Chapter 2
Measuring Complexity

2.1 What Do We Measure? More on the Problem of Definition

As said at the beginning of the previous chapter, the clear and rigorous definition of the concept that one wishes to measure is the indispensable first step in constructing an instrument suited to that purpose.[1] But in the specific case of globalization the process is particularly problematic. As already emphasised, the theoretical and scientific debate on the topic has been unable to reach a generally approved definition of the term. Consequently, despite the numerous attempts described in this book, neither has it been possible to devise a unanimously approved tool for the measurement of globalization. Indeed, it is precisely the large number of such attempts that testifies to the lack of a generally accepted definition of globalization.

The definition of the concept that one intends to measure determines all subsequent steps in construction of the relative instrument, beginning with the choice of the indicators of which it is composed (Horn 1993, pp. 68–69). Consequently because different definitions are given to the same concept, different and incomparable tools for its measurement are devised. Given the multiplicity of the possible meanings of the term 'globalization', therefore, the goodness of the tools developed for its measurement cannot be easily evaluated in general terms. They can be so only in relation to the specific definitions of the concept on which such tools have been based.

Given this situation, Dreher et al. (2008, p. 5) suggest that construction of a tool for the measurement of globalization should start from a definition of the concept that is as broad and generic as possible, characterized by multidimensionality, and with a certain degree of flexibility. This suggestion, which in truth seeks more to sidestep the problem than to solve it, has been largely followed by those scholars

[1] As the *Handbook on Constructing Composite Indicators* (OECD 2008, p. 22) puts it, "what is badly defined is likely to be badly measured".

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who have engaged in attempts of this kind. Moreover, one gains the impression that such instruments originate, not from generic and flexible definitions, but rather from a somewhat vague notion of globalization. Often, the only aspect of the concept explicitly evoked is that of multidimensionality. Measures of globalization almost always try to reflect this aspect overtly, but in doing so they raise another problem. While one notes a modicum of convergence among the various proposals put forward—or at any rate considerable refinement in the devising of those parts of the instrument intended to gauge the economic aspects of globalization—decidedly coarser are the attempts made to quantify its political and cultural aspects. This reiterates the point made in the previous chapter: it has often been the economic dimension of globalization that has attracted the closest attention and the greatest interest from researchers. As a consequence, the political and cultural dimensions of globalization have often been treated as mere adjuncts to the economic one. In other words, analysis in the literature on the economic aspects of globalization is much more profound than the analysis on its political and cultural aspects. As we shall see in the next two chapters, this has had significant repercussions on how globalization measures have been constructed.

2.2 How Can Complexity be Measured?[2]

2.2.1 Indirect Measurement: Indicators and Indices

While the adequate measurement of a concept depends on its definition, whether or not such measurement can be made directly will depend largely on that concept's degree of complexity—which consequently should not be too high.

Given that the specific characteristic of globalization is precisely its complexity, it follows that the phenomenon can only be measured indirectly by means of indicators—that is, concepts which are measured not because they are of interest in themselves[3] but because they are surrogates for other, non-measurable concepts (Bauer 1967, p. 45; Cartocci 1984, p. 76). An indicator, in fact, is a specific concept which can be given an operational definition that makes it directly measurable.[4] It is able to represent a general concept or, more often, one of its parts (Corbetta 1999, p. 115; Cartocci 1984, p. 76). The connection established between the specific concept (indicator) and the general concept (object of analysis) has been called the 'indication relationship' (Marradi 1994, p. 184).

[2] This section develops discussion already conducted in Caselli (2001, pp. 45–49).

[3] This obviously does not rule out that such indicators, besides their use to measure a third concept, can themselves constitute interesting objects of analysis.

[4] Once an indicator has been given an operational definition, it becomes a variable. The concept of 'variable' is therefore more specific than that of 'indicator' (Corbetta 1999, p. 118), and it will be used in this way here. It should be pointed out, however, that the distinction between the two terms is not always clearly defined in the current scientific debate, and they are used in different ways by different authors.

An indicator is therefore a tool able to furnish information about the state—not directly measurable—of the concept that one wishes to analyse (Parra Saiani 2009, p. 28). Such information may take the form of simple presence or absence, an indication of direction or—and this is usually the aspect of greatest interest—a level with respect to some scale of reference (Horn 1993, p. 7).

The indication relationship—or the degree of correspondence between the indicator and the concept to be measured—can be identified empirically or theoretically. However, the relationship identified empirically—for example, by means of a factor analysis in which the variables are the indicators, and the factors identified (or latent variables) constitute the concept indicated—should then be justified on theoretical bases (Scamuzzi 1996, pp. 18–19; McGranahan 1972, p. 91).

The indication relationship is generally founded on a part/whole or cause/effect relation. In the former case, although a particularly complex concept may not be directly measurable in its entirety, some of its parts may be quantifiable. In the latter case, two different situations are possible. The first is the situation in which the effect is assumed to be the indicator of the cause, on the principle that "a phenomenon which cannot be directly observed will nevertheless leave traces which, properly interpreted, permit the phenomenon to be identified and studied" (Lazarsfeld and Barton 1961, p. 100). For an indication relationship to be valid, however, it is necessary that the effect (indicator) be not the possible consequence of several causes; or at least that the researcher be able to keep these other possible causes under control. The second situation is more complex. It is the one in which the indicator constitutes the cause and the concept its effect.[5] Here, the optimal situation is where the indicator is the necessary and sufficient cause of the effect under study. If it is not, it is essential to identify, and to transform into indicators, also the further possible causes of the phenomenon: an operation which is rarely possible, and in any case not easy to perform.

A not-directly-measurable concept can usually be represented by means of a plurality of indicators: in this regard, Lazarsfeld (1959, p. 48) speaks of a "universe of indicators". Furthermore, the multidimensionality and complexity of a concept like that of globalization mean that a very large number of indicators are theoretically available for its measurement. Various procedures, described in the next section, can be used to aggregate these indicators into a single measure of the concept to be investigated. This overall measure is termed an *index* or a *composite indicator* (OECD 2008).

When an index is constructed, a series of difficulties arise—also of a strictly technical nature—which will be considered in the next section. However, aside from the specific problems encountered when constructing an index, there are more general factors which may render the index itself problematic.

According to Bauer (1967, pp. 80–85), a first problem may be a *lack of correspondence* between the indicators selected—or at least some of them—and

[5] This situation occurs rather frequently: for example, when attempts are made to measure the concept of development. For a critical survey see Caselli (2001).

the concept to be measured. Secondly, there may be a problem of *inaccuracy* due, for example, to errors in measuring the indicators. Different indicators, moreover, may furnish incongruent information on the same concept. A further problem may be the lack of data for certain units of analysis with respect to the indicators identified: in this case, the index is not calculable for a part of the population studied. Lastly, the validity of an index intended to measure a complex concept may prove problematic because of disagreement on the choices and judgements that have led to the construction of that same index.

2.2.2 The Construction of an Index and the Problem of Weights

But how is an index constructed?[6] The first operation to perform, given the concept that one wishes to measure, is to identify its various dimensions; or better, given that complete coverage of such dimensions is often impossible, to select those dimensions which seem most important in light of the perspective adopted by the researcher, and the purposes which s/he intends to pursue with the measure. Moreover, the researcher must take account of *how many* factors s/he believes the index can handle.

Once the researcher has identified the fundamental dimensions—which may then be broken down into subdimensions—s/he must identify suitable indicators for each of them. In this regard, some authors have pointed out that it is usually easier to identify the dimensions of a concept than the relative indicators because when the latter are being selected, the constraints and practical requirements imposed by empirical inquiry inevitably arise (McGranahan 1971, p. 66). To be stressed, however, is that it is usually possible to identify a plurality of indicators for each dimension of the concept to be measured. How, then, can one select the indicator or indicators to be included in the instrument being constructed? The answer is that the selection, which although motivated will be essentially subjective, is made by the researcher, who will have to bear in mind, as said, the actual availability of the indicator selected—a problem to which we shall return in a later section.[7] But the researcher must also take account of the fact that no indicator refers solely to the concept subject to inquiry: in other words, an indicator almost always comprises an "indicating part" and an "extraneous part" (Marradi 1980, p. 36). The choice of the indicators to include in the index should therefore fall, as far as possible, on those in which the indicating part is larger than the extraneous part (Corbetta 1999, p. 116).

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[6] This section draws on and develops discussion in Caselli (2008, pp. 385–387).

[7] This is a subjective but not entirely arbitrary selection, in that it is in any case conditioned by constraints of a technical nature, i.e. the possibility of obtaining the data, and secondly by the need to be able to defend the choices made before the scientific community.

When the indicators have been selected, the next—and controversial—step is deciding the weight to attribute to each of them when constructing the overall index. Once again, the decision should be taken on the basis of theoretical considerations, and bearing the research objectives in mind.[8] Nevertheless, the choice is always subjective; and this subjectivity has induced some authors to doubt whether any index has real meaningfulness (Sharpe 2004). In particular, if there are no overlaps or imbalances among the indicators selected and among their underlying dimensions, and in the absence of explicit indications from theoretical analysis, according to some authors a reasonable choice would be to attribute the same weight to all indicators. Besides obviously simplifying the calculations, this approach would reduce to the minimum the incidence of each indicator on the overall value of the index and, consequently, also reduce to the minimum the impact, again on the overall value of the index, of possible errors in a particular indicator (Morris 1979, p. 48). However, this solution is acceptable only provided that there is nothing to suggest that one or more of the indicators considered is of especial importance in relation to the concept to be measured: in this case, the use of diversified weights is essential. Whatever the case may be, it should be stressed that the possible choice of not attributing any weight to the indicators selected—that is, of attributing the same weight to all of them—is no less subjective than the choice of attributing diversified weights to them (Parra Saiani 2009, p. 29; Tufte 1970).

Finally, the value of each of the indicators must be expressed in a form homogeneous with those of the others, so that they can be aggregated into the overall index, or into the subindices, which in their turn are aggregated. In particular, if the values of the indicators are expressed in cardinal or quasi-cardinal (metrical) form,[9] they must be *normalized*, that is, related to a common scale of reference, for example 0–1 or 0–100. In other words, the values of the indicators must be transformed into *index numbers*. For this purpose a maximum value and a minimum number corresponding to the extremes of the normalized scale must be identified for each indicator. Sometimes this maximum and/or minimum is intrinsically given—for example, the literacy rate cannot be less than 0% or more than 100%—but in other cases they must be determined by the researcher, who for that matter may also decide to use thresholds other than 'natural' ones if s/he believes that the latter are not congruent with his/her purposes.[10] Determination of these maximum and minimum values therefore introduces a further element of subjectivity into construction of the index. This operation may be particularly problematic if the intention is to construct an index to measure globalization processes. This is because, as emphasized in the previous chapter, the outcome of

[8] Also the choice, which will be illustrated in the next chapter, to attribute the weights by means of statistical procedures ultimately derives from a particular theoretical position.

[9] That is to say, to use more common terminology, if they assume the form of *ratio* or *interval* variables.

[10] For a complete survey of techniques for normalizing the value of the indicators see OECD (2008, pp. 27–31).

globalization can be neither taken for granted nor, even less, predicted because it depends on the complex overlapping of numerous human choices (Martell 2007, p. 176): consequently, nor can one take for granted the value that can be associated for each indicator with a maximum or minimum level of globalization. Not by chance, in some of the globalization indexes described in the next chapter, the attribution of the limit values of the various indicators comes about in relative and not absolute form: for example, chosen as the threshold value of a particular indicator may be the maximum value for that same indicator recorded in a certain interval of time.

The values of each indicator must therefore be transposed onto the normalized scale. This operation may be performed by complying rigidly with the criterion of proportionality between the 'natural' scale and the normalized one, or alternative options may be chosen (for example, the use of logarithmic scales) if they are deemed better suited to the objectives for which the index is being constructed. And this once again is an arbitrary choice.

Once the various indicators have been normalized, it is finally possible to get the overall value of the index, which can be obtained by summing the indicators or by calculating an average (arithmetic mean, geometric mean, median, etc.).

Described above is the case of indices with cardinal or quasi-cardinal (metrical) indicators. However, the indicators may also be expressed by dichotomous variables (presence/absence). In this case, indices can be constructed by summing—and once again the weight assigned to each factor will be decisive—or by creating typological indices. Again, one may have nominal variables, and in this case too typological indices must be used. Particular solutions may then be devised for the ordinal indicators, for example by transforming them into quasi-cardinal or dichotomous variables.

Finally, it is possible to envisage indices which combine indicators of diverse nature. In this case, the aggregation technique must be selected case-by-case according to the types of indicator employed.

2.2.3 How Many Indicators to Select

Therefore, when constructing an index designed to measure a complex concept indirectly, a crucial juncture comes when *what* indicators to include in that index must be decided. However, this decision is closely connected with another choice, which at least partly precedes it: the choice of *how many* indicators should be selected to create the index.

This choice, too, is particularly delicate; and all the more so because the researcher is caught between two contrasting exigencies. There is a series of reasons, in fact, for including the largest possible number of indicators in an index intended to measure a particularly complex social phenomenon. At the same time, however, another series of reasons contrarily suggest including the smallest possible number of indicators in the aforesaid index.

The principal reason for using a large number of indicators is the need to take account of the manifold dimensions of a complex concept like, in our case, globalization. A further reason is that on increasing the number of indicators, one concomitantly reduces the contribution of each of them to the overall measure, thereby reducing the impact on the latter of possible errors made when calculating a particular indicator. Nevertheless, the decision to construct an index using a large number of indicators also has numerous drawbacks. Firstly, the use of numerous indicators generally makes construction of the index more complex. Consequently, there is a higher likelihood that errors will be committed in its determination and, in parallel, a lower likelihood that an external user will be able to exert control over the instrument.[11] Above all, however, the decision to use a large number of indicators leads to problems in data collection. Gathering data relative to numerous indicators may require a great deal of effort and time, with a high probability that in some cases the data will not be available. For example, if it is decided to use the state as the unit of analysis with which to measure globalization—a topic addressed in the next section—it is likely that increasing the number of indicators to include in the index will reduce the number of the states for which that index is calculable. Again, increasing the number of indicators makes it more likely that the overall measure will be based on qualitatively heterogeneous data. It not rarely happens, in fact, that data collected at the appropriate moment must be 'frozen' while waiting, even for two or three years, until the data relative to the other indicators become available. Lastly, as already said, the presence of a large number of indicators substantially reduces the impact of each of them on the overall measure: every extra indicator therefore entails a significant increase in data collection operations and efforts, but with only a very slight increase in the information yielded by the index.

Conversely, basing an index on a small number of indicators reduces the difficulties and the amount of time required to collect the information necessary for construction of the instrument. The latter thus becomes more rapidly useable and manageable, as well as calculable. An extreme solution in this case might be that of identifying a single indicator of such significance that on its own it can represent the complex concept subject to analysis—in our case globalization—and furnish a satisfactory measurement thereof. This solution would have significant advantages. Firstly, a measurement instrument consisting of a single indicator is extremely simple to construct and to manage. Moreover, if only one datum is required to determine a country's level of globalization, all efforts can be concentrated on collecting that datum in timely manner, and on limiting possible measurement errors. But the greatest advantage that derives from measuring a complex concept with a single indicator is, probably, that it by-passes the problem of how to aggregate several indicators and, particularly, avoids the difficulty of choosing the weights to attribute to each of the elements that instead make up an index—difficulties which

[11] In this regard, Sachs (1995, p. 7) maintains that it is impossible to handle measurement instruments consisting of more than 15 or 20 indicators.

were mentioned earlier. Nevertheless, it seems doubtful that it is possible to find a single indicator able to represent on its own such a complex phenomenon as globalization,[12] and attempts to do so would not obtain substantial consensus. For that matter, the problem with any measurement made with a single indicator is that it is extremely vulnerable to possible errors in the data on which it is based. This latter situation, however, is ambivalent: while it is true that when a single indicator is used, any error may have severe repercussions, it is equally true that the probability of committing a significant error in this case tends to diminish considerably, given that the quality of the datum relative to a single indicator is more easily verifiable than when a long list of indicators must be checked.

In light of these considerations, probably the optimal solution—even if it is not yet particularly widely used—for construction of a measure of globalization is that of designing instruments composed of a limited number of indicators: for example, three or four, but in any case more than one. This solution makes it possible to combine coverage of the concept's multidimensionality with the advantages connected with the instrument's manageability, and with the ease of gathering the data necessary for its construction.

2.3 Choosing the Unit of Analysis as a Specific Problem in the Measurement of Globalization

The choice of the most appropriate indicators with which to create a globalization measure depends first of all on the definition given to the concept by the analyst. But it also depends on the unit of analysis in reference to which the measure will be constructed (Cartocci 1984, p. 84): of what is the degree of globalization to be measured? However, also the choice of the unit of analysis depends on the definition adopted of the phenomenon subject to study. Therefore, if definition of the subject of analysis is as problematic and controversial as it is in the case of globalization, inevitably just as problematic is the choice of the unit of analysis best suited to measuring the concept.

Nevertheless, if we consider the attempts made to date to measure globalization—attempts described in the next chapter—we find that the difficulty is resolved by a choice taken for the sake of convenience, so to speak. Notwithstanding, in fact, all the theoretical reflection that may be devoted to the nature and characteristics of globalization, the unit of analysis usually selected for its measurement is the nation-state. This choice is made 'for convenience' because most of the statistical data, and therefore indicators, available in regard to globalization have the state as the unit of analysis (Scholte 2005, pp. 86–87). But this is not surprising

[12] An example of a single indicator used to measure a complex phenomenon is provided by the concept of 'development', which is usually measured in terms of per capita GDP, that is, with a single indicator. On this see Caselli (2001).

if we consider that statistics and the use of indicators originally arose in regard to the state (Parra Saiani 2009, pp. 9–10)—as demonstrated by the etymology itself of the word 'statistics'.

Yet the somewhat obligatory choice of this unit of analysis raises some particularly problematic issues. One suspects, in fact, that measuring globalization by referring to the nation-state is to distort the very essence of the concept studied. As already pointed out in the previous chapter, it is of crucial importance to distinguish between globalization and internationalization: while the latter refers to processes and dynamics occurring within and in relation to the system of nation-states, the concept of globalization refers (also) to processes that unfold heedless of that system (Sklair 1999, pp. 144–145). In this regard, various authors have stressed that the distinctive feature of globalization is deterritorialization (Sassen 2000; Giaccardi and Magatti 2003; Scholte 2000, pp. 48–49), or the emergence of processes entirely free of territorial constraints—processes, that is, which may be situated anywhere or, conversely, nowhere (in virtual space for example).

In light of these considerations, reflection on the theme of globalization has induced several authors to dispute what has been variously labeled 'methodological nationalism' (Beck 2004), 'embedded statism' (Sassen 2000), or 'methodological territorialism' (Scholte 2000): that is, the perspective largely dominant since the origins of the social sciences and which envisages a substantial overlap between the concept of society and that of the nation-state, which is therefore considered the natural container of economic, cultural, and political processes.

That of the nation-state, therefore, cannot be the only perspective, the only lens through which one studies and analyses a multidimensional and above all multiscalar process like globalization (Sassen 2007). However, this does not mean that it is illegitimate to use the nation-state as the unit of analysis for construction of a globalization measure. Affirming the existence of deterritorialized dynamics and processes is not to deny the persisting and in many respects renewed—as highlighted in the previous chapter—importance of the spatial dimension of globalization. Globalization in fact, as repeatedly said, is an extremely complex phenomenon, and part of its complexity resides in the fact that it can be interpreted from different points of view: the deterritorialized dimension of globalization does not exclude the localized one, and the global dimension does not exclude the local one. The national point of view is therefore one of the many legitimate points of view from which globalization can be read (Beck 2004). This is of particular importance if one considers that the state contributes substantially to shaping globalization processes: for example, it has already been pointed out in the previous chapter that it is the state which furnishes the infrastructures—particularly for transport and communications—that make possible the transnational flows that constitute the essence itself of globalization (Axford 2007, pp. 322–323). Added to this is the fact that nation-states continue to be key actors in the economic and social spheres (Ray 2007, p. 75) as well as essential referents in the everyday lives of all the planet's inhabitants.

Apart from practical convenience, therefore, using the nation-state as the unit of analysis in the study and measurement of globalization processes is in many respects an acceptable procedure. However, this should not obscure the fact that this procedure, however legitimate, allows the analyst to grasp only some aspects of globalization and not others, even though they are extremely significant. It has been pointed out, for example, that it is almost impossible to measure the ecological aspects of globalization by working on national bases (Dreher et al. 2008, p. 38). More generally, there is the problem of grasping more genuinely global aspects of the process on the basis of international data (Scholte 2005, pp. 86–87). Nevertheless, to conclude this discussion, if globalization processes are distinguished by their multi-scalar nature, the problem is not so much finding and using units of analysis alternative to the nation-state as combining several units of analysis and, therefore, different perspectives of inquiry. This is said in the awareness that no perspective and no unit of analysis, on its own, can enable an exhaustive account to be made of the complexity of globalization processes. We shall return to this topic in the final chapter.

2.4 Globalization Measures as Subjective Constructs

The fact that a concept in a particular setting can be described by means of quantitative information suggests, to those who use it, that this information has entirely objective value. This belief is reinforced if the information is presented as resulting from the application of complex mathematical formulas—mathematical formulas, for that matter, which receive very little attention from the users of statistical and social reports, who are generally much more interested in the results than in the procedures used to produce them (Parra Saiani 2009, pp. 61–62).

This perception of objectivity, however, is entirely unfounded. With reference to the subject of this book, to be stressed is that the researcher must make frequent choices throughout the process of constructing an index to measure globalization. The rationale for these choices can be argued before the scientific community, but it cannot be demonstrated incontrovertibly (Corbetta 1999, p. 116). This is because, as said, such choices are essentially subjective. This subjectivity operates at various levels: in the definition of the concept to be analyzed; in the choice of the dimensions to consider, and of the relative indicators; in determination of the weights; and, finally, in the choice of techniques to normalize and aggregate the variables on the basis of which the index is calculated. None of these choices is, so to speak, neutral; on the contrary, they result from specific decisions taken by the researcher (Atta Mills 1980, p. 23). They depend primarily on the researcher's values and on his/her personal vision of the concept under study.

Added to this is the fact that, at a stage so crucial as the choice of the indicators to constitute the globalization index, the researcher must mediate between the exigency imposed by theoretical analysis—the requirement that the indicators must reflect the nature of the concept as closely as possible—and the pragmatic

exigencies related to the real possibility of obtaining the data necessary to construct the index, as well as their quality, updatedness and, not least, their cost. Once again, the success of this mediation between exigencies will depend on the abilities and the judgements, evidently subjective, of the researcher.

If, therefore, the validity of a globalization measure can arise only from critical scrutiny by the scientific community (OECD 2008, p. 14), the process of constructing that measure must be as transparent as possible (Dreher et al. 2008, p. 26). In particular, the procedure with which a globalization index has been constructed—but this applies to any other index—must be described with the maximum clarity, and so must the assumptions on whose basis the various decisions leading to the procedure's definition have been taken.

Moreover, when stating the data obtained from calculation of a globalization index, it is advisable—to the benefit especially of less experienced and competent users—that the partial and stipulative nature of the instrument proposed be made clearly explicit. Yet, as mentioned above, this lack of objectivity is not infrequently dissimulated. It is so, for example, through the application of particularly complex mathematical formulas in construction of the index. In this regard, Drewnowski (1970, pp. 21–23) argues that the calculation procedures, in particular those relative to attribution of weights to the indicators making up the index, must be the most elementary possible. This is necessary both to render the conventional nature of such attribution entirely explicit and to facilitate critical review of the work by the scientific community; critical revision whose importance was emphasized above. Moreover, the fact that the procedure for construction of the index is clearly comprehensible, also to a broader public, assists the users in understanding the instrument's potentials and limits, and, therefore, its real heuristic capacity.

2.5 The Characteristics of a Good Globalization Measure

As emphasized in the previous section, construction of an instrument for the measurement of a complex social phenomenon, and in particular of an instrument for the measurement of globalization, is a process which frequently involves the researcher's subjectivity.[13] It accordingly seems appropriate to specify what should be the desirable characteristics of a globalization measure so that such considerations can orient the researcher's choices.[14] To be noted is that the majority of the characteristics now described are desirable in any measurement

[13] This section draws on and develops discussion conducted in Caselli (2008, p. 387).

[14] Without specifications for each of the points that follow, these are the texts referred to here to identify the desirable features of an index constructed to measure a complex social phenomenon: UNDP (2000), Scamuzzi (1996), Graziosi (1979), Cipolla (1987), United Nations (1989), Morris (1979), Scidà (1997), Alberti et al. (1995), Drewnowski (1970), Cartwright (2000), Church and McHarry (1994).

instrument; but some of them are especially important for an instrument designed to measure a complex social phenomenon like globalization.

Firstly, an instrument of measurement must be *valid*: that is, it must accurately and specifically measure the concept that it has been designed to measure. In particular, it should be as *complete* as possible, in the sense that it considers all the main dimensions of the phenomenon examined, while also giving them *right coverage*: each of the phenomenon's elements must be represented in proportion to its importance within the phenomenon.

The measurement must be repeatable after an interval of time, and it must be able to record any variations in the phenomenon precisely and promptly. It must, that is, be *sensitive*. This feature is especially important when analyzing globalization, given the rapidity with which the phenomenon evolves.

The measurement instrument must also be *reliable*: if its use is repeated, the results must be consistent. Above all, it must yield the same results when used by different researchers. In this regard, given the subjective nature of the choices that lead to the instrument's creation, the *criteria and procedures on which construction of the indices has been based* must be *clearly specified and made public*. The value of a globalization measure—to remain on topic—can never be demonstrated on the basis of objective criteria; its value can result only from scrutiny by the scientific community, and this scrutiny can only be possible if the nature and structure of the index is as 'transparent' as possible.

The instrument, in its use and results obtained, must be adequate to its purpose. That is, it must be *efficacious*. And it must also be *efficient*, in the sense that there must be a good ratio between the costs of using the instrument and the benefits obtained.

The measurement instrument must also be able to furnish the information required in *timely* manner: there must be a minimum gap between the moment when the information becomes available and the moment to which it refers. For this to be possible, the instrument must be *easy to handle* and must not require excessively complex calculations or other operations. It is also important that the measure is based on *easily accessible* and *good quality* data.

If an index of globalization is to gain broad recognition, it must—as a whole and in its individual parts—be *relevant*, *meaningful*, and *easily understandable* for experts, but not only these, given that the concept of globalization is used well beyond the strictly academic community. Finally, a measurement instrument should furnish results that are *clear*, *easily interpretable*, and *unambiguous*. In this regard, it has already been emphasized the importance of ensuring that the construction procedure of the measure proposed is as transparent as possible.

Besides all these elements, Dreher et al. (2008, p. 26) point out that the construction of a globalization index is only justifiable if the instrument is able to furnish added value to the understanding and analysis of the process studied. In particular, a globalization index must yield information in some respects better than that obtainable from analysis of the individual indicators of which the index is composed. Dreher et al. also emphasize, again with regard to added value, that a globalization measure should in the final analysis be something different from and

more specific than a measure of internationalization, Westernization, or economic development.

2.6 Why Measure Globalization? And Why Do So With a Synthetic Measure?

Having reached this point in the discussion, and before moving, in the next chapter, to analysis of the main instruments developed to measure globalization, it is advisable to address a question which is sometimes neglected but certainly crucial: why measure globalization? Answering this question not only serves to justify the efforts made in this direction; but it is also necessary in order to evaluate the adequacy of the instruments developed to date, as well as those that will be proposed in the future: to what extent are such instruments coherent with the purposes for which they have been devised?

The so-called 'social indicators movement' sprang originally from the conviction that the possibility to translate social phenomena into numbers guaranteed the objectivity of knowledge (Parra Saiani 2009, p. 55). More recently, and in relation to the specific topic of this book, Martens and Zywietz (2006, p. 332) have claimed that measuring globalization is "an important first step in putting the globalization debate on a more scientific base". While the quantophrenic excesses of these two assertions are to be rejected, I nevertheless believe that it is difficult to dispute that reflection on the methods and instruments most appropriate for the measurement of a concept contributes significantly to refining the definition of that concept, as well as to identifying its nature and essential features. The indicators used to measure a concept help clarify its definition (Horn 1993, p. 6). In the specific case of globalization, there are those who argue that the tendential indeterminacy of the concept of globalization is due to the absence of general agreement on what indicators and measures are most appropriate for it (Rosenberg 2005, p. 15).

But reflection on globalization does not restrict itself solely to the problem of the concept's definition. On the contrary, it also investigates, among other things, the effects of the phenomenon. In this regard, a measure of globalization may therefore be an important resource with which to identify and, where possible and useful, to quantify those effects, even if the results often vary according to the measurement instrument used (Ray 2007, p. 141). Moreover, it should be stressed that identifying a statistical relationship between an index of globalization and the indicator or indicators of another social phenomenon is an important step in the analysis of globalization's effects; analysis, however, that cannot be restricted to this element alone. In particular, it should be borne in mind that, once a correlation between the globalization index and other variables has been established, it is difficult to identify the direction of any cause/effect relationship (Dreher 2006).

To be noted, however, is that those who set out to study the effects of globalization often concentrate on the economic aspects of the phenomenon. Consequently, some of the indices proposed for measurement of globalization allow separation from the

overall index of information relative to the phenomenon's economic dimension—which moreover, as said, is less difficult to measure than the other dimensions, mainly political and cultural. The difficulties that arise when measuring the political and cultural aspects of globalization will be discussed in the following chapters.

Beyond every other consideration, however, the fact that globalization measures are increasingly used in studies and research is probably the most evident proof of the usefulness of these tools of inquiry. For example, Dreher et al. (2008, pp. 75–79) counted more than thirty studies in which the KOF index (discussed in the next chapter) was used to measure globalization.

Given the existence of a conspicuous number of indicators able to grasp the diverse aspects of globalization, one wonders why some researchers have attempted to identify a synthetic—and therefore single—measure. The question becomes all the more significant if one considers the doubts—legitimate in my view—raised as to whether a complex, multiform and manifold concept like that of globalization can be captured and represented by means of a single value. One can reply that a synthetic measure certainly does not tell us anything more than a battery of indicators; indeed, the aggregation of these indicators, whatever procedure is used, inevitably entails a loss of information. Nevertheless, a single measure is much more convenient and manageable; and it is able—considerably more than a battery of indicators perhaps accompanied by rich qualitative analysis—to focus the attention of public opinion, as well as that of the scientific community. It can thus stimulate debate. A single measure is eye-catching, it has psychological impact and appeal; and, as such, it has a better chance of influencing decision-making processes (Streeten 1995, p. 28). Finally, a single measure of globalization—or any other phenomenon—makes comparisons easier: comparisons among units of analysis but also among different periods, which make a valuable contribution to analysis of a concept's history. Adequate measures of globalization can probably furnish a better understanding and description of the historical evolution of the process (Caselli 2008, p. 400). As a consequence of all these considerations, one must conclude that the attractiveness of single measures is as such to justify the efforts put into their development, so that the doubts about their validity are overcome (Horn 1993, p. 70).

It is nevertheless important to emphasize that a synthetic measure of globalization can only be a instrument which supplements the batteries of indicators available and qualitative investigations. In no way it can replace them (Caselli 2001, p. 34).

References

Alberti, M., Solera, G., & Tsetsi, V. (1995). *La città sostenibile. Analisi, scenari e proposte per un'ecologia urbana in Europa*. Milano: FrancoAngeli.

Atta Mills, C. (1980). *On social indicators and development*. Dakar: United Nations African Institute for Economic Development and Planning.

Axford, B. (2007). Editorial. *Globalizations, 4*(3), 321–326.

Bauer, R. A. (1967). Detection and anticipation of impact: the nature of the task. In R. A. Bauer (Ed.), *Social Indicators*. Cambridge Mass: The MIT Press.

Beck, U. (2004). *Der kosmopolitische Blick order: Krieg ist Frieden*. Frankfurt am Main: Suhrkamp Verlag.

Cartocci, R. (1984). Concetti e indicatori: il contributo della nuova retorica. *Sociologia e Ricerca Sociale, 5*(13), 69–98.

Cartwright, L. E. (2000). Selecting local sustainable development indicators: does consensus exist in their choice and purpose? *Planning Practice & Research, 15*(1–2), 1565–1578.

Caselli, M. (2001). *Misurare lo sviluppo. Tecniche e problemi*. Genova: Ecig.

Caselli, M. (2008). Measuring. What? Notes on some globalization indices. *Globalizations, 5*(3), 383–404.

Church, C. J., & McHarry, J. (1994). Indications of sustainability. *Town & Country Planning, 63*(7–8), 208–209.

Cipolla, C. (1987). Indicatore Sociale. In F. Demarchi, A. Ellena & B. Cattarinussi (a cura di) *Nuovo Dizionario di Sociologia* (pp. 999–1004), Torino: Edizioni Paoline.

Corbetta, P. (1999). *Metodologia e tecniche della ricerca sociale*. Bologna: Il Mulino.

Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. *Applied Economies, 38*(10), 1091–1110.

Dreher, A., Gaston, N., & Martens, P. (2008). *Measuring globalisation. Gauging its consequences*. New York: Springer.

Drewnowski, J. (1970). *Studies in the measurement of levels of living and welfare*. Geneva: Unrisd.

Giaccardi, C., & Magatti, M. (2003). *L'io globale. Dinamiche della socialità contemporanea*. Roma-Bari: Laterza.

Graziosi, M. (1979). Problemi nella misurazione del benessere sociale: indicatori oggettivi e soggettivi. *Quaderni di Sociologia, 28*(1), 71–101.

Horn, R. V. (1993). *Statistical indicators for the economic and social sciences*. Cambridge: Cambridge University Press.

Lazarsfeld, P. F. (1959). Problems in methodology. In R. K. Merton, L. Broom, & L. S. Cottrel Jr. (Eds.), *Sociology Today. Problems and Prospects*. New York: Basic Books.

Lazarsfeld, P. F., & Barton, A. H. (1961). Some functions of qualitative analysis in social research. In S. M. Lipset & N. J. Smelser (Eds.), *Sociology. The progress of a decade*. Englewood Cliffs: Prentice-Hall.

Marradi, A. (1980). *Concetti e metodo per la ricerca sociale*. Firenze: Giuntina.

Marradi, A. (1994). Referenti, pensiero e linguaggio: una questione rilevante per gli indicatori. *Sociologia e Ricerca Sociale, 15*(43), 137–207.

Martell, L. (2007). The third wave in globalization theory. *International Studies Review, 9*, 173–196.

Martens, P., & Zywietz, D. (2006). Rethinking globalisation: a modified globalisation index. *Journal of International Development, 18*, 331–350.

McGranahan, D. (1971). Analysis of socio-economic development through a system of indicators. *The Annals of The American Academy of Political and Social Science, 393*, 65–81.

McGranahan, D. (1972). Development indicators and development models. In N. Baster (Ed.), *Measuring Development*. London: Frank Class.

Morris, M. D. (1979). *Measuring the condition of the world's poor. The physical quality of life index*. New York: Pergamon Press.

Oecd. (2008). *Handbook on constructing composite indicators. Methodology and user guide* Oecd Publishing.

Parra Saiani, P. (2009). *Gli indicatori sociali*. Milano: FrancoAngeli.

Ray, L. (2007). *Globalization and everyday life*. Abingdon: Routledge.

Rosenberg, J. (2005). Globalization Theory: A Post Mortem. *International Politics, 42*, 2–74.

Sachs, I. (1995). Introduction: the quantitative and qualitative measurement of development–its implications and limitations. *International Social Science Journal, 143*, 1–10.

Sassen, S. (2000). New frontiers facing urban sociology at the Millennium. *British Journal of Sociology, 51*(1), 143–159.
Sassen, S. (2007). *A Sociology of Globalization*. New York: Norton.
Scamuzzi, S. (1996). *Misurare le società. Indicatori sociali di modernizzazione, benessere, disuguaglianza*. Torino: Il Segnalibro.
Scholte, J. A. (2000). *Globalization. A critical introduction*. Basingstoke: Palgrave.
Scholte, J. A. (2005). *Globalization. A critical introduction* (2nd ed.). Basingstoke: Palgrave.
Scidà, G. (1997). *Sociologia dello sviluppo*. Milano: Jacka Book.
Sharpe, A. (2004). *Literature review of frameworks for macro-indicators*. Ottawa: Centre for the Study of Living Standards.
Sklair, L. (1999). Competing conceptions of globalization. *Journal of World-Systems Research, 5*(2), 143–163.
Streeten, P. (1995). Human development: the debate about the index. *International Social Science Journal, 143*, 25–37.
Tufte, E. R. (Ed.). (1970). *The Quantitative Analysis of Social Problems*. Reading: Addison-Wesley.
Undp. (2000). *Human Development Report 2000. Human Rights and Human Development*. New York: Oxford University Press.
United Nations. (1989). *Handbook on Social Indicators*. New York: UN Pubblications.

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