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Globalisation Continues: The Maastricht Globalisation Index Revisited and Updated

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ABSTRACT *Globalisation is a complex process which leads to an increasing connectedness and interrelatedness in the political, economic, social and cultural, technological, and environmental domain on many different scales. While this is a truly global phenomenon, it also has different impacts and manifestations in different geographic localities. As a result, different nations exhibit different levels of globalisation or connectedness. Further, perspectives on globalisation are manifold and change over time, therefore it is crucial to continuously reflect upon and revise existing methodologies. Composite indices are a powerful tool to capture and measure complex concepts that allow for monitoring complex systems over time and yield relative rankings and comparisons. This article presents a revised and updated Maastricht Globalisation Index for 117 countries and three points in time—2000, 2008, and 2012—including a new calculation methodology and data. Results show that globalisation still continues but has slowed down, due to the recent economic crisis.*

Keywords: globalisation, composite indices, integrated assessment, MGI

Introduction

During the last few decades, human dynamics, institutional change, political relations, and the global environment have become successively more intertwined. Increased global economic integration, global forms of governance, and globally interlinked 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 on social and cultural arrangements (Waters, 1995); the increased dissemination of ideas and technologies (Albrow, 1996); the threat to national sovereignty by transnational actors (Beck, 2004); or the

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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 and new and enhanced legal systems and institutions that facilitate these flows. On the cultural front, there are more international cultural exchanges, the spread of multiculturalism, 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.

For many commentators, 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, which, 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 worldwide, climate change, an accelerating loss of biodiversity, and the scarcity and pollution of freshwater resources (for an extensive overview of the discontents of globalisation, see Stiglitz, 2002).

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). 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, Gaston, & Martens, 2008). In this article we revised and updated the Maastricht Globalisation Index regarding its database and calculation methodology.

A Pluralistic Approach to Globalisation

There is rather broad agreement among key thinkers that contemporary globalisation is the continuation of longer-term developments of increasing societal integration at the global level while also exhibiting features that are qualitatively different from previous times. Jones (2010) further points out that there is still disagreement whether or not globalisation is a single thing, i.e. being systemic, and what the underlying driving forces are. Most (historical) analyses acknowledge that globalisation is driven by economic incentives and innovation in time–space shrinking technologies (Allen, 2011; Dicken, 2011; Friedman, 2007; Rennen & Martens, 2003). This, however, does not imply that social, cultural, and ecological factors are also not important as

pointed out by others (Held, McGrew, Goldblatt, & Perraton, 1999; Martens & Rotmans, 2005; Osterhammel & Petersson, 2005; Pieterse, 2009; Stiglitz, 2002).

We state that globalisation has the following two key characteristics: it is multidimensional and multiscalar. Further, as laid out by Jessop (2000), globalisation is the result of the co-evolution of nested and complex panarchies, rather than exhibiting simple and one-dimensional characteristics. This pluralistic (or complexity) approach enables us to perceive globalisation as a phenomenon, or an overarching process in which many different processes simultaneously take place in many domains (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 driving forces and its consequences is an essential step in describing the phenomenon. From a conceptual perspective, this has the implication that one cannot grasp the full extent of globalisation by looking at it only from side. However, one can more or less consciously choose to ignore other dimensions. Taking a truly global or holistic perspective on globalisation by acknowledging its multiscalarity also has certain implications. Processes and structures at different scales—i.e. the global, international, regional, national, and sub-national—are seen to be interconnected and co-evolving and shall therefore not be analysed in isolation. Several scholars who follow Scholte's definition of globalisation as suprateritoriality see globalisation as a single process that takes place only at the global scale. Accordingly, they argue, that it should be conceptually differentiated from other concepts, such as internationalisation, liberalisation, and universalisation (Caselli, 2012; Dreher, Gaston, Martens, & Van Boxem, 2010; Lombaerde & Iapadre, 2008; Scholte, 2005, 2008).

In the broadest sense, globalisation is defined as 'the growing interconnectedness and inter-relatedness of all aspects of society' (Jones, 2010). Adding multidimensionality and multiscalarity, we define contemporary globalisation as the intensification of cross-national interactions that promote the establishment of transnational structures and the global integration of cultural, economic, ecological, political, technological, and social processes on global, supranational, national, regional, and local levels (Rennen & Martens, 2003). Taking a global systems perspective, globalisation as the growing interconnectedness of subsystems results in increasing system complexity at various scales. However, different national systems may of course exhibit diverging levels of connectedness and complexity.

The Maastricht Globalisation Index

One powerful tool to illustrate, monitor, and communicate complex issues or concepts that exhibit multidimensionality, such as globalisation, are composite indicators (CI). CIs are constructed by aggregating individual quantitative or qualitative indicators into a final index. Most CIs are constructed on a national level, and therefore allow for a relative ranking or comparison of country performance (OECD, 2008). It is important to acknowledge that CIs are quantitative, mathematical, or computational models and the construction process involves many subjective choices of the craftsman who puts them together. In his critique, Caselli (2012) argues that globalisation can only be indirectly measured. Accordingly, there is not one right or objective way to do it, and it is rather important that subjective methodological choices are made transparent. This is contradictory to previous claims of absolute, exact, and objective measurement of both causes and consequences of globalisation (Dreher et al., 2008, 2010).

If the primary objective is to derive a comprehensive quantitative model of globalisation, then there are several conditions that a composite indicator of globalisation needs to fulfil. In particular, it has to be valid, relevant, robust, transparent, and it needs to add value (i.e. to not be

redundant) (Caselli, 2012; Dreher et al., 2008; Martens & Raza, 2009). The differentiation of a measure of globalisation from other concepts such as internationalisation and regionalisation, as called for by (Caselli, 2012; Lombaerde & Iapadre, 2008) is, however, not the objective, when employing a pluralistic and multiscalar definition of globalisation.

One composite indicator is the Maastricht Globalisation Index (MGI) as developed by Martens and Raza (2009), Martens and Zywiets (2006), and Rennen and Martens (2003) and further applied in Martens, Akin, Maud, and Mohsin (2010), Martens and Amelung (2010), and Martens and Raza (2010). For a detailed overview and discussion on the use of indicators to measure globalisation, we refer to Dreher et al. (2008). For a detailed overview and critical reflections, see Caselli (2008 & 2012), Dreher et al., (2010), and Lombaerde & Iapadre (2008). Potrafke (2013) gives an extensive overview on the empirical evidence from the KOF index of globalisation.

The new 2012 edition of the MGI incorporates two key changes as compared to the previous 2008 edition. The first one is the logarithmic transformation of indicators, which is included for reasons explained in the section calculation of the MGI. Further, two indicators have been changed. The indicator Cell Phone replaced Phone, which had been defined as ‘incoming and outgoing international telephone traffic in minutes per capita’, and the Ecological Footprint of imports and exports as a share of biocapacity replaced ecological deficit (see Table 1 and Martens & Raza, 2009 for a comparison). The following sections describe the subsequent steps of the index construction, namely the choices of domains and variables (see Table 1) and the calculation methodology in more detail.

Table 1. MGI indicators

| Domain | Indicator name, abbreviation | Weight / transformation | Indicator definition |
|-------------------|------------------------------|-------------------------|-----------------------------------------------------------------------|
| Political | Embassies (Emb) | 1/15 | Absolute number of in-country embassies and high commissions |
| | Organizations (Org) | 1/15 | Absolute number of memberships in international organizations |
| | Military (Mil) | 1/15 | Trade in conventional arms as a share of military spending |
| Economic | Trade (Tra) | Log | Imports + exports of goods and services as a share of GDP |
| | FDI (Fdi) | 1/15 | Gross foreign direct investment, stocks (% of GDP) |
| | Capital (Cap) | Log | absolute value of net private capital flows (% of GDP) |
| Social & Cultural | Migrants (Mig) | 1/10 | International migrant stock as a share of population |
| | Tourism (Tou) | Log | International arrivals + departures per 100 inhabitants |
| | Cell Phone (Cel) | 1/10 | Mobile cellular subscriptions per 100 inhabitants |
| Technological | Internet (Int) | 1/10 | Internet users as a share of population |
| | Eco footprint (Env) | 1/5 | Ecological footprint of imports and exports as a share of biocapacity |

Components of the MGI

The choice of which domains and indicators to include and which not is a subjective one. Different scholars have made different choices for their own reasons, as the variety of indices has shown. Where one researcher includes a domain/indicator or not, another would make a contradictory choice with arguments which may be equally valid; the same holds for the calculation method that is to be explained later. The choices reflect a person's perception of what he or she thinks are the most important aspects. These are influenced by their perspectives and worldviews (see Offermans, 2012). The choice is also subject to data availability and quality. Indicators included in a CI should therefore be seen as exemplifiers of the major themes within the globalisation debate, as perceived by its author. However, stating that one makes an objective measurement or that a CI represents an objective truth about globalisation creates the danger of hiding behind a 'curtain of quantitative and statistical objectivity'.

The original MGI (Martens & Zywiets, 2006) was an effort to improve on the indices, which had a neoliberal focus on the economic dimension of globalisation. The first step is to choose the domains. In line with the multidimensional definition of globalisation as laid out above, the MGI is made up of five domains: the political, economic, socio-cultural, technological, and environmental. Table 1 lists all the sub-indicators that were chosen. Log means that the data has been transformed by taking the logarithms. What makes the MGI unique compared to other multidimensional globalisation indices, is the inclusion of the environmental domain and an indicator for the globalisation of the military-industrial complex of a country.

The current version of the MGI covers 117 countries (see Figure 1 and Table 4). The main source of data was the World Development Indicators of the World Bank. It is explicitly stated in the description of the indicators below, when other sources have been used.

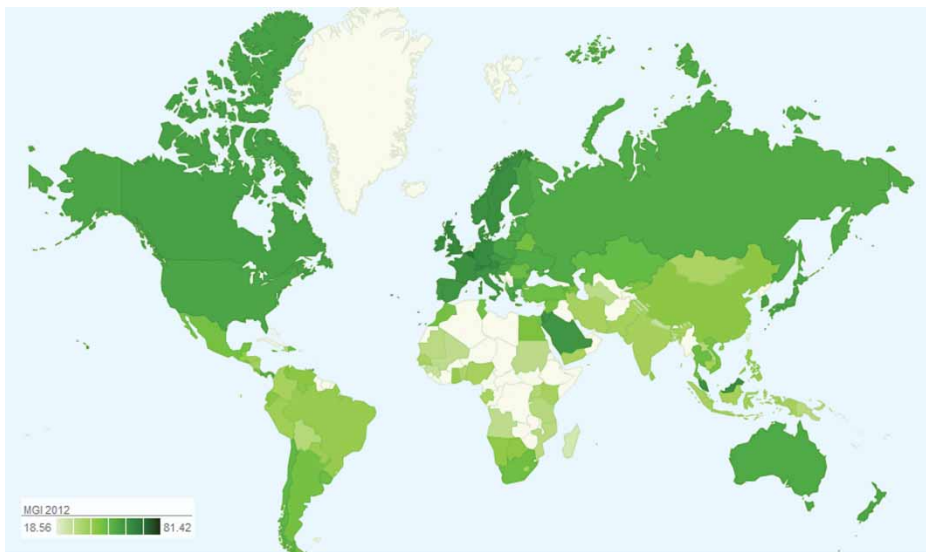


Figure 1. World map of MGI 2012.

Political Domain

The first indicator to measure political connectedness is the absolute number of in-country embassies, which are crucial communication channels for international relations. The more important a country is in the realm of international relations, the more countries will have an embassy there. Since no aggregated statistics on diplomatic relations are available at a global level, the number of in-country embassies and high commissions as listed in the Europe World Yearbook are used.

Membership in international organisations is a complementary indicator, which measures the extensity of a country's multilateral engagement. The CIA World Factbook provides information on membership. This indicator, however, does not say anything about the real engagement (e.g. financial or political) of a country in an organisation.

Organised violence measures the involvement of a country's military-industrial complex with the rest of the world. While data quality is low, this indicator offers an insight into weapons proliferation and international military aid. Of the quantitative military indicators proposed by Held et al. (1999), trade (i.e. imports and exports) 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 comparable, a country's trade in conventional arms is divided by its total military expenditure. Military trade often involves 'big-ticket' items and programmes that are approved and recorded in one year but may actually take several years to be delivered. To smooth the data and account for infrequent, large purchases a moving three-year average is used.

Economic Domain

The first indicator to measure enmeshment in the global economy is trade as a share of GDP. It gives a good idea of how much a country's economy is involved in international trade. However, it does not say anything about trade imbalances.

Gross Foreign Direct Investment (FDI) stocks as a share of GDP is an indicator for the financial enmeshment of an economy. FDI is defined as an investment involving a long-term relationship of an investor in a foreign business enterprise. The FDI includes the initial and all subsequent transactions between the domestic and the foreign affiliates. The FDI stock is defined as 'the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises' (UNCTAD, 2012). As such, it measures the investments of multinational corporations and their involvement in an economy.

The second measure of financial interdependence used is net private capital flows (as a percentage of GDP). This is 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 stock figures. For data smoothing the trailing three-year average is employed.

Social and Cultural Domain

We used the international migrant stock as an indicator for the outcomes of cross-border migration of the last generation. It is defined as the share of foreign-born residents of a given

country. It is only an imperfect indicator for the reason that it does not count in people with a migration background. As a result, a country may be much more culturally diverse, if immigration was higher in previous generations. Nevertheless, it is a good variable to catch the migration effects from the last few decades, since immigrants often maintain close connections to their home countries based on family ties and cultural similarities, often sending remittances home. 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 will have to suffice as a measure of the intensity of this 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. Tourism here is defined as the sum of international inbound and outbound tourists per capita, i.e. the number of visitors who travel to a country other than their usual residence for a period not exceeding 12 months and whose main purpose is not employment related. The quality of the data is to be treated with caution though, since data collection takes place at the national level and is subject to highly diverging standards and practices.

Ideally, the cultural domain would include an indicator that captures people's attitudes, values, and norms with respect to globalisation, more specifically indicators that capture (a) the people's awareness of global issues such as climate change, but also those of economic and political nature; (b) attitudes towards global values such as human rights and democracy and peace (which are arguably rather western values); and (c) the consumption of global media and communication flows. Unfortunately, such indicators are not available. Arguably point (c) is partly captured by the technological domain.

Technological Domain

There is common agreement among scholars that technological change has played and continues to play a significant role in globalisation processes. Specifically, communication and transport technologies that lead to a shrinking of time and space (Dicken, 2011). Due to data availability, the choice here is limited to communication technology.

The share of a country's population that uses the internet is an important indicator in the contemporary world, since it indicates how many people in a population have access to the worldwide network. Having access to the internet enables people to participate in a truly global social space, (more or less) independent of where they live. Among many other possibilities, they can 'consume' global media flows, attend global events (such as the jump from the stratosphere by Felix Baumgartner), and consume cultural goods that have received global attention (such as Gangnam Style). But much more, thanks to social media platforms, such as Facebook, YouTube, Twitter, and also blogs among many others, people can also 'produce' or contribute to the global flows of communication. Whether informing the international community about human rights abuses 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. However, the indicator is limited in the sense, that it does not differentiate between consumption of local vs. global media flows. Further it does not adjust for the digital divide, which

stems from differences in bandwidth, national restrictions (e.g. in Russia and China), internet literacy, the capability to speak English, etc. Dicken (2011) provides some compelling evidence that there is a very uneven geography of the internet, which is not taken into consideration here.

The second component is mobile cellular descriptions per 100 people, which replaced ‘international telephone traffic’. The reason for this switch is the rising importance of cell phones in developing countries, especially in Africa. Due to ‘leapfrogging’, many countries skip the step of setting up an infrastructure of landlines and install mobile networks instead. In those countries, telecommunication technology is used for much more than just calling and texting (and mobile internet). It is also used for banking, access to markets and many more. One shortcoming of the new indicator is that it does not say anything about the relative intensity of the global. Nevertheless it is an important indicator of how connected a country’s population is internally and also externally.

Environmental Domain

Existing multidimensional indices ignore the intensity of globalisation in the environmental 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 look at environmental aspects (or impacts) of traded goods and services. While trade may be good in increasing overall welfare, it allows for the externalisation of environmental costs of production and consumption. Accordingly, we include the Ecological Footprint of trade (exports and imports) as a share of (national) biocapacity (Global Footprint Network, 2014). The Ecological Footprint is a measure of ‘how much area of biologically productive land and water a certain economic unit or activity (in this case the traded good and services) requires to produce all the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices’ (Global Footprint Network, 2012). Biocapacity is a measure of land productivity. This indicator replaced the previously used ‘ecological deficit’ and is not so much an indicator of the state of the environment, but rather one for the environmental dimensions of trade. As such, this indicator is to be seen complementary to the indicator of trade.

A high score in the environmental dimension means that the ecological deficit of traded goods and services for a country is high, relative to national biocapacity. This, however, must be neither good nor bad. Trade enables countries with a relatively low biocapacity to import environmentally intensive goods from countries with abundant biocapacity, instead of degrading the domestic environment. Accordingly, there are strong arguments that trade can be beneficial for the environment. However, as mentioned before, it can dislocate the negative externalities of consumption.

Calculation of the MGI

The calculation of the index is the next step in the construction process. For an overview of the different methodological approaches, we refer to the OECD *Handbook on Constructing Composite Indicators* (OECD, 2008). The calculation methodology is just as subjective as the choice of domains and indicators to be included. This section briefly explains the calculation methodology as applied here.

The first step is calculation of indicators and imputation of missing data. Calculation is necessary for those indicators that are not directly available as used in the index. Imputation of missing

data is done through extrapolation from historical data. Second, indicators that have strongly skewed distributions are transformed by taking the logarithm; this is a necessary step for the normalisation of the data and is applied to the variables Military, FDI, Capital, Migrants, Tourism, and Eco Footprint (see Table 1). Third, Following Dreher (2006), indicator scores are calculated, by applying panel normalisation and using the formula $((V_i - V_{\min})(V_{\max} - V_{\min}) \times 100)$, with V_{\max} and V_{\min} being the absolute maximum and minimum value as observed over the three points of time. As a result of the previous steps, we can then finally aggregate the indicators first at the domain level and subsequently at the MGI level. Here equal weighting is applied in both aggregation steps, in coherence with our multidimensional definition of globalisation. We assume that there is no hierarchy of domains, but that each is equally important. The final score is then used to rank and compare countries. The higher the score, the more 'globalised' a country is (see Table 4).

This calculation methodology is different from the 2008 edition of the MGI (Martens & Raza, 2009). The one key difference is the logarithmic transformation of those indicators with skewed distributions. The motivation to include this step is to make the index more robust and coherent with the multidimensional definition of globalisation and the argument that all indicators and domains should be equally weighted. The distribution of the underlying data has significant implications for the final index score and ranking, especially when equal weighting is applied. When aggregating two equally weighted indicators, which have significantly different distributions, the actual (average) weight of the indicators or domains will not be equal in the domain or final index respectively, despite the application of equal weighting. For example, when sub-indicator 1 is skewed to the left and sub-indicator 2 is skewed to the right (or even normally distributed), then the latter one will make up a much greater percentage of the final index, and both indicators will effectively not be equally weighted.

This has to be taken into consideration especially when indicators are changed. For example, the 2008 edition used the ecological deficit, with a distribution skewed to the right, whereas the ecological footprint of imports and exports as a share of biocapacity, as employed in the 2012 edition, is skewed to the left. Accordingly, the share of the ecological domain in the final index would have gone down significantly if logarithmic transformation had not been applied. Further, countries with extremely high values in the untreated data tend to be overvalued if not transformed and normalised. We looked at histograms in order to detect skewed distributions and graphs with the countries on the x axis, from lowest to highest and the respective indicator values on the y axis in order to detect exponential patterns. Logarithmic transformation has been applied to the indicators Military, FDI, Capital, Migrants, Tourism, and Eco Footprint (see also Table 1).

As a result of the inclusion of this new step, the average weight of the domains as actually observed in the final index is much more balanced. On average, the sub-domains make up the following percentage of the final MGI score for the 2008 and 2012 edition of the MGI respectively: political (30 → 15%), economic (16 → 22%), (socio-) cultural (12 → 24%), technological (16 → 18%) and environment (30 → 21%), keeping in mind that perfect equal weighting would imply a weight of 20% for each.

Assumptions and Limitations

The data used in the MGI does not distinguish explicitly between globalisation, internationalisation, and regionalisation. Whereas some see this as a problem (Caselli, 2012; Lombaerde & Iapadre, 2008), we rather argue that this is in line with our multiscalar definition. Accordingly,

internationalisation and regionalisation are seen as integral sub-processes of globalisation rather than being something distinguishable. Accordingly, we do not claim to measure globalisation as defined by Scholte as supraterritoriality (2008). We make the implicit assumption that countries with many international and regional links also have a greater number of global linkages. Furthermore, we do not distinguish between the globalisation based on the two criteria of functional (economic) integration and the extent of geographical spread as laid out by Dicken (2011). An index of globalisation as a distinctive process is definitely interesting, but cannot be constructed with the data at hand. Concluding, one could argue that the MGI should rather be called Maastricht Globalisation/Internationalisation/Regionalisation index.

As expected, international statistics on 11 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. 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. 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, Singapore, and Hong Kong) are also missing from the statistics and therefore excluded from the MGI. Furthermore, data was not available for all domains of globalisation for the target year. Several components of the indicator were therefore extrapolated from older data. Since year-to-year changes tend to be small in those domains, we do not expect this to have a large impact on the results (see Martens & Raza, 2008). Table 2 below gives an overview of the coverage of the countries included in the MGI for the economic, political, and environmental dimensions of globalisation (as % of world). The 117 countries included cover 95% of world GDP, 92% of world trade, and 94% of the global biocapacity.

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 3 shows the correlation confidants for the MGI 2012. All indicators are

Table 2. Coverage of countries included in the MGI for various aspects for 2010

| Indicator | Coverage |
|----------------------|----------|
| embassies receiving | 80% |
| total org membership | 68% |
| population | 91% |
| 2010 GDP | 95% |
| Total Trade 2010 | 92% |
| Tourism | 89% |
| Biocapacity | 94% |
| Ecological Footprint | 81% |
| FDI inflows | 81% |
| FDI outflows | 84% |

Table 3. Spearman correlation matrix for MGI (2012) and its components

| | Embassies | Organizations | Military | Trade | FDI | Capital | Tourism | Migrants | internet | CellPhones | EcoFootprint | MGI |
|---------------|-----------|---------------|----------|---------|--------|---------|---------|----------|----------|------------|--------------|--------|
| Embassies | 1.000 | .814** | .347** | -.249** | .215* | -.044 | .325** | .183* | .598** | .368** | .436** | .585** |
| Organizations | .814** | 1.000 | .258** | -.296** | .168 | -.114 | .349** | .183* | .610** | .315** | .428** | .576** |
| Military | .347** | .258** | 1.000 | -.086 | .088 | .150 | .246** | .197* | .316** | .220* | .139 | .323** |
| Trade | -.249** | -.296** | -.086 | 1.000 | .460** | .207* | .311** | .168 | .138 | .269** | .267** | .262** |
| FDI | .215* | .168 | .088 | .460** | 1.000 | .384** | .585** | .354** | .538** | .474** | .391** | .604** |
| Capital | -.044 | -.114 | .150 | .207* | .384** | 1.000 | .209* | .129 | .106 | .189* | .095 | .220* |
| Tourism | .325** | .349** | .246** | .311** | .585** | .209* | 1.000 | .483** | .753** | .669** | .674** | .838** |
| Migrants | .183* | .183* | .197* | .168 | .354** | .129 | .483** | 1.000 | .477** | .386** | .433** | .600** |
| internet | .598** | .610** | .316** | .138 | .538** | .106 | .753** | .477** | 1.000 | .673** | .708** | .905** |
| CellPhones | .368** | .315** | .220* | .269** | .474** | .189* | .669** | .386** | .673** | 1.000 | .609** | .771** |
| EcoFootprint | .436** | .428** | .139 | .267** | .391** | .095 | .674** | .433** | .708** | .609** | 1.000 | .852** |
| MGI | .585** | .576** | .323** | .262** | .604** | .220* | .838** | .600** | .905** | .771** | .852** | 1.000 |

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

significantly correlated with the final index. The indicators ‘Internet’, ‘Eco Footprint’, and ‘Tourism’ are highly correlated with the index, with Spearman rank correlation coefficients of 0.905, 0.838, and 0.852 respectively. Surprisingly, the economic indicators ‘Trade’ and ‘Capital’ have the lowest correlation coefficients with 0.262 and 0.22 respectively.

On the domain level, the final MGI is correlated strongest (as expected from the individual indicators correlations) with the technological domain (Spearman correlation (r_s) = 0.926), followed by the ecological (r_s = 0.844), social and cultural domain (r_s = 0.838), and political domain (r_s = 0.621). The MGI is least correlated with the economic domain (r_s = 0.526).

Results

CIs allow for several types of observations. First, ‘global’ observations can be made about general trends (e.g. increasing, decreasing). Second, the scores and rankings give insights into relative changes of individual countries. Third, observations can be made for groups of countries that are clustered according to certain characteristics (e.g. geographic regions, economic performance, and level of globalisation). And lastly, indicators that have been constructed with different methodologies can be compared. This analysis is limited to the first two types of observations.

On average, countries have been globalising between 2000 and 2012 from a score of 40.56 in 2000 to 51.19. The most significant driver has been the technological domain, which increased from 1.89 to 9.08. This, however, should not be surprising, given that the indicators for this domain are internet users and cell phone subscriptions. Further, on average, globalisation has been slower between 2008 and 2012 than in the period before, with an absolute decrease in the economic domain. This is partly due to the global economic crisis, which started in 2008 and was still not fully overcome in 2012 and which would explain a temporary slowdown of globalisation processes. Another reason could be that globalisation processes, as defined and measured by the MGI, are slowing down in general and more importantly for highly globalised countries, since they are asymptotically reaching a maximum level of globalisation.

Table 4 gives an elaborate overview of ranks, scores, and developments over time. The first column is the rank according to the MGI for 2012 and ‘dR 00–12’ is the change (d = delta) in rank between 2000 and 2012. The results for the MGI score of 2012 can also be observed in **Figure 1**.

The most globalised country is Belgium, followed by the Netherlands, Switzerland, the UK, Austria, and Germany. In general, the top end of the list is dominated by European countries. Interestingly, however, Malaysia managed to make a jump by 10 ranks and is now the ninth most globalised country and Jordan is on rank 12. The BRICS countries, which are said to be the biggest emerging economies of the twenty-first century rank 39 (Russia), 53 (South Africa), 71 (China), 75 (Brazil), and 85 (India). Most interestingly here is that South Africa actually lost six ranks, while all the others increased their rank between 11 and 18 ranks. The lowest ranked countries are Burundi, Madagascar, Nepal, Guinea, Mali, Angola, and Turkmenistan.

The next three columns give the scores for 2000, 2008 and 2012. Further ‘dS 00–12’ is the change in score between 2000 and 2012, which can also be observed in **Figure 2**. Only two countries, Papua New Guinea and Burundi, were (slightly) ‘de-globalising’ in absolute terms. Most notably, Albania increased its rank by 42 and its score by 25.24 points.

One question of interest is whether there has been convergence in levels of globalisation. **Figure 1** and **Table 4** make it clear that there are significant differences in levels of globalisation. Convergence takes place when countries with lower initial index values have a greater increase

Table 4. MGI (2012)

| country | Rank 12 | dR 00-12 | Score 00 | Score 08 | Score 2012 | dS 00-12 | more G recently |
|---------------------|---------|----------|----------|----------|------------|----------|-----------------|
| Belgium | 1 | 1 | 67.86 | 77.25 | 81.42 | 13.56 | -0.13 |
| Netherlands | 2 | -1 | 69.22 | 78.72 | 78.12 | 8.90 | -1.34 |
| Switzerland | 3 | 0 | 65.72 | 73.78 | 74.69 | 8.96 | -0.78 |
| United Kingdom | 4 | 5 | 58.79 | 71.18 | 73.21 | 14.42 | -1.04 |
| Austria | 5 | -1 | 61.55 | 72.11 | 72.81 | 11.27 | -1.15 |
| Germany | 6 | -1 | 61.26 | 68.97 | 72.22 | 10.96 | -0.15 |
| Ireland | 7 | 4 | 58.11 | 68.17 | 70.94 | 12.82 | -0.56 |
| Sweden | 8 | -2 | 60.82 | 69.49 | 70.74 | 9.92 | -0.77 |
| Malaysia | 9 | 10 | 54.89 | 65.79 | 70.69 | 15.80 | -0.14 |
| France | 10 | -3 | 59.65 | 68.60 | 69.91 | 10.27 | -0.79 |
| Norway | 11 | 4 | 56.72 | 67.77 | 69.71 | 13.00 | -0.90 |
| Jordan | 12 | 4 | 55.71 | 66.70 | 69.57 | 13.85 | -0.66 |
| Denmark | 13 | -5 | 59.58 | 70.20 | 68.73 | 9.15 | -1.70 |
| Israel | 14 | -4 | 58.40 | 66.24 | 68.29 | 9.89 | -0.47 |
| Spain | 15 | 2 | 55.17 | 66.41 | 68.23 | 13.06 | -0.95 |
| Italy | 16 | -4 | 57.25 | 65.25 | 68.04 | 10.80 | -0.30 |
| Saudi Arabia | 17 | 13 | 49.66 | 63.37 | 67.95 | 18.30 | -0.57 |
| Portugal | 18 | 5 | 52.45 | 64.06 | 67.43 | 14.98 | -0.61 |
| Czech Republic | 19 | 7 | 51.91 | 65.45 | 66.76 | 14.84 | -1.37 |
| Slovenia | 20 | 9 | 50.19 | 61.89 | 66.74 | 16.56 | -0.25 |
| Kuwait | 21 | -1 | 54.51 | 64.85 | 64.80 | 10.29 | -1.31 |
| Hungary | 22 | 5 | 51.65 | 64.62 | 64.43 | 12.78 | -1.67 |
| Korea, Rep. | 23 | -1 | 52.89 | 63.93 | 64.33 | 11.43 | -1.28 |
| Canada | 24 | -11 | 56.90 | 61.34 | 64.13 | 7.22 | 0.14 |
| Croatia | 25 | 13 | 44.04 | 61.00 | 63.84 | 19.79 | -1.41 |
| Slovak Republic | 26 | 10 | 45.49 | 62.06 | 62.87 | 17.39 | -1.87 |
| Finland | 27 | -13 | 56.88 | 61.09 | 62.72 | 5.84 | -0.12 |
| Poland | 28 | 9 | 45.05 | 59.56 | 62.66 | 17.62 | -1.04 |
| Japan | 29 | 2 | 49.47 | 59.25 | 62.43 | 12.96 | -0.43 |
| Estonia | 30 | -9 | 53.21 | 61.08 | 62.31 | 9.10 | -0.67 |
| United States | 31 | -13 | 55.00 | 61.41 | 62.18 | 7.18 | -0.61 |
| Lithuania | 32 | 7 | 43.99 | 59.89 | 61.74 | 17.75 | -1.53 |
| New Zealand | 33 | -8 | 52.25 | 60.33 | 61.59 | 9.34 | -0.69 |
| Greece | 34 | -10 | 52.26 | 61.56 | 61.59 | 9.32 | -1.15 |
| Latvia | 35 | 5 | 43.95 | 59.73 | 60.81 | 16.87 | -1.70 |
| Bulgaria | 36 | 7 | 43.16 | 61.52 | 60.66 | 17.50 | -2.51 |
| Australia | 37 | -9 | 50.78 | 58.67 | 60.59 | 9.81 | -0.51 |
| Ukraine | 38 | 3 | 43.70 | 56.92 | 60.09 | 16.39 | -0.86 |
| Russian Federation | 39 | 15 | 40.88 | 54.39 | 59.92 | 19.04 | -0.31 |
| Trinidad and Tobago | 40 | -5 | 45.77 | 55.05 | 57.56 | 11.80 | -0.53 |
| Panama | 41 | 4 | 42.56 | 51.85 | 57.47 | 14.92 | 0.24 |
| Albania | 42 | 42 | 31.98 | 51.61 | 57.22 | 25.24 | -1.05 |
| Armenia | 43 | 17 | 39.08 | 43.98 | 55.71 | 16.63 | 2.32 |
| Chile | 44 | 2 | 42.45 | 52.45 | 55.58 | 13.13 | -0.47 |
| Jamaica | 45 | -12 | 46.82 | 56.81 | 55.49 | 8.67 | -1.58 |
| Kazakhstan | 46 | -14 | 47.57 | 50.94 | 55.00 | 7.43 | 0.60 |
| Macedonia | 47 | 6 | 40.92 | 52.62 | 54.56 | 13.64 | -0.98 |
| Mauritius | 48 | -14 | 46.51 | 53.36 | 54.34 | 7.82 | -0.61 |

(Continued)

Table 4. Continued

| country | Rank 12 | dR 00-12 | Score 00 | Score 08 | Score 2012 | dS 00-12 | more G recently |
|--------------------|---------|----------|----------|----------|------------|----------|-----------------|
| Romania | 49 | 12 | 38.87 | 53.63 | 53.78 | 14.91 | -1.81 |
| Turkey | 50 | 9 | 39.10 | 51.45 | 53.64 | 14.54 | -1.00 |
| Uruguay | 51 | 13 | 38.62 | 51.19 | 53.55 | 14.93 | -0.98 |
| Thailand | 52 | -10 | 43.64 | 52.35 | 53.27 | 9.63 | -0.86 |
| South Africa | 53 | -6 | 42.41 | 51.25 | 52.97 | 10.57 | -0.67 |
| Dominican Republic | 54 | 2 | 40.26 | 47.35 | 52.71 | 12.45 | 0.45 |
| Georgia | 55 | 0 | 40.58 | 48.89 | 52.21 | 11.63 | -0.21 |
| Azerbaijan | 56 | 10 | 38.00 | 48.29 | 52.07 | 14.06 | -0.34 |
| Moldova | 57 | 1 | 39.51 | 49.76 | 52.03 | 12.52 | -0.72 |
| Tunisia | 58 | -14 | 42.73 | 53.33 | 51.91 | 9.18 | -1.68 |
| Argentina | 59 | -11 | 42.35 | 49.12 | 51.69 | 9.34 | -0.20 |
| Belarus | 60 | -11 | 41.58 | 47.62 | 51.68 | 10.10 | 0.26 |
| Morocco | 61 | 8 | 36.95 | 47.86 | 51.40 | 14.45 | -0.48 |
| Mexico | 62 | -12 | 41.21 | 46.98 | 51.38 | 10.17 | 0.38 |
| Syria | 63 | 5 | 37.18 | 46.05 | 51.29 | 14.11 | 0.20 |
| Costa Rica | 64 | -12 | 40.99 | 49.67 | 51.20 | 10.21 | -0.70 |
| Viet Nam | 65 | 22 | 31.67 | 44.59 | 50.46 | 18.79 | -0.15 |
| Egypt, Arab Rep. | 66 | -9 | 39.71 | 47.74 | 50.04 | 10.33 | -0.43 |
| Kyrgyzstan | 67 | 12 | 32.73 | 46.13 | 49.36 | 16.63 | -0.87 |
| El Salvador | 68 | 3 | 36.51 | 45.94 | 48.93 | 12.42 | -0.43 |
| Ecuador | 69 | 4 | 34.44 | 40.36 | 47.20 | 12.76 | 0.97 |
| Venezuela, RB | 70 | -8 | 38.83 | 45.81 | 46.74 | 7.91 | -0.64 |
| China | 71 | 11 | 32.54 | 41.59 | 46.44 | 13.90 | 0.08 |
| Botswana | 72 | -5 | 37.96 | 38.94 | 45.95 | 7.99 | 1.63 |
| Namibia | 73 | -22 | 41.05 | 46.92 | 45.37 | 4.32 | -1.12 |
| Sri Lanka | 74 | -4 | 36.93 | 42.15 | 44.39 | 7.46 | -0.09 |
| Brazil | 75 | 16 | 30.84 | 39.35 | 44.01 | 13.17 | 0.10 |
| Ghana | 76 | -13 | 38.78 | 42.15 | 43.61 | 4.83 | -0.05 |
| Guatemala | 77 | 6 | 32.30 | 41.22 | 43.41 | 11.11 | -0.57 |
| Philippines | 78 | -13 | 38.29 | 41.68 | 43.21 | 4.92 | -0.04 |
| Paraguay | 79 | 13 | 30.78 | 40.49 | 42.67 | 11.89 | -0.67 |
| Gambia, The | 80 | -4 | 34.22 | 40.42 | 42.23 | 8.01 | -0.32 |
| Peru | 81 | 13 | 29.89 | 41.44 | 42.20 | 12.31 | -1.25 |
| Honduras | 82 | 7 | 31.31 | 40.69 | 41.91 | 10.61 | -0.87 |
| Nicaragua | 83 | 5 | 31.50 | 37.26 | 41.44 | 9.93 | 0.32 |
| Cambodia | 84 | 11 | 29.61 | 39.57 | 40.96 | 11.36 | -0.90 |
| India | 85 | 18 | 28.00 | 35.13 | 40.66 | 12.66 | 0.49 |
| Indonesia | 86 | -5 | 32.60 | 36.54 | 40.58 | 7.98 | 0.52 |
| Pakistan | 87 | -2 | 31.91 | 39.09 | 40.34 | 8.44 | -0.58 |
| Kenya | 88 | -8 | 32.62 | 36.92 | 40.31 | 7.69 | 0.31 |
| Iran | 89 | -11 | 32.82 | 36.78 | 40.21 | 7.39 | 0.36 |
| Colombia | 90 | 8 | 28.78 | 38.48 | 40.19 | 11.41 | -0.78 |
| Nigeria | 91 | 5 | 29.56 | 38.00 | 39.87 | 10.31 | -0.59 |
| Yemen | 92 | -20 | 35.54 | 39.89 | 39.72 | 4.18 | -0.59 |
| Mongolia | 93 | 20 | 22.89 | 30.71 | 38.95 | 16.05 | 1.08 |
| Gabon | 94 | -17 | 34.03 | 38.20 | 38.89 | 4.86 | -0.35 |
| Senegal | 95 | 5 | 28.37 | 36.98 | 38.75 | 10.38 | -0.63 |
| Cote d'Ivoire | 96 | -10 | 31.89 | 37.32 | 38.17 | 6.28 | -0.47 |

(Continued)

Table 4. Continued

| country | Rank 12 | dR 00-12 | Score 00 | Score 08 | Score 2012 | dS 00-12 | more G recently |
|------------------|---------|----------|----------|----------|------------|----------|-----------------|
| Benin | 97 | 8 | 27.72 | 35.50 | 37.65 | 9.92 | -0.43 |
| Uganda | 98 | 3 | 28.32 | 33.90 | 36.12 | 7.80 | -0.14 |
| Togo | 99 | -9 | 31.02 | 35.21 | 35.90 | 4.88 | -0.35 |
| Lesotho | 100 | -26 | 34.43 | 35.39 | 35.22 | 0.80 | -0.16 |
| Bolivia | 101 | 6 | 26.58 | 33.37 | 34.87 | 8.30 | -0.47 |
| Rwanda | 102 | 0 | 28.31 | 31.47 | 34.59 | 6.28 | 0.38 |
| Laos | 103 | 3 | 26.98 | 31.24 | 34.38 | 7.40 | 0.25 |
| Tanzania | 104 | 0 | 27.72 | 33.97 | 33.89 | 6.17 | -0.80 |
| Mozambique | 105 | 3 | 25.96 | 32.08 | 33.46 | 7.50 | -0.42 |
| Papua New Guinea | 106 | -31 | 34.35 | 33.25 | 33.45 | -0.90 | 0.19 |
| Haiti | 107 | 2 | 25.39 | 31.79 | 33.20 | 7.81 | -0.45 |
| Bangladesh | 108 | -9 | 28.51 | 33.24 | 33.08 | 4.58 | -0.63 |
| Mauritania | 109 | 1 | 24.96 | 29.31 | 32.67 | 7.71 | 0.29 |
| Sudan | 110 | 2 | 24.05 | 31.88 | 31.77 | 7.72 | -1.01 |
| Turkmenistan | 111 | -18 | 30.10 | 27.10 | 31.56 | 1.46 | 1.49 |
| Angola | 112 | -15 | 29.14 | 30.77 | 31.18 | 2.04 | -0.10 |
| Mali | 113 | -2 | 24.45 | 27.94 | 30.84 | 6.39 | 0.29 |
| Guinea | 114 | 0 | 22.40 | 27.84 | 28.42 | 6.02 | -0.54 |
| Nepal | 115 | 0 | 21.18 | 21.82 | 27.91 | 6.72 | 1.44 |
| Madagascar | 116 | 1 | 17.27 | 23.84 | 23.65 | 6.38 | -0.87 |
| Burundi | 117 | -1 | 19.13 | 17.15 | 18.56 | -0.57 | 0.60 |

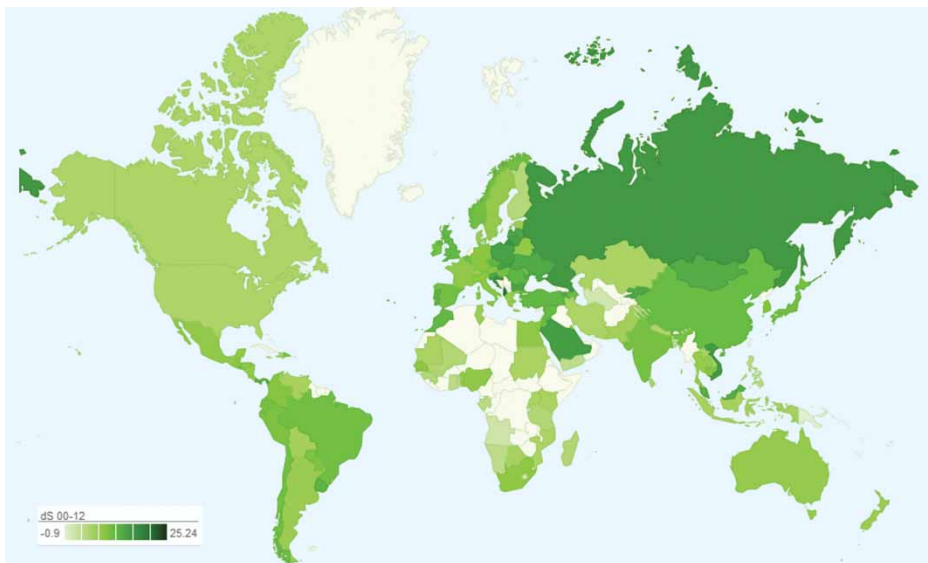


Figure 2. World map of score changes between 2000 and 2012.

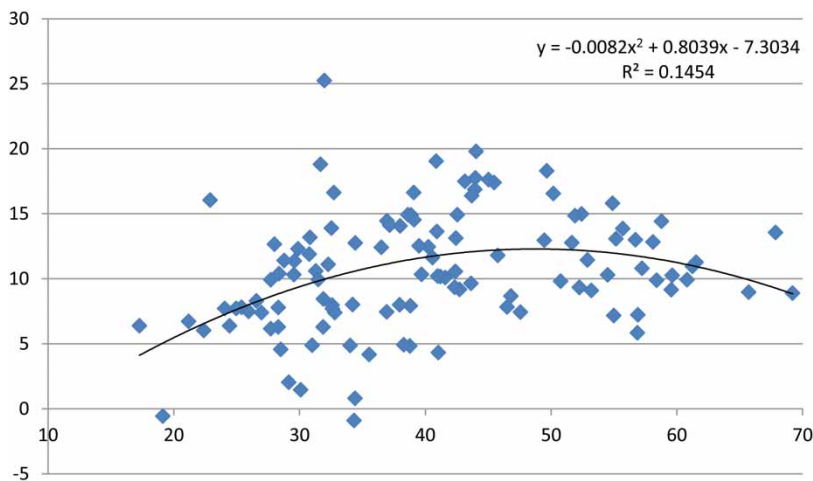


Figure 3. Regression results with MGI score 2000 on the X-axis and dS 00–12 on the Y-axis.

in the score in subsequent years. This can be analysed by regressing ds 00–12 as dependent variable (Y-axis) against the MGI score for 2000 (X-axis). Regression results have shown that the squared term of the MGI score 2000 should also be included. Figure 3 shows the results of the regression model. MGI score 2000 and the squared term are both significant at the 1% level. R^2 is relatively low with 0.1454, so that the model does not explain a lot of the variation. However, it indicates that there is a negative quadratic relationship, which means that on average countries with lower scores had smaller increases. Countries with a score of about 50 in 2000 had the highest increases and countries with high scores had relatively lower increases. Clearly, there is no clear evidence for convergence. Variation is rather high; some countries are catching up while others remain stuck with low levels of globalisation.

The last column, ‘more G recently’, is the per annum change between 2000 and 2008 minus the per annum change between 2008 and 2012. Accordingly, a positive number means that countries have been globalising more in the period between 2008 and 2012 than in the period between 2000 and 2008. Highest scoring countries here are Armenia, Botswana, Turkmenistan, Nepal, and Mongolia. A general observation is that this is rather the case for some countries that are ranked lower, whereas globalisation processes have been slowing down in the higher ranked countries. There are two plausible explanations. First, those countries had a strong momentum of globalisation and secondly they have been less integrated in the global capitalist system initially. Accordingly, the economic crisis had a smaller impact on them.

Discussion and Conclusions

One issue that scholars seem to disagree on is whether globalisation indices are objective measurements (Dreher et al., 2010) or subjective constructions (Caselli, 2012). The OECD handbook (2008) states that indices are mathematical or computational models, which include a multitude of subjective choices of the modeller in the construction process. Research has shown that there is no single correct way to construct a globalisation index, and each may be right and consistent in itself. However, different indices will also yield different results, depending on the choices with respect to indicators and the aggregation methodology. In the field of

globalisation, indices have been mostly constructed and used by economists with some exceptions. This, of course, should not come as a surprise, given the central role of quantitative work in this field.

A related question is whether we should (continue to) measure globalisation? And if so, what should be the unit of analysis (e.g. the nation-state, regions, individuals). To the first question, Dreher et al. (2010) have answered that GIs give the globalisation debate a solid scientific footing, and they justify themselves by peer acceptance and use (Caselli, 2012). However, it seems that the peak of the measurement of globalisation has already been passed, which, however, is the case for the globalisation debate in general (Jones, 2010). There have been several suggestions for a different unit of analysis than the nation-state (Caselli, 2012; Lombaerde & Iapadre, 2008), but so far there have been no real attempts to put those ideas into practice. Some interesting developments are two new indices. One index that is similar to existing GIs but does not use the terminology anymore is the DHL connectedness index (Ghemawati & Altman, 2012). And the consultancy A.T. Kearney, who published one of the first globalisation indices, have switched away from the country level to cities (Hales & Pena, 2012). One drawback of this is the limited scope of 66 cities, which does not allow for a 'global' comparison.

Globalisation indices by themselves do not contribute so much to the debate whether it is good or bad. Previous indices usually praised the most globalised countries for being in the top ten (Dreher et al., 2008). However, the MGI includes indicators that are not necessarily positive. Most importantly, the Ecological Footprint of trade as a percentage of domestic biocapacity is rather a negative indicator. Countries that score high on this indicator put greater pressures on ecosystems, either at home or elsewhere. The Netherlands, for example, scores relatively high in this domain, which is because of a relatively low domestic biocapacity and a high ecological footprint of trade. Other countries, such as Bolivia, have a relatively high biocapacity and a smaller Ecological Footprint of trade. Whether the interpretation of the MGI as a measure of connectedness is something positive or negative is also a matter of argumentation and underlying perspectives (Offermans, 2012). Connectedness can be good in the sense that it makes a system more resilient, if the other systems to which it is connected are also more resilient. However, if the overall system, which could be said to be global capitalism, has certain undesirable properties, then this translates also to less desirable properties in the sub-system. Further, more connected countries are also more affected by spill over effects from other countries.

Linking the MGI to indices of sustainability may give better answers as to whether globalisation is good or bad. Several studies with the MGI have shown that countries that are more globalised are also more sustainable, and in general also healthier (Martens et al., 2010; Martens & Raza, 2010). However, taking an ecological perspective, it would be interesting to analyse whether countries that are more globalised have a higher Ecological Footprint of consumption. Countries may achieve desirable outcomes in human development and health, but may do so within a global system that puts other countries at a disadvantage by externalising social and environmental costs. The problem of global connectedness is that it allows for externalisation of those costs. The pressures and impacts of consumption on distant socio-economic and ecological systems are decoupled from the experience of consumption. Further, on a global scale, the tragedy of the commons seems to persist, with climate change and resource exploitation (e.g. deforestation and over-fishing) continuing at unprecedented levels. Future trends, however, seem to hold a second round of globalisation, when emerging economies will 'catch up'.

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