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Globalisation in the 21st Century: Measuring Regional Changes in Multiple Domains

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Abstract

It is clear that globalisation is something more than a purely economic phenomenon manifesting itself on a global scale. Among the visible manifestations of globalisation are the greater international movement of goods and services, financial capital, information and people. In addition, there are technological developments, more international cultural exchanges, facilitated by the freer trade of more differentiated products as well as by tourism and immigration, changes in the political landscape and ecological consequences. To be in a position to evaluate the consequences of globalisation in a rational and scientific manner, objective indicators are needed. In this paper, we have updated and improved upon the Maastricht Globalisation Index. This index measures the economic, social-cultural, technological, ecological and political dimensions of globalisation and allows comparison of the degree and change in globalisation for a large number of countries.

Keywords: Globalisation; indicators; integrated assessment

1 Introduction

During the last few decades, human dynamics, institutional change, political relations and the global environment have become successively more intertwined. These increased global economic integration, global forms of governance, globally inter-linked social and environmental developments are often referred to as globalisation. However, depending on the researcher or commentator, it can mean the growing integration of markets and nation-states and the spread of technological advancements (Friedman 1999); receding geographical constraints

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on social and cultural arrangements (Waters 1995); the increased dissemination of ideas and technologies (Albrow 1996); the threat to national sovereignty by trans-national actors (Beck 2004); or the transformation of the economic, political and cultural foundations of societies (Mittleman 2000).

Among the more visible manifestations of globalisation are the greater international movement of goods and services, financial capital, information and people. In addition, there are technological developments, new and enhanced legal systems and institutions that facilitate these flows. On the cultural front, there are more international cultural exchanges, the spread of multi-culturalism and greater cultural diversity within many countries. Such developments are facilitated by the freer trade of more differentiated products as well as by tourism and immigration. Flows of immigration—both legal and illegal—also contribute to today's melting pot societies.

For many commentators, particularly economists, there is little doubt that globalisation has produced significant gains at the global level (Bhagwati 2004). Foreign trade in goods and services, capital, technology and labour all move more freely across borders. In addition to economic gains, there have been significant benefits in the areas of culture and governance (Falk 2000). Public awareness of issues such as human rights, democracy and gender equality has increased significantly because of the greater access to newspapers, radio, television, telephones, computers and the internet. These developments have arguably led to improved allocative efficiency that, in turn, enhances growth and human development (UNDP 1999).

At the same time, globalisation is also perceived as creating new threats: to individuals, societies and ecosystems. There are fears that it may exacerbate the gap between rich and poor—both within and across countries—creating new threats to human security in terms of financial volatility, political and cultural insecurity and environmental degradation. In other words, the beneficial, innovative and dynamic aspects of globalisation are being tempered, and according to some more than offset, by forces that create disruption and marginalisation, such as population growth and migration, the emergence of infectious diseases, widening disparities in development world-wide, climate change, an accelerating loss of biodiversity and the scarcity and pollution of fresh-water resources. In this context, we argue that the complexity of the process of globalisation calls for a truly integrated but pluralistic approach that combines economic, socio-cultural and ecological dimensions (Rennen & Martens 2003).

To answer questions about the overall impact of globalisation, and to evaluate the consequences of globalisation in a rational and scientific manner, underscores the importance of measuring globalisation. To assess the extent to which a nation-state is more (or less) globalised at any particular point requires much more than employing data on flows of trade, migration or foreign direct investment (FDI). Instead of choosing particular variables that best fit a particular author's ideology, in our opinion, a measure of globalisation has to be developed independent of any specific research agenda. With this objective in mind, in this paper the development of a measure of globalisation is broken down into three separate tasks. First, we define globalisation as broadly as

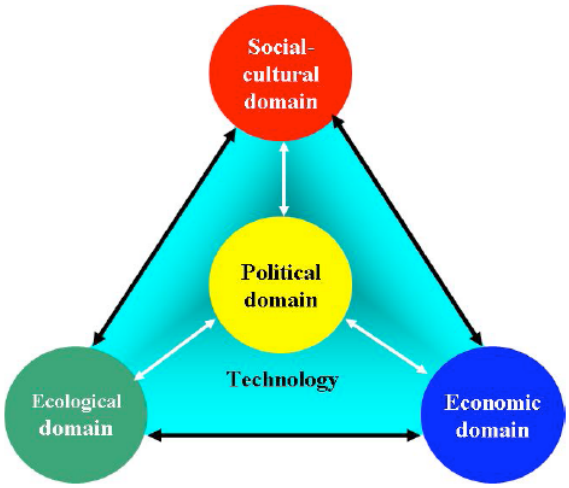

Figure 1: A pluralistic approach to globalisation (Rennen & Martens 2003).

possible. Secondly, variables that best fit that definition are identified. And thirdly, a specific method to calculate the index has applied to these variables. Of course, there are many ways of describing the complexity of global dynamics including processes like globalisation, none of which is perfect. However, light can be shed on the increasing complexity of the global system by the process of measuring globalisation. A thorough overview on various globalisation indices can be found in (Dreher et al. 2008).

2 A pluralistic approach to globalisation

Despite controversies about the historical evolution and the nature of globalisation, the major forces at stake are primarily economic, political and technological. This does, however, not imply that social, cultural and ecological factors are not also important. Most historical analyses of globalisation acknowledge that globalisation is driven by economic incentives (Rennen & Martens 2003). Technological innovations—in particular innovations in transport and communications technology—form a second primary foundation of globalisation (Langhorne 2001).

Figure 1 presents a multi-domain model, which shows the interaction between the various domains and dimensions of globalisation (see Rennen & Martens 2003, for more details). In this model, the boundaries between the various dimensions—better referred to as domains—are not fixed. Rather, they are inter-connected and affect each other in various ways. Technology occupies a mediating role since the application, functioning and innovative impulses of technological developments are always an integral part of economic, ecological, political and socio-cultural practices.

Although the interaction between economic development and technological innovation formed the foundation of globalisation, political dimensions cannot be ignored either. But it is not only economic and political power-related issues that enforced the process of global politics. The establishment of international and supranational organisations are important factors underlying the emergence of global social, cultural and environmental politics (Nederveen Pieterse 2008).

As the world is increasingly becoming a global village because people's lives—despite their location in one place—are connected with other parts of the world through the media, globalisation has increased interpersonal and international social-cultural exchanges via migration, tourism or exchange studentship. Many homogeneous societies have turned into multicultural communities in which people from different cultural backgrounds live together (Burity 2008).

Finally, ecological factors should not be overlooked when analysing globalisation, although they do differ from the other dimensions of globalisation. In contrast to the other dimensions, they usually appear to be the consequence of globalisation, rather than a driving force. However, many ecological factors, such as global climate change, might become driving forces in the future.

This multi-domain, pluralistic approach enables us to perceive globalisation as a phenomenon, or an overarching process in which many different processes simultaneously take place in many domains. Consequently, the term globalisation is a collective label and not one giant process in itself (Martens & Rotmans 2002, 2005). After all, not all factors that underlie or shape globalisation, or all the consequences of this process have yet been identified. Acknowledging the pluralistic character of the forces that drive globalisation and its consequences are an essential step in describing the phenomenon—for example by indicators—as we will do in the next section.

3 The Maastricht Globalisation Index

When a phenomenon like globalisation encompasses several aspects that taken together may have an effect greater than the sum of their constituent parts, it appears logical to assess these effects together. Composite indices provide an excellent way to accomplish this since they provide a single statistic on which comparisons can be based, without the confounding effects of variation at lower levels of aggregation.

If the primary objective is to derive a comprehensive measure of globalisation, then there are several conditions that a composite index of globalisation needs to fulfil. In particular, it has to be relevant, robust, transparent and it needs to add value (i.e., to not be redundant). Indices used in previous research have been criticised for their lack of theoretical foundation and relevance and their lack of robustness (Scholte 2002, Lockwood 2004). The differentiation of a measure of globalisation from the concepts identified by (Lockwood 2004) as dead-ends in the globalisation debate—namely internationalisation, liberalisation, universalisation and Westernisation—is especially

challenging in this context. Further, many potential measures of globalisation are likely to be correlated with economic development. Therefore, a comprehensive globalisation measure must not simply be a more complicated measure of economic development. In the next sections, we describe the Maastricht Globalisation Index (MGI). For a detailed discussion on the use of indicators to measure globalisation, we refer to Dreher et al. (2008), but see also http://www.globalisationindex.info/.

3.1 Components of the MGI

The Maastricht Globalisation Index or the "MGI" was developed by Martens & Zywietz (2006) and Martens & Raza (2008) to improve upon the existing indices. Some of the previous indices have an arguably neo-liberal focus on the economic dimensions of globalisation. This may stem from the definition of globalisation used. As argued earlier, the definition of globalisation should refer to the process in its current state, including social, cultural and environmental factors. Hence, contemporary globalisation is defined as the intensification of cross-national interactions that promote the establishment of trans-national structures and the global integration of cultural, economic, ecological, political, technological and social processes on global, supra-national, national, regional and local levels (Rennen & Martens 2003). As discussed in the previous sections, reflecting the need for a balance between broad coverage, data availability and quality motivated the following choice of indicators (see Table 1), with data for 117 countries (see Figure 2), for each of the domains presented in Figure 1.

Political domain: First among the indicators of political integration are the diplomatic relations that constitute an historical basis for communication between countries. It seems logical that the more important are the links to the outside world, then the more diplomatic links countries will establish to stay informed, protect their interests and facilitate communication. Since no aggregated statistics on diplomatic relations are available at a global level, the number of in-country embassies and high commissions listed in the Europe World Yearbook are used. The data are available for nearly all countries world-wide, but are corrected for country size, since very small countries often cannot afford the expense of maintaining multiple embassies and often accredit one representative for several countries. Membership in international organisations is a similar measure of the extensity of the international relations and involvement of a country. Moreover, since such memberships do not necessarily entail the need to maintain expensive representations abroad, this measure is less dependent on the size of the country. Organised violence measures the involvement of a country's military-industrial complex with the rest of the world. While data quality is low, they nevertheless offer an insight into weapons proliferation, international military aid and the reasons and results of international peace-keeping operations. As this dimension has not previously appeared in other globalisation indices, no comparison is possible with those indices. Of the

Table 1: Maastricht Globalisation Index (MGI) variables.

Category	Variable name	Variable definition
Political Domain	Embassies	Absolute number of in-country embassies and high commissions
	Organizations	Absolute number of memberships in international organizations
	Military	Trade in conventional arms as a share of military spending
Economic Domain	Trade	Imports + exports of goods and services as a share of GDP
	FDI	Gross foreign direct stocks as a share of GDP
	Capital	Gross private capital flows as a share of GDP
Social & Cultural Domain	Migrants	Those who changes their country of usual residence per 100 inhabitant
	Tourism	International arrivals + departures per 100 inhabitants
Technological Domain	Phone	Incoming + outgoing international telephone traffic in minutes per capita
	Internet	Internet users as a share of population
Ecological Domain	Eco footprint	Ecological deficit in global ha

quantitative military indicators proposed by Held et al. (1999), trade in conventional arms, compiled by the Stockholm International Peace Research Institute (SIPRI), is the only variable available for a reasonable number of countries. To make the data internationally comparable, a country's trade in conventional arms is correlated to its military expenditure. Since a large share of the trade is in "bigticket" items and programmes that are approved and recorded in one year may actually take several years to deliver and service, a moving three-year average is used. The period is arbitrary but offers a reasonable compromise between data availability and the need to smooth the data for infrequent, large purchases.

Economic domain: Like other globalisation indices, global trade intensity is included as a measure of the intensity of economic globalisation. Trade intensity is the sum of a country's exports and imports of goods and services as a share of GDP. The data in this domain have been documented thoroughly over an extended period, in many cases extending back to the nineteenth century. Trade in services has brought new challenges to the statistical process, as it is far easier to value goods physically crossing border checkpoints than, e.g., data processing or telecommunications, or even outsourced management consultancy services. Nonetheless the data are widely available and generally reliable. Gross Foreign Direct Investment (FDI), representing financial enmeshment, is the sum of the absolute values of inflows and outflows of FDI recorded in the balance of payments financial accounts. It includes equity capital, reinvestment of earnings, as well as other long-term and short-term capital. This indicator differs from the standard measure of FDI, which captures only inward investment. For the measurement of globalisation, however, the direction of the flow is less important than the volume. FDI is the long-term involvement of a foreign firm in a country and has cascading effects throughout an entire economy. It exposes local companies to foreign technical innovations, management styles, techniques as well as increased direct competition. The second measure of financial interdependence used is gross private capital flows (as a percentage of GDP). This is the sum of the absolute values of direct, portfolio and other investment inflows and outflows recorded in the balance of payments financial accounts, excluding changes in the assets and liabilities of monetary authorities and the government. It measures the wider involvement of international capital in an economy and complements the FDI figures. Once again, the trailing three-year average is employed.

Social and Cultural Domain: To encapsulate migration and the international linkages that come with the movement of populations between different countries, we used the number of people on the move. Newly-arrived immigrants often maintain close connections to their home countries based on family ties and cultural similarities, often sending money home to their relatives and economic dependents. While a detailed analysis of migrant stocks and flows, specified by type and reason of migration would certainly be instructive, again

only limited data are available on a global scale. As immigration and naturalisation policies vary widely internationally and illegal immigration is widespread, the stock of migrants (the share of foreign-born residents of a given country) will have to suffice as a measure of the intensity of this increasingly controversial dimension of globalisation.

Tourism brings people in contact with each other. It changes attitudes and promotes understanding between cultures that would otherwise have little contact. As a major economic activity, it can bring prosperity to regions with no other resources than the natural beauty of the surroundings or the cultural value of historic sites. Tourism has grown steadily in the last century, the major impetus being cheaper air travel. It represents an important part of globalisation and is therefore included in the index. The World Tourism Organisation, the source of the data, provides the sum of international inbound and outbound tourists, i.e., the number of visitors who travel to a country other than their usual residence for a period not exceeding twelve months and whose main purpose in visiting is not employment related.

Technological Domain: The share of a country's population that uses the internet still adds detail to the picture of the intensity of the technological aspect of globalisation. Whether informing the international community about human rights abuses in reclusive countries or giving farmers access to commodity prices on the world's exchanges, as a global medium that transmits information cheaply over large distances it is an important factor. The second component, international telephone traffic (again measuring intensity), can be used with fewer reservations, as the technology is older and therefore more widespread and less dependent on a country's income. International telephone traffic is defined as the sum of incoming and outgoing phone calls for a country, measured in minutes per capita (the original data are from the International Telecommunication Union, but are available from various published sources).

Ecological Domain: Overlooked by existing indices are ecological indicators, i.e., measures of the intensity of globalisation in the ecological domain. Held et al. (1999) investigate global environmental degradation and the corresponding political and societal responses. These responses, however, are very difficult to track on a country-by-country basis. A more promising approach is to measure international linkages in terms of trade of goods that have a strong environmental impact, if not a high monetary one. Trade in software, for example will generally have a far smaller impact on the environment than trade in tropical hardwoods, hazardous waste or water-intensive agricultural products. Ecological footprint data offer a summary for many of these components since production and trade of these kinds of goods are summarised in a single measure. An ecological deficit (a footprint greater than the bio-capacity) indicates that a country must either "import space" from somewhere (or stop "exporting" it) or face rapid ecological degradation. Similarly, an ecological surplus offers opportunities to "export space" by trade in space-intensive goods and services.

The World Wide Fund for Nature's (WWF) Living Planet Reports provide ecological footprint and bio-capacity data in several categories (cropland, grazing land, forest, fishing grounds, energy lands and built-up land) and aggregate them into a single index, the ecological deficit (WWF 2006). While a country with no ecological deficit or surplus could be either completely autarchic or a major trader, by definition there is less dependence on outside linkages. A high ranking according to this indicator therefore denotes more involvement with the outside world and, accordingly, a more globalised country along this dimension.

3.2 Calculation of the MGI

The MGI is constructed in a four-stage process (see also UNDP 2002, Martens & Zywietz 2006) The first stage is conceptual and choices are made about which variables are most relevant and should be included in the index (see Section 2). In the second stage, suitable quantitative measures are identified for these variables. In the third stage, following Dreher (2006), each variable is transformed to an index with a zero to hundred scale (this differs from earlier calculations constructing the MGI (Martens & Zywietz 2006)), with the extreme values of ecological indicator (with a highly skewed distribution) being normalised (OECD 2008). Higher values denote more globalisation. The data are then transformed—on the domain level—according to the percentiles of the base year (2000) distribution (using the formula $\frac{(V_i - V_{min})}{(V_{max} - V_{min})} \times 100$. In the last and final stage, a weighted sum of the measures is calculated to produce the final score, which is then used to rank and compare countries. The "most globalised" country has the highest score. Within each domain, every variable is equally weighted. The MGI scores are simply added, i.e., all domains receive the same weight (see below for the results of the sensitivity analysis). The MGI is calculated for 2000 and 2008.

3.3 Assumptions

Since there are missing data on the share of international linkages that are regional rather than global, it is impossible to distinguish globalisation from internationalisation and regionalisation with complete certainty. Therefore, there is an underlying assumption that countries with many international links have a correspondingly greater number of global linkages. As expected, international statistics on eleven different indicators ranging from politics and military to the environment have widely varying degrees of data quality, reflecting the different capabilities and priorities of the organisations collecting the data. Of particular concern are the domains in which the underlying data have not been collected by official international bodies like the World Bank, IMF or UN, but by private or semi-public organisations. In addition, many countries are reluctant to share information about activities related to their national security, which creates data gaps that are not easily filled.

The fact that countries with fewer international linkages tend to publish less data and are less likely to be included in international statistics biases against

states that are less globalised (Rosendorff & Vreeland 2006). Additionally, despite being members of the UN and most other international bodies, countries with totalitarian or communist economic systems (e.g., North Korea, Cuba) are often excluded in international financial statistics. Therefore, this also leads to their exclusion due to lack of data. Finally, yet importantly, countries that are too small to collect internationally coherent statistics and/or are strongly integrated into the economies of their big neighbours (e.g., Luxembourg, Monaco, and Swaziland) are also missing from the statistics and therefore excluded from the MGI. Furthermore, not for all domains of globalization there was data available for the target year. Several components of the indicator where therefore extrapolated from older data. Since year-to-year changes tend to be small in those domains we don't expect this to have a large impact on the results (see Martens & Raza 2008).

Both the sensitivity to extreme values, correlation between indicators, and year-to-year variations are a major concern for the robustness of globalisation indices (Dreher et al. 2008, OECD 2008). Table 2 shows the correlation coefficients for the MGI 2008. The indicators 'Internet', 'Tourism' and 'Phone' are highly correlated with the final index, with Spearman rank correlation coefficients of 0.843, 0.794 and 0.736 respectively. On the domain level, the final MGI is correlated strongest (as expected from the individual indicators correlations) with the technological domain (Spearman correlation (rs) = 0.862), followed by the social and cultural domain (rs = 0.772), political domain (rs = 0.622), and ecological domain (rs 0.580). The MGI is least correlated by the economic domain (rs = 0.480).

Several weighting methods for composite indicators—like the MGI—exist, all with their own pros and cons. Regardless which weighting methods is used, weights are essential value judgments. For maximum transparency, we relied on equal weighting (acknowledging the limits of doing so (see OECD 2008)). We next tested the sensitivity of the weighting scheme at the domain level, by varying the domain weights between 0 and 1 (at incremental steps of 0.05). The results of the 105 runs (expressed as the Standard Deviation (SD)), and the countries most affected by this change, are given in Table 3. With respect to the weights for the five domains tested in the sensitivity analysis, the country rankings are relatively reliable for approximately half of the countries, while any conclusion on the ranking for the other half of the countries should be made with great caution. Thus, the choice of the weights must be evaluated according to its analytical rationale, globalisation relevance, and implied value judgments. The real value of the MGI lies not in the overall ranking of the countries, but rather in the solid framework and construction of the indicators.

4 Results

Table 3 shows the results for the 2008 MGI for several countries, as well as the changes between the MGI 2000 and MGI 2008. As can be seen, the world's most globalised country is Ireland with a score of over 70. This result is driven by a

	Embassies	Organizations	Military	Trade	FDI	Capital	Tourism	Migrants	Internet	Phone	Eco footprint	MGI
Embassies	1.000	0.787(**)	0.191(*)	-0.304(**)	0.175	0.182(*)	0.318(**)	0.117	0.511(**)	0.273(**)	0.318(**)	0.585(**)
Organizations	0.787(**)	1.000	0.033	-0.292(**)	0.245(**)	0.326(**)	0.423(**)	0.183(*)	0.624(**)	0.395(**)	0.237(*)	0.586(**)
Military	0.191(*)	0.033	1.000	-0.172	-0.115	-0.030	-0.002	0.105	0.020	-0.054	0.077	0.192(*)
Trade	-0.304(**)	-0.292(**)	-0.172	1.000	0.352(**)	0.402(**)	0.313(**)	0.230(*)	0.102	0.235(*)	0.100	0.235(*)
FDI	0.175	0.245(**)	-0.115	0.352(**)	1.000	0.604(**)	0.482(**)	0.293(**)	0.381(**)	0.465(**)	0.010	0.462(**)
Capital	0.182(*)	0.326(**)	-0.030	0.402(**)	0.604(**)	1.000	0.695(**)	0.495(**)	0.591(**)	0.694(**)	0.225(*)	0.634(**)
Tourism	0.318(**)	0.423(**)	-0.002	0.313(**)	0.482(**)	0.695(**)	1.000	0.507(**)	0.755(**)	0.833(**)	0.397(**)	0.794(**)
Migrants	0.117	0.183(*)	0.105	0.230(*)	0.293(**)	0.495(**)	0.507(**)	1.000	0.440(**)	0.540(**)	0.200(*)	0.532(**)
Internet	0.511(**)	0.624(**)	0.020	0.102	0.381(**)	0.591(**)	0.755(**)	0.440(**)	1.000	0.777(**)	0.350(**)	0.843(**)
Phone	0.273(**)	0.395(**)	-0.054	0.235(*)	0.465(**)	0.694(**)	0.833(**)	0.540(**)	0.777(**)	1.000	0.374(**)	0.736(**)
Eco footprint	0.318(**)	0.237(*)	0.077	0.100	0.010	0.225(*)	0.397(**)	0.200(*)	0.350(**)	0.374(**)	1.000	0.565(**)
MGI	0.585(**)	0.586(**)	0.192(*)	0.235(*)	0.462	0.634(**)	0.794(**)	0.532(**)	0.843(**)	0.736(**)	0.565(**)	1.000

Table 2: Spearman correlation matrix for MGI (2008) and its components. **Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

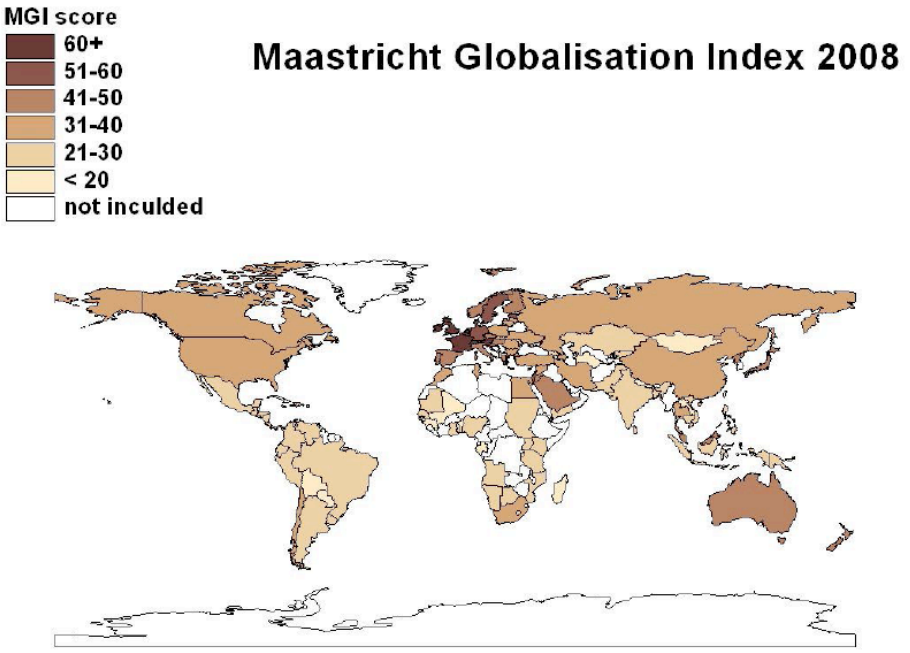

Figure 2: Map of the MGI 2008.

top 5 score on most of the indicators. On the other hand, Ireland ranks only 67th when it comes to political integration (and is also not in the upper region when it comes to the ecological integration). According to the MGI, France has the highest political integration with the rest of the world, followed by the United Kingdom, Russia and Germany. According to the political integration index, Turkmenistan is the country with the lowest score. The social-cultural globalisation ranking is headed by Kuwait, Austria, and Ireland, while Mali, Madagascar and India place at the bottom of the ranking. From a technological perspective, next to Ireland, Switzerland, New Zealand, the Netherlands, and Sweden complete the top 5 (with Bangladesh, Cambodia and Madagascar being the bottom 3). Kuwait ranks 1 on the (not normalised) ecological index, followed by Belgium and Israel. Least ecologically integrated are Gabon and Bolivia. While Panama scores in the top 5 in terms of economic globalisation, overall, they are ranked much lower. This is mainly due to their lower integration within the other domains with the rest of the world. Ireland, Belgium and The Netherlands compose the top-3 in this domain. Haiti is the country least integrated in economic terms. Table 3 also shows that the world's least globalised country in 2008 is Madagascar, with an index of less than 15.

Figure 2 shows a globalisation world map, the more globalised countries in a darker colour. The Figure shows that Western European and North American Countries are usually the most globalised, while countries in Sub-Saharan Africa are the least globalised.

Table 3: Maastricht Globalisation Index (2008).

Country	Rank	MGI 2008	SD	Change score	Change rank
Ireland	1	72.0	13.1	20.2	1
Belgium	2	68.4	11.5	18.5	3
Switzerland	3	68.3	12.1	9.8	-2
Netherlands	4	68.3	11.8	19.7	3
France	5	62.5	16.3	17.6	7
Austria	6	62.1	11.0	12.2	0
Kuwait	7	59.4	17.0	14.5	6
United Kingdom	8	58.7	11.8	7.4	-5
Germany	9	54.8	15.2	8.8	1
Denmark	10	53.8	10.9	7.0	-1
Spain	11	53.1	14.0	14.9	7
Israel	12	51.9	10.1	5.9	-1
Italy	13	51.7	16.8	13.1	3
Sweden	14	51.6	10.3	4.5	-6
Estonia	15	50.5	9.8	11.5	0
Saudi Arabia	16	49.7	18.0	11.3	1
Czech Republic	17	49.3	10.8	12.2	2
Jordan	18	48.0	11.9	13.2	5
Korea, Rep.	19	48.0	18.5	14.1	5
Norway	20	48.0	6.4	-3.0	-16
Greece	21	47.8	16.6	12.0	0
Portugal	22	46.8	12.6	7.6	-8
Japan	23	45.7	20.5	15.7	6
Croatia	24	45.5	8.9	15.2	4
Malaysia	25	44.7	4.3	13.2	0
Slovenia	26	43.2	10.1	14.0	5
Hungary	27	43.0	10.1	7.7	-5
New Zealand	28	42.7	13.2	14.9	5
Bulgaria	29	39.5	10.3	13.1	8
Poland	30	37.0	13.4	6.5	-3
Slovak Republic	31	36.3	10.2	9.0	4
Finland	32	36.3	7.6	-0.6	-12
Australia	33	35.6	13.1	4.1	-7
Ukraine	34	35.3	13.0	7.0	-2
Romania	35	33.4	11.6	8.5	7
Russian Federation	36	33.1	14.6	6.6	0
Egypt, Arab Rep.	37	32.9	17.0	7.7	3
Iran	38	32.8	13.7	10.5	21
Trinidad and Tobago	39	32.3	16.3	2.8	-9
Turkey	40	32.1	14.3	6.6	-1
Jamaica	41	32.0	13.1	6.1	-3
Tunisia	42	32.0	11.3	7.0	-1
Morocco	43	31.8	13.2	10.0	19
China	44	31.5	16.5	8.7	4
Azerbaijan	45	31.3	13.1	10.1	22
Syria	46	30.9	14.0	7.2	-2
Lithuania	47	30.6	9.9	9.3	17
Belarus	47	30.5	10.5	7.7	1
Canada	49	30.5	10.5	7.7	1
Latvia	50	30.2	4.4	7.6	2
Thailand	51	29.7	11.8	7.2	4
United States	52	29.7	11.8	7.2	4
South Africa	53	29.6	13.1	2.3	-19
Costa Rica	54	29.6	10.9	8.9	16
Mexico	54	29.4	13.1	5.5	-12
Chile	56	29.4	8.3	5.8	-11
Panama	57	28.7	12.3	8.2	15
Macedonia	58	28.6	13.5	6.1	0
Mauritius	59	28.4	11.9	5.8	-8
Kazakhstan	60	28.3	10.4	5.8	-3
Dominican Republic	61	27.6	12.4	7.5	14
Moldova	62	27.4	12.4	4.0	-15
Nigeria	63	27.1	13.6	3.6	-17
El Salvador	64	27.0	12.9	8.4	17
India	65	27.0	16.4	5.7	0
Pakistan	66	26.8	15.7	4.8	-6
Venezuela, RB	67	26.6	11.6	6.7	10
Philippines	68	26.6	13.1	4.0	-15
Gambia, The	69	26.3	12.9	5.3	0
Albania	70	25.2	12.0	8.4	25
Viet Nam	71	25.2	12.4	6.4	9
Yemen	72	24.8	14.2	4.6	2
Armenia	73	24.5	12.2	4.3	0
Ecuador	74	24.5	11.0	6.8	14
Sri Lanka	75	24.4	13.9	2.7	-12
Senegal	76	24.3	13.1	4.2	0
Brazil	77	24.2	11.5	11.1	34
Kyrgyzstan	78	24.1	11.2	3.0	-10
Ghana	79	23.8	11.3	3.1	-8
Indonesia	80	23.7	13.4	4.7	-1
Georgia	81	23.6	10.7	6.4	10
Sudan	82	23.4	12.4	7.5	23
Kenya	83	23.2	13.5	3.8	-5
Lesotho	84	22.6	12.2	0.6	-23
Cote d'Ivoire	85	22.6	9.2	4.1	-2
Colombia	86	22.5	10.6	4.6	0
Argentina	87	22.3	7.5	6.3	16
Togo	88	22.2	12.2	3.7	-6
Cambodia	89	21.9	12.4	4.4	1
Guatemala	90	21.6	12.0	3.6	-6
Angola	91	21.3	9.4	8.0	19
Namibia	92	21.1	5.1	5.6	14
Burundi	93	20.9	13.9	4.5	6
Honduras	94	20.7	11.0	3.1	-5
Papua New Guinea	95	20.6	13.8	8.8	17
Tanzania	96	20.3	11.7	2.5	-9
Uganda	97	20.3	13.6	3.1	-5
Mongolia	98	20.2	8.2	9.2	15
Bangladesh	99	20.0	14.1	2.0	-14
Peru	100	19.7	8.3	9.3	15
Nepal	101	19.4	13.4	3.0	0
Botswana	102	19.3	5.4	2.6	-5
Mali	103	18.6	11.9	2.1	-5
Benin	104	18.1	12.7	1.4	-8
Turkmenistan	105	17.6	13.2	-3.6	-39
Mozambique	106	17.6	9.6	3.2	2
Nicaragua	107	17.1	7.8	0.1	-14
Rwanda	108	17.0	13.6	0.8	-6
Uruguay	109	16.9	4.3	-5.6	-55
Gabon	110	16.9	3.3	6.0	4
Mauritania	111	16.8	6.7	-0.1	-17
Guinea	112	16.0	9.2	0.1	-8
Haiti	113	15.8	14.1	0.4	-6
Bolivia	114	15.5	5.5	-0.9	-14
Laos	115	14.9	12.6	5.7	1
Paraguay	116	13.9	4.7	4.7	1
Madagascar	117	13.2	8.7	-0.3	-8

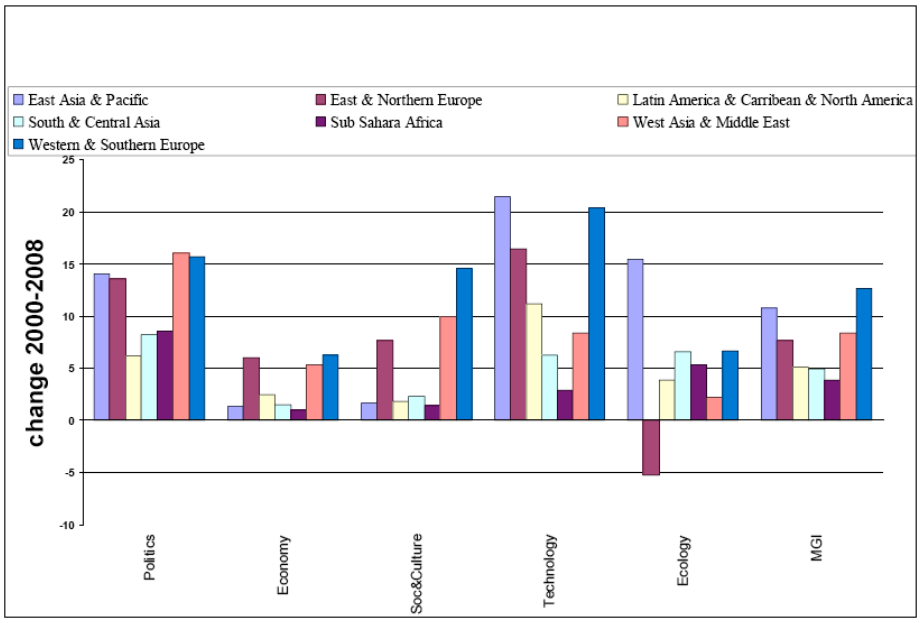

Figure 3: Development of globalisation across the domains by region (Regions are based on: http://www.un.org/depts/dhl/maplib/worldregions.htm).

Looking at the evolution of globalisation as measured by the MGI and given in Table 3, we see that the overall index rose continuously, starting from a value of about 25 in 2000 to almost 32 in 2008. As also shown in Figure 3, this increase is largely driven by technological and political integration. Economic and social-cultural globalisation evolved similarly over time, while ecological globalisation changed less (or decreased in the case of East & Northern Europe). For most countries included in the sample, globalisation increased. For many countries, the increases were substantial. The biggest increase was experienced by Ireland (+20.2), followed by the Netherlands (+19.7) and Belgium (+18.5), while globalisation decreased most in Turkmenistan (-3.6) and Uruguay (-5.6).

Figure 3 also displays the pattern of the overall globalisation index by region. The Figure reveals that this development has been relatively independent of region, even though the degree of globalisation varies considerably. Overall, the index suggests that some countries are systematically more globalised than others. While in the last 8 years globalisation has been pronounced in all regions, some regions are more globalised than others. In particular, Western European and other industrialised countries display the greatest integration, South Asia and Sub-Saharan Africa are the regions least globalised.

5 Discussion and Conclusions

As we have argued, to confront new questions on the essential nature of globalisation requires an interdisciplinary approach. Sociologists, critics of science and technology, and economists and others need to work on different dimensions of the same questions. Globalisation (as other complex issues do) requires academics and professionals alike to step outside their disciplinary boundaries. In our view, there is a possibility of bridging this gap. A composite index of globalisation can reconcile multi-facetted approaches. An index needs matters to be conceptually analysed and formulated and this leads to the issue of measurement. Instead of objecting to the possibility of adequately measuring globalisation, a certain degree of optimism is vital for making the improvements in measurement, which are necessary to advance an understanding of the globalisation phenomenon.

If we look at existing indices, the 'top ten' countries are usually lauded (Dreher et al. 2008). However, the MGI is an exception to this, because it has integrated two variables—ecological deficit and organised violence—that change the meaning of the overall outcome. The inclusion of new indicators that cannot be considered "positive", changes the discussion about a country's ranking according to an index. For example, if the Netherlands ranks highly in every index of globalisation is that something to be applauded? It does imply, of course, that this country has many linkages with the world outside its national borders. According to the MGI, in 2008 the Netherlands, e.g., ranks third in the overall rank and seventh in the ecological domain, implying that the Netherlands has a large ecological footprint (it also scores well in other areas such as capital flow, trade, FDI and telephone traffic).

A large ecological footprint implies a large ecological deficit, which needs to be compensated for by 'space' outside the country's territory. In this way, the growth in transport, for instance, is connected to the exploitation of natural resources (Martens et al. 2003) . So while this helps to elevate the Netherlands to the top ranking of this globalisation index, it also raises questions about the relationship between globalisation, economic growth and the environment. Another example, India, is regarded as one of the most important emerging powers, with impressive growth rates, which seem to have their basis in the recent policies of globalization. However, in this country environmental degradation is of serious concern (Kumar 2008). Unlike the other variables in the globalisation index, the ecological domain appears to be a consequence of globalisation rather than a driving force. However, as the globalising processes intensify over time, the "indirect impacts of human-induced disruption of global biogeochemical cycles and global climate change start to become apparent" (Martens & Rotmans 2005).

If consumerism and global economic processes do have polluting side-effects, it needs to be asked which direction these dynamics need to take for a sustainable future. With 'ecology' integrated into the index, the long-existing 'environment versus growth' tension can be exposed, for which the term 'sustainable development' has been coined. Since globalisation implies inter-connectedness and

complexity, its various aspects need to be considered. The environment cannot be treated separately from everything else that is supposedly global. Moreover, an integrated index of globalisation can stimulate a new framework of analysis for the market system, recognising the need to integrate ecological costs in trade and consumption. The inclusion of trade in conventional arms in the MGI also serves to highlight such trade. Do global mechanisms promote production and open gateways to trade in arms? Clearly the issue is a complicated one involving economic costs and benefits, political risk, social tensions and ethical values. While such issues are a long way from being resolved, the way the addition of such indicators influence the relevance of a measurement of globalisation needs to be emphasised.

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