difference in some countries, in order to generate and add value for their citizens and investors.

The test with the method of structural equations used by the fact that this research has the characteristic of an exploratory research, confirmed the results found with the method of linear regression.

Another relevant association occurred between better governance and greater life expectancy. With lower statistical significance we also observed the negative relationship amongst better governance and low CO₂ emissions.

We consider that the trend for improvement in governance levels seems to be increasing and consistent, and that there is clear evidence that this growth is closely associated with the concepts of sustainable development. So, we associate the growth of governance levels with the diminishing of CO₂ emissions, the increasing in clean energy supply, the increased dispersion of knowledge and better management of the economy and the finances of nations. Thus, we would expect that this trend will be a road of no return.

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