

Globalization of National Economies, 1975-20051

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Recent studies on economic globalization have used various indicators, such as the ratio of trade-to-GDP and the ratio of FDI-to-GDP, to analyze the globalization performances of national economies. Although each indicator is useful in itself, our contention is that a single composite indicator (index) can provide more comprehensive information and would enable policy-makers and researchers to compare and rank the globalization performances of different countries, country groups and regions in a given year (or period) and over time. Accordingly, in this paper, we developed the economic globalization index to measure the extent of globalization of national economies.

We have constructed the economic globalization index for the period 1975-2005. The overall results indicate that rich countries tend to be more globalized than poor countries. Furthermore, rich countries have improved their globalization –relative global integration level- from 1975 to 2005; however, many of poor countries’ relative levels of global integration have deteriorated during the same period. Our results seem to be in line with studies that characterize the recent situation in the world as “truncated globalization” or simply “triadization”.

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Introduction

“Globalization” has been the most fashionable term in the world economy during the last two decades. Nearly all countries, willingly or unwillingly, have become a part of the globalization process. Some policy makers and researchers frequently argue that while some group of countries, particularly the high income countries, have rapidly integrated into the global economy others have fallen way back behind in this global race.² The question is, how can we test these claims and more importantly, can we rank countries according to their level of economic globalization?

Some researchers have attempted to shed some light on these questions by measuring the performances of single or group of countries on the specific dimensions of global integration, such as trade³ and production (see, for example, Cook & Kirkpatrick, 1997; Hirst & Thompson, 1996; World Bank, 1998; Wade, 1996; among many others).⁴ Without any doubt these studies provide us with useful information on the specific dimensions and provide us with general, albeit crude, information on economic globalization performance. But, if we need precise information for more accurate evaluation or ranking of national economies according to their globalization performances, unfortunately these studies are insufficient. Thus, a more efficient way would be to construct an index that could give us single but comprehensive information on the global economic integration. To accomplish this task it is essential to have a clear definition of economic globalization. Generally, economic globalization, or global economic integration, can be defined as a process of integration of domestic economies into the global economy through trade, investment (production) and finance.⁵ In other words, economic globalization has three main pillars: trade, investment and finance.

Accordingly, in this paper, in line with the above definition of economic globalization, we developed the economic globalization index to measure the relative level of global economic integration of a particular economy through trade, investment (production) and finance; in other words, we attempt to develop a composite indicator to determine the extent of economic globalization of national economies.

This paper is organized as follows. Following section provides information on the components and construction of the proposed index. Next section applies the index to a sample of 156 countries for the period 1975-2005 and evaluates the main results. Finally, the last section presents the summary and concluding remarks.

² See, for example, Held and McGrew (2000) among many others for an overview of the arguments on economic globalization.

³ These studies, for example, used trade-to-GDP ratio to measure the trade dimension.

⁴ See also Held and McGrew (2000) for more studies.

⁵ See Held and McGrew (2000) for similar as well as other definitions of (economic) globalization.

The Proposed Index

This study is a substantially revised version of our previous work (Ismihan *et al.*, 1998, 2001).⁶ Prior to Ismihan *et al.* (1998), World Bank (1996) attempted to develop an index to measure speed of integration. This index, which is called the “integration index”, is based on FDI-to-GDP ratio, trade-to-GDP ratio, institutional rating and manufacturing exports as a share of exports. It is computed by taking the simple average of the standard scores of these four indicators. World Bank (1996) measured the speed of integration (as an index) by taking the simple average of the changes in these four indicators (expressed as standard scores) over the sample period. Nevertheless, as we shall make it clear below there are methodological differences between World Bank (1996) index and our index. As we explained before, we have different purposes for constructing the EGI.

In general, two broad approaches are used to measure global economic integration (World Bank, 1998; p. 303). The first approach aims to evaluate the barriers to integration, such as average tariffs and indicators of capital controls, and the second approach aims to evaluate the outcomes of integration, such as trade-to-GDP ratio, FDI-to-GDP ratio and private capital flows-to-GDP ratio.⁷

Many recent studies that we mentioned in the introduction have used these (and other) indicators to analyze the specific dimensions of the economic globalization. Although each indicator is useful in itself, our contention is that a single composite indicator (an index), which measures the relative level of integration of a particular domestic economy to the global economy in a given year and over time, can provide more comprehensive information and would enable policy-makers (both at national and international level) and researchers to compare and rank the globalization performances of different countries, country groups and regions in a given year (or period) and over time.

In constructing the economic globalization index, we use outcome indicators of global integration, namely the ratios of gross FDI-to-GDP, foreign trade⁸-to-GDP and gross private capital flows (minus gross FDI)⁹-to-GDP.¹⁰ Roughly speaking, these three indicators capture the three main dimensions of economic globalization process: investment (production), trade and finance, and hence fit into the above definition of economic globalization.

⁶ Quite recently, A. T. Kearney / Foreign Policy Magazine developed the globalization index to measure the integration of ideas, peoples and economies (Foreign Policy, 2001). Dreher (2006) developed a similar index. These studies use similar (outcome-based) indicators - to measure economic dimension of globalization - to ours.

⁷ It should be noted that the outcome indicators of integration can also look at prices, such as prices of products and financial assets (World Bank, 1998; p. 304).

⁸ It includes exports and imports of services as well as goods since many countries are highly involved in the former.

⁹ Since the gross private capital flows figures include gross FDI values, we deducted the latter from the former in order to avoid the double counting in our index. Also note that *gross flows* (e.g. gross FDI values) includes inflows as well as outflows (see World Bank, 1998, 2007 for more detail).

¹⁰ As we have mentioned in the introduction section, some studies (cited there) have used these indicators to measure the specific dimensions of economic globalization.

Although all of these indicators are in same units they have different ranges, i.e., they have different minimums and maximums. So we use the Human Development Index (HDI) methodology¹¹ in order to get common ranges. That is, we set a minimum and a maximum bound to each one of the three indicators (ratios) and then determine the position of each country (in each and every year) within these boundaries; that is, we obtain a number (index value) for each observation (of these indicators) between 0 and 1000.¹² Formally speaking, with this conversion the three indicators become indices which we label as the foreign trade index (FTI), the foreign direct investment index (FDII) and the private capital flows index (PCFI). More precisely, the following formulas (Eq. 1-3) are used to calculate the three indices for each and every country under consideration:

$$\text{FTI}_{it} = \frac{\text{FTR}_{it} - \text{Min}_{\text{FTR}}}{\text{Max}_{\text{FTR}} - \text{Min}_{\text{FTR}}} \times 1000 , \quad (\text{Eq.1})$$

where FTI_{it} is the foreign trade index value of the i -th country in year t , FTR_{it} is the foreign trade-to-GDP ratio of the i -th country in year t and Min_{FTR} (Max_{FTR}) is the minimum (maximum) bound, which is determined by finding the minimum (maximum) value from all FTR values across countries and over time.¹³

$$\text{FDII}_{it} = \frac{\text{FDIR}_{it} - \text{Min}_{\text{FDIR}}}{\text{Max}_{\text{FDIR}} - \text{Min}_{\text{FDIR}}} \times 1000 , \quad (\text{Eq.2})$$

where FDII_{it} is foreign direct investment index value of the i -th country in year t , FDIR_{it} is the gross FDI-to-GDP ratio of the i -th country in year t and Min_{FDIR} (Max_{FDIR}) is the minimum (maximum) bound, which is determined by finding the minimum (maximum) value from all FDIR values across countries and over time.

¹¹ The methodology of converting actual values into an index values ranging between 0 and 1 is used to calculate the sub-indices in the construction of Human Development Index (HDI), which was developed to measure countries' performances in human development. See the Human Development Reports of the United Nations Development Programme (UNDP) for more detail (see, for example, UNDP, 1992).

¹² In order to increase the interpretability of the index values, they take values between 0 and 1000 rather than between 0 and 1. That is we only change the scale of the index values without changing the essence of the methodology of calculating the index values.

¹³ It should be noted that, in line with UNDP (1992), we select a minimum and a maximum bounds from all values across countries and over time, but not from the values in a given year for any ratio (indicator). That is, we use the same minimum and maximum bounds in the calculation of the respective index values in all years. Our aim here is to make the respective index values comparable both across countries and over time. This is necessary for any indicator aimed at measuring globalization which is a dynamic phenomenon. However, one may also construct a single year index (e.g. for 1996) by finding a minimum and a maximum from the values specific to that year for making cross-country comparisons but the index values are not comparable with another year's (e.g. 1986) index values constructed in similar way (by finding a minimum and a maximum from the values specific to that year, e.g. 1986) since they have different bounds (minimums and maximums). Thus, UNDP's (1992) methodology is useful for both purposes: cross-country and over time comparison.

$$\text{PCFI}_{it} = \frac{\text{PCFR}_{it} - \text{Min}_{\text{PCFR}}}{\text{Max}_{\text{PCFR}} - \text{Min}_{\text{PCFR}}} \times 1000, \quad (\text{Eq.3})$$

where PCFI_{it} is the private capital flows index value of the i -th country in year t , PCFR_{it} is the gross private capital flows (minus gross foreign direct investment) -to-GDP ratio of the i -th country in year t , and Min_{PCFR} (Max_{PCFR}) is the minimum (maximum) bound, which is determined by finding the minimum (maximum) value from all PCFR values across countries and over time.

Note that each sub-index determines the position of a given country in a given year relative to the maximum bound; hence, these indices are not measuring “absolute” but “relative” levels. This is also true for the economic globalization index, which we shall consider next.

We can easily obtain an economic globalization index (EGI) by taking the arithmetic average of the three sub-indices (FTI, FDII and PCFI).¹⁴ Formally, EGI can be written as:

$$\text{EGI}_{it} = (\text{FTI}_{it} + \text{FDII}_{it} + \text{PCFI}_{it}) / 3, \quad (\text{Eq.4})$$

where EGI_{it} is the economic globalization index (EGI) value of the i -th country in year t .

The economic globalization index (EGI) defined in Eq.4 is a composite of the three sub-indices which roughly captures the three main dimensions of economic globalization. Therefore, the EGI shows the relative integration level of a particular country to the global economy. Roughly speaking, countries with an EGI value close to 0 (1000) will have low (high) levels of global integration. The EGI can also be used to rank countries. A country with a higher EGI value can be considered to be more integrated than a country with lower EGI value. Furthermore, EGI can be used to analyze the performance of a given country over time. If country X has a higher EGI value in year 2 ($t=2$) compared to year 1 ($t=1$) [i.e. $\text{EGI}_2 - \text{EGI}_1 > 0$], then we may say that country X has improved its integration. Unfortunately, this may not indicate a positive change in the ranking (see next section).

In sum, EGI is constructed so as to analyze both cross-country and over time performances of a given country (or country group). This accords with the fact that globalization is an ongoing dynamic process and must be analyzed over time and across countries. Ideally speaking, due to the nature and the purpose of the EGI we should construct the EGI for all the countries and all the years. But, in practice there are some difficulties in achieving this ideal. The most important difficulty is data-related: Data is unavailable for some countries. Unfortunately, we can do nothing to remedy this but to construct EGI for those countries with available data. Similarly, data is available for certain years for some countries. Thus we can construct EGI for the available years for such countries.

¹⁴ We define the EGI as the simple average of the three sub-indices since, to our knowledge, there exists no a priori information to assign different weights to different indices. EGI could also be constructed by taking the weighted average of the three sub-indices and the weights of the sub-indices could be calculated by using the method of principal components (see, for example, Alesina & Perotti, 1996). However, the problem with this method is that it is a pure statistical approach.

Another problem is that there might be some “outliers” -extreme values- within the data of each indicator, due to the heterogeneity of the countries under consideration, which will indirectly affect the calculations of the EGI values. Since the EGI is computed as an arithmetic average of the three sub-indices, each sub-index naturally has equal weight ($=1/3$). However, extreme values may indirectly affect the sub-indices’ relative weights in the construction of the EGI. In other words, FTI, FDII, PCFI and EGI will have lower values in the presence of the extreme values since they affect the maximum values (Max_{FTR} , Max_{FDIR} , Max_{FCFR}). For example, suppose that there is only one “outlier”, in the FTR data. In this case, the maximum bound (MAX_{FTR}) will be extremely high; hence, FTI values will be very low, compared to the case with no extreme value within the same data. This will, in turn, lower (indirectly) the weight of the FTI in the construction of the EGI. Nevertheless, this problem can be solved either by omitting those “outliers” based on certain rules or making adjustments¹⁵ and/or transformations based on certain procedures. Alternatively, we may construct the EGI for certain group of countries, i.e. for the members of the OECD. Technically speaking, there is no difference whether we construct the EGI either for certain group of countries or for all countries. However, we must be careful while evaluating the results.

The Application of the Index and the Overall Results

In this study, we have constructed the EGI for the period 1975-2005, for which the data was readily available for many countries in World Bank (2007) (Appendix-1 illustrates the computation of the index values as well as related technical details).

¹⁵ For example, based on a certain method and purpose, per capita incomes (above the threshold), which is one of the underlying indicators of the HDI, were discounted or adjusted in the construction of the income sub-index of the HDI (See UNDP, 1992)

Table 1: Overall Results^a

Country ^e Name	Popu- Lation ^b 75-05	Per Capita Income ^c 75-05	Economic Globalization Index (EGI) ^f Period averages ^d							Change ^h			
										Ranking (R)		Rank	EGI
			75-9	80-4	85-9	90-4	95-9	00-5	75-05	75-9	00-5	75-9/00-5	00-5/75-9
<i>Ireland</i>	3.6	18,153	197	204	211	293	643	804	392	10	1	9	607
<i>Netherlands</i>	15.0	22,986	228	239	286	284	515	676	381	5	2	3	447
<i>UK</i>	57.7	21,621	161	221	292	283	409	494	316	18	3	15	333
<i>Iceland</i>	0.3	23,927	114	121	115	122	195	476	203	32	4	28	362
<i>Seychelles</i>	0.1	12,113	390	300	291	238	339	415	330	2	5	-3	25
<i>Finland</i>	5.0	21,038	99	128	133	201	304	412	219	39	6	33	313
<i>Malaysia</i>	18.2	6,072	174	230	205	348	349	400	284	15	7	8	226
<i>Sweden</i>	8.6	22,069	97	116	171	221	451	399	248	40	8	32	302
<i>Swaziland</i>	0.8	3,664	293	311	381	394	368	388	357	3	9	-6	94
<i>Grenada</i>	0.1	5,146	183	190	235	236	278	367	244	12	10	2	184
<i>Denmark</i>	5.2	23,691	106	134	168	205	231	365	213	36	11	25	259
<i>Austria</i>	7.8	23,052	131	165	138	150	225	363	201	26	12	14	232
<i>Portugal</i>	10.0	13,616	74	116	136	173	259	362	192	54	13	41	289
<i>Jamaica</i>	2.4	3,276	126	161	160	217	227	349	214	29	14	15	223
<i>Lesotho</i>	1.5	2,102	184	217	220	218	.. ^g	336	.. ^g	11	15	-4	152
<i>Spain</i>	39.0	17,470	51	67	84	144	202	321	150	62	16	46	269
<i>Kuwait</i>	1.8	20,729	205	206	211	300	267	314	252	8	17	-9	109
<i>Trin.&Tob.</i>	1.2	8,600	182	154	134	202	.. ^g	298	196	13	18	-5	116
<i>Jordan</i>	3.5	4,179	180	197	157	282	203	287	219	14	19	-5	107
<i>Norway</i>	4.3	26,612	167	152	177	177	245	273	201	17	20	-3	107
<i>Germany</i>	80.0	20,851	73	86	114	128	207	273	151	55	21	34	200
<i>France</i>	56.5	21,546	96	98	113	145	187	270	155	43	22	21	174
<i>Barbados</i>	0.3	.. ^g	228	246	205	187	226	264	227	6	23	-17	36
<i>Chile</i>	13.3	6,484	100	155	155	160	244	260	182	37	24	13	160
<i>Canada</i>	27.7	22,859	122	130	128	140	221	251	165	31	25	6	129
<i>Thailand</i>	54.0	4,593	78	96	112	187	219	239	158	50	26	24	162
<i>Israel</i>	5.0	18,464	217	186	172	158	172	232	191	7	27	-20	15
<i>Mali</i>	9.2	764	60	62	77	91	137	220	104	58	28	30	160
<i>Botswana</i>	1.4	5,474	416	306	238	188	163	214	254	1	29	-28	-202
<i>Philippines</i>	61.7	3,802	94	86	107	138	219	211	148	46	30	16	117
<i>Dominican R.</i>	7.0	5,002	87	77	113	136	..	210	124	47	31	16	122
<i>Togo</i>	4.0	1,490	250	211	177	135	149	201	189	4	32	-28	-49
<i>Costa Rica</i>	3.1	6,811	144	177	107	136	182	201	160	22	33	-11	57
<i>Greece</i>	10.2	15,205	74	87	80	77	103	198	107	53	34	19	125
<i>Australia</i>	17.0	21,081	54	74	128	110	139	197	117	61	35	26	143
<i>Honduras</i>	5.0	2,827	137	114	94	139	180	191	144	23	36	-13	54
<i>New Zealand</i>	3.5	17,793	96	128	165	197	203	183	161	44	37	7	87
<i>Nicaragua</i>	4.0	3,613	171	.. ^g	73	133	189	182	143	16	38	-22	12
<i>Ecuador</i>	10.2	3,317	97	105	104	142	.. ^g	182	.. ^g	41	39	2	85
<i>Paraguay</i>	4.2	4,240	97	82	103	150	199	177	136	42	40	2	80
<i>Tunisia</i>	8.0	5,006	145	169	130	177	170	175	162	20	41	-21	31
<i>El Salvador</i>	5.3	4,175	136	90	67	68	123	171	110	25	42	-17	36
<i>Ghana</i>	15.7	1,756	54	29	.. ^g	90	136	170	95	60	43	17	115
<i>Bolivia</i>	6.8	2,311	128	131	81	96	190	168	134	27	44	-17	40

TABLE 1
(cont'd)

Country ^c Name	Per		Economic Globalization Index (EGI) ^f							Change ^h			
	Popu- Lation ^b	Capita Income ^c	Period averages ^d							Ranking (R)		Rank	EGI
	75-05	75-05	75-9	80-4	85-9	90-4	95-9	00-5	75-05	75-9	00-5	75-9/00-5	00-5/75-9
<i>Italy</i>	56.7	20,834	77	85	74	106	157	167	113	51	45	6	90
<i>Cote d'Ivoire</i>	12.6	1,881	144	126	107	102	152	160	133	21	46	-25	16
<i>Venezuela, RB</i>	19.7	6,224	108	86	96	179	170	156	133	35	47	-12	48
<i>Oman</i>	1.8	10,537	199	160	128	120	141	153	151	9	48	-39	-46
<i>Guatemala</i>	9.1	3,687	99	75	80	89	.. ^g	151	.. ^g	38	49	-11	52
<i>Korea, Rep.</i>	42.6	10,411	113	117	113	101	169	150	128	33	50	-17	36
<i>Colombia</i>	35.2	5,425	50	62	73	79	115	147	90	64	51	13	97
<i>Argentina</i>	32.5	11,006	49	75	46	80	121	147	91	65	52	13	98
<i>Sudan</i>	26.4	1,287	34	43	22	.. ^g	51	143	.. ^g	70	53	17	110
<i>Turkey</i>	56.0	5,399	28	38	55	77	98	139	75	71	54	17	111
<i>Morocco</i>	23.7	3,245	85	80	83	102	93	139	98	48	55	-7	54
<i>Sri Lanka</i>	16.8	2,559	94	124	132	171	154	137	135	45	56	-11	43
<i>Syria</i>	12.9	2,929	76	61	75	179	184	129	120	52	57	-5	53
<i>Senegal</i>	8.1	1,408	136	149	101	104	129	128	124	24	58	-34	-7
<i>United States</i>	253.3	28,058	41	50	62	60	107	118	73	67	59	8	77
<i>Egypt</i>	55.7	2,749	147	127	111	108	93	117	115	19	60	-41	-30
<i>Benin</i>	5.4	914	123	133	94	143	124	114	122	30	61	-31	-9
<i>Sierra Leone</i>	4.0	770	85	86	189	99	.. ^g	109	.. ^g	49	62	-13	25
<i>Brazil</i>	148.2	6,637	42	47	36	50	89	106	63	66	63	3	64
<i>Peru</i>	21.7	4,749	59	60	53	74	123	100	80	59	64	-5	41
<i>Kenya</i>	23.5	1,051	113	95	83	104	101	99	99	34	65	-31	-14
<i>Japan</i>	122.2	21,881	40	61	60	61	91	95	70	68	66	2	55
<i>Madagascar</i>	12.5	947	51	40	52	63	.. ^g	76	.. ^g	63	67	-4	25
<i>Haiti</i>	6.7	2,051	72	78	59	45	.. ^g	75	65	56	68	-12	3
<i>India</i>	850.8	1,752	11	13	14	29	46	69	29	72	69	3	58
<i>Niger</i>	8.9	829	127	106	76	92	63	69	90	28	70	-42	-58
<i>Pakistan</i>	109.9	1,562	39	47	54	69	69	58	57	69	71	-2	19
<i>Rwanda</i>	6.4	1,031	69	64	46	47	41	49	52	57	72	-15	-19

a. We used the data in World Bank (2007) in our calculations. See World Bank (2007) for more information on the definitions of the relevant data and other information. **b.** Overall (1975-2005) period average in millions. **c.** Overall (1975-2005) period average of Per Capita PPP GDP in 2000 international \$. **d.** 5-year averages (75-9, 80-4, 85-9, 90-4, 95-9, 00-05 (only this is 6-year average due to the sample period)) and overall period average (75-05). We calculated 5-year (or 6-year) average for a given country only if that country has at least 3 observations. Similarly, we calculated the overall period (1975-2005) average for a given country only if that country has at least 25 observations. **e.** Countries reported in this table are those with available data for ranking purpose. See Appendix-2 for the results of other countries. Note that, the countries are ranked based on the EGI values in 2000-5 sub-period. **f.** We have used the formulas in equations 1-4 for computing the EGI values. **g.** “..” means that data are either unavailable or insufficient for calculating the relevant period average (see note **d**). **h.** “/” represents subtraction; therefore, “00-5/75-9” should be read as “the change in EGI from 1975-9 to 2000-5”.

Source: Authors' calculation.

Table 1 and the Appendix-2 report the values for the economic globalization index (EGI) for the six sub-periods (1975-9, 1980-4, 1985-9, 1990-4, 1995-9 and 2000-5)¹⁶ and the overall period (1975-05), and the change (or difference) between the initial sub-period (1975-9) and the final sub-period (2000-5) for 156 countries¹⁷ and country income groups. Table 1 also provides the EGI ranking for 72 countries, for which the required data is available, for the initial and final sub-period as well as the change in the ranking between the initial and final sub-period. Furthermore, Table 1 and the Appendix-2 provide data on per capita income (real PPP GDP per capita) and population levels for the overall period.

The main conclusion emerging from our results (see Table 1 and the Appendix-2) is that there are disparities in the relative level of global integration across countries, across country groups, across developing regions and over time.

As is seen from Table 1, rich countries tend to be more globalized than poor countries.¹⁸ Furthermore, Table 2 and Figure 1 provide evidence on the economic globalization of country income groups¹⁹ from 1975 to 2005.

Table 2: Economic Globalization of Country Income Groups, 1975-2005

Country Income Group	EGI (Period averages)						Change	
	75-9	80-4	85-9	90-4	95-9	00-5	75-05	00-5 / 75-9
Low income (LI)	31	34	37	58	75	92	54	61
Middle income (MI)	69	74	72	107	141	160	108	92
High income (HI)	77	91	104	113	179	234	133	158
<i>Gap (HI vs LI)</i>	45	57	67	55	104	142		97
<i>Gap (HI vs MI)</i>	8	17	32	6	38	74		66

See Table 1's notes (a – g)

¹⁶ In order to facilitate more healthy comparisons of the index values we provide the results as a 5-year average for 6 sub-periods. This is important in the sense that it will help us to eliminate distortionary single year effects, such as those characterized by terms of trade shocks or financial crises. However, the full (yearly) dataset for the EGI and sub-indices can be obtained from the first author upon request.

¹⁷ There are 156 countries with some available data in 1975-2005 period for the three indicators in World Bank (2007).

¹⁸ However, there are some exceptions; for instance, USA and Japan performed poorly in EGI rankings. Similar results -in terms of economic integration- are reported for these countries by Foreign Policy (2001). It would be useful to analyze country-specific globalization experiences (as well as providing policy implications) but this is beyond the aim and the scope of this paper.

¹⁹ Country income groups are as defined in World Bank (2007).

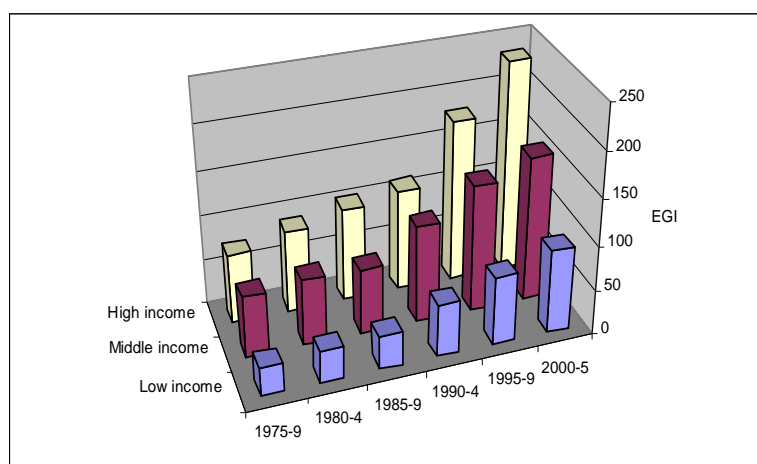
Figure 1: Economic Globalization of Country Income Groups, 1975-2005

Figure 1 reveals that the high income countries were more integrated than the low and middle income countries during the period 1975-2005.²⁰ Also, as can be seen from the last two rows of Table 2, the gaps between high income (HI) countries and low (LI) and middle (MI) income countries have been widening since the early 1990s.

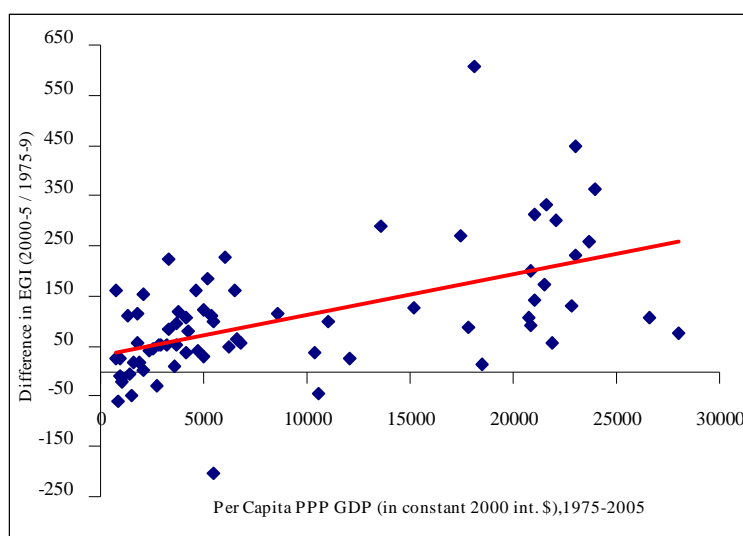
Moreover, countries do not appear to integrate into the global economy at the same speed over time. Figure 2 is a scatter plot of the difference (change) in EGI (2000-5/75-9)²¹ and real per capita income for 71 countries²² (coefficient of correlation between the two variables is +0.548). This figure clearly shows that rich countries, on average, have improved their integration to the global economy from 1975 to 2005.

²⁰ For 72 countries from 1975 to 2005, there is a positive relation between the average economic globalization performance and the average real per capita income. The correlation coefficient between these two variables is +0.239 (please note that all reported correlation results in this study are statistically significant at 5% level of significance unless otherwise indicated). Furthermore, in line with our expectations there is a negative correlation between population levels and the EGI values for 73 countries (the coefficient of correlation between these variables is -0.306) during the same period. Nevertheless, besides per capita income and population size, other factors -such as geographic location, membership of a regional bloc and natural resource endowments- also play a crucial role on globalization performance. Therefore, it should be mentioned at the outset that there is a need for a formal empirical analysis for estimating and testing the empirical relationships mentioned in this study. However, the use of descriptive analysis is in line with the aim and the scope of this paper.

²¹ “/” represents subtraction; therefore, “00-5/75-9” should be read as “the change in EGI from 1975-9 to 2000-5”.

²² Data availability determines the number of countries in our analyses (see Table 1 and the Appendix-2).

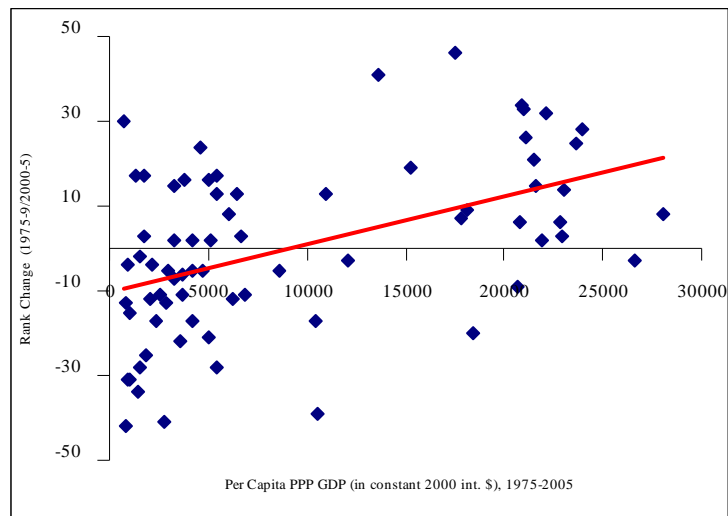
Figure 2: The Cross-Country Relation between the Change in EGI and Per Capita Income, 1975-2005



Nevertheless, it should be noted here that even if a country has a positive difference in its EGI over a time period, its ranking position might have deteriorated or stayed the same. For example, Norway achieved a positive difference (107 points), but lost three places in its ranking position from 1975-9 to 2000-5. Therefore, a positive difference value indicates an “improvement” over the earlier period, but it is not an indicator for improvement in ranking position. As a result, we also look at the change in the ranking value (1975-9/2000-5)²³ in Table 1, which indicates that from 1975 to 2005 poor countries’ ranking positions were highly volatile and many of these countries ranking positions have deteriorated. Figure 3 -which shows the cross-country relation between the rank change and average real per capita income for the period 1975-2005 for 71 countries-, provides visual evidence. The coefficient of correlation between the two variables is +0.481. Therefore, the positive correlation between the two variables shows that improvements in the ranking position tend to be associated with increases in real per capita income.

²³ Note that, in order to have valid interpretation, we subtract 2000-5 rank values from 1975-9 rank values. Therefore, positive rank change indicates an improvement in the ranking position.

Figure 3: The Cross-Country Relation between the Rank Change and Per Capita Income, 1975-2005



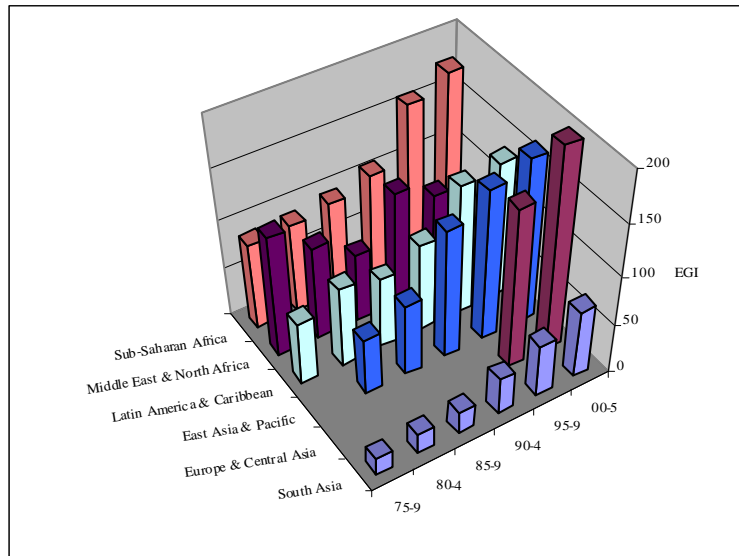
There are also disparities among the developing regions, which comprise the low and middle income countries (see Table 3). As of the 2000-5 sub-period, developing countries in Europe and Central Asia were, on average, more integrated into the global economy than the developing countries of other regions. However, developing countries of the South Asia were, on average, least integrated into the global economy. Figure 4 –which shows the economic globalization performances of the developing regions from 1975 to 2005- reveals the disparities among the developing regions. Middle East and North Africa region is the most volatile region, probably due to the existence of the oil exporting countries since the performances of these countries’ are highly indexed to the oil prices (this is evident from the peaks in 1975-9, 1980-4 and 1990-4 sub-periods in Figure 5). Furthermore, Figure 5 shows that developing regions do not appear to integrate into the global economy at the same speed over time.

Table 3: Economic Globalization in Developing Regions, 1975-2005

Country Income Group	EGI (Period averages)					
	75-9	80-4	85-9	90-4	95-9	00-5
East Asia & Pacific	..	57	73	130	151	165
Europe & Central Asia	..	..	..	..	159	208
L. America & Caribbean	63	80	71	89	130	136
M. East & North Africa	122	93	68	113	95	..
South Asia	17	21	22	38	53	69
Sub-Saharan Africa	87	90	96	106	159	176

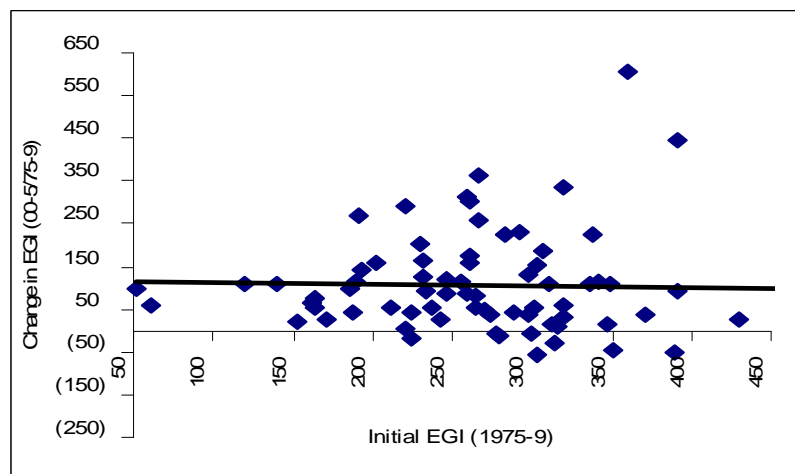
See Table 1’s notes (a – g)

Figure 4: Economic Globalization in Developing Regions, 1975-2005



Finally, we would like to check whether the least globalized countries are catching-up the most globalized countries from 1970-5 to 2000-5. Figure 5 shows the cross-country relation between the difference (change) in EGI (2000-5/1975-9) and the initial sub-period EGI (1975-9) values for 72 countries. The coefficient of correlation is almost zero ($r=-0.017$) -which indicates that the two variables are not linearly related. Also, it is clear from the estimated (*flat*) line in Figure 5 that there is no evidence of catch-up.²⁴ That is, those countries that have low values of EGI in 1975-9 period have not significantly improved their relative level of economic globalization, on average, vis-à-vis other countries -with relatively high values of EGI in 1975-9-, from 1970-5 to 2000-5.

Figure 5: The Cross-Country Relation Between the Initial EGI and change in EGI



²⁴ For the evidence of catch-up, the estimated line should have a significant negative slope.

Summary and Concluding Remarks

By developing the economic globalization index we aimed to provide a unified and comparable information for researchers and policy-makers, both at national and international level, to assess the globalization performances of different countries, country groups and regions in a given year (or period) and over time.

The main conclusion emerging from our study is that rich countries tend to be more globalized than poor countries. Furthermore, rich countries have improved their globalization –relative global integration level- from 1975 to 2005; however, many of poor countries' relative levels of global integration have deteriorated during the same time period. These results seem to be in line with the studies that characterize the recent situation in the world as “truncated globalization” or simply “triadization”; that is, the high concentration of the FDI, financial flows, and trade in the Triad of North America, Western Europe and Japan plus other “tigers” in East Asia. (see, for example, Petrella, 1996, p. 69; Hirst & Thompson, 1996, p.2).

Our results also underline the crucial role of state (e.g. promotion of human development and provision of adequate infrastructure, which are essential for competing in today's global world) and international organizations (e.g. balanced management of the current global economy) in helping poor countries to cope with the challenges of globalization.

Appendix-1

Economic Globalization Index: Computation and Related Technical Details

Firstly, we must set the minimum (Min_{FTR} , Min_{FDIR} , Min_{PCFR}) and maximum bounds (Max_{FTR} , Max_{FDIR} , Max_{PCFR}) for each indicator (ratio) (FTR, FDIR, PCFR) in order to compute the respective sub-index values for all countries. Since we aim to construct the EGI for all countries (with some available data), we suffer from the extreme value/“outlier” problem mentioned in the text. Hence we must set the minimum and maximum bounds according to a rule.

We can refer to the Exploratory Data Analysis (EDA) for detecting “outliers” and setting the minimum and the maximum bounds. According to this approach, a given data point (X_0) in a batch of data (X) is a moderate (far) outlier, if $X_0 > Q_U + k \times \text{IQR}$, where Q_U and IQR represent upper/third quartile and interquartile range, respectively, and k is a parameter and equal to 1.5 (3) (see Mukherjee *et al.*, 1998; Siegel & Morgan, 1996; Hoaglin, 1983). Note that the right hand side of this inequality, by definition, represents maximum bound (MAX_X) for the batch of data (X) under consideration. Therefore, in line with this approach, we can also define other alternative “outlier”/maximum bounds ($\text{MAX}_X = Q_U + k \times \text{IQR}$) for different values of k .

For our purpose, however, we must proceed in two steps for setting the maximum bounds since we have both cross-section and time dimension in our data. First we must find the maximums achieved by all the countries in the data (World Bank, 2007) for each indicator, e.g. FTR, and then set the maximum bound for the relevant indicator, e.g. MAX_{FTR} , by performing the above mentioned procedure. Note that we must pre-select the value of k and use the same value for setting the maximum bounds for the three indicators.

If we apply moderate-outlier definition ($k=1.5$) for outlier detection and set the maximum bounds accordingly, we will have outlier countries, such as Singapore and Ireland. Even if we try for higher values of k (e.g. $k=3$ or higher), we will still have “outliers” but less than the case of $k=1.5$. Thus, as k increases, total number of “outliers” decreases but also the EGI values decrease and this affects the interpretation of the EGI values, i.e., there will be downward bias in the EGI values.

Hence, there is a trade-off between the interpretability and total number of outliers. Keeping this in mind, we selected the value of k as 1.5. So, the minimum and maximum bounds of the respective indicators (ratios) are as follows:²⁵

$$\begin{array}{lll} \text{Min}_{\text{FTR}} = 6.3 \% & \text{Min}_{\text{FDIR}} = 0 & \text{Min}_{\text{FCFR}} = 0 \\ \text{Max}_{\text{FTR}} = 250.5 & \text{Max}_{\text{FDIR}} = 25.9 & \text{Max}_{\text{FCFR}} = 71.6 \end{array}$$

We use equation (1)-(3) to calculate the respective sub-index values.²⁶ And, then we use equation (4) to calculate the EGI values for each country.

²⁵ We used the actual minimums, i.e., minimum of all values across countries and over time, as the minimum bounds since we have outlier problem for the maximums.

²⁶ Maximum value (1000) is assigned to the respective sub-index value(s) of the “outlier” countries in given period(s). By doing so, all countries with the available data are included in our analysis without distorting the index values.

Appendix-2 Results for Other Countries

Country Group Name	Population 75-05	Per Capita Income 75-06	Economic Globalization Index Period Averages						
			75-9	80-4	85-9	90-4	95-9	00-5	75-05
<i>Aruba</i>	..	..	..	..	..	498	420	..	..
<i>Angola</i>	10.9	1,608	..	..	108	237	395	441	..
<i>Albania</i>	3.0	3,298	..	..	..	176	108	143	..
<i>Armenia</i>	3.2	..	..	..	..	..	..	189	..
<i>Azerbaijan</i>	7.1	..	..	..	..	..	342	500	..
<i>Burundi</i>	5.5	785	..	..	49	59	45	63	..
<i>Belgium</i>	10.0	22,301	..	194	..	..	..	696	..
<i>Burkina Faso</i>	8.9	919	57	58	53	49	..	..	..
<i>Bangladesh</i>	105.3	1,270	..	..	19	25	45	57	..
<i>Bulgaria</i>	8.5	6,211	..	..	..	176	212	339	..
<i>Bahamas, The</i>	0.3	14,986	223	187	172	..	..	..	..
<i>Bosnia and Herzegovina</i>	3.9	..	..	..	..	..	..	279	..
<i>Belarus</i>	9.9	..	..	..	..	..	208	211	..
<i>Belize</i>	0.2	4,262	..	..	216	210	227	316	..
<i>Central African Republic</i>	3.0	1,330	112	102	76	70	..	..	..
<i>Switzerland</i>	6.8	28,030	..	..	268	244	453	504	..
<i>China</i>	1,124.4	2,261	..	30	56	109	125	141	..
<i>Cameroon</i>	11.8	2,055	89	142	117	99	..	..	..
<i>Congo, Rep.</i>	2.6	1,163	..	274	191	188	458	397	289
<i>Comoros</i>	0.5	1,845	..	..	126	95	..	..	..
<i>Cape Verde</i>	0.4	3,686	..	..	85	87	180	..	..
<i>Cyprus</i>	0.6	13,915	216	221	187	214	273	..	..
<i>Czech Republic</i>	10.3	..	..	..	..	..	279	330	..
<i>Dominica</i>	0.1	4,361	..	203	270	274	304	249	..
<i>Algeria</i>	24.9	5,445	140	83	52	..	..	..	..
<i>Estonia</i>	1.5	8,916	..	..	..	254	368	531	..
<i>Ethiopia</i>	50.9	817	..	23	19	30	..	..	..
<i>Fiji</i>	0.7	4,533	..	164	207	278	279	..	..
<i>Gabon</i>	1.0	7,041	..	207	210	190	272	234	220
<i>Georgia</i>	5.0	3,688	..	..	..	..	151	195	..
<i>Guinea</i>	6.5	..	..	..	..	..	81	87	..
<i>Gambia, The</i>	1.0	1,633	..	178	168	205	..	..	..
<i>Guinea-Bissau</i>	1.1	921	..	..	204	161	..	172	..
<i>Guyana</i>	0.7	3,334	223	220	..	..	..	..	..
<i>Hong Kong, China</i>	5.8	19,182	..	..	..	..	..	914	..
<i>Croatia</i>	4.6	..	..	..	..	..	232	309	..
<i>Hungary</i>	10.4	11,290	..	..	105	155	323	350	..
<i>Indonesia</i>	177.5	2,250	..	72	63	91	146	126	..
<i>Iran, Islamic Rep.</i>	52.3	5,746	108	52	26	98	52	..	..

(cont'd)

Country Group Name	Population 75-05	Per Capita	Economic Globalization Index						
		Income 75-06	Period Averages						
			75-9	80-4	85-9	90-4	95-9	00-5	75-05
<i>Kazakhstan</i>	15.4	..	..	..	..	..	207	342	..
<i>Kyrgyz Republic</i>	4.3	..	..	..	..	..	..	189	..
<i>Cambodia</i>	9.9	..	..	..	..	..	..	255	..
<i>St. Kitts and Nevis</i>	0.0	7,761	..	371	395	325	336	507	..
<i>Lao PDR</i>	4.2	..	..	..	63	95	167	..	..
<i>St. Lucia</i>	0.1	4,614	..	395	332	312	281	271	..
<i>Lithuania</i>	3.5	..	..	..	..	..	235	253	..
<i>Luxembourg</i>	0.4	33,351	..	..	..	..	..	999	..
<i>Latvia</i>	2.5	8,019	..	..	..	228	293	300	..
<i>Moldova</i>	4.2	2,402	..	..	..	..	297	302	..
<i>Maldives</i>	0.2	..	..	..	..	..	300	302	..
<i>Mexico</i>	82.7	7,980	..	84	84	96	146	134	108
<i>Macedonia, FYR</i>	1.9	..	..	..	..	..	..	242	..
<i>Mongolia</i>	2.1	1,434	..	..	..	205	213	328	..
<i>Mozambique</i>	14.6	704	..	92	43	79	128	191	..
<i>Mauritania</i>	2.1	1,915	282	224	195	275	261	..	..
<i>Mauritius</i>	1.1	7,318	..	146	194	204	221	230	200
<i>Malawi</i>	8.9	565	115	84	76	88	..	..	..
<i>Nigeria</i>	92.4	865	66	70	151	207	..	..	..
<i>Nepal</i>	19.6	1,071	33	39	45	..	86	..	..
<i>Panama</i>	2.4	5,280	..	601	556	582	584	432	546
<i>Papua N. Guinea</i>	4.2	2,217	159	207	183	203	260	..	..
<i>Poland</i>	37.3	..	..	..	..	90	128	171	..
<i>Romania</i>	22.4	6,706	..	..	..	84	135	183	..
<i>Russia</i>	143.9	..	..	..	..	..	136	168	..
<i>Singapore</i>	3.2	15,537	..	..	..	..	..	877	..
<i>Solomon Islands</i>	0.3	1,939	..	216	233	266	234	..	..
<i>Sao Tome & Prin.</i>	0.1	..	..	..	154	..	..	..	..
<i>Slovak Republic</i>	5.2	..	..	..	..	..	272	388	..
<i>Slovenia</i>	2.0	..	..	..	..	188	186	277	..
<i>Chad</i>	6.4	879	85	49	108	90	..	..	..
<i>Tajikistan</i>	5.1	..	..	..	..	..	..	263	..
<i>Tonga</i>	0.1	5,893	..	..	147	129	..	..	..
<i>Tanzania</i>	26.7	..	..	..	..	86	106	114	..
<i>Uganda</i>	18.4	..	..	..	36	49	74	92	..
<i>Ukraine</i>	50.2	..	..	..	..	..	175	260	..
<i>Uruguay</i>	3.1	7480.39	..	99	111	88	104	247	133
<i>St. Vincent & G.</i>	0.1	4,096	..	246	277	..	..	..	..
<i>Vietnam</i>	66.0	..	..	..	..	..	223	228	..
<i>Vanuatu</i>	0.2	2,980	..	542	423	458	..	..	..
<i>Samoa</i>	0.2	..	..	..	..	..	145	..	..
<i>Yemen, Rep.</i>	12.9	..	..	..	..	..	..	120	..
<i>South Africa</i>	35.5	9,242	..	82	81	76	153	148	109
<i>Zambia</i>	8.4	981	..	144	239	..	159
<i>Zimbabwe</i>	10.1	2,526	54	71	69	90

Source: See Table 1....Note: See Table 1's notes (a – g)

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