

ECONOMIC FREEDOM, GLOBALIZATION, CORRUPTION AND MACROECONOMIC RESULTS

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This paper aim was to determine the correlations between corruption, economic freedom globalization and macroeconomic development through its most representative measure GDP.

A total of 114 countries were included in this study, being simultaneously able to offer three main economic indices: Index of Economic Freedom (IEF), Index of Globalization (IG) and Index of Corruption Perceptions Index (CPI). Validated measures of associations scores (Pearson, Yule, etc) were calculated, as well as classical levels of correlations (Kendall, Spearman). All measures were significantly correlated with each other. Comparison was made between all this statistical instruments, and conclusions represent an interesting control of the liaisons between macro- economic results and the process of economic freedom, economic corruption, and globalization. Macroeconomic results decrease always with certain levels by economic dysfunction such as less of liberty in all economic activities, refusal of globalization and higher corruption perception.

Key Words: Index of Economic Freedom (IEF), Index of Globalization (IG), Index of Corruption Perceptions Index (CPI), statistical correlations.

Introduction

During the last few decades more than ever, macroeconomic dynamics, economic freedom, globalization level, corruption perceptions changes have become successively more intertwined. Among the major world relevant economical and statistical indices there are Index of Economic Freedom (IEF-defined as a series of 10 economic measurements created by the Wall Street Journal and The Heritage Foundation to measure the degree of economic freedom in the world's nations), Index of Globalization (IG-constructed by Axel Dreher from KOF Swiss Economic Institute, measures the three dimensions of globalization: economic, social and political) and Corruption Perceptions Index (CPI-published by Transparency International and ordering the countries according to the degree to which corruption is perceived to exist among public officials and politicians). All the values for these three statistical instruments are detailed in the appendix no 1 (available only for 114 countries of the world).

The highest form of economic freedom provides an absolute right of property ownership, fully realized freedoms of movement for labour, capital, and goods, and an absolute absence of coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself (individuals are free to work, produce, consume, and invest in any way they please, and that freedom is both protected by the state and unconstrained by the state). IEF measures freedom for 10 specific factors (business, trade, fiscal, government size, monetary, investment, financial, property rights, corruption, labour), and average them equally into a total score, using a scale from 0 to 100, where 100 represents the maximum freedom. Being such a multidimensional phenomenon, globalization is not catalogued in any unique database, until '80. Contemporary statistics, using these significant composite and decomposable indices, is able to quantify globalization's distributions, sources and territorial impacts. Axel Dreher and its KOF Index of Globalization (KOF-IG), A.T Kearney and its Economic Globalization Indices like ATKFP-GI (A.T. Kearney/ Foreign Policy Magazine Globalization Index) or M-GI (Modified Globalization Index, as a result of the new ideas of Pim Martens and Daniel Zywietz, *Rethinking Globalization, A Modified Globalization Index*, available from <http://www.ub.unimaas.nl/ucm/e-readers/>. 2006), and Index of Globalization's constructed by the Centre for the Study of Globalization and Regionalization are important steps in this direction.

Even corruption itself can be and is being measured in many forms from gathering the informed views of relevant stakeholders, tracking countries' institutional features to careful audits of specific projects. Survey-based questions of corruption have also become increasingly specific, focused, and quantitative. Data from the following sources were included in the index: Country Policy and Institutional Assessment by the IDA and IBRD (World Bank), Economist Intelligence Unit, Freedom House Nations in Transit, International Institute for Management Development (Lausanne), Merchant International Group Limited (London), Political and Economic Risk Consultancy (Hong Kong), United Nations Commission for Africa, World Economic Forum (WEF), World Markets Research Centre (London). The Global Corruption Report offers an annual, systematic analysis of corruption, reporting on the state of corruption around the great majority of the countries, using only experts' opinions. The report and the specific index are produced by Transparency International and in 2007 were in the sixth year of publication. The 2007 survey covered 180 countries. A higher score means less (perceived) corruption. The results show seven out of every ten countries (and nine out of every ten developing countries) with an index of less than 5 points out of 10.

Material and method

The concept of correlation is based on Francis Galton and Carl Pearson's notion that there is a category beyond causation of which causation is only a limit. Correlation and associations are not causation. The method of correlation opened new ways for quantitative social science. The notion of causality as a simple explanatory principle of events was broadened to include the notion of association between events. Expectation was born that these quantified associations would be elaborated into homological networks, encompassing relationships between elements of complex systems. As the association between events becomes stronger, the probability that those events are also influenced by unknown factors lessens. The observed correlation or associations between two variables might be due to the action of a third, unobserved variable. But this paper tries only to validate some measures of association scores (Pearson, Yule, etc) as well as classical levels of correlations (Kendall and Spearman). All the three indices are significantly correlated with each other. The following six coefficients as measures of association are symmetric, it does not matter which variable is the independent variable and which is the dependent variable:

$$\text{First Yule coefficient (Q)} \quad Q = \frac{ad - bc}{ad + bc} \quad (1)$$

$$\text{Pearson coefficient (Qc)} \quad Q_c = \frac{ad - bc}{\sqrt{(a+d)(a+c)(b+d)(c+d)}} \quad (2)$$

$$\text{Second Yule coefficient (Y)} \quad Y = \frac{\sqrt{ad} - \sqrt{bc}}{\sqrt{ab} + \sqrt{bc}} \quad (3)$$

$$\text{Correlation coefficient (r_d)} \quad r_d = \sqrt{\frac{d^2}{n}} \quad (4)$$

$$\text{Jaccard coefficient (J)} \quad J = \frac{a}{a + b + c} \quad (5)$$

$$\text{Coincidence coefficient (IC)} \quad IC = \frac{2a}{2a + b + c} \quad (6)$$

Association refers to a wider variety of coefficients which measure strength of relationship, defined various ways. In common usage association refers to measures of strength of relationship in which at least one of the variables is a dichotomy, nominal, or ordinal. The results of the analysis based on the data from appendix no.1, for the six association measures are described and presented below, on the columns front:

Association (GDP	or / CPI	correlatio n or /IG or	type / IEF)	Yule Q	Pearso n Qc	Yule Y	Correlatio n coefficient	Jaccar d J	Coincidenc e coefficient
	CPI=4,5			0,979	0,565	0,813	0,752	0,783	0,878
	<4,5	>=4,5	Total						
GDP<10.000	54	2	56						
GDP>=10.000	13	45	58						
Total	67	47	114						
	IG=59,29			0,939	0,526	0,699	0,689	0,735	0,848
	<59,29	>=59,29	Total						
GDP<10.000	50	6	56						
GDP>=10.000	12	46	58						
Total	62	52	114						
	IEF=62,02			0,903	0,490	0,632	0,632	0,687	0,814
	<62,02	>=62,02	Total						
GDP<10.000	46	10	56						
GDP>=10.000	11	47	58						
Total	57	57	114						
	CPI=4,5			0,970	0,645	0,782	0,764	0,829	0,907
	<4,5	>=4,5	Total						
GDP<15.872	63	9	72						
GDP>=15.872	4	38	42						
Total	67	47	114						
	IG=59,29			0,931	0,570	0,683	0,651	0,740	0,851
	<59,29	>=59,29	Total						
GDP<15.872	57	15	72						
GDP>=15.872	5	37	42						
Total	62	52	114						
	IEF=62,02			0,927	0,550	0,675	0,618	0,697	0,822
	<62,02	>=62,02	Total						
GDP<15.872	53	19	72						
GDP>=15.872	4	38	42						
Total	57	57	114						

	IG=59,29								
	<59,29	>=59,29	Total						
CPI<4,5	55	12	67	0,938	0,572	0,697	0,684	0,753	0,859
CPI>=4,5	6	41	47						
Total	61	53	114						
	IEF=62,02								
	<62,02	>=62,02	Total						
CPI<4,5	56	11	67	0,983	0,636	0,829	0,781	0,812	0,896
CPI>=4,5	2	45	47						
Total	58	56	114						

Table no. 1. Values of the Coefficients of Associations

Most coefficients of association vary from 0 (indicating no relationship) to 1 (indicating perfect relationship) or -1 (indicating perfect negative relationship). However, there are various types of perfect relationship and various types of no relationship.

The classical statistical coefficients (or simply the Spearman *rho* coefficient and Kendall *tau* coefficient) are non-parametric statistic quantitative measures of correlation based on ranking. Both are used to measure the degree of correspondence between two rankings and assessing the significance of this correspondence. In other words, it measures the strength of association of the variables.

Coefficients	PIB/CPI	PIB/IG	PIB/IEF	CPI/IG	CPI/IEF	IG/IEF
rs - Spearman	0,850	0,834	0,765	0,813	0,862	0,697
rk - Kendall	0,634	0,609	0,576	0,610	0,668	0,510

Table no. 2. Values of the Spearman and Kendall coefficients

The levels are different, but in the same position, Spearman coefficient being above Kendall value.

Conclusions

Each study in the economics that have been performed within domain of indices discovers variability of statistical instruments. Statistics like this are by nature not imprecise but different only as the level of the measurements. Statistics from such a different family of indices are not necessarily comparable but when the conclusions are similar the research has been fulfilled.

1. All the three indices are less or more criticized. For instance, corruption perception index has sometimes been criticized as the perception of a selected few since it ignores the perception of wider population and focuses on perception of the experts. Furthermore, some have opined that the index analyzes a mere perception and the method followed in preparing the index could not measure institutional corruption...
2. We examined five domains of possible associations or correlations, but always the hierarchy was the same (table no 2, but must not forget that less or perceived corruption means a higher score).
3. Average value of each index is different in various continental or regional areas. In other words, the continental or regional average data cover the range 3.0 to 6.8 for CPI, the range 44.20 to 74.60 for IG, and 55.21 to 75.10 for IEF.

Countries	Continental or regional area	Average GDP / capita (PPP)	Average CPI	Average IG	Average IEF
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32	Africa	3481	3.0	44.20	55.21
11	Central America	9082	3,5	49.82	63.29
11	South America	8745	3.6	56.36	59.28
7	Central Asia	10429	3.9	52.14	58.24
10	Middle Orient	34700	4.3	57.35	60.70
4	South Asia	18650	5.1	68.46	68.36
33	Europe	28633	6.2	73.92	67.51
3	North America	32233	6.5	74.60	75.10
3	Oceania	22733	6.8	68.56	72.00
114	World	15872	4.5	58.9	61.9

Table no. 3. Average continental or regional values of the indices (CPI, IG, IEF)

4. All measures were significantly associated or correlated with each other. However, the strength of association or correlation varied greatly. Our data shows that variables of welfare described by macroeconomics results (e.g. GDP) are strongly dependent on less or perceived corruption, and only after that on globalization and economic freedom.

5. It has been shown, that contrary to the beliefs of its critics, globalization indeed promotes economic growth, but economic freedom and globalization do not have the same significance, even for the experts. Economic growth or development means less or perceived corruption, more than globalization and economic freedom. Statistical associations and correlations are major proofs of this conclusion.

6. The measure of the effects of economic freedom, globalization and corruption in macroeconomic results economically relevant. All these indexes are built as a framework for redefining one another, and for analyzing the relationships among economic, political, and social variables. In particular, all the three indices apply the methodology to analyze the effects of a defined process on economic growth. Thus all the three indices could be considered additional avenues for research, analysis, and decision making, in the international process of globalization, to enhance an insight into the functioning of the complex global system that is economic world.

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DATA BASE

	Country	PIB/ capita	CPI	IG	IEF		Country	PIB/ capita	CPI	IG	IEF
1	Albania	5500	2,9	42,01	62,42	58	South Korea	24600	5,1	64,82	67,18
2	Algeria	8100	3,0	45,50	55,03	59	Kuwait	55300	4,3	63,51	66,65
3	Argentina	13000	2,9	64,12	55,02	60	Latvia	17700	4,8	61,62	68,25
4	Australia	37500	8,6	80,91	81,05	61	Lithuania	16700	4,8	63,30	71,52
5	Austria	39000	8,1	91,60	70,14	62	Luxembourg	80800	8,4	74,18	75,27
6	Bahrain	34700	5,0	60,93	71,24	63	Madagascar	1000	3,2	37,45	61,10
7	Bangladesh	1400	2,0	36,01	48,02	64	Malawi	800	2,7	43,73	53,99
8	Barbados	19700	6,9	43,45	69,98	65	Malaysia	14400	5,1	75,81	64,48
9	Belgium	36500	7,1	91,96	72,36	66	Mali	1200	2,7	42,40	54,70
10	Belize	7800	3,0	47,29	63,19	67	Malta	23200	5,8	63,78	66,13
11	Benin	1500	2,7	41,73	54,95	68	Mauritius	11900	4,7	48,75	69,18
12	Bolivia	4400	2,9	49,11	54,38	69	Mexico	12500	3,5	55,49	66,29
13	Botswana	14700	5,4	46,80	68,51	70	Morocco	3800	3,5	52,93	57,19
14	Brazil	9700	3,5	59,60	56,09	71	Namibia	5200	4,5	53,79	63,15
15	Bulgaria	11800	4,1	65,51	62,00	72	Nepal	1100	2,5	35,27	55,12
16	Burundi	800	2,5	25,75	47,07	73	Netherlands	38600	9,0	89,15	74,92
17	Cameroon	2300	2,4	41,32	55,38	74	New Zealand	27300	9,4	73,46	81,04
18	Canada	38200	8,7	87,49	78,09	75	Nicaragua	3200	2,6	51,63	61,94
19	Central African Republic	700	2,0	26,79	50,31	76	Niger	700	2,6	34,28	53,12
20	Chad	1600	1,8	39,56	50,02	77	Nigeria	2200	2,2	52,97	55,99
21	Chile	14400	7,0	69,91	78,98	78	Norway	55600	8,7	77,75	68,36
22	China	5300	3,5	65,26	51,80	79	Oman	19100	4,7	51,67	66,07
23	Colombia	7200	3,8	52,30	59,65	80	Panama	9000	3,2	57,58	64,57
24	Congo	3700	2,1	38,78	44,38	81	Paraguay	4000	2,4	50,33	58,94
25	Costa Rica	13500	5,0	55,00	64,55	82	Peru	7600	3,5	57,12	62,50
26	Cote d'Ivoire	1800	2,1	45,44	55,95	83	Philippines	3300	2,5	59,00	56,91
27	Croatia	15500	4,1	69,30	53,92	84	Poland	16200	4,2	78,22	57,40
28	Cyprus	27100	5,3	62,48	71,74	85	Portugal	21800	6,5	83,06	64,49
29	Czech Republic	24400	5,2	84,46	67,76	86	Romania	11100	3,7	63,34	61,24
30	Denmark	37400	9,4	84,27	77,02	87	Russia	14600	2,3	69,91	52,46
31	Dominican Republic	9200	3,0	51,72	57,66	88	Rwanda	1000	2,8	29,25	52,40
32	Ecuador	7100	2,1	54,50	55,56	89	Saudi Arabia	20700	3,4	53,69	61,61
33	Egypt	5400	2,9	54,18	55,11	90	Senegal	1700	3,6	48,55	58,07
34	El Salvador	5200	4,0	58,03	69,80	91	Sierra Leone	800	2,1	33,27	47,61
35	Estonia	21800	6,5	72,11	77,96	92	Singapore	48900	9,3	82,14	87,22

36	Finland	35500	9,4	84,84	74,24	93	Slovak Republic	19800	4,9	72,58	68,43
37	France	33800	7,3	87,71	62,82	94	Slovenia	27300	6,6	68,82	60,17
38	Gabon	13800	3,3	49,20	54,20	95	South Africa	10600	5,1	62,45	63,41
39	Germany	34400	7,8	82,48	71,52	96	Spain	33700	6,7	82,52	69,93
40	Ghana	1400	3,7	56,01	57,31	97	Sri Lanka	4100	3,2	49,67	59,31
41	Greece	30500	4,6	74,94	58,25	98	Sweden	36900	9,3	89,89	69,01
42	Guatemala	5400	2,8	49,98	61,27	99	Syria	4300	2,4	39,09	48,11
43	Guinea Bissau	600	2,2	40,68	46,81	100	Tanzania	1100	3,2	43,22	56,81
44	Guyana	5300	2,6	47,38	54,32	101	Thailand	8000	3,3	56,87	64,81
45	Haiti	1900	1,6	28,61	51,38	102	Togo	900	2,3	42,23	49,73
46	Honduras	3300	2,5	53,99	60,43	103	Trinidad Tobago	21700	3,4	50,79	71,38
47	Hungary	19500	5,3	81,15	64,44	104	Tunisia	7500	4,2	51,81	59,57
48	Iceland	39400	9,2	67,75	76,75	105	Turkey	9400	4,1	63,45	58,24
49	India	2700	3,5	49,70	54,08	106	Uganda	1100	2,8	44,49	63,68
50	Indonesia	3400	2,3	51,31	53,92	107	Ukraine	6900	2,7	61,83	51,63
51	Iran	12300	2,5	35,19	44,09	108	United Arab Emirates	55200	5,7	70,39	62,83
52	Ireland	45600	7,5	83,09	82,59	109	United Kingdom	35300	8,4	89,29	80,00
53	Israel	28800	6,1	70,83	64,63	110	United States	46000	7,2	80,83	80,91
54	Italy	31000	5,2	80,61	62,69	111	Uruguay	10700	6,7	61,79	68,80
55	Japan	33800	7,5	64,22	72,20	112	Venezuela	12800	2,0	53,75	47,86
56	Jordan	4700	4,7	64,74	63,54	113	Zambia	1400	2,6	51,76	57,20
57	Kenya	1600	2,1	49,12	59,93	114	Zimbabwe	500	2,1	40,06	31,87