GOVERNMENT EFFECTIVENESS, EDUCATION, ECONOMIC DEVELOPMENT AND WELL-BEING: ANALYSIS OF EUROPEAN COUNTRIES IN COMPARISON WITH THE UNITED STATES AND CANADA, 2000-2007

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Abstract

In this article we present an econometric analysis of the relationship between several indicators of economic development and wellbeing in Europe, the United States and Canada. We calculate a compound index of several indicators based on three groups: 1) Life satisfaction and income per capita, 2) governance indicators based on World Bank, including Voice and Accounting Index and Government Effectiveness Index, and 3) Educational indicators, including public education expenditure per capita and average total years of schooling, The most outstanding countries in the overall index are Norway, Denmark, Sweden, the United States, Austria, Ireland, Switzerland, Canada, Finland, Netherlands, and the United Kingdom. The three groups of indicators are highly correlated in several ways, due to the important positive effects of education on economic development and governance effectiveness, as well as to the positive effects of the "Voice and Accounting" index on "Governance Effectiveness", and the importance of the latter for economic development, as it is shown in the estimated econometric models. In section 2 we present an interesting summary of main factors of economic development, based on the several selected econometric models applied to international comparisons.

Keywords: Governance, Education, Social Capital, Economic Development, Well-being Indexes, European Union, United States, Canada.

JEL: A13, C5, H11, I2, J24, O51, O52, O57

1. Introduction

The many positive relationships that usually exist between social and economic development makes difficult to understand sometimes the order of causality. Both sense of causality and order of causality are important features to have into account in this regard. After the pioneering studies of the 1960s and 1970s regarding the important positive role of education in economic development, the interest for other indicators related with social development has been increasing and fruitful. Here we present a short reference to some of the main indexes that have been developed and used in econometric modeling.

Sharpe(1999) presents a survey of indicators, including the five indexes that provide historically consistent estimates of trends in Canada and three cross-national indexes: 1) The Human Development Index (HDI) of the United Nations Development Program. 2) the Quality of Life Index (QOL) developed by Ed Dienes of the University of Illionois. 3) The Index of Social Progress (ISP) developed by Richard Estes of the University of Pennsylvania. Bjornskow, C. (2006) presents an interesting analysis of the impact of Social Trust on economic development, for the years 2003-2004 with a sample based in the World Values Survey, Danish Social Capital Project and Latin Barometer.

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Johnson(2008) and Teorell, Holmberg and Rothstern(2008) present and analyze a set of international sources of Quality of Government indicators, including bureaucratic quality, electoral systems among others. Kaufmann, Kraay and Mastruzzi(2008) present detailed definitions, data sources, data evolution and analysis of the following aggregate governance indicators, published by the WB(2008) in the World Governance Indicators (WGI): 1) Voice and Accountability. 2) Political Stability and Absence of Violence. 3). Government Effectiveness. 4). Regulatory Quality. 5). Rule of Law (which in our view should be more precisely defined as "Rule of Fair Law"). 6). Control of Corruption.

We have selected Voice and Government Effectiveness for this analysis of the relationships between Social Capital and Education and their effects con economic development.

In section 2 we present a general analysis of the main causal relationships explaining economic development, accordingly to the experience of some selected studies of applied econometrics research related with socio economic development, with special reference to the role of human capital, social capital and physical capital, among other variables. Section 3 presents data and social indicators of European and Eurasian countries in comparison with the United States and Canada. Section 4 presents the estimation of several equations which are interesting to show the positive relationships that usually hold among the selected variables. Finally section 5 presents the main conclusions.

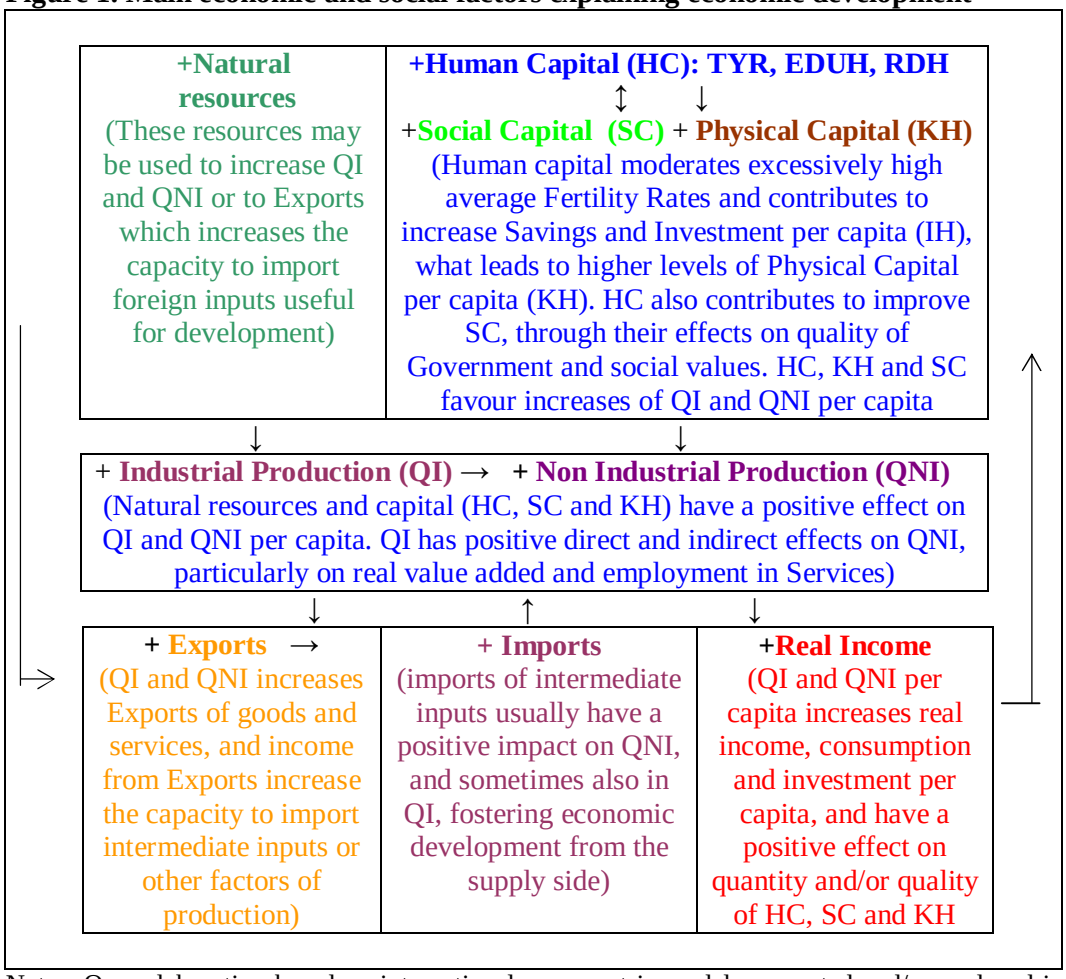
2. The role of Human Capital and Social Capital on Economic Development.

Figure 1 presents some of the most outstanding factors that explain the increase of real income per capita from the supply side, accordingly to the results of many relevant econometric studies applied to international comparisons. Of course there are other interesting effects of the demand side, which usually do not present problems for efficient economic policies when supply evolves positively.

As seen in Guisan and Neira(2006), an in other studies there cited, there are many positive direct and indirect effects of education and other factors related with human capital, on economic development. There we explain some reasons because the positive effects not always appear clearly in the results of production function estimations. One of the reasons is that the effects of human capital are usually transmitted to the production per inhabitant through the increase of physical capital per capita (KPH).

As seen in Guisan, Aguayo and Exposito(2001a,b) international differences in the average rate of growth of Gross Domestic Product per head, during the 20th century where due not only to higher rates of growth of real GDP but also to lower rates of Population growth. Those studies show the important effect of education on the moderation of excessively high rates of population growth for countries with total years of education below 8 years of schooling per adult. Countries with more than 8 years of schooling per adult are usually richer than countries below that level and that sometimes imply a moderate positive income effect on the fertility rates although within moderate levels. In international comparisons we have found little effects of religion in this regard, being education the most important factor for moderation of average fertility rates.

Figure 1. Main economic and social factors explaining economic development



Notes: Own elaboration based on international econometric models presented and/or analyzed in Guisan(1980), Guisan, Aguayo and Exposito(2001), Guisan(2006) and (2007) and Guisan and Neira(2006), and other sources. Human capital (HC) in the first row includes educational and research indicators: TYR is total years of schooling, EDUH and RDH are, respectively, Education and Research expenditure per head.

The moderation of average fertility rates of usually favor the increase in Savings and Investment per inhabitant and that increases physical capital per head (KH), which will lead to increases in industrial and non industrial production per capita. Besides human capital through expenditure on research and development per capita (RDH) has also positive effects on the quality of physical capital and production.

There are positive bidirectional relationships between human capital and social capital, as more educated population usually has more means to increase voice in public affairs and improves Government efficiency. Social values, trust and many other factors which improve social capital and wellbeing not always get the high values that they deserve in educated societies. That may happen sometimes due to some obstacles emerging for political or economic pressures from powerful groups not interested in the development

of those values. In any case highly educated societies usually show better results in those indicators than less educated ones.

We can notice the importance of industry and foreign trade to increase the development of services and other non industrial sectors, with positive effects, both directly and indirectly, as seen in Guisan(2006) and (2007) and other studies. Domestic industry provides intermediate inputs, machinery and other goods, with positive and direct effects in the development of non industrial production. Besides industrial production has indirect positive effects on economic development because it increases Exports and thus the capacity to Import. That is generally positive for development as Imports of intermediate inputs have an average positive impact on production, particularly in non-industrial sectors. Inter-sector relationships are thus very important to explain economic development although unfortunately few macroeconomic studies emphasize this relevant question and very often policy makers do not have it into account.

The important effects of production supply on Real Income per capita also implies positive effects from the demand side with increases in real consumption and investment. Finally increase in Real Income per capita favors further improvements on human, social and physical capital with additional positive effects on economic development.

Other factors may have great influence on economic development, as those which contribute to increase Imports, besides Exports of goods and services, such as net remittances from abroad, foreign investment and credit from abroad. Of course the quality of economic policies developed by public institutions is of great importance, not only when it affects directly to demand and supply, as for example through the fiscal policy, but also when regulations affect the behavior of financial institutions and other economic sectors. Social Capital includes both Government quality and social values.

3. Social capital and human capital in Europe in comparison with USA and Canada

Table 1 shows the values of the following indexes of socio-economic wellbeing in European countries in comparison with the United States and Canada. We include in the analysis not only Western, Central and Eastern European countries, but also some Eurasian countries which belong to the Council of Europe.

I1= average of the shares of Life Satisfaction and GDP per capita.

I2= average of the shares of Gov1 and Gov2.

I3= average of the shares of Eduh00 and Tyr99

I4 =compound index given by the average of the three indexes

Table 1 also includes PH05PP which is the value of Gross Domestic Product (GDP) per inhabitant in year 2005 expressed in dollars at 2005 prices and Purchasing Power Parities, and EDUH00 which is expenditure on public education per capita in year 2000. The last column includes the percentage of people in each country which agrees with the statement that the country has a good level of Social Trust. In this table countries are ordered accordingly to their ranking positions of the compound index I4, out of 132 countries analyzed in Guisan(2008a) and (2008b). Norway, Denmark, Sweden, the

United States, Austria, Ireland, Switzerland, Canada, Finland and the Netherlands were the ten most outstanding countries of the World in this regard.

Table 1. Economic Development, human capital and social capital

Country	ph05pp	eduh00	I1	I2	I3	I4	Rank I4	Trust
Norway	35956	2104	2.55	1.77	3.73	2.6830	1	63.9
Denmark	30163	2311	2.31	1.80	3.84	2.6493	2	60.1
Sweden	27784	2082	2.14	1.75	3.66	2.5160	3	62.3
USA	37437	1627	2.63	1.58	3.15	2.4526	4	42.1
Austria	30109	1702	2.27	1.66	2.95	2.2938	5	32.8
Ireland	36621	1371	2.60	1.65	2.54	2.2653	6	41.2
Switzerland	30729	1351	2.34	1.80	2.64	2.2580	7	42.1
Canada	29415	1425	2.22	1.69	2.82	2.2447	8	46.9
Finland	27947	1454	2.15	1.73	2.75	2.2068	9	56.4
Netherlands	29452	1353	2.21	1.71	2.54	2.1520	10	53.9
UK	28628	1403	2.13	1.67	2.61	2.1382	11	36.9
France	26941	1336	2.00	1.55	2.44	1.9977	15	23.3
Germany	26216	1075	2.01	1.65	2.23	1.9649	16	36.1
Belgium	28798	830	2.16	1.64	1.83	1.8758	18	31.4
Italy	25956	1102	1.97	1.32	2.02	1.7733	20	31.4
Spain	23368	880	1.84	1.44	1.76	1.6825	21	33.6
Slovenia	19940	924	1.62	1.46	1.91	1.6696	22	18.2
Portugal	18000	1004	1.48	1.46	1.71	1.5526	24	15.7
Czech R.	19067	584	1.56	1.42	1.45	1.4832	26	27.5
Greece	21101	530	1.66	1.32	1.42	1.4685	27	23.7
Hungary	16177	614	1.34	1.39	1.55	1.4328	29	25.9
Estonia	14515	521	1.20	1.48	1.29	1.3283	30	23.9
Poland	12505	484	1.17	1.26	1.48	1.3080	31	23.7
Slovakia	14722	432	1.24	1.38	1.20	1.2782	32	21.9
Lithuania	12864	483	1.08	1.37	1.20	1.2237	36	25.9
Latvia	12192	402	1.05	1.31	1.14	1.1703	37	20.3
Croatia	11779	427	1.13	1.23	1.13	1.1658	38	21.0
Bulgaria	7866	200	0.78	1.17	0.85	0.9407	49	28.6
Romania	8236	167	0.88	1.10	0.79	0.9279	50	14.9
Macedonia	6392	297	0.75	0.99	0.90	0.8893	53	10.9
Russia	9747	251	0.88	0.73	0.99	0.8733	55	28.4
Turkey	7540	193	0.85	1.03	0.66	0.8512	58	10.4
Ukraine	6086	181	0.63	0.88	0.80	0.7748	65	29.1
Albania	4757	105	0.64	0.95	0.61	0.7381	70	25.7
Georgia	2842	80	0.50	0.95	0.64	0.7004	77	18.7
Armenia	4484	63	0.55	0.83	0.62	0.6743	84	24.7
Azerbaijan	5016	104	0.68	0.65	0.65	0.6658	86	20.5
Moldova	1707	92	0.39	0.77	0.64	0.6053	92	18.4

Source. Column 1 WB(2008). For columns 2 to 7 own elaboration based on international sources included in the references. For column 8 the source data is Bjornskow(2006) based on World Values Survey and other sources for 2002-2003. Note: 36 Countries members of Council of Europe (including Europe and Eurasia) and comparison with the United States and Canada.

In the Annex 1 we include table A1 with countries ordered alphabetically. Other outstanding countries, analyzed in Guisan(2008a,b) but not included in this table, are Australia, New Zealand, Israel and the Chinese territory of Hong-Kong, with top positions numbers 12, 13, 14 and 17 respectively, out of 132 countries.

Social Trust is an important indicator of social well-being and it is highly and positively correlated with the other indicators, as seen in table 3. Regarding Social Trust, Canada and the USA has a value higher than 40 while the values of this variable in the six most populated EU countries are below: UK 36.9, Germany 36.1, Spain 33.6, Italy 31.4, Poland 23.7 and France 23.3.

Table 2 shows the evolution of two indicators of Government quality for 2000-2007 in the six most populated EU countries in comparison with the USA and Canada, while graph 1 shows the evolution of the average of both indicators in each country.

Table 2. Government quality indicators in USA, Canada and six EU countries, 2000-2007

	Country	Gov1x 00	Gov1x 07	Gov2x 00	Gov2x 07	Average 2000	Average 2007	Dif1	Dif2
1	Canada	8.14	7.72	8.84	8.84	8.49	8.28	-0.42	0.00
2	France	7.24	7.54	8.24	7.60	7.74	7.57	0.30	-0.64
3	Germany	7.74	7.80	8.86	8.36	8.30	8.08	0.06	-0.50
4	Italy	6.98	7.24	6.80	5.66	6.89	6.45	0.26	-1.14
5	Poland	7.08	6.62	6.24	5.76	6.66	6.19	-0.46	-0.48
6	Spain	7.52	7.10	8.44	7.00	7.98	7.05	-0.42	-1.44
7	United Kingdom	7.72	7.76	8.80	8.54	8.26	8.15	0.04	-0.26
8	USA	7.74	7.18	8.82	8.24	8.28	7.71	-0.56	-0.58

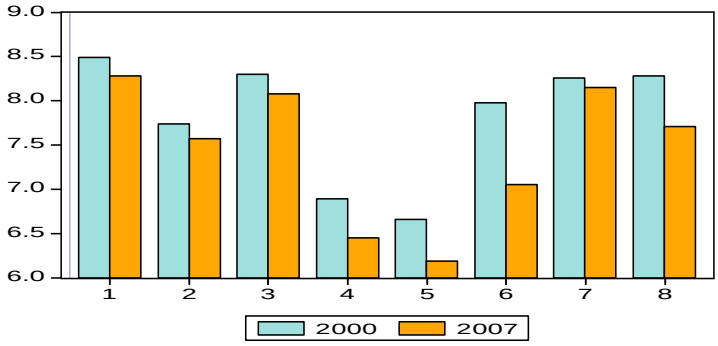
Note: Own elaboration from table A2 of the Annex and the sources there cited. Average 2000 and 2007 is the average of indicators Gov1x (Voice of Citizens) and Gov2x (Government Effectiveness) in each year. The range of those indicators is from 0 to 10. Dif1 and Dif2 indicate the increases of each indicator for the period 2000-2007.

Graph 1 shows that Canada, Germany, the United Kingdom and the USA present the highest values in both years, and Italy and Poland the lowest ones.

Unfortunately, diminutions of average quality of Government, for the period 2000-2007, may be noticed in the eight countries, particularly in Spain, Italy, Poland and the USA. In our view it is surprising the relatively high value of Gov1x in Spain in year 2000 in comparison with France.

An analysis of the evolution of France an Spain for the period 1996-2007 shows an upward trend in Voice of Citizens for the period 1996-2004 in both countries, and a downward evolution for the period 2004-2007. In some years France has reached values of this indicator higher than Spain but not in year 2000. We expected higher values for France having into account that the French electoral system is, at least theoretically, more open to the Voice of Citizens than the Spanish one. We analyze this question in Annex 3.

Graph 1. Government Quality, average of Gov1x and Gov2x
in Canada, France, Germany, Italy, Poland, Spain, UK and USA



Note: Elaborated from data of table 2.

Tables 3 and 4 show positive correlations between several pairs of socio-economic indicators, with the sample of 38 countries and with a larger sample of 132 countries. In table 3 we may notice highly coefficients of correlation between each pair of variables. Social trust is highly correlated with education because education leads to improve social trust, through the positive effect that it usually has on the quality of Government and Public Administration, as well as in social values.

Table 3. Correlation among variables in the sample of 38 countries of table 1

	PH05PP	EDUH00	I1	I2	I3	I4	TRUST
PH05PP	1.0000	0.9107	0.9980	0.9032	0.9212	0.9726	0.7420
EDUH00	0.9107	1.0000	0.9158	0.8661	0.9943	0.9734	0.8301
I1	0.9980	0.9158	1.0000	0.9104	0.9253	0.9765	0.7416
I2	0.9032	0.8661	0.9104	1.0000	0.8725	0.9338	0.6889
I3	0.9212	0.9943	0.9253	0.8725	1.0000	0.9807	0.8508
I4	0.9726	0.9734	0.9765	0.9338	0.9807	1.0000	0.8085
TRUST	0.7420	0.8301	0.7416	0.6889	0.8508	0.8085	1.0000

In table 4 we find that Life satisfaction has a high correlation with Government Effectiveness, Education expenditure and GDP per head. GDP per capita shows very high correlation with EDUH00 and with Government Effectiveness. Government Effectiveness and Voice of Citizens are also highly correlated.

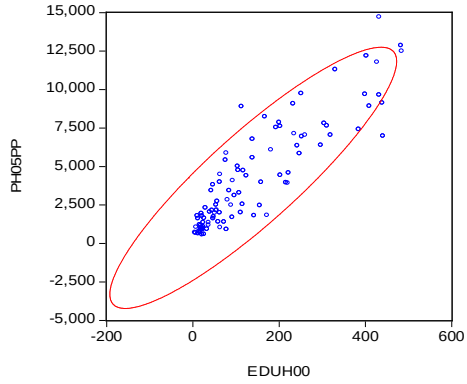
Table 4. correlation among social indicators in the large sample of 132 countries

	LIFE SWL2	GDPH	EDUH00	TYR99	VOICE	GOV.EFFECT.
LIFE SWL2	1.00	0.63	0.64	0.54	0.55	0.65
GDPH	0.63	1.00	0.93	0.84	0.72	0.89
EDUH00	0.64	0.93	1.00	0.78	0.69	0.84
TYR99	0.54	0.84	0.78	1.00	0.66	0.82
GOV. VOICE	0.55	0.72	0.69	0.66	1.00	0.81
GOV. EFFECT.	0.65	0.89	0.84	0.82	0.81	1.00

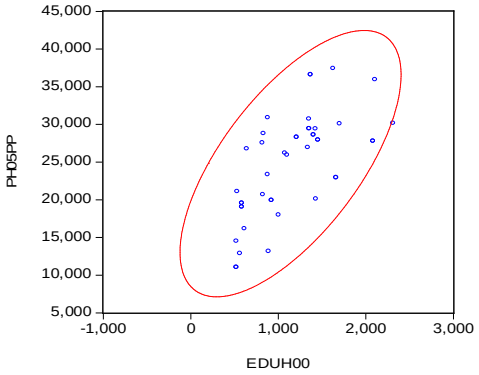
Source: Elaboration by Guisan(2008 a,b) based on several statistical sources. Notes: SWL2= Satisfaction with Life Index, GDPH: Gross Domestic Product per head, EDUH00 = Expenditure on Public Education per head, TYR99 = average total years of schooling of population over 15 years in year 1999, Voice of citizens and Gov Effectiveness published by Kaufman et al (2008).

Graphs 2 to 4 show several positive relationship between Education (Eduh00 or Tyr00x), Social Capital (Gov1x and Gov2x) and real Gross Domestic Product per capita (Ph05pp, in dollars at 2000 prices and PPPs), in the large sample of 132 countries. Data of Gov1x (Voice) and Gov2x (Government Effectiveness) correspond to year 2007, calculated rescaling the WB(2008) values as indicated in table A2 of the Annex.

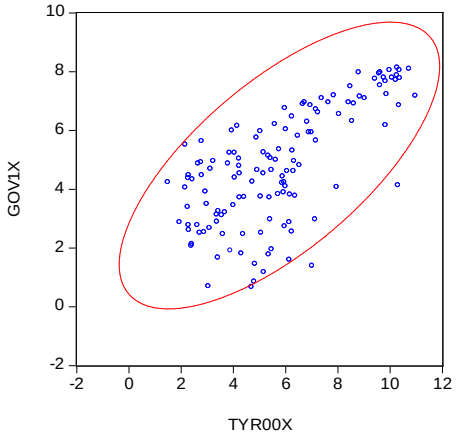
Graph 2 a. GDP pc and Educational Indicators. Countries with EDUH00 below 600 $



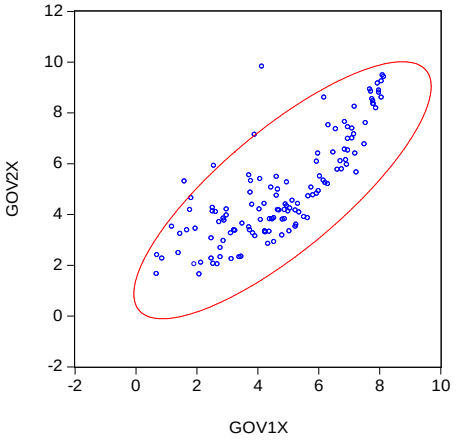
Graph 2b.GDP pc and Educational Indicators. Countries with EDUH00 over 600$



Graph3. Gov1x and Education (Tyr)



Graph 4. Gov2x amd Gov1x



4. Econometric models with the sample of Europe, Eurasia, USA and Canada

Here we present some selected equations which show many interesting relationships among human capital, government quality and economic development with the sample of 38 countries of table 1. Other interesting relationships are included in the Annex. The terms between parentheses are the t-student statistics.

Equation 1a relates GDP per capita in year 2005 with its lagged value in year 2000 and with Government Effectiveness. There are many other factors of development related with the included explanatory variables. Equation 2a shows positive and significant effects on Government Effectiveness provided by the following explanatory variables: lagged value of the dependent variable, increase in Gov1 (Voice), educational level of population and economic development (increase of GDP per inhabitant). Equation 3a

relates the indicator of Voice of Citizens (Gov1x) in year 2007 with its lagged value in year 2000 and with the increase in Government Effectiveness for the period 2000-2007. It seems to be some feedback between both indicators of quality of Government, although perhaps with some lags as we expect to analyze in future research. Equation 4a relates Social Trust with Eduh and the average of the two indicators of quality of Government.

$$Ph05pp = 0.8947\ Ph00pp + 583.0086\ Gov2x00 \qquad (1a)$$
$$(23.17) \qquad (5.34)$$
Adj. $R^2 = 0.9837$ S.E. = 1364 Mean of dep. Variable 18764

$$Gov2x07 = 0.7893 Gov2x00 + 0.4050 D(Gov1x) + 0.1432 Tyr00x + 0.1022 D(Ph) \qquad (2a)$$
$$(8.75) \qquad (2.11) \qquad (1.87) \qquad (1.78)$$
Adj $R^2 = 0.9327$ S.E. 0.4968 Mean of dependent variable = 6.68

$$Gov1x07 = 1.0023\ Gov1xx + 0.2678\ D(Gov2x) \qquad (3a)$$
$$(101.74) \qquad (2.29)$$
Adj. $R^2 = 0.9251$ S.E.= 0.4083 Mean of dep. Variable = 6.59

$$Trust = 12.1581\ (Eduh00/1000) + 3.0488\ (Gov1x00+Gov2x00)/2 \qquad (4a)$$
$$(3.83) \qquad (6.28)$$
Adj. $R^2 = 0.6168$ S.E. = 8.70 Mean of dep. Variable 30.85

5. Conclusions

Norway, Denmark, Sweden, the United States, Austria, Ireland, Switzerland, Canada, Finland and the Netherlands are the ten most outstanding countries of the World regarding index I4 of economic development and wellbeing. The 6 most populated EU countries show values of quality of government lower and social capital below those of the USA and Canada. We have noticed that the indicators of quality of Government have declined in the six countries of table 2 during the period 2000-2007, although the mean of the 38 countries of table A2 increase slightly in the same period. From the econometric regressions we conclude that the existence of real channels to favor Voice of Citizens is of great importance to improve Government Effectiveness and that Government Effectiveness foster development.

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Annex 1. Data of 38 countries ordered alphabetically

A1. Ph, Eduh, Trust, Tyr, and I1 to I4: Countries ordered alphabetically

	Country	ph05 pp	eduh 00	I1	I2	I3	I4	Rank I4	Social Trust	Tyr 00
1	Albania	4757	105	0.64	0.95	0.61	0.7381	70	25.7	5.42
2	Armenia	4484	63	0.55	0.83	0.62	0.6743	84	24.7	6.17
3	Austria	30109	1702	2.27	1.66	2.95	2.2938	5	32.8	10.37
4	Azerbaijan	5016	104	0.68	0.65	0.65	0.6658	86	20.5	5.96
5	Belgium	28798	830	2.16	1.64	1.83	1.8758	18	31.4	10.26
6	Bulgaria	7866	200	0.78	1.17	0.85	0.9407	49	28.6	6.82
7	Canada	29415	1425	2.22	1.69	2.82	2.2447	8	46.9	10.22
8	Croatia	11779	427	1.13	1.23	1.13	1.1658	38	21.0	6.98
9	Czech R.	19067	584	1.56	1.42	1.45	1.4832	26	27.5	8.41
10	Denmark	30163	2311	2.31	1.80	3.84	2.6493	2	60.1	10.27
11	Estonia	14515	521	1.20	1.48	1.29	1.3283	30	23.9	7.38
12	Finland	27947	1454	2.15	1.73	2.75	2.2068	9	56.4	9.62
13	France	26941	1336	2.00	1.55	2.44	1.9977	15	23.3	9.61
14	Georgia	2842	80	0.50	0.95	0.64	0.7004	77	18.7	6.30
15	Germany	26216	1075	2.01	1.65	2.23	1.9649	16	36.1	10.07
16	Greece	21101	530	1.66	1.32	1.42	1.4685	27	23.7	8.61
17	Hungary	16177	614	1.34	1.39	1.55	1.4328	29	25.9	7.84
18	Ireland	36621	1371	2.60	1.65	2.54	2.2653	6	41.2	9.76
19	Italy	25956	1102	1.97	1.32	2.02	1.7733	20	31.4	9.86
20	Latvia	12192	402	1.05	1.31	1.14	1.1703	37	20.3	7.16
21	Lithuania	12864	483	1.08	1.37	1.20	1.2237	36	25.9	6.95
22	Macedonia	6392	297	0.75	0.99	0.90	0.8893	53	10.9	6.25
23	Moldova	1707	92	0.39	0.77	0.64	0.6053	92	18.4	5.95
24	Netherlands	29452	1353	2.21	1.71	2.54	2.1520	10	53.9	9.98
25	Norway	35956	2104	2.55	1.77	3.73	2.6830	1	63.9	10.36
26	Poland	12505	484	1.17	1.26	1.48	1.3080	31	23.7	7.23
27	Portugal	18000	1004	1.48	1.46	1.71	1.5526	24	15.7	8.48
28	Romania	8236	167	0.88	1.10	0.79	0.9279	50	14.9	6.89
29	Russia	9747	251	0.88	0.73	0.99	0.8733	55	28.4	7.13
30	Slovakia	14722	432	1.24	1.38	1.20	1.2782	32	21.9	7.64
31	Slovenia	19940	924	1.62	1.46	1.91	1.6696	22	18.2	8.84
32	Spain	23368	880	1.84	1.44	1.76	1.6825	21	33.6	9.02
33	Sweden	27784	2082	2.14	1.75	3.66	2.5160	3	62.3	9.58
34	Switzerland	30729	1351	2.34	1.80	2.64	2.2580	7	42.1	10.72
35	Turkey	7540	193	0.85	1.03	0.66	0.8512	58	10.4	6.06
36	Ukraine	6086	181	0.63	0.88	0.80	0.7748	65	29.1	6.53
37	United Kingdom	28628	1403	2.13	1.67	2.61	2.1382	11	36.9	9.42
38	USA	37437	1627	2.63	1.58	3.15	2.4526	4	42.1	10.97

In table A1 Ph05 is in dollars per inhabitant at 2005 prices and PPPs. Eduh00 in dollars per inhabitant at 2000 prices and exchange rates. Indexes I1 to I4 calculated as explained in section 2. Social trust in years 2002-2004 from Bjornskow(2006). Tyr is total years of schooling of population over 15 years, following Barro and Lee(1999) and own provisional estimations for year 2000.

Table A2. Government quality indicators: Voice of Citizens and Gov. Effectiveness, 2000-2007

	Country	Voice Citizens		Gov. Effectiveness		Gov1x		Gov 2x		Dif1	Dif2
		00	07	00	07	00	07	00	07		
1	Albania	-0.32	0.03	-0.82	-0.38	4.36	5.06	3.36	4.24	0.70	0.88
2	Armenia	-0.43	-0.59	-0.60	-0.31	4.14	3.82	3.80	4.38	-0.32	0.58
3	Austria	1.39	1.39	1.94	1.73	7.78	7.78	8.88	8.46	0.00	-0.42
4	Azerbaijan	-0.98	-1.13	-0.84	-0.65	3.04	2.74	3.32	3.70	-0.30	0.38
5	Belgium	1.39	1.44	1.73	1.59	7.78	7.88	8.46	8.18	0.10	-0.28
6	Bulgaria	0.48	0.65	0.05	0.10	5.96	6.30	5.10	5.20	0.34	0.10
7	Canada	1.57	1.36	1.92	1.92	8.14	7.72	8.84	8.84	-0.42	0.00
8	Croatia	0.41	0.47	0.36	0.54	5.82	5.94	5.72	6.08	0.12	0.36
9	Czech R.	0.72	0.98	0.76	0.99	6.44	6.96	6.52	6.98	0.52	0.46
10	Denmark	1.57	1.57	1.97	2.21	8.14	8.14	8.94	9.42	0.00	0.48
11	Estonia	0.96	1.05	0.93	1.19	6.92	7.10	6.86	7.38	0.18	0.52
12	Finland	1.64	1.49	2.00	1.94	8.28	7.98	9.00	8.88	-0.30	-0.12
13	France	1.12	1.27	1.62	1.30	7.24	7.54	8.24	7.60	0.30	-0.64
14	Georgia	-0.26	-0.19	-0.62	-0.13	4.48	4.62	3.76	4.74	0.14	0.98
15	Germany	1.37	1.40	1.93	1.68	7.74	7.80	8.86	8.36	0.06	-0.50
16	Greece	0.93	0.96	0.75	0.48	6.86	6.92	6.50	5.96	0.06	-0.54
17	Hungary	1.17	1.10	0.93	0.70	7.34	7.20	6.86	6.40	-0.14	-0.46
18	Ireland	1.41	1.40	1.75	1.67	7.82	7.80	8.50	8.34	-0.02	-0.16
19	Italy	0.99	1.12	0.90	0.33	6.98	7.24	6.80	5.66	0.26	-1.14
20	Latvia	0.71	0.86	0.49	0.55	6.42	6.72	5.98	6.10	0.30	0.12
21	Lithuania	0.85	0.93	0.38	0.78	6.70	6.86	5.76	6.56	0.16	0.80
22	Macedonia	-0.35	0.16	-0.70	-0.29	4.30	5.32	3.60	4.42	1.02	0.82
23	Moldova	0.02	-0.38	-0.65	-0.83	5.04	4.24	3.70	3.34	-0.80	-0.36
24	Netherlands	1.58	1.53	2.09	1.80	8.16	8.06	9.18	8.60	-0.10	-0.58
25	Norway	1.56	1.53	1.94	2.12	8.12	8.06	8.88	9.24	-0.06	0.36
26	Poland	1.04	0.81	0.62	0.38	7.08	6.62	6.24	5.76	-0.46	-0.48
27	Portugal	1.33	1.25	1.14	0.88	7.66	7.50	7.28	6.76	-0.16	-0.52
28	Romania	0.40	0.47	-0.38	-0.09	5.80	5.94	4.24	4.82	0.14	0.58
29	Russia	-0.46	-1.01	-0.60	-0.40	4.08	2.98	3.80	4.20	-1.10	0.40
30	Slovakia	0.79	0.98	0.45	0.76	6.58	6.96	5.90	6.52	0.38	0.62
31	Slovenia	1.05	1.08	0.81	1.08	7.10	7.16	6.62	7.16	0.06	0.54
32	Spain	1.26	1.05	1.72	1.00	7.52	7.10	8.44	7.00	-0.42	-1.44
33	Sweden	1.61	1.47	2.01	2.08	8.22	7.94	9.02	9.16	-0.28	0.14
34	Switzerland	1.45	1.55	2.16	2.24	7.90	8.10	9.32	9.48	0.20	0.16
35	Turkey	-0.48	-0.19	-0.06	0.24	4.04	4.62	4.88	5.48	0.58	0.60
36	Ukraine	-0.57	-0.09	-0.65	-0.60	3.86	4.82	3.70	3.80	0.96	0.10
37	U. Kingdom	1.36	1.38	1.90	1.77	7.72	7.76	8.80	8.54	0.04	-0.26
38	USA	1.37	1.09	1.91	1.62	7.74	7.18	8.82	8.24	-0.56	-0.58

Sources: Columns 1 to 4 are World Bank indicators published by Kaufmann, Kraay and Mastruzzi(2008), while columns 5 to 8 are the indicators used in the regressions of section 4, which we have calculated rescaling those data to an interval between 0 and 10. Notes: Gov1x is the indicator of Voice of Citizens and Gov2x the indicator of Government Effectiveness. Dif1 and Dif2 are the increases for 2000-2007.

Non weighted averages of the countries of table A2 have shown an small increase for the period 2000-2007: from 6.56 to 6.59 in the case of Gov1x and from 6.64 to 6.68 in the case of Gov2x. In spite of that some countries have experienced a decrease in both indicators as seen in table 2 of section 3.

Annex 2. Econometric models estimation:

Equation 1a
Dependent Variable: PH05PP
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PH00PP	0.894737	0.038603	23.17792	0.0000
GOV2X00	583.0086	109.1533	5.341193	0.0000
R-squared	0.984227	Mean dependent var		18764.61
Adjusted R-squared	0.983788	S.D. dependent var		10718.03
S.E. of regression	1364.667	Akaike info criterion		17.32640
Sum squared resid	67043390	Schwarz criterion		17.41259
Log likelihood	-327.2017	Durbin-Watson stat		1.730206

Equation 1b
Dependent Variable: PH05PP
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PH00PP	0.907436	0.043488	20.86635	0.0000
GOV2X00	370.6384	342.8227	1.081137	0.2870
TYR00X	147.6488	225.7350	0.654080	0.5173
R-squared	0.984417	Mean dependent var		18764.61
Adjusted R-squared	0.983527	S.D. dependent var		10718.03
S.E. of regression	1375.643	Akaike info criterion		17.36689
Sum squared resid	66233784	Schwarz criterion		17.49617
Log likelihood	-326.9709	Durbin-Watson stat		1.736310

Equation 1c
Dependent Variable: PH05PP
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PH00PP	0.940231	0.031234	30.10235	0.0000
TYR00X	378.7876	72.62084	5.215963	0.0000
R-squared	0.983897	Mean dependent var		18764.61
Adjusted R-squared	0.983449	S.D. dependent var		10718.03
S.E. of regression	1378.866	Akaike info criterion		17.34711
Sum squared resid	68445723	Schwarz criterion		17.43329
Log likelihood	-327.5950	Durbin-Watson stat		1.797987

Equation 2a

Dependent Variable: GOV2X07
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOV2X00	0.789359	0.090149	8.756113	0.0000
(GOV1X07-GOV1X00)	0.405006	0.191665	2.113088	0.0420
TYR00X	0.143213	0.076743	1.866147	0.0707
(PH05PP-PH00PP)/1000	0.102280	0.057443	1.780537	0.0839
R-squared	0.932753	Mean dependent var		6.683684
Adjusted R-squared	0.926820	S.D. dependent var		1.836594
S.E. of regression	0.496833	Akaike info criterion		1.538176
Sum squared resid	8.392674	Schwarz criterion		1.710554
Log likelihood	-25.22535	Durbin-Watson stat		1.805236

Equation 2b

Dependent Variable: GOV2X07
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOV2X00	0.710386	0.121514	5.846121	0.0000
(GOV1X07-GOV1X00)	0.434285	0.194190	2.236399	0.0322
EDUH00/1000	0.235349	0.242558	0.970283	0.3390
TYR00X	0.176604	0.084166	2.098285	0.0436
(PH05PP-PH00PP)/1000	0.123190	0.061399	2.006380	0.0531
R-squared	0.934618	Mean dependent var		6.683684
Adjusted R-squared	0.926693	S.D. dependent var		1.836594
S.E. of regression	0.497262	Akaike info criterion		1.562679
Sum squared resid	8.159883	Schwarz criterion		1.778150
Log likelihood	-24.69089	Durbin-Watson stat		1.693192

Equation 2c

Dependent Variable: GOV2X07
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOV1X00	0.582622	0.139838	4.166417	0.0002
TYR00X	0.181147	0.116219	1.558664	0.1283
PH05PP/1000	0.036538	0.016526	2.210990	0.0339
TRUST	0.021616	0.010894	1.984181	0.0554
R-squared	0.891587	Mean dependent var		6.683684
Adjusted R-squared	0.882021	S.D. dependent var		1.836594
S.E. of regression	0.630834	Akaike info criterion		2.015753
Sum squared resid	13.53035	Schwarz criterion		2.188130
Log likelihood	-34.29930	Durbin-Watson stat		1.677102

Equation 3a

Dependent Variable: GOV1X07
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOV1X00	1.002384	0.009852	101.7474	0.0000
GOV2X07-GOV2X00	0.267898	0.116506	2.299435	0.0274
R-squared	0.927169	Mean dependent var		6.591579
Adjusted R-squared	0.925146	S.D. dependent var		1.492617
S.E. of regression	0.408372	Akaike info criterion		1.097918
Sum squared resid	6.003627	Schwarz criterion		1.184107
Log likelihood	-18.86044	Durbin-Watson stat		2.246018

Equation 3b

Dependent Variable: GOV1X07
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TYR00X	0.385382	0.113271	3.402308	0.0017
GOV2X07	0.501253	0.138300	3.624396	0.0009
R-squared	0.768436	Mean dependent var		6.591579
Adjusted R-squared	0.762003	S.D. dependent var		1.492617
S.E. of regression	0.728172	Akaike info criterion		2.254636
Sum squared resid	19.08843	Schwarz criterion		2.340825
Log likelihood	-40.83809	Durbin-Watson stat		1.870014

Equation 3c

Dependent Variable: GOV1X07
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TYR00X	0.380347	0.118193	3.218024	0.0028
GOV2X00	0.507330	0.144218	3.517801	0.0012
GOV2X07-GOV2X00	0.468418	0.230307	2.033883	0.0496
R-squared	0.768649	Mean dependent var		6.591579
Adjusted R-squared	0.755429	S.D. dependent var		1.492617
S.E. of regression	0.738161	Akaike info criterion		2.306346
Sum squared resid	19.07084	Schwarz criterion		2.435629
Log likelihood	-40.82057	Durbin-Watson stat		1.866128

Equation 4a
Dependent Variable: TRUST
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDUH00/1000	12.15811	3.174040	3.830483	0.0005
(GOV1X00+GOV2X00)/2	3.048839	0.484821	6.288583	0.0000
R-squared	0.627205	Mean dependent var		30.85263
Adjusted R-squared	0.616850	S.D. dependent var		14.06513
S.E. of regression	8.706194	Akaike info criterion		7.217142
Sum squared resid	2728.721	Schwarz criterion		7.303331
Log likelihood	-135.1257	Durbin-Watson stat		2.281432

Equation 4b
Dependent Variable: TRUST
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDUH00/1000	13.54699	4.343844	3.118664	0.0036
GOV1X00	2.635287	2.354630	1.119194	0.2707
GOV2X00	0.260079	2.676625	0.097167	0.9231
R-squared	0.629587	Mean dependent var		30.85263
Adjusted R-squared	0.608420	S.D. dependent var		14.06513
S.E. of regression	8.801445	Akaike info criterion		7.263366
Sum squared resid	2711.290	Schwarz criterion		7.392649
Log likelihood	-135.0039	Durbin-Watson stat		2.230173

Equation 4c
Dependent Variable: TRUST
Method: Least Squares
Sample: 1 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PH00PP/1000	0.523500	0.241876	2.164334	0.0371
(GOV1X00+GOV2X00)/2	3.307286	0.696061	4.751433	0.0000
R-squared	0.535682	Mean dependent var		30.85263
Adjusted R-squared	0.522784	S.D. dependent var		14.06513
S.E. of regression	9.716308	Akaike info criterion		7.436684
Sum squared resid	3398.639	Schwarz criterion		7.522873
Log likelihood	-139.2970	Durbin-Watson stat		2.284955

Annex 3. Government quality indicators and comments about differences in the EU

WB(2008), includes the following statement about the policy aimed contribution of the WGI indexes for socio-economic analysis:

"*The World Bank's Governance Indicators, transparently constructed and available to everyone, are invaluable for policy makers, researchers, and business people around the globe. They are critical for monitoring governance and the quality of state action and growth, making it more difficult for governments to ignore failures, and easier for reformers to persuasively articulate the need for change."* Andrei Illarionov**,** former Economic Advisor to the President of the Russian Federation, and currently president of the Institute of Economic Analysis"

WB(2008) also states that "*the Indicators presented here aggregate the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, and international organizations. The aggregate indicators do not reflect the official views of the World Bank, its Executive Directors, or the countries they represent. The WGI are not used by the World Bank Group to allocate resources or for any other official purpose.*

An analysis of the differences between France and Spain will be included in a next update of this Annex 3.

Note: Updated 09-12-10. Equation (2a) in section 4 was updated on 10th December of 2010, accordingly to table 2b in the Annex. The previous version of section 4 included standard errors, instead of t-ratios, in coefficients of DGov1x, Tyr00x and Dph. We also include a new version of (2a) where dph07 is the increase of real GDP per inhabitant in the period 2000-2007, with an increase of t statistics of DGov1x y Dph.

Table 2a´. Updated with Dph07.

Dependent Variable: GOV2X07				
Method: Least Squares. Included observations: 38				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOV2X00	0.773129	0.082508	9.370315	0.0000
DGOV1X	0.398052	0.176063	2.260846	0.0303
TYR00X	0.128517	0.069804	1.841126	0.0743
DPH07	0.110193	0.034704	3.175203	0.0032
R-squared	0.943243	Mean dependent var		6.683684
Adjusted R-squared	0.938235	S.D. dependent var		1.836594
S.E. of regression	0.456442	Akaike info criterion		1.368590
Sum squared resid	7.083530	Schwarz criterion		1.540967
Log likelihood	-22.00320	Hannan-Quinn criter.		1.429920
Durbin-Watson stat	1.767958			

http://www.usc.es/economet/aeid.htm