Chapter 12

Globalization Indicators: Ways Forward

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1. Introduction

The first attempts to capture the phenomenon of globalization by means of composite indices, and thus opening new avenues for quantitative research on its causes and consequences, saw the light a little more than ten years ago. Since then, a small community of indicator-builders has gradually refined the conceptual framework and has technically fine-tuned their design. The indicators have been used in econometric work to test the relationships between globalization and other variables.[1] Our contribution takes stock of the work on globalization indicators so far (section 2) and explores ways to take this research programme further (section 3).

2. Globalization indicators: where do we stand?

Indicator-based assessments of international openness and competitiveness prepared the terrain for the development of the globalization indicators as we know them today. Of relevance are: the World Economic Forum's indicator of competitiveness, since 1979 (López-Claros et al., 2006), Gwartney and Lawson's work on economic freedom, since 1996 (Gwartney, Lawson and Block, 1996; Gwartney and Lawson, 2006), and the World Market Research Center globalization index (G-index) (Randolph, 2001).

Until the late 1990s globalization was indeed generally considered as a synonym of 'global economic integration'. Brahmbhatt (1998: 2), for example, defined globalization as: 'the increasing freedom and ability of individuals and firms to undertake voluntary economic transactions with residents of other countries, a process entailing a growing contestability of national markets by foreign suppliers'. The definition used by the World Markets Research Center, developers of the G-index, referred to 'the ever closer knitting together of a one-world economy' (Randolph, 2001: 5). More recently, the OECD in its Handbook still affirmed that '[g]lobalisation refers above all to a dynamic and multidimensional process of economic integration whereby national resources become more and more internationally mobile while national economies become increasingly interdependent' (OECD, 2005a: 11). The work on economic globalization indicators, which was facilitated by the OECD, has materialized in a Handbook (OECD, 2005a) and a set of indicators (OECD, 2005b; 2010), but has not involved the

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[1] For a review of the econometric evidence on the consequences of globalization, using the KOF index (see below), we refer to Dreher, Gaston and Martens (2008: chapter 4) and De and Pal (2011).

construction of a composite index of globalization.[2]

Inspired by the conceptual work of Held et al. (1999), Scholte (2000) and several others, a shift towards a multi-dimensional understanding of globalization has been observed since the late 1990s.[3] Scholte (2002: 13-14), for example, argues for an understanding of globalization 'as the spread of transplanetary – and in recent times more particularly supraterritorial – connections between people ... globalization involves reductions in barriers to transworld contacts. People become more able – physically, legally, culturally, and psychologically – to engage with each other in 'one world' ... globalization refers to a shift in the nature of social space'.

The subsequent development of globalization indicators did not radically change the country-perspective, but started to consider globalization as a multi-dimensional phenomenon. The A.T. Kearney/Foreign Policy Magazine globalization index (Kearney/FP-GI), which is generally considered as the first proposal to construct a composite measure of globalization (A.T. Kearney/Foreign Policy Magazine, 2001, 2002, 2003, 2004, 2005, 2006, 2007), covers the economic, technological, political and personal aspects of globalization, taking inspiration from the approach used to build the Human Development Index (UNDP, 1998). The Kearney/FP-GI measures the globalization of a country in four dimensions (components): (i) the degree of integration of its economy into the world economy, (ii) the internationalization of the personal contacts of its citizens, (iii) the use of internet technology, and (iv) the extent of its international political engagement.

Several proposals followed the Kearney/FP-GI, all trying to improve some aspect(s) of it. Lockwood and Redoano (2005), consistent with Lockwood's critique of the Kearney/FP-GI (Lockwood, 2001, 2004), designed the Centre for the Study of Globalisation and Regionalisation globalization index (CSGR-GI). Whereas they partly use a different set of variables, the index mainly differs from the Kearney/FP-GI on the operational aspects.[4]

Martens and Zywietz (2004, 2006), based on Zywietz (2003), proposed a Modified Globalization Index (MGI).[5] The authors also take the Kearney/FP-GI as their point of reference, but start from a broader definition of globalization: 'the intensification of cross-national cultural, economic, political, social and technological interactions that lead to the establishment of transnational structures and the global integration of cultural, economic, environmental, political and social processes on global, supranational, national, regional and local levels' (Rennen and Martens, 2003: 143).

Two additional dimensions are included in the MGI: (i) the involvement of a country's military-industrial complex with the rest of the world, and (ii) the intensity of globalization in the ecological domain. In addition, some technical improvements to

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[2] The OECD indicators aim at measuring the magnitude and intensity of economic globalization, in several areas: international trade, foreign direct investment (FDI), portfolio investment, the activity of multinational firms, global value chains, and the production and international diffusion of technology and knowledge.

[3] The spread of ideas, information, images, and people have been grouped together by Keohane and Nye (2000: 4) and labelled 'social globalization', in contrast to 'economic' and 'political' globalization.

[4] Including adjustment, normalization, and weighting of specific sub-indicators. The latter is now based on statistical models. For an overview of weighting techniques for composite indices, see e.g. Nardo et al. (2005).

[5] Later re-named the 'Maastricht Globalization Index'.

the construction of the indicator are introduced.

Heshmati's indicator (Kearney/FP/H) (Heshmati, 2006), does not alter anything to the choice of variables and structure of the Kearney/FP-GI, but adds a sophisticated statistical weighting procedure.

Dreher (2006: 3) builds on the definitions proposed by Clark (2000: 86) and Norris (2000: 155) and refers to a process of 'creating networks of connections among actors at multi-continental distances, mediated through a variety of flows including people, information and ideas, capital, and goods', a process 'that erodes national boundaries, integrates national economies, cultures, technologies and governance, and produces complex relations of mutual interdependence'. As far as the different dimensions of international integration are concerned, Dreher's globalization index is therefore a more significant departure from the Kearney/FP-GI than the previous ones (Dreher, 2006; Dreher, Gaston and Martens, 2008).[6] Dreher expands the variables concerning personal contact and information flows, includes a cultural convergence variable, and re-introduces economic policy measures, which had been used before the Kearney/FP-GI to assess the degree of international economic integration. As in the CSGR index, statistical weighting of variables is used.

Table 12.1 presents a synthetic overview of the dimensions covered by the different globalization indicators, and the distribution of the variables across dimensions.

The different weighting procedures and the actual weights that are attached to the different components of the globalization indicators are shown in Table 12.2. For this purpose we reorganized the variables behind the different indicators in common categories: economic globalization, social globalization (further broken down into: flows of ideas, mobility of people, and cultural proximity), global political engagement, and global environmental impact.

No single weighting procedure is *a priori* superior to any other. Different theoretical and methodological considerations can be put forward to prefer one procedure over another. The choice is not straightforward and an element of arbitrariness will always remain. From an empirical point of view, however, robustness tests of the original Kearney/FP index have shown that changing the normalization procedure and using statistical weights have only small effects on country rankings (Lockwood, 2001; Martens and Zywietz, 2004, 2006; Martens and Raza, 2008). Heshmati (2006) performed a sensitivity analysis of Kearney/FP-GI via Principal Component Analysis and found that the index performs relatively well and that the value added of statistical weighting is limited.

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[6] Dreher's globalization index will be referred to as the KOF index because the Konjunkturforschungsstelle (KOF) of the ETH Zürich is hosting the index.

Table 12.1 – Globalization indicators – Number of variables and dimensions

Globalization index	Number of variables	Number of dimensions	Dimensions
G-Index (Randolph, 2001)	6	2	'old' economy (3 variables), 'new' economy (3)
Kearney/FP-GI (A.T. Kearney/Foreign Policy Magazine, 2001)	11	4	globalization in goods and services (2), financial globalization (3), globalization of personal contact (3), internet connectivity (3)
Kearney/FP-GI (A.T. Kearney/Foreign Policy Magazine, 2003)	13	4	economic integration (4), personal contact (3), technology (3), political engagement (3)
Kearney/FP-GI (A.T. Kearney/Foreign Policy Magazine, 2004)	14	4	economic integration (4), personal contact (3), technological connectivity (3), political engagement (4)
Kearney/FP-GI (A.T. Kearney/Foreign Policy Magazine, 2005, 2006, 2007)	12	4	economic integration (2), personal contact (3), technological connectivity (3), political engagement (4)
CSGR-GI (Lockwood and Redoano, 2005)	16	3	economic globalization (4), social globalization (9), political globalization (3)
MGI (Martens and Zywietz, 2004, 2006; Martens and Raza, 2008)	11	7	global trade (1), global finance (2), global politics (2), organized violence (1), people on the move (2)*, technology (2), environment (1)
MGI (Martens and Raza, 2009)	11	5	political domain (3), economic domain (3), social and cultural domain (2), technological domain (2), ecological domain (1)
Kearney/FP/H (Heshmati, 2006)	13	4	economic integration (4), personal contacts (3), technology (3), political engagement (3)
KOF (Dreher, 2006)	23	3	economic integration (8), political engagement (3), social globalization (12)
KOF (Dreher, Gaston and Martens, 2008; KOF, 2011)	25	3	economic globalization (9), political globalization (3), social globalization (13)

* In the updated MGI (Martens and Raza, 2008), this dimension was called 'social and cultural aspect'.

Table 12.2 – Weighting of categories/dimensions

	Weighting procedure (S or NS)*	Economic global-ization	Social globalization: flows of ideas – international use of commu-nication technology	Social global-ization: mobility of people	Social global-ization: cultural proximity	Global political engage-ment	Global environ-mental deficit
G-index (Randolph, 2001)	NS	0.9	0.1	0	0	0	0
Kearney/FP-GI (A.T. Kearney/Foreign Policy Magazine, 2001)	NS	0.54	0.31	0.15	0	0	0
Kearney/FP-GI (A.T. Kearney/Foreign Policy Magazine, 2003)	NS	0.46	0.31	0.15	0	0.08	0
Kearney/FP-GI (A.T. Kearney/Foreign Policy Magazine, 2004, 2005, 2006, 2007)	NS	0.5	0.2	0.2	0	0.1	0
CSGR-GI (Lockwood and Redoano, 2005)	S/NS**	0.33	0.22	0.11	0	0.33	0
MGI (Martens and Zywietz, 2004, 2006; Martens and Raza, 2008)	NS	0.27	0.18	0.18	0	0.27	0.09
Kearney/FP/H (Heshmati, 2006)	S	*country specific weights*					
KOF (Dreher, 2005)	S	0.35	0.21	0.03	0.14	0.28	0
KOF (Dreher, Gaston and Martens, 2008; KOF, 2011)	S	0.36	0.18	0.07	0.14	0.26	0

*   S = statistical; NS = non-statistical.
**   Within category statistical weighting, across category non-statistical.

3. Globalization indicators: ways forward

3.1. Moving beyond the measurement of openness

Starting from the simplifying assumption that measuring globalization amounts to measuring the degree of international integration, defined as the extent to which the

space dimension of a given social process tends not to be restricted by national borders, the precise definition of international integration and related indicators changes according to the perspective of the observer. The first and most common option is to assume the standpoint of a single country or territory with respect to the rest of the world. In this case, measuring international integration amounts to assessing to what extent that particular country is open to relationships with the rest of the world, treated as a single partner country. The typical example, in the economic domain, is the trade-to-GDP ratio, universally considered as the most intuitive measure of international openness.[7] This variable is an important component in practically all globalization indicators.

In this approach, normally no attention is paid to the geographical distribution of foreign relationships. A country with very intense linkages with only one neighbouring partner can in principle be considered as open as another country with moderate linkages with every possible partner.

An alternative approach would be to combine traditional measures of international openness with indicators of the geographic diversification of bilateral relationships.[8] The simplest way to do so is by computing the ratio between the number of actual partners and the total number of potential partners (the total number of countries in the world).[9] This index, however, would not account for any differences across partners in the intensity of the relationship, so that, for any given level of aggregate foreign openness and number of partners, a country having intense links with only one of them and marginal interactions with the others would be treated in the same way as a country interacting with all of them at the same level of intensity. In order to solve this problem, more precise measures of diversification are available, such as the inverse of the Herfindahl concentration index, sometimes called the 'number of equivalent partners'.[10]

However, these measures normally compare the actual geographic distribution of trade flows with an equidistribution benchmark, i.e. a distribution where all units have the same weight. This is an obvious choice for studies about income distribution among individuals, but in our case it is unreasonable to assume that trade flows should be equally distributed across partner countries of largely different size. A more appropriate benchmark could be a neutrality criterion, based on the relative importance of each partner country in the rest of the world's trade. In other words, it may be assumed that the maximum level of relative diversification is reached if a country's geographic distribution of bilateral trade flows is proportional to its partner countries' weights in total world trade. The underlying idea is that if the geographic distribution of trade is neutral, it depends only on the differences in the trade size of partners, and is not af-

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[7] It should be reminded that, for a variety of reasons, trade openness indicators tend to be negatively correlated with country size, so that the resulting ranking must be interpreted with caution.

[8] The recently flourishing literature about extensive and intensive margins of trade refers to a similar problem, i.e. the decomposition of world trade growth into the increase in the number of bilateral relationships (extensive margins) and the growth in the volume of trade per relationship (intensive margins). See Helpman, Melitz and Rubinstein (2007).

[9] This is the approach followed by the *binary network analysis* of international trade (see below), where the ratio between the number of actual and potential partners is called *node density index*.

[10] The Herfindahl indices of total exports and imports were included in the list of supplementary indicators to measure the extent of trade globalization in the OECD Handbook (OECD, 2005a:185).

fected by bilateral proximity factors, so that the globalization process can be said to have reached its maximum level in removing the influence of distance-related barriers to trade. It is then possible to measure to what extent the actual distribution of a country's trade is similar to our neutrality benchmark. This can be done through a Finger-Kreinin index of similarity, which we will name as *global geographic diversification index* ($GGDI_i$):

$$GGDI_i = 1 - \sum_{j \neq i} \left| S_{ij} - V_{ij} \right| / 2 \qquad\qquad (12.1)$$

where S_{ij} denotes each partner country's share of country's *i* total trade and V_{ij} denotes each possible partner's share of total world trade, net of country *i*'s trade. This index ranges from 0, when country *i*'s trade is concentrated with partners having no trade between each other, to 1, when it is neutrally distributed across all its possible partners.[11]

Although improving with respect to the previous option (i.e. measuring openness), indicators of geographical diversification fail to inform properly on the geographical reach of the integration process, because they treat every partner in the same way, independently of its distance, so that a country linked exclusively with a certain group of neighbouring partners (i.e. with its 'region') would not be distinguished from a country interacting with an equal number of partners scattered all over the world.[12] The severity of this problem is obviously negatively related to the total number of partners, but still it cannot be neglected, also because of its interaction with the problem of concentration, in the sense that bilateral relationships tend to be relatively less intense with distant partners.

A possible solution lies in estimating a basic version of the gravity model of international trade flows, where only GDP size and bilateral distance are used as regressors. The residuals of this model could be used to build a measure of trade globalization, defined as the degree of dissimilarity between the actual distribution of bilateral trade flows and their *gravity benchmark*, determined only by size and distance. In other words, trade globalization would reach its maximum level if size and distance were the *only* factors determining the intensity of bilateral trade flows, in a world where neither trade barriers, nor proximity factors, such as sharing a common language, would play any role.

A more pragmatic solution would consist of measuring the relative importance of 'extra-regional' interactions (trade, FDI, migration, tourism, etc.) as a proxy for 'global' interactions by deducting intra-regional flows from total flows, rather than using the usual 'international' interactions. Although some consider this as the most promising avenue (Martens and Raza, 2008: 31-32), one is left with the (difficult) problem related

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[11] A similar approach has been followed by Iapadre and Tironi (2009) for the measurement of trade regionalization.

[12] Martens and Raza (2008:18) recognize this problem. The depth of the European integration process might explain the European dominance among top-ranked countries according to the MGI index. The authors agree that this is one of the biggest problems facing globalization indicators. Rugman and Verbeke (2004) and Rugman (2005, 2008), using data on the operations of multinational companies, have also pointed to the improper use of 'globalization' to describe processes which often tend to be regional.

to the identification of the relevant region for each country. In addition, extra-regional integration measures do not solve the problem because the 'extra-regional world' is still seen as a unique partner, independently of the country distribution of transactions. And finally, as a solution it might be a bridge too far as the regional dimension of globalization is then completely filtered out.

3.2. Adding dimensions

One obvious way to further develop the globalization indicators is to add dimensions, thus reflecting a richer understanding of globalization. It has been argued, for example, that the cultural dimension should be brought at the centre of the efforts to measure globalization (Kluver and Fu, 2004). The builders of the MGI have added an ecological dimension and included an indicator of the ecological footprint of countries. In principle, other relevant dimensions could be added, data availability often being the determining restriction. In this respect, let us put forward three general considerations. A first consideration is that, as also noted by Dreher et al. (2010), adding dimensions and variables may imply that one shifts from a globalization indicator with – from an economic and/or political point of view – 'positive' connotations to an indicator with 'mixed' or 'neutral' connotations. This is, for example, the case with the MGI where ecological footprints and arms trade were included.

A second consideration is that one should be aware of the fact that 'adding dimensions' to a globalization indicator in practice often boils down to a disaggregation of existing flows and may result in double-counting. For example, if military or cultural dimensions are added via the incorporation of measures of cross-border arms transactions or exchange of cultural products, this implies using some elements of goods and services trade flows. If, in addition, the aggregate variables are also kept (because they supposedly reflect the economic dimension of globalization), certain flows are counted twice, which questions the validity of the whole weighting procedure. Unless there are good (theoretical, normative) reasons to give a double weight to certain flows, a possible procedure would be to subtract cross-border arms transactions or exchange of cultural products, in these examples, from total trade in goods and services.

A third and final consideration is that all the efforts to include more and better information in globalization indicators should be balanced against the requirements of parsimony, efficiency and transparency. Analysts like Caselli (2006: 15-16, 25-26; 2008: 394-395), for example, argue already in favour of including less variables in the construction of globalization indicators than usually is the case. The Human Development Index is thereby referred to as good practice.

3.3. Moving beyond methodological territorialism and adding levels of analysis

A more fundamental issue has been raised by Scholte (2002), who questions the 'methodological territorialism' which is still dominating the social sciences, and hence the identification of globalization with international integration which underlies most of

the indicators discussed so far.[13] Scholte's definition of globalization (see above) emphasizes the rise of supra-territorial relationships between people, arguing that a non-territorial conception of social spaces is essential to understand the distinctive features of the globalization process, with respect to other phenomena such as internationalization, liberalization, universalization, and westernization.

Two related issues will be discussed here: the relevance of grouping actors on a territorial basis, on the one hand, and the choice of the appropriate level of analysis, on the other.

With respect to the first issue, some reflection seems to be needed on the actors involved in the globalization process. The builders of globalization indicators usually do not address explicitly the fact that different actors are taking part in the process: states, regions, individual citizens, organized civil society, companies, etc. Nevertheless, by selecting certain specific indicators they implicitly privilege the behaviour of certain actors over others. Paying attention to the actors is probably a good shortcut to check that one is not neglecting important aspects of globalization. Indicators that reflect the activity of global actors could add value to the usual measures based on transactions among national actors.[14] The difficulty resides in finding the right balance between the need to group actors within existing jurisdictions and relevant policy spaces (where the nation is still the obvious primary candidate), on the one hand, and the need to capture the activity of trans-national and global actors, on the other.

This is related to the issue of choosing an appropriate level of analysis. Globalization indicators are generally limited to a national perspective. Indicators at a higher level, regional or global, could only be obtained as appropriate averages of national measures.[15] A radically different approach would be to take the perspective of a group of countries, be it a region, or an arbitrarily defined set of countries belonging to different regions. In this case, the central issue becomes that of distinguishing between intra- and extra-group integration. Again, this can be done in two different ways, either by treating both the group and the rest of the world as two single partners, or by exploiting the available information at bilateral level, and building appropriate measures of distance-weighted geographic diversification for intra- and extra-group relationships. Traditional measures of regional integration tend to follow the first and simplest approach, but the second option is clearly superior, particularly for large regions with many member countries, such as the European Union.

At the world level, an appropriate average of national indicators could be enough to meet the need for a simple measure of globalization, but additional information about the distribution of the indicators across countries would give important insights.

However, as pointed out by Caselli (2006), measures of global integration based on averages of national indicators fail to capture the specific nature of some aspects of globalization, which can be defined only at the global level, without any reference to specific locations. In other words, certain processes, the classical example being climate change, although being the result of activities with a specific territorial location, do not

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[13] Compare with Beck's concept of methodological nationalism (Beck, 2004). For a discussion, see also: Caselli (2008: 397-399).

[14] The work done by the OECD on the activities of multinational enterprises is an interesting reference point (OECD, 2005a: 75-136).

[15] For a recent attempt to construct globalization indicators at the ('lower') sub-national level, see Polasek and Sellner (2011).

entail bilateral cross-border interactions, and can be better defined with reference to the entire planet. Yet, these intrinsically global processes, although very important, do not seem to represent exhaustively the nature of globalization. Interactions across national borders are still fundamental, not only for pragmatic reasons (data availability), but also in terms of policy relevance, given their role in forging global interdependence. A reference to cross-border interactions seems essential even when the unit of analysis is defined at the local level, such as sub-national regions, cities, and individual agents.

A more promising approach has recently emerged as an application of *social network analysis* to international trade flows. The underlying idea is that trade relationships can be considered as a system of linkages among a set of countries. The topological features of this trade network can be studied through the analytical and statistical tools developed by network analysis in other contexts, mainly in the study of social relationships. This allows to understand the systemic structure of the world trade network in terms of connectivity among its nodes (countries), or in order to detect possible core-periphery patterns and their evolution across time.[16]

A proper specification of regional and global integration indicators would be particularly useful to shed light on the empirical basis of the debate about regionalism and multilateralism.[17] At the policy level, with particular reference to the trade domain, there is increasing concern about what is customarily named the 'proliferation' of preferential integration agreements. The traditional debate is centred around the alleged negative effects of regional integration on economic welfare and on the functioning of the multilateral trading system. More recently, the 'new regionalism' literature has shifted the attention to the issue of the optimal allocation of competences across a multi-level architecture of international relations, where a proper application of the subsidiarity principle clearly reveals that regional integration performs important functions in the production of trans-national public goods. At the same time, concerns are now focused on the rapid development of bilateral integration agreements, which can create problems not only for the multilateral system, but also for regional integration processes. The debate about these normative issues could receive useful inputs by a correct measurement of the actual intensity of regional vs. global integration processes. It is therefore particularly important to build appropriate measures of the intensity and the extension of international transactions, as suggested above.[18]

3.4. Unpacking the globalization process

As Scholte (2002) points out, 'globality' as a state should be distinguished from the 'globalization process'.[19] Indeed, any state can be seen as the result of a corresponding

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[16] See Smith and White (1992), Li, Jin and Chen (2003), Serrano and Boguñá (2003), Garlaschelli and Loffredo (2005), Fagiolo, Reyes and Schiavo (2007, 2008), Kali and Reyes (2007), Serrano, Boguñá and Vespignani (2007), De Benedictis and Tajoli (2011).

[17] See, for example, Woolcock (2006), De Lombaerde (2007), Fiorentino, Verdeja and Toqueboeuf (2007), and Cooper, Hughes and De Lombaerde (2008).

[18] See, for example, the work that has been undertaken by UNU-CRIS on regionalization indicators in the context of the Regional Integration Knowledge System (RIKS) (http://www.cris.unu.edu).

[19] In the literature about regional integration, which will be considered below, a similar point has been raised by De Lombaerde and Van Langenhove (2006).

process. What makes the difference is the perspective of the observer: when we want to see the process, we have to observe it across time; if we want to see the state, a snapshot at a given instant is required. From a conceptual point of view, the fact that globalization refers to a long term and complex process, is generally acknowledged. One of the implications thereof for the construction of indicators is that these can theoretically refer to different logical components of this process, such as 'inputs' in the process, 'features' of the process, or 'outputs' (results, effects) of the process. According to Heshmati (2006: 2), for example, the purpose of the construction of an index of globalization is 'to be able to quantify its sources and impacts', which would suggest that the purpose is not to measure the characteristics and progress of the process itself. Brahmbhatt (1998: 2-3) shares the view that globalization indicators can show both prerequisites and outcomes. Prerequisites or 'drivers' of the process include, e.g., the progressive reduction in official obstacles to the conduct of cross-border economic transactions and the fall of business transaction costs, whereas the outcomes of the process refer to increased cross-border transactions (international trade, FDI, financial flows, labour migration) or international price convergence. An alternative organization of the variables (and related indicators) is followed by Held et al. (1999), who distinguish between the extensity, intensity, velocity and impact of global interactions. Some confusion seems to exist concerning these logical categories of variables; apparently various authors use 'outcome indicators' to measure the 'intensity/extensity' of the process, and not as synonyms of 'impact indicators' in Held's terminology. One way out could be to define 'inputs' in the process following Brahmbhatt (see above), to define 'features of the process', following Held, in terms of the velocity, extensity and intensity of global interactions, and to define 'outputs' of the process as effects of the increased global interactions on variables (growth, employment, income inequality, cultural convergence, ...) different from those directly used in the definition of globalization in terms of global interactions.

A better understanding of the different components of the globalization process should make it easier to detect blank spots in the construction of indicators. The current practice, as already mentioned, tends to focus on 'outcomes' or 'extensity/intensity' indicators (Martens and Zywietz, 2004: 12; Martens and Raza, 2008: 29), and has thus moved away from policy indicators (input indicators) that were covered in the earlier work on economic globalization (World Economic Forum, Heritage Foundation), with Dreher (2006) as a noticeable exception. Paradoxically, the gains related to incorporating more dimensions in the globalization indicators might have come at the cost of reduced coverage in terms of logical categories. The practical difficulty to directly quantify policy measures in non-economic areas partially explains this (Lockwood, 2001: 6).

From the perspective of the construction of globalization indicators two options lay open to bring policy in. The first is to explicitly include policy variables, as in the earlier economic globalization indicators, and also in the KOF index. These policy variables can refer to trade barriers, FDI policies, competitiveness enhancing policies, connectivity policies, migration policies, etc.

Given the already mentioned difficulty to construct a direct quantitative indicator of policies, the second option is to adjust 'output' measures of globalization in order to extract the net policy effects. This is done by regressing them on a set of exogenous variables, representing structural country characteristics considered to influence global-

ization independently of policies. The regression residuals are then used to construct the adjusted indicators, assuming that they measure the effect of policies on a country's integration in the world economy.

Lockwood (2001: 6-9), for example, applied Pritchett's (1996) approach to adjust the Kearney/FP variables. The cost to pay is a considerable loss of transparency, readability and user-friendliness of the index. One should also be aware of the fact that after such adjustment the indicator might reflect less what could be called de facto globalization. For example, for the MGI the effect of countries being landlocked is filtered out (i.e. geographical adjustment) (Martens and Zywietz, 2006; Martens and Raza, 2008), but one could ask whether relatively low levels of international integration and connectedness is not exactly what one would like the globalization indicator to reveal for landlocked countries...?[20] The appropriateness of such *ex ante* corrections is still an open question for indicator-builders (Dreher et al., 2010).

A further problem is that this kind of index adjustment is usually not done in a systematic way. In the case of the CSGR-GI, for example, one could ask why the adjustment is applied only to economic variables (Caselli, 2006: 17).

However, in our opinion the most important question is related to the very purpose of the globalization indicators. In most proposals, the designers do not choose clearly between an indicator showing the de facto degree of globalization of a country (or a region, a group of citizens, a group of companies, ...), which would not call for structural adjustment, or an indicator assessing the scope and quality of globalization policies. We would recommend distinguishing more clearly between the two concepts, for example by systematically using a pair of indicators: one referring to the de facto degree of globalization, and one referring to the quality of globalization policies. The latter could well be a structurally adjusted version of the former.

4. Conclusions and way forward

Over the last decade we have witnessed the development of various globalization indicators, and econometric work has shown their potential to be used for testing hypotheses about the causes and consequences of globalization. As shown in our review, the indicators were gradually adjusted and fine-tuned from both a conceptual and technical point of view. However, there are still a number of issues that are either unresolved or – at least – deserve continued attention from the indicator-building community.

One issue is related to the possibility to add dimensions and variables to the indicators. Although it certainly makes sense to view globalization as a more multi-faceted phenomenon, one should be aware of the fact that expanding the indicators has sometimes come at the expense of their conceptual clarity. In particular, the increasing number of dimensions has been accompanied by a lack of a clear-cut distinction between the logical components of the globalization process – its driving factors, its intrinsic features, its results – which might be better measured separately.

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[20] The fact that the landlocked dummy variable shows highly significant coefficients when regressing the different indicator components (Martens and Raza, 2008: 14-19) does not seem to be a sufficient argument.

Another important unsettled issue is that of defining and representing correctly the geographic space of the process. On the one hand, the available indicators still rely on a misleading identification of globalization with a country's openness to the rest of the world, seen as a unique partner, without paying due attention to the geographic diversification and reach of its international relationships. On the other, they often fail to properly take into account the supra-territorial nature of some important elements of globalization. More generally, we feel the lack of an adequate treatment of the different spatial levels of the process, so that important phenomena emerging mainly at the regional level are sometimes misrepresented as signs of globalization.

A promising alternative is based on the recognition that the scope of international integration is not necessarily global, as cross-border interactions among human societies are often limited in their geographic reach. A new generation of statistical indicators should therefore be developed, in order to clearly distinguish between regional and global integration. Nevertheless, many conceptual and methodological issues remain open.

Acknowledgement

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