Poverty Measurement Methods— An Overview

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In this paper two aspects of poverty measurement are reviewed. First, some conceptual issues regarding the definition of poverty and its different dimensions are explored. Second, based on this discussion, a three-way classification of poverty measurement methodologies is introduced: income poverty line (a unidimensional, indirect approach); unsatisfied basic needs (a multidimensional, direct approach), and combinations of the two approaches. Within each of these groups, different variants are presented and assessed.

Introduction—Some Conceptual Issues Behind Poverty Measurement

Contents

This article provides a broad panorama of poverty measurement methodologies. The basis for the classification is explored in the first part, while the methods are described in the second part.

The first distinction between methodologies is whether they rely entirely on one variable (usually money) as the yardstick or not. This divides the field into unidimensional and multidimensional methodologies. This issue is discussed in the section "The Lack of a Unique Measurement Yardstick" below. The second distinction is whether dissatisfaction of needs is assessed directly or indirectly. These can also be combined (see last part of the next section). Both distinctions constitute the organizing principles for the tables in the text and the annexes. It should be noted that not all of these methodologies described are used for identifying (counting) the number of poor households or individuals; some are used to rank geographical areas. As such, they do not constitute poverty measurement methodologies in the strict sense of the term. However, given their close association with the latter, they have been included.

Poverty is regarded throughout this essay as a special case of the measurement of well being. The purpose of the introduction is to clarify some of the conceptual issues behind the measurement of poverty and well being. The next section broaches the definition of poverty and refers to concepts

of human needs. The spectrum of human needs has to be restricted, it is argued, in order for poverty to be a meaningful analytical concept.

The section titled "The Lack of a Unique Measurement Yardstick" links the problems of conceptualizing and measuring poverty with some general issues of development indicators and policies based on them. This section highlights the distinction between unidimensional and multidimensional measurement of poverty.

The following section "On the Nature of the Poverty Threshold Definition" deals with a central topic for the measurement of poverty. This can be expressed as the polemic on whether the poverty threshold is (or should be) arbitrarily defined by the interested party (researcher, government, etc.), or whether it has a social objective existence and the duty of scientific research is to observe and describe it. The first part of this paper concludes with a brief account of the controversy between the advocates of the absolute and of the relative concepts of poverty.

The central part of this article describes the panorama of poverty measurement methodologies. It does not aim at being exhaustive. Only those approaches of methodological interest have been included. Poverty studies are conceived as a special case of welfare studies. This explains the inclusion of some methods that are designed for the measurement of welfare or deprivation, rather than strictly poverty.

Some Conceptual Issues on Poverty

According to *The Concise Oxford Dictionary*, the adjective poor means "lacking adequate money or means to live comfortably." The noun poverty is defined as the state of being poor and as "want of the necessities of life." As in Spanish (*pobreza*) and Arabic (*faqr*), the word gives the sense of lacking those things that are necessary. Therefore, we should look at the meaning of necessity, necessary and need. The first is a noun defined as an indispensable thing, as an imperative need, and as "a state of things or circumstances enforcing a certain course." The same applies in Spanish and Arabic. This same meaning is contained in one definition of the adjective necessary: "determined, existing, or happening by natural laws…not by free will." Poverty can be construed as a state of necessity in which freedom is absent. The coincidences and differences between meanings, when comparing languages, might be very instructive.

From the above it is clear that: 1) poverty and the poor are associated with a state of want, with deprivation; 2) such deprivation is related to the necessities of life. Thus, the term poverty, in its daily use, implies a comparison between the conditions of a person, family or human group, and the perception of the one who speaks or writes, about what is necessary to sustain life. That is to say, poverty always implies a comparison between an observed and a normative (standard) condition. While these norms are implicit in daily life, they must be explicit in scientific language. While in daily life it is the conception of the one who speaks or writes about the

necessaries of life that might be validly used, in social research, as we will argue strongly later, it is the socially prevailing conception which has to be brought forth. The normative content of the concept makes it different from many other concepts used in the social sciences, which are entirely positive. This has to be kept in mind to understand some frequent difficulties faced by those who work in this field. We will come back to this issue later, when discussing the nature of these norms, standards or thresholds. Despite this fact, not all measurement methods are normative. There are, as we shall see, some non-normative or empirical methods.

Necessity or need can be contrasted with desire and preference. Desire is defined in the dictionary as an "unsatisfied longing or craving," and preference is defined as the "favouring of one person before others," the verb to prefer is explained as "choose rather or like better." Clearly, there is a gradation of significance from necessity or need to preference, with desire occupying an intermediate position. This gradation goes from the irresistible drive of need, which has an involuntary character, to the voluntary strong elements of desire, to preferences, which lack the force of desire but which are also voluntary. The preceding has to be considered when applying economic analysis, almost entirely based on preferences, to the poverty issue.

As stated, the conception of poverty depends on the concept of human needs that is adopted. However, human needs are not just biological needs. Biological needs are only a point of departure. As human beings are capable of transforming a wide variety of natural phenomena into the object of their needs and activities, the development of productive skills determines the emergence of new needs and the modification of existing ones. Thus, human needs (as well as capacities) are socially and historically determined. Moreover, production and the income derived from it cannot be viewed as instruments to satisfy needs which are independent of them.

Consequently, human needs can be understood as biological needs such as food and shelter, and non-biological needs including intellectual, recreational, aesthetic and religious needs.

This discussion has so far addressed the relationship between needs and poverty. However, not all needs should be included in a definition of poverty. Needs can be classified into those whose satisfaction depends primarily on economic conditions (availability and access to scarce resources), and those that depend primarily on noneconomic ones. These categories are sometimes called material or structurally determined and nonmaterial or agent-determined.

If the concept of poverty, in its definitional dimensions, is to be useful at all, it has to be restricted to those human needs whose satisfaction depends on economic conditions, i.e., that are structurally determined. Otherwise, poverty gets confused with other dimensions of human suffering or human disadvantage. If the definition of poverty were to include concepts whose satisfaction does not depend on access to resources (like affection, participation, creation, identity and freedom) some paradoxical results could be

obtained. For instance, a very rich man who is very lonely would be classified as poor. Then the differentiating capacity of the concept (its ability to distinguish the poor from the nonpoor) would be lost. Then it would become useless as a tool for policy. This does not mean, however, that in the determinants of poverty some of these needs might not play a role, sometimes an important one. This could be the case, for instance, of the need to participate in social and political activities. When people participate in the solution of their problems, success is easier to attain. So, it is valid to include some of these dimensions in the poverty discussion at the explanatory and at the policy level, but not at the definition level.

Human needs change throughout life. For instance, when children are small and numerous, household needs are large but income earning capacity is low, so many households fall below the poverty thresholds during this period. Also, life has many risks, which might affect the economic situation of an individual or a household. A person can become sick or disabled and loose his/her ability to work. The breadwinner might die. There might be a crop failure due to the weather or to a plague. Someone might become unemployed. These risks give rise to an additional human need: *security*, i.e., that conditions for the satisfaction of human needs be present throughout life. Traditional insurance mechanisms among families and social security are both designed to cope with this need. Some people fall into poverty transitorily because one of these risks is realized. Some live permanently in poverty. Both the changing relation between resources and needs through the life cycle and the risk factor may cause households to fall, temporarily or permanently, into poverty. Although these elements are important in understanding the dynamics of poverty, conceptually it is useful to distinguish poverty from poverty risk.

Once the conceptual and definition issues are cleared, poverty has to be measured. Unsatisfied human needs can be observed directly. For instance, one can find out if somebody is able to read and write, or, one can calculate the caloric intake of a person to define if he/she is meeting this measure of nutritional requirements. One is thus verifying the *factual satisfaction* of needs. The observed condition is compared, need by need, or satisfier by satisfier, with its normative threshold. This is the *direct or basic-needs approach to poverty measurement*. A nontrivial issue regarding this method is what elements to include as basic needs. In what follows this approach is called the Unsatisfied Basic Needs Method.

Alternatively, one can measure the resources (not only income but, in a more general sense, entitlement or rights) that a household commands, and compare the magnitude and composition of these resources with the resource requirement to meet the set of basic needs.[1] This is the *indirect approach to the measurement of* poverty. When the resources identified are reduced to private current income (or private consumption expenditures) the methodology is referred to as *poverty line*. This consists of comparing a specified level of income (or consumption) called "the poverty line" with

actual household income (or consumption/expenditure). Both terms of the comparison are expressed as a quantity of money per unit of time. This is the only method, within the indirect approach, which has been applied empirically. In the indirect approach, what one identifies is the *potential satisfaction of human needs*. In effect, the household with a high level of income might not satisfy any need if it saves most of its income, or even when it spends huge amounts on things like alcohol and drugs. Nevertheless, the method classifies them as nonpoor when they have the resources to meet needs but choose not to do so.[2] Clearly, both approaches have a different concept of poverty. Each has its own merits and demerits. The use of both approaches gives way to the combined (or mixed) methodologies of poverty measurement.

The Lack of a Unique Measurement Yardstick

Any integral approach to the measurement of living standards, poverty and development (or alternative bases to GDP), confronts the problem of the lack of a unique measurement yardstick. This problem is avoided in national accounting, where money plays the role of unique and universal yardstick. This is achieved by national accounting systems at the cost of measuring only those objects which the economic process measures in terms of value: commodities or bought-use values (i.e., use values acquired through the market).[3]

Can money be adopted as the sole measuring rod in the study of poverty and of the standard of living? Those who use the indirect approach and identify the poor using the poverty line methodology but very strong, give a positive answer, implicit. In many countries, this is the official method for measuring poverty and the one most frequently used.[4] It is the method promoted by the World Bank.[5] It is also utilized by the Economic Commission for Latin America and the Caribbean (CEPAL by its name in Spanish).[6]

In practice, then, poverty is most commonly measured in money-metric terms, while social indicators are used side-by-side, unintegrated. A sort of social schizophrenia prevails. Development is assessed by growth in GDP, the aggregate of goods and services measurable with money. Poverty, under the same logic, is measured with income, again a sum of money. In parallel, a nonstructured and variable list of social indicators is handled, which are not directly or immediately incorporated in the measurement of poverty or development. Even though poverty is measured only in money-metric terms, strategies to alleviate it focus on human capital (interpreted as investing in education, nutrition and health). This generalized social schizophrenia is an expression of the disassociation of the economic and social realms, of production and consumption, of use values and exchange values, of what is measured by money and what is not.

Although the three elements (GDP, poverty and social indicators) form part of the analytic universe of governments and international organizations, at the end of the day appraisals and decision making are based on GDP behaviour and poverty is measured in money-metric terms. Given the

overwhelmingly institutionalized acceptance of the poverty-line method, one might wonder about the role which could be played by social indicators, like literacy rates or drinking water availability, most of which are obviously linked with the standard of living and deprivation but expressed in terms very different from money.

Some alternative approaches to the measurement of poverty, the standard of living and development, have been constructed starting from the explicit rejection of the possibility of finding a unique and universal measuring rod, and thus inevitably become multidimensional approaches. It should be noted that UNDP has adopted exactly this position as can be seen in its Human Development Reports (1990–1997).[7] Although there are many variants of this approach, they usually start with the "natural" units of measurement of each indicator, as does the Human Development Index.

Summarizing the conclusions of this and the previous section, we could classify poverty measurement instruments as uni- or multidimensional. Also, they could be classified as direct or indirect measurements.

As mentioned above, the poverty line (PL) is the only existing application of the indirect method and it is the quintessential unidimensional method. In contrast, nonmoney-metric indicators are by their very nature multi-dimensional. For example, the variants of Unsatisfied Basic Needs (UBN) methodology utilize several indicators in order to cover a representative set of basic needs. Although it is conceivable to construct direct-unidimensional and indirect-multidimensional indicators, they have not been applied in practice. In the second part of this paper, different applications of the PL and UBN, as well as methods which combine them, are further explored. Before embarking on this, however, the issues relating to how to set poverty thresholds must be addressed.

On the Nature of the Poverty Threshold Definition

Is it true, as Mollie Orshansky (1969, p. 37) stated, that "poverty, like beauty, lies in the eyes of the beholder"? This is also the position adopted by many development organizations. For instance, in a recent book by the World Bank on poverty and income distribution in Latin America it is stated: "any poverty cut-off will reflect some degree of arbitrariness due to the subjectivity of how poverty is defined" (World Bank, 1993, p. 51). According to this perspective, the concept of poverty is a value judgment by the researcher.

On the other hand, Karl Marx states in *Capital* that, in contradiction to other commodities, "there enters into the determination of the value of labour-power a historical and *moral* element. Nevertheless, in a given country, at a given period, the average quantity of the means of subsistence necessary for the labourer is *practically known*" (*Capital*, Chapter VI, my emphasis). Note two things: first, the historical and moral element and, second, the explicit social character of knowledge about what the subsistence means are, i.e., these needs not only have a social existence, but their speci-ficities are socially known.

Amartya Sen (1981, chapter 2), arguing against the subjective view of poverty, considers that researchers describe existing social prescriptions (norms or standards), thus implying that these prescriptions or norms *have a social objective existence and can be observed and described by the social scientist*. In fact, if what Marx says above is true, the social scientist would be required to know no more than ordinary people.

The well-known British historian, E. P. Thompson (1971 and 1993), coined the term *Moral Economy* and applied it to the analysis of "bread" riots in 18th century Britain. Subsequently, James Scott (1976) has applied this term and other authors, to tribal and peasant societies. According to Scott, both the peasantry in the Third World and in pre-capitalist Europe were organized, before the capitalist transformation, to provide social insurance to individual households, minimizing their risk of falling below a *minimum income*. "Traditional forms of patron-client relationships, reciprocity, and redistributive mechanisms may be seen from this perspective." This minimum income should not only provide for subsistence but also for "a certain level of resources to discharge necessary ceremonial and social obligations" (p. 9). Subsistence needs or minimum income had behind them not only a moral element but were also a driving force for the organization of the economy and for uprisings when the acceptable rules were violated. Thus, Scott states that two themes prevailed in peasant protest: "first, claims on peasant incomes by landlords, moneylenders, or the State were never legitimate when they infringed on what was judged to be the *minimal culturally defined subsistence level*; and second, the *product* of the land should be distributed in such a way that all were guaranteed a subsistence niche" (p. 10). As E. P. Thompson expressed it, "a consistent traditional view of social norms and obligations, of the proper economic functions of several parties within the community, which, taken together, *can be said to constitute the moral economy of the poor*. An outrage to these moral assumptions, quite as much as actual deprivation, was the usual occasion for direct action" (1993, p. 188).

Two conclusions with regards to our subject can be derived from Scott's and Thompson's analyses. First, in both of them it is implicit that the minimum culturally defined subsistence level is quite well known by the people (otherwise they would not know when protest is due). Second, it reminds us that political economy is also, inevitably, moral economy. That moral social responsibility for the life and well being of people is something present in all societies. After all, the main purpose of poverty studies should be a moral one: overcoming poverty.

Peter Townsend (1979) tried to achieve an *objective* definition of the poverty line when he was looking for a point in the income curve below which the indices of deprivation increased quickly. (For a review of the very intense discussion that this attempt brought about, see M. Desai and Anup Shah, 1988, reproduced in M. Desai, 1995, as well as Desai, 1986.) Later on, Townsend and Gordon, 1993, and in Townsend, 1993, pursuing the

same goal, carried out a discriminate analysis, "a technique that does not require a predefined 'poverty threshold.' We have assumed that two groups exist: a generally smaller 'multiply deprived' group (poor) and a larger group who suffer from less deprivation (nonpoor). Since there is a direct relationship between income and deprivation, the income level (or narrow band of income levels) at which these two groups can best be separated 'objectively,' can be considered to be the poverty line." (p. 57).

In deep contrast, and as part of the controversy that followed Townsend's 1979 monumental work, Piachaud (1981, reproduced in Townsend, 1993) states that Townsend's search for an objective measure is "not only destined to eternal frustration but also profoundly wrong. Social scientists can describe the inequality of resources within and between countries as objectively as possible. *But inequality is not the same as poverty….* The definition by an individual, or by society collectively, of what level represents 'poverty,' will always be a value judgment." (p. 119)

This is a crucial controversy. For if these norms do not have an objective social existence, then the concept of poverty cannot be regarded as amenable for scientific research and the measurement of poverty would be a subjective exercise only. As Sen has put it: it would be the display of the researcher's personal morals on the statistics of deprivation (1981, p. 17).

The position taken in this article is that social prescriptions defining thresholds in human needs are social norms that motivate and drive people towards their achievement. These prescriptions come increasingly, but not only, from specialists. For instance, dentists prescribe the use of a dental brush; advertisement reinforces this prescription; after many years, it becomes a social norm and an essential satisfier. Some norms have an international character and have been agreed by international organizations. They are sometimes incorporated within legislation and/or become the goals of grassroots organizations. Peer groups socialize many norms. As Adam Smith, the father of political economy, pointed out in a widely quoted paragraph from the *Wealth of Nations*, people feel ashamed when they are unable to meet the minimum social prescriptions. Nowadays, any Mexican would be ashamed to come to a public gathering without shoes. This was not the case 50 years ago.

These prescriptions have universal and locally determined elements. Some universal elements are determined by international conventions and consensus-forming. In open societies universal elements become more important than in closed ones. To distinguish between the two, it is important to understand how is it that specific satisfiers become indispensable. A good example is the private car in Lebanon. As public transportation is almost nonexistent, the private car tends to become an essential satisfier.[8] So a car is much more a necessity in Beirut than in London, which has a fairly good public transportation system. In more general terms, it is the conditions of production and consumption that define what satisfiers will become essential to meet a certain need. For instance, in a service-oriented

economy like the Lebanese, a labour force with high levels of education is essential. This becomes a structural determinant of the importance given to education in the country. To give some other examples, working times, long time journeys from work to home, and participation of women in the labour force, have produced a social need to consume prepared food outside the home in large Latin American cities. Day-care centres for pre-school children of working mothers has also become a social need as the participation of women in the labour force has increased in Latin America. In identifying what satisfiers become indispensable in a given society, this type of analysis becomes necessary. It has to be complemented with some sociological-anthropological analysis of how prescriptions reach people, how they are socialized and how they motivate behaviour. Lastly, analysis of prescriptions by specialists, like medical doctors or nutritionists, and by international and national organizations, has to be carried out. The eating culture of a country determines, to a large extent, mediated by the influence of prices, what foodstuffs are preferred and thus become indispensable.

The Controversy between Absolute and the Relative Conceptions of Poverty

This controversy, initiated in the United Kingdom, revolves around the answer to the following question, according to A. Sen (although he restricts the pertinence of the controversy unnecessarily to rich countries): "Should poverty be estimated with a cut-off line that reflects a level below which people are, in some sense, 'absolutely impoverished,' or a level that reflects (minimum) standards of living 'common to that country' in particular?" (1984, p. 325).

One of the most outstanding advocates of the relative concept has been Townsend, who has stated, for example, that "any rigorous conceptualization of the social determination of need dissolves the idea of "absolute" need. And a thorough-going relativity applies to time as well as place. The necessities of life are not fixed. They are continuously being adapted and augmented as changes take place in a society and in its products." (1979a, quoted by Sen, 1984, p. 328).

After publishing *Poverty and Famines* (1981), A. Sen was viewed as the main advocate of the absolute concept of poverty. In that work he stated, "there is an irreducible core of *absolute* deprivation in our idea of poverty, which translates reports of starvation, malnutrition and visible hardship into a diagnosis of poverty without having to ascertain first the relative picture. Thus the approach of relative deprivation supplements rather than supplants the analysis of poverty in terms of absolute dispossession" (1981, p. 17).[9]

One does not need to conceive of absolute poverty as reduced to starvation, in order to agree with Sen. Thus, O. Altimir (1979, p. 11) has gone beyond this starvation idea of absolute poverty and has argued that it is based in our conception of human dignity and human rights:

"Our perception of this irreducible core of absolute poverty, independently of the context of the country or community in question, has as a reference some basic welfare elements, of the living style prevailing in industrialized societies, elements to which we believe all human beings are entitled to. The absolute norm which allows us to define this irreducible core, whatever the national situation, springs from our current notion of human dignity and from the universality attributed to basic human rights, whose fulfilment should not depend on local scarcity of resources, nor on cultural resignation, internalized through centuries of misery and oppression. It is beyond this irreducible core of absolute poverty where conditions of relative deprivation can be found, only definable with regard to the predominant lifestyle in each community."

Thus, for Altimir, the absolute irreducible core of poverty is much more than rice and encompasses all human rights. Both authors can be interpreted as saying that the poverty standard (threshold or line) has two components: the absolute core (universal) and the relative one (specific to each society).

In later writings, Sen somewhat modified this idea. In his "Poor, Relatively Speaking" (1983, reproduced in 1984), he argues that "poverty is an absolute concept in the space of capabilities but very often it will take a relative form in the space of commodities or characteristics" (1984, p. 335). Thus, Sen criticizes Townsend for not distinguishing the space of needs from the space of goods and services. His assertion that needs are not fixed is out of focus, according to Sen, for the "cases that are typically discussed in this context involve a different bundle of commodities and a higher real value of resources fulfiling the *same* general needs". (Ibid., p. 336).

Townsend replied to this critique by bringing out some of the political implications of Sen's emphasis on absolute poverty. "Professor's Sen's argument carries the dangerous implication that meagre benefits for the poor in industrial societies are more than enough to meet their (absolute) needs and, depending on economic vicissitudes, might be cut," he wrote. "Professor's Sen minimalism is worrying, therefore, not only because he appears to ignore or underestimate the importance of certain forms of social need, but because that indifference or underestimation carries an implicit recommendation for policy. It opens the door to a tough state interpretation of subsistence rations" (1985, extracted in 1993, p. 132). On the other hand, Townsend questions Sen's capability approach, by asking how the capabilities are selected and in what sense they are absolute. He puts forth the idea that notions of shelter, disease, etc., are social notions, whereas "Sen's conceptualization does not allow sufficiently for the social nature of people's lives and needs." He ends his reply by saying, "His is a sophisticated adaptation of the individualism that is rooted in neo-classical economics. That theoretical approach will never provide a coherent explanation of the social construction of need" (Ibid., p. 136).

Although this debate has not come to a close yet, it is important to keep in mind the difficulties in determining the threshold below which people are considered poor. Especially, as most of the poverty measures described in the rest of the chapter rely on being able to specify such a threshold.

Panorama of Available Poverty Methods

This paper describes several poverty measurement methods. The following section describes the non-normative methods. The second section describes the semi-normative and normative ones. For the purposes of this classification, normative methods are those which define a threshold (or thresholds) *on the basis of some notion of a minimum living standard* (however vague or imprecise) and then compare it with the household or individual observed. Non-normative methods either define a threshold based on a notion disconnected from a minimum living standard or do not define an *ex-ante* threshold.

Non-normative (Relative) Measurement Methodologies

Among the non-normative methods one finds the purely relative ones, which define the poverty line as a fraction of average income (or median or mode) or those which define the poor as the population in certain specified deciles.

One would also include here procedures like the Wolf Point or equilibrium point method, which identifies the poverty line as that level of income where household savings are zero. The argument for this methodology is that consumers make reasonable choices in allocating their budget. According to Lidia Barreiros (1992) and others, "This method seems very rudimentary for the analysis of poverty."

H. F. Oshima and D. Nanto (quoted by Barreiros, 1992) have identified the income level where the Engel coefficient (proportion of income/expenditure) allocated to food reaches a maximum,[10] which would indicate that the household has reached a point where most "urgent food needs have been met." Barreiros concludes that this point in Ecuador can only be identified in the rural areas and that the resulting poverty line is at less than 50 per cent of the cost of the minimum diet, thus rejecting the method as useless.

All these procedures attempt to identify a pattern of household behaviour that might indicate that food or all basic needs have been met. Thus, they could be termed the "poverty line revealed" procedures.

A Map of Semi-normative and Normative Methods

In this section, a very general panorama of semi-normative and normative methods is given.[11] The methods presented have been classified into three groups: multidimensional-direct, unidimensional-indirect and multidimensional-combined methods. As previously discussed, these are the only methodologies which have actually been applied.

VARIANTS OF THE UNSATISFIED BASIC NEEDS (UBN) OR DIRECT MULTIDIMENSIONAL METHOD

Not all multidimensional methods apply to individuals (or households) or provide a threshold with which to define poverty. A division between those methods, which do and do not offer such a criterion is shown in Graph 1.

Graph 1

Unsatisfied Basic Needs (UBN)
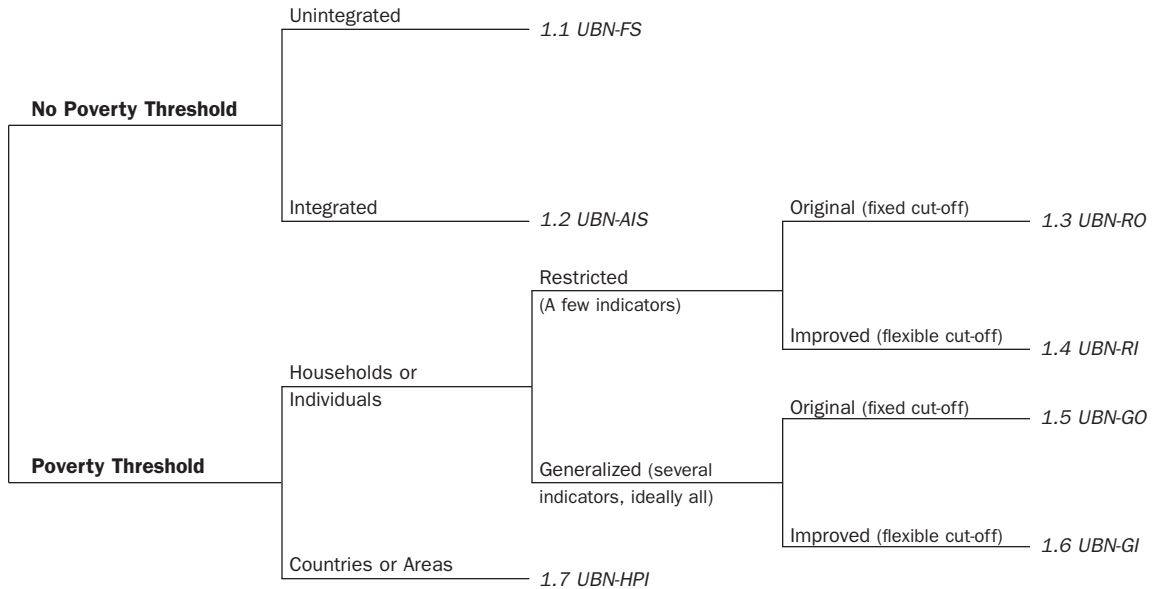
1.1 UBN-FS — UBN-Fragmented Sectorial		1.5 UBN-GO — UBN-Generalized Original
1.2 UBN-AIS — UBN-Area Integrated Sectorial		1.6 UBN-GI — UBN-Generalized Improved
1.3 UBN-RO — UBN-Restricted Original		1.7 UBN-HPI — UBN-Human Poverty Index
1.4 UBN-RI — UBN-Restricted Improved		

Those methods, which do provide a criterion to define the poor, are further divided into those, which apply to individuals (or households), and those, which apply to countries.[12]

There are two variants of the UBN methods that do not identify poor individuals or households but rather rank geographical areas. In both, a minimum threshold is defined in each dimension (need) analyzed (i.e., literacy, piped water, caloric and protein requirements) and the proportion of population below that threshold is calculated for each geographical area. This is a traditional method in social analysis and many of the so-called social indicators have this format. After this is done there are two options. In the first one each dimension is analyzed separately and one ends up with a list of partial gaps for each geographical level. This may be called the Fragmented Sectorial (UBN-FS) variant (branch 1.1). Examples of the UBN Fragmented Sectorial variant are the COPLAMAR sectorial volumes (COPLAMAR, 1983 a, b, c and d) and UNDP's gap analysis for Latin America as a whole.[13] At the international level, UNDP's Human Development Reports and some World Bank reports are good examples.[14] This approach is useful for sectorial analysis and planning, as well as for social

planning as a whole. Nevertheless, from the standpoint of poverty, it does not allow to calculate a unified target population, but handles fragmented target populations. As a matter of fact, the word poverty is not used in this approach.

The other option, which constitutes the next variant, is to synthesize all the indicators for each geographical area into one composite index. It can be labeled the UBN Area-Integrated Sectorial (UBN-AIS) variant (branch 1.2). This is similar to the previous approach, but goes a step further and obtains a composite index, by a statistical procedure (usually the principal components technique) which produces the weights for each indicator.[15] The result, the poverty or marginality index (as it has been called in Mexico) is in the form of a pure number without specific content, which is then used to rank (ordinal) geographical areas from the more deprived (marginalized) to the less so. The studies by the National Council for Population (CONAPO, 1993) in Mexico are a good example of the approach.

The other methodologies are derived from the previous two, but the different dimensions are seen at the household level, allowing for the identification of poor households and individuals. Some of them can also be used, as in the previous two methods, to rank geographic regions (typically countries). Those, which apply strictly to households and individuals, can be further divided into restricted and general methods (see Graph 1).

The difference between the restricted and general methods is basically the number of indicators. Restricted methods comprise a few indicators (usually chosen by experts) while general indicators attempt to capture all dimensions of poverty. Thus, in one variant of the restricted indicators the procedure of identification is as follows. A few basic needs are chosen as indicators, and households (or individuals) are examined to see whether each need is satisfied. This transforms each need (dimension of poverty) into a yes–no indicator.[16] All households, which have one or more indicators below the threshold, are considered poor.

However, this method does not allow one to estimate the poverty gap or poverty intensity, neither at the household nor at the aggregated level (and, as a consequence, none of the other poverty measures). Besides, given the poverty criterion, which identifies those households as poor with one or more items below the threshold, poverty incidence is not independent of the number of indicators included. In fact it cannot decrease, but usually increases as more indicators are included. This is a very negative feature for a measurement method. This can be termed the UBN Restricted Original (or UBN-RO, branch 1.3) variant because it is built with few indicators covering only some basic needs (typically: housing, water, sewerage and attendance at grammar school by school-age children. See Table 1 in the annex for the Colombian example). The UBN-RO has been extensively applied in Latin America for building "poverty maps."[17]

When this method is modified by allowing each indicator (dimension of poverty) to take more values than just yes or no, several of these negative properties are overcome. For example, it allows the poverty gap, and other poverty measures, to be calculated. Also, poverty incidence may be separated from the number of indicators (needs) included, allowing for an enlarged number of poverty dimensions. Besides, the threshold is no longer whether a particular need is satisfied or not but depends on the degree to which it is satisfied. Thus, a procedure to include people's views about the appropriate level of unsatisfaction to decide who is poor and who is not, can also be introduced. This implies a relative concept of poverty as thresholds within a given item (for instance overcrowding), which vary according to the levels attained in the specific society. This procedure shares with the UBN-AIS the weighting of individual indicators to obtain an overall index, but instead of doing it at geographical units, goes down to the household level. This variant may be called the UBN Restricted Improved (UBN-RI) method (branch 1.4).

Attempts have been made to go beyond a few indicators and verify directly, in principle, the satisfaction of all human needs. The emphasis is on indicators, which represent the style of living. In order to avoid the criticism that many lifestyle indicators reflect tastes or preferences and not necessarily deprivation (criticism raised on Townsend's work, especially by Piachaud), Mack and Lansley (1985) introduced the concept of "enforced lack," by which deprivation in a certain item is counted only when people answered they could not afford the item although they consider it a necessity. This version includes more indicators of need than the restricted versions, which, when not satisfied, can be called "enforced lack items" (ELI). The prototype of this approach is Mack and Lansley (1985)[18] who adopted the rule that three or more ELI (from a list of 26 necessities) implies being poor. Like the restricted original method, this procedure does not calculate the distance of each household to the threshold. Thus, poverty gaps cannot be calculated. Also, the number classified as poor cannot decline, but tends to increase, when the number of indicators increases. In contrast, this approach shares with the restricted improved method the relative nature of the poverty threshold. In contrast to all previous variants, which rely on expert judgment, the definition of thresholds is based here on people's opinion on what is necessary and what is not. I call this the Generalized Original (UBN-GO) approach (branch 1.5).

Working towards generalizing this approach, Desai and Shah (1988, reprinted in Desai, 1995) proposed to start from a measure which is continuous, can be estimated for each household and is suitable for constructing poverty indices, thus overcoming the limitations of UBN-GO. In order to combine specific deprivation indicators into an overall household deprivation index, the weights are based on proportions of the population satisfying the

item, thus reflecting subjective feelings of deprivation, which are worse when one belongs to a small deprived minority. Although empirically they were limited in applying it by the fact that Townsend's indicators (with which they worked), are dichotomical, their variant could be termed the UBN Generalized Improved (UBN-GI) method, which has not been applied (branch 1.6).

Finally, some indices are made up by counting the percentage of people who satisfy, or do not satisfy, certain needs. The weighted average of these percentages can be used both to rank countries, as the fragmented and integrated sectorial approaches, and as a measure of poverty, i.e., percentage of households or people who do not satisfy certain needs, which is similar to a poverty headcount. One such method is the capability-functioning approach, developed by Amartya Sen. Although it is presented here as a variant of the direct method, it would require a different place in the classification. Nevertheless, Professor Sen's proposal has remained mostly a conceptual one, and very little progress has been made in the operationalizing it. In this paper it is limited to two attempts at operationalization. In the *Human Development Report 1996*, the Capability Poverty Measure was used at the country level. The measure is an arithmetic mean of three "capability" indicators.[19] These indicators are not easily distinguishable from classic basic needs indicators, reflecting the difficulties of implementing Sen's approach.[20]

A new index was presented in the *Human Development Report 1997*, the Human Poverty Index. Although it was not conceived as the operationalization of the capability approach, but rather as the deprivation perspective of human development, it is not very different from the previous method. It can be called UBN-HPI (branch 1.7). The main difference lies in the indicators included in the weighted average. It also includes illiteracy but refers to the whole adult population and not only to women. It includes a quantity of life indicator in the form of the percentage of the population, which will die before 40 years of age which, as was indicated, can be interpreted as a capability indicator. Lastly, it attempts to indicate the level of "economic provisioning," not through income, but through a combination of three basic needs indicators related with water, health and nourishment of children. As in the previous case, the units of analysis are countries, and the compound index (a weighted average of the three indicators with weights varying positively with deprivation levels) is interpreted as a proxy of the headcount index. This index cannot be used to calculate poverty gaps. The four simple indicators (excluding the proportion of people who will not live beyond 40 years) can be construed as UBN indicators, to which a deprivation indicator is added in the quantity of life dimension.
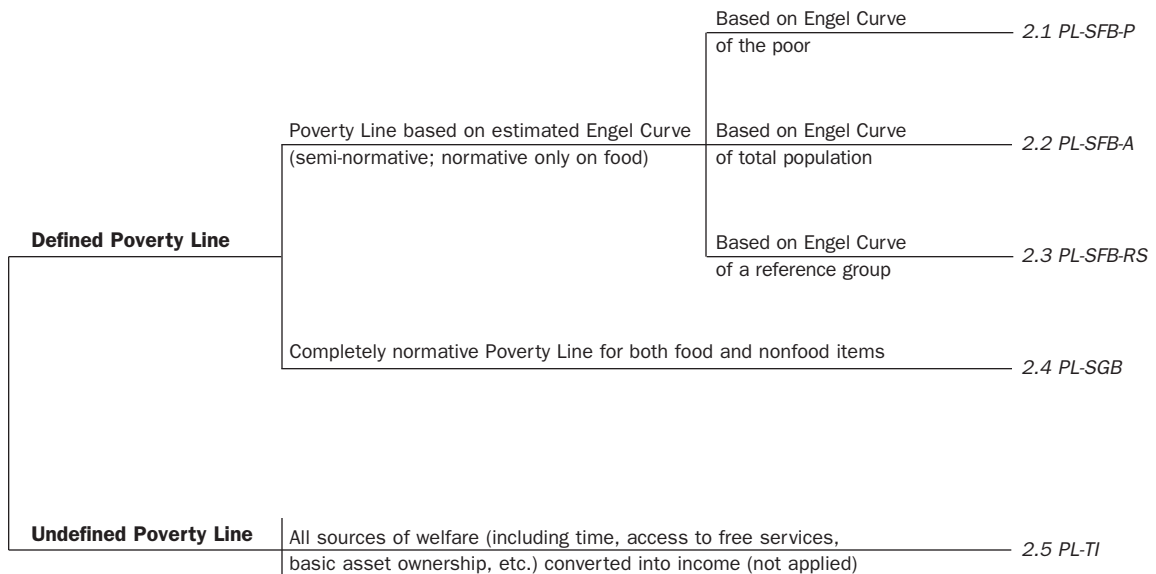
VARIANTS OF THE POVERTY LINE OR INDIRECT UNIDIMENSIONAL METHODOLOGY

There are essentially two approaches to the poverty line (PL). In the first one, the PL is fully defined, calculating the cost of a basket of goods considered as the minimum required consumption. The second approach goes beyond this to include such factors as time, access to free services, basic asset ownership (see Graph 2).

When the cost of a minimum basket of goods is used, two alternatives are present. One is a completely normative method, while the other is based on an estimate of the Engel curve. The latter can be considered a semi-normative or empirical approach, which I have called the *Food Standard Basket or Food Poverty Method*, as it combines a normative stand on food and a non-normative (empirical) stand on the rest of the needs. It works as follows: first, a food basket is defined and its cost is calculated. This is the normative part as the food basket is supposed to cover a properly specified minimum nutritional floor. As the poor have to cover other costs, which are harder to enumerate than a minimum diet, an estimate of the Engel Coefficient (proportion of income/expenditure spend on food) is used to

Graph 2

Poverty Lines (PL)

		Based on Engel Curve of the poor	*2.1 PL-SFB-P*
Defined Poverty Line	Poverty Line based on estimated Engel Curve (semi-normative; normative only on food)	Based on Engel Curve of total population	*2.2 PL-SFB-A*
		Based on Engel Curve of a reference group	*2.3 PL-SFB-RS*
	Completely normative Poverty Line for both food and nonfood items		*2.4 PL-SGB*
Undefined Poverty Line	All sources of welfare (including time, access to free services, basic asset ownership, etc.) converted into income (not applied)		*2.5 PL-TI*

2.1 PL-SFB-P—PL-Standard Food Basket (poor's behavior)
2.2 PL-SFB-A—PL-Standard Food Basket (average behavior)
2.3 PL-SFB-RS—PL-Standard Food Basket (reference stratum behavior)
2.4 PL-SGB—PL-Standard Generalized Basket
2.5 PL-TI—PL-Total Income

obtain the poverty line. This is the non-normative or empirical part. For instance, if the Engel Coefficient is 0.5, it means that half of the expenditures are devoted to food. Consequently, in order to be considered nonpoor, a household should be able to buy the minimum diet, which would represent half of their purchases, and they should be able to buy the rest of the commodities they need with the other half of their budget.[21] In some applications, the cost of the food basket alone is regarded as the extreme poverty line.

There are three main variants in the way in which the Engel Coefficient is selected. In branch 2.1, the PL-SFB-P uses the Engel Coefficient observed among the poor (i.e., the World Bank, 1990 and Shari, 1979). The PL-SFB-A, in branch 2.2, selects the average coefficient of the population as a whole (this was adopted by Mollie Orshansky, 1965, who can be considered as the creator of the variant, and was followed by CEPAL in Latin America). Lastly, in branch 2.3, the Engel coefficient of a reference stratum (PL-SFB-RS), which satisfies its nutritional requirements, is used. This was suggested by Townsend (1954), and adopted by Altimir (1979) and by CEPAL-UNDP, 1992).[22]

The oldest methodology, although rarely used nowadays, is the PL-SGB. It is a completely normative method (branch 2.4). A complete basket of goods and services (satisfiers) required to meet all basic needs is defined. Its cost constitutes the poverty line. Adopted by Rowntree (1902, 1937, 1941 and 1951), it has been utilized extensively in Mexico under the name Standard Basket of Essential Satisfiers (SBES).[23] Apparently, this variant was predominant in the world up to World War II, both in Rowntree's works and in many countries, for the definition of the baskets on which the calculation of minimum wages was based.[24]

Nevertheless, it has somehow been abandoned. For example, take expenditures on shoes. In some countries it might be considered shameful to walk around barefoot. So expenditure on shoes would be included in the basket. Arguing that it is very difficult, or arbitrary as Atkinson says, to define the quality and quantity of shoes, these critics end up eliminating implicitly all shoes from the basket.[25] Thus, one ends up imputing a zero expenditure requirement for shoes, which almost always implies a higher degree of error than any amount of expenditure estimated as necessary.[26]

The pros and cons of some of these methods, as well as their policy implications, are discussed in the first article in Part Two of this volume.

The last variant (PL-TI), in branch 2.5, transforms all sources of welfare (time, access to free services, basic assets ownership) into monetary flows, sums them into monetary income, and arrives at total income. Although this method ends with one indicator—total income—it has to work with many dimensions, which cannot be included under the previous PL methods (like time and access to free services). This is done by transforming all these
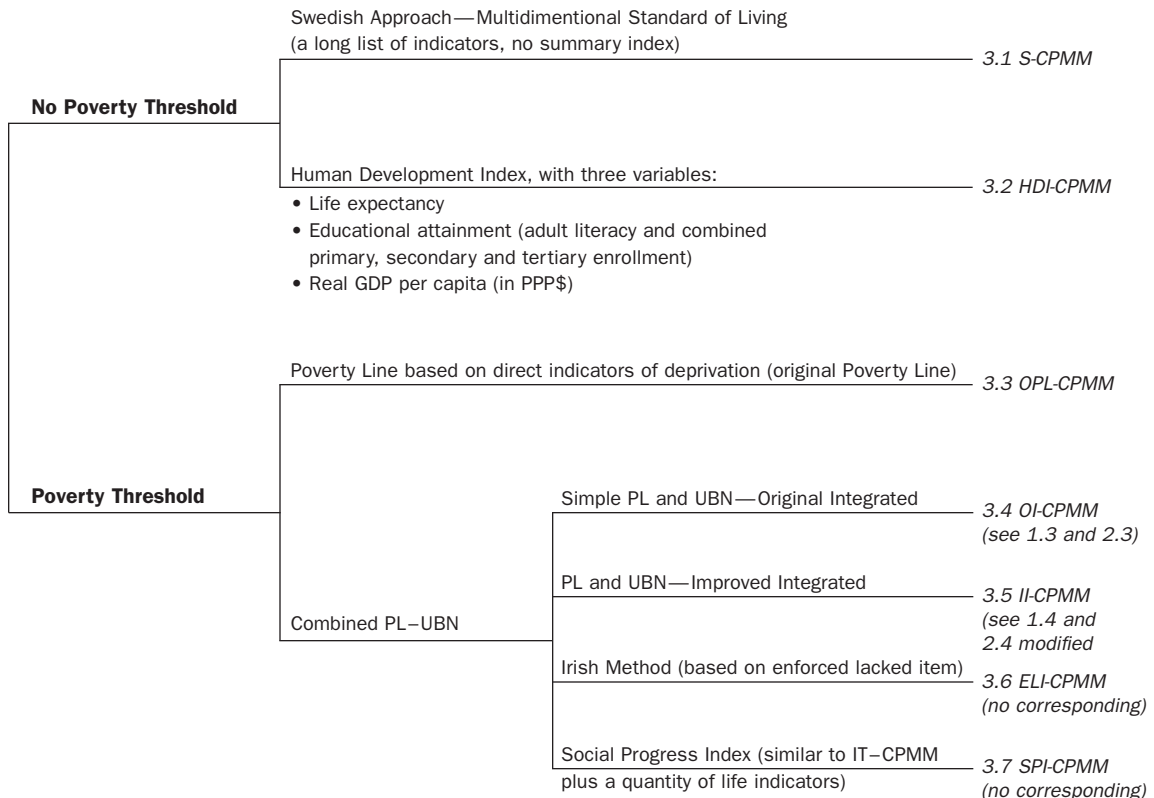
additional dimensions to an income equivalent (see the last section for a discussion of the legitimacy of doing this). The resulting total is then compared to a poverty line defined in the same terms. Grootaert (1982) suggests this method, but does not develop it in full.[27] Apparently it has not been applied.

Combined Poverty Measurement Methods (CPMM)

Seven ways to combine direct and indirect measures of poverty (unsatisfied basic needs and poverty line approaches) and to integrate different dimensions of poverty, are presented. Two of them are used to rank geographic areas or socioeconomic groups, while the others measure the number of poor individuals or households. In the latter cases the poor are identified using a poverty threshold (see Graph 3).

Graph 3

Combined Poverty Measurement Methods

No Poverty Threshold

Swedish Approach—Multidimentional Standard of Living
(a long list of indicators, no summary index) — *3.1 S-CPMM*

Human Development Index, with three variables: — *3.2 HDI-CPMM*
• Life expectancy
• Educational attainment (adult literacy and combined
  primary, secondary and tertiary enrollment)
• Real GDP per capita (in PPP$)

Poverty Threshold

Poverty Line based on direct indicators of deprivation (original Poverty Line) — *3.3 OPL-CPMM*

Combined PL−UBN

Simple PL and UBN—Original Integrated — *3.4 OI-CPMM (see 1.3 and 2.3)*

PL and UBN—Improved Integrated — *3.5 II-CPMM (see 1.4 and 2.4 modified*

Irish Method (based on enforced lacked item) — *3.6 ELI-CPMM (no corresponding)*

Social Progress Index (similar to IT−CPMM plus a quantity of life indicators) — *3.7 SPI-CPMM (no corresponding)*

3.1 S-CPMM—Swedish Combined Poverty Measurement Methods
3.2 HDI-CPMM—Human Development Index-CPMM
3.3 OPL-CPMM—Original Poverty Line-CPMM
3.4 OI-CPMM—Original Integrated-CPMM

3.5 II-CPMM—Improved Integrated-CPMM
3.6 ELI-CPMM—Enforced Lacked Item-CPMM
        (Irish Method)
3.7 SPI-CPMM—Social Progress Index-CPMM

Within the first group, two very different approaches are found. The Swedish approach to welfare (branch 3.1), rather than a poverty measurement method, is a level-of-living method. It does not try to identify the poor, but the socioeconomic groups, which might suffer certain kinds and degrees of deprivation or problems. The concept of level-of-living adopted is the command over resources through which individuals can control and consciously direct their living conditions. Thus, the level-of-living depends both on people's resources and their living conditions (i.e., social conditions as well as assets, security, recreation and culture). This brings out in a different light the direct–indirect dilemma (as seen in the section "Some Conceptual Issues on Poverty"). It also illustrates very well the radical multi-dimensional position according to which no synthetic index is possible or desirable. Although Erikson's (1993) unit of analysis is socioeconomic groups, information was gathered at the household and individual level.

The second approach, the Human Development Index (branch 3.2), is a triple combination. It is a weighted average of a direct or basic needs indicator (educational level); a quantity of life indicator (life expectancy at birth), which is not a UBN indicator strictly speaking; and the indirect indicator of access to resources (GDP per capita using PPP). Designed for the ranking of countries, it has been very influential in counteracting the overwhelming influence of GDP as the only indicator of development.

Of the methodologies that identify poor individuals or households, there are several for determining the poverty threshold. Direct indicators of need satisfaction (lifestyle) are used to reveal the "objective" poverty line in Townsend's attempt to obtain an "Objective" Poverty Line (branch 3.3— called the "original poverty line" OPL-CPMM). This is a combined procedure in a very special sense. The procedure resembles the completely normative poverty line, which uses the cost of all required satisfiers to convert them into an equivalent income amount in order to obtain the poverty line. Townsend (1979) does not follow this route of the specific costs of each satisfier. He tries instead to find the level of income that would satisfy all the requirements by correlating the level of income of different households with their observed overall deprivation score. Nevertheless, poverty is measured only by income. It could then be said to constitute a potential concept of poverty. The approach was criticized for its failure (according to critics like Piachaud, 1981) to distinguish "tastes" from deprivation. In Townsend and Gordon (1993) a different statistical technique is used in order to circumvent this problem.

The first truly integrated method was born from an experiment conducted by Beccaria and Minujin (1987) with data for Buenos Aires in which they were trying to determine whether UBN and PL identify the same households as poor. (The answer was a strong negative one). It became the simultaneous application of two methods (the restricted original UBN and the CEPAL poverty line). Thus, it can be called Original Integrated Poverty

Measurement Method or OI-CPMM (branch 3.4). This method uses a contingency table in which the population was classified into four categories: poor by both methods, nonpoor by both, poor only by UBN and poor only by PL. This method has various attractive features. One of them is that it allows the distinction between the recently impoverished population (in recession-stricken countries it is strongly associated with those whose income falls below the PL, but whose basic needs are satisfied) from the more structural type of poverty (poor by both methods) and from the "publicly-provided-goods" poverty and other categories of poverty (i.e., only UBN poor). Nevertheless, it also has various weaknesses, among them its incapacity to produce any poverty index beyond the headcount, and those weaknesses derived from the UBN and PL variants utilized.[28]

The Improved Integrated Combined Poverty Measurement Method (II-CPMM) was designed to overcome the limitations of the original version. (branch 3.5).[29] This methodology combines UBN-RI with a modified completely normative PL. The latter incorporates an indicator of excess working time, in an integrated poverty index per household which enables all poverty measures (among others: headcount, poverty gap, the Sen poverty index and the family of measures defined by Foster, et. al.,). The index can be disaggregated into its components, the contribution of each deprivation dimension (indicator) to the overall index can be calculated, and contingent tables as in the original integrated method can be produced. The method has been applied only to Mexican data.

Nolan and Whelan (1996) start from Townsend's poverty definition and from the advances achieved by Mack and Lansley in distinguishing tastes from deprivation associated with lack of resources. They adopted the concept of enforced lack of necessities to derive a measure of poverty and exclusion which could be labeled the "Irish" or Enforced Lacked Item (ELI-CPMM, branch 3.6). They show that the association between enforced deprivation and income below the poverty line is not as strong as one would expect. They operationalize "exclusion because of lack of resources" as at least one ELI (enforced lack item) *and* being below a completely relative poverty line. (Enforced deprivation is reduced to the items given in annex table 3, which correspond to what they call basic life-style deprivation, thus excluding the secondary and the housing deprivation indicators they constructed). Thus, they consider poor only those in the first row first column cell of the contingency table below:

Nolan & Whelan Poverty Matrix	With One or More Enforced Lack Indicators	With No Enforced Lack Indicators
Below the relative poverty line	Poor	PL poor only (not counted as poor)
Above the relative poverty line	Deprivation poor only (not counted as poor)	Nonpoor and nondeprived

Finally, the approach suggested by Desai (1991 and 1992), that could be called the Social Progress Index or Lifetime Deprivation (SPI-CPMM, branch 3.7), is a solution very similar to the II-CPMM.[30] However, there are some major differences: 1) Incorporation of a third "space": quantity of life with the two used in II-CPMM, thus arriving at lifetime deprivation; 2) UBN-specific indicators are weighted by proportions of non-deprived population instead of relative costs used in II-CPMM; 3) the UBN and the income indicators are combined by a multiplicative format instead of the weighted average adopted in II-CPMM; 4) the explicit use of a welfare function to transform the satisfaction index into welfare, whereas in II-CPMM these procedures are implicit in the re-scaling of indicators. The quantity-of-life indicator is called the proportion of life potential, realized in normal conditions. The index has not been applied. The quantity-of-life indicator is in principle not computable for individuals (only for groups) and thus requires a previous classification of people with regard to quality of life.

The above description fulfils the purpose of this essay: to provide a broad and general panorama of measuring methods. The choice of the measuring method determines the level of poverty and the policies required to address it. A discussion of the virtues and limitations of many of the methodologies described here is taken up in the essay, "Poverty in Latin America: A Critical Analysis of Three Studies," in this volume.[31]

Conclusion

Based on the range and limits of different concepts of poverty, the difficulties establishing thresholds and the debates concerning the absolute and relative aspects of poverty which have been explored in this paper, two criteria for classifying poverty measurement methodologies have been utilized. This allows for a two-by-two classification and includes some combinations that have not been applied.

As is clear in the first part of the chapter, the various methodologies and thresholds are based on concepts of poverty. Not surprisingly, then, they yield different (often very different) results in terms of the incidence of poverty. By exploring their foundations, it is possible not only to distinguish the most useful methodologies, but also to show that there might not be a "best" one. Rather, different approaches may be suitable for different purposes. Hopefully, this paper will help the practitioner make better, more informed choices in this regard.

Annex

The variants described in part two are classified in tabular form in three tables in this annex. The tables present eight variants of the direct or Unsatisfied Basic Needs (UBN) method, all of them multidimensional, five variants of the Poverty Line (PL) or indirect method, and seven variants of what can be called generically mixed methods. The variants are listed in the rows of the tables, whereas the columns show the following features (with some small variations in Table 2):

Column 2 The *concept of poverty.* Each variant is located within the following dichotomies: normative–semi-normative; direct or factic–indirect or potential; absolute–relative. In the absolute–relative dichotomy, the classification is based on the specific authors and applications quoted as examples, for most methods, are compatible, in principle, with a relative or an absolute stand.

Column 3 *The variable(s) or indicators* used to compare the household/individual stand *vis à vis* the threshold and the *integration procedure, if any, utilized.*

Column 4 The bases for *threshold definition.*

Column 5 The *poverty identification criterion or criteria,* i.e., the decision rule which, after the comparison of observed situation and threshold has been made, is applied to classify a household or individual as poor or nonpoor.

Column 6 The unit of analysis (countries, geographical areas, households or individuals)

Column 7 The resulting *poverty groups or strata.*

Column 8 Some *author(s)* whose work exemplifies the method.

Table 1

Variants of the Multidimensional-Unsatisfied Basic Needs (UBN) Method for Poverty Measurement

UBN Variants	Poverty/Deprivation Concepts	Variables / Indicators and Integration
1.1 Fragmented sectorial (UBN-FS)	Normative Factic Absolute	Basic needs indicators of achievement or deprivation. *Frequently but not always dichotomic indicators* (i.e., proportion of population without: piped water, sewerage, adequate housing, basic education, access to health care, adequate nutrition). Variables are not integrated into a composite index.
1.2 Area integrated sectorial (UBN-AIS)	Normative Factic Absolute	As in UBN-FS but restricted to *dichotomic* indicators available at desired area level. CONAPO's example of *dichotomic* indicators are the following proportions of (the appropriate) population: illiterate, without basic education, living in dwellings with no toilet nor sewerage, without electricity, without piped water, with mud floor, living in localities of less than 5,000 inhabitants, proportion of crowded dwellings, and proportion of occupied population earning less than twice the minimum wage. An area integrated marginality index (AIMI) is obtained by a weighted average, where weights are derived statistically (principal components technique).
1.3 Restricted-Original (UBN-RO)	Normative Factic Absolute	Few BN *dichotomic* indicators. An overall index is not obtained for each household. Dᴀɴᴇ example: • overcrowding (more than 3 persons per room); • precarious dwelling (mud floor in urban areas; precarious materials on walls *and* mud floor in rural areas); • no sewerage *or* no piped water in urban areas; no toilet *and* no piped water in rural areas; • one or more children aged 7 to 11 not in school; • 4 or more dependants per breadwinner *and* household head has less than 3 years of schooling.
1.4 Restricted-Improved (UBN-RI)	Normative Factic Relative	Sized number of BN *non-dichotomic* indicators. Inadequacy of: • Dwelling quality (materials) • Dwelling quantity (space) • Water supply • Sanitary system • Energy • Education (attendance and levels acquired) • Health services (access to) • Basic household durables (possession) • Excess working hours. An overall deprivation index, I(UBN), is obtained for each household, varying from –1 to +1. Weights are based on relative costs.
1.5 Generalized Original (UBN-GO)	Normative Factic Relative	Large number of *Living Style dichotomic* indicators: *Housing*: • indoor-not-shared toilet and bath • heating • damp-free home • self-contained accommodation • a bedroom for everyone above 10 of different sex • a garden. *Appliances and furniture:* • beds for everyone • carpets • refrigerator • washing machine • television. *Clothing and shoes:* warm water-proof coat • new, not second hand, clothes • two pairs of shoes. *Food:* • a special dish once a week • three meals a day (children) • two hot meals for adults • meat or fish every other day. *Leisure:* • a holiday once a year • leisure equipment and toys (children) • celebrations on special occasions • a hobby. *Other items:* • presents for friends or relatives once a year • public transport. To reflect deprivation an item must be lacking due to resource constraints, i.e., it has to be an "enforced lack". An overall index is not obtained except as the mere count of "enforced lack items."
1.6 Generalized Improved (UBN-GI)	Normative Factic Relative	Undefined *non-dichotomic* indicators. An overall index of deprivation (DI) is obtained for each household as a weighted average of specific indicators. Weights are based on proportion of population having the item. They reflect subjective feelings of deprivation.
1.7 Human Poverty Index (UBN-HPI)	Normative Factic Absolute	3 indicators of deprivation: per cent who will die before 40, per cent of illiterate adults and economic provisioning, which is a simple arithmetic mean of: per cent without safe drinking water; per cent without health services and per cent of children under five underweight. HPI is obtained from the 3 indicators through a formula which assumes non-perfect substitution between them, giving more weight to the highest percentage.

	Bases for Threshold Definition	Poverty / Deprivation Identification Criterion	Unit of Analysis	Poverty Groups	Sources
	Expert based deprivation thresholds	Poor not identified. Deprived: below each threshold.	Geographic areas	Ranks areas in each dimension.	*Coplamar* 1982 UNDP-LA 1992
	Expert based deprivation thresholds	Poor not identified. Area ranking by AIMI	Geographic areas	Ranked areas are grouped into deprivation strata.	*Coplamar* 1982e *Conapo* 1993
	Expert based deprivation thresholds	Poor: those with one or more UBN, i.e., indicators below the threshold	Households and individuals	Extreme poor: 2 or more UBN. Non-extreme poor: 1 UBN.	INDEC 1984 *DANE* 1991[32] UNDP-LA
	Expert and expectation based on deprivation thresholds	Poor are those with positive I(UBN)	Households and individuals	According to I(UBN): indigent, very poor, moderately poor	*Boltvinik 1994* Bolivia's Poverty Map (UDAPSO, 1994)
	Based on people's views on what is necessary	Poor are those with three or more "enforced lack items" (ELI)	Households and individuals	Based on # of ELI: in poverty: (3 or more); "sinking deeper": (5 or more) intense poverty: (7 or more)	*Mack & Lansley (1985)*
	Not defined	Poor: those with positive DI	Households and individuals	Not defined	*Desai & Shah (1988)*
	Expert based	Countries are ranked by HPI. HPI is taken as % of poor	Countries	Non-applicable	*UNDP-HDR (1997)*

Table 2

Unidimensional Poverty Lines (PL) Variants for Poverty Measurement

Variants	Poverty Concepts	Measurement Variable[33]	Threshold Definition
2.1 Standard Food Basket poor's behaviour (PL-SFB-P)	Normative-empirical Potential Absolute	Household income per capita. PL in same terms	Cost of SFB based on poor's diets divided by poor's Engel Coefficient[35]
2.2 Standard Food Basket average behaviour (PL-SFB-A)	Normative-empirical Potential Absolute[36]	Household income. PL for each type-size of household.	Cost of SFB (average diet)[37] divided by average Engel Coefficient
2.3 Standard Food Basket reference stratum behaviour (PL-SFB-RS)	Normative-empirical Potential Relative	Household income per capita. PL in same terms	Cost of SFB (diet of reference stratum) divided by reference stratum Engel Coefficient[38]
2.4 Standard Generalized Basket (PL-SGB)	Normative Potential Relative	Total household income or expenditure. PL for average household size	Cost of a basket which includes all satisfies to meet basic needs
2.5 Total income (PL-TI)	Undefined Potential Undefined	Total income. Operationally unspecified	PL in total income terms. Procedure unspecified

Poverty Criterion	Unit of Analysis	Poverty Groups	Sources[34]
Poor: household per capita income below PL in per capita terms	Households	Extremeley poor: income below 50% of PL Moderately poor: income below PL, but greater than 50%	Shari (1973) *World Bank (1990, 1993)*
Poor: household income below PL for specific household type and size	Households	Only one group: Poor	*Orshansky (1965)* Altimir (1979)
Household per capita income below PL in per capita terms	Households	Extremeley poor Moderately poor	Townsend (1954) *CEPAL-UNDP (1992)*
Income below PL	Households	Indigent Very poor Moderately poor	Rowntree *Boltvinik (1992, 1995)* Hernández-Laos (1994)
Total Income below PL (in total income terms)	Households	Unspecified	*Grootaert (1982)*

Table 3

Multidimensional Combined Poverty Measurement Methods (CPMM)

Combined Methods	Poverty/Welfare Concepts	Variables/Indicators and Integration
3.1 Swedish Approach to Welfare (S-CPMM)	Normative Potential Relative-Absolute [40]	Indicators in the following areas: health and health access; employment and working conditions; economic resources; education and skills; family and social integration; housing; of life and property; diet and nutrition;[41] recreation and culture; security and political resources. A summary index is considered impossible/undesirable.
3.2 Human Development Index (HDI-CPMM	Normative Fact.-pot. Absolute	• Life expectancy at birth. • Educational level (weighted average of): Adult literacy (weight 2/3); Combined enrolment rate (weight 1/3). • GDP per capita using PPP. The arithmetic mean of the 3 indicators are standardized/indexed,[42] and their arithmetic mean is the HDI.
3.3 Townsend 1979-Original PL (OPL-CPMM)	Normative-revealed Potential Relative	Deprivation indicators; these are lack of or non-participation in: holidays; receiving guests; being guests; a friend visit to play (children) ; birthday party (children); evening out; fresh meat 4 days a week; regular cooked meals; cooked breakfast; refrigerator; sole use of flush toilet, sink, bath or shower, gas or electric cooker. A deprivation score is obtained as the sum of unmet items.
3.4 Original IPMM (OI-CPMM)[44]	Norm.-emp. Fact.-pot. Relative-Absolute	Both UBN indicators and a poverty line are used. UBN indicators as in the UBNRO variant. Poverty line follows the PL-SFB-RS variant. UBN and PL are not combined into a single index.
3.5 Improved IPMM (II-CPMM)	Normative Amplified-potential [47] Relative	Household Income per equivalent adult[48] and UBN indicators as in UBNIMP. Combining PL and "excess working hours" an indicator of income and time (PLT) results, whose weighted average with UBN overall index (calculated over the rest of UBN indicators as in UBNIMP) gives the intensity index or gap: I (IPMM).
3.6 "Irish" Enforced Lack Item (ELI-CPMM)	Norm.-emp. Fact.-pot. Relative	Household disposable income per equivalent adult[50] plus "basic life-style deprivation"(enforced lack item: ELI): go without heat, do not have a substantial meal, has experienced debt problems/ arrears to meet ordinary living expenses, lack of: new, not second-hand clothes; meat, chicken or fish every second day, of warm waterproof overcoat, of two pairs of strong shoes, of roast weekly. The two dimensions are not integrated in a single index.
3.7 Social Progress Index: Lifetime Deprivation (SPI-CPMM)	Normative Fact.-pot. Relative	Household level: private consumption per capita (C); scores for each UBN item (d) , whose average (weighted by % of non-deprived) is the overall deprivation index D. The product of 1-D (achievement indicator) and C is the global satisfaction indicator by comparison with the standards, which is then transformed into individual welfare (quality of life: deprivation when negative) by a step function (Atkinson type). Life indicator (proportion of life potential realized in capable conditions) is integrated with quality of life in a multiplicative format to obtain quality and quantity of life (lifetime well being) at individual level and then aggregated.

Bases for Threshold Definition	Poverty / Deprivation Identification Criterion	Unit of Analysis	Poverty Groups	Authors[39]
Expert-based thresholds are defined to distinguish problematic from non-problematic conditions.	Not applicable, but a number of problematic areas would come close.	Socioeconomic groups (combination of sex, age, class and region)	Socioeconomic groups by number of problematic areas.	*Erikson (1993)*
Literacy: expert-based threshold. No other threshold is defined.	The method does not attempt to identify the poor.	Countries	Non-applicable. Countries ranked by HDI.	*UNDP-HDR (90–97)*
"Objective" (deprivation-based) definition: the deprivation score is used to identify the income poverty threshold.	Poor are those below the income threshold.	Individuals, households and income units[43]	In poverty. On the margins of poverty.	*Townsend (1979)* Townsend and Gordon (1993)
SFB cost (based on ref. strat. diet and nutritional requirements) is divided by ref. strat. Engel coefficient. BN thresholds: expert-based.	Poor are those whose income / exp. are below PL *and / or* have one or more UBN.	Households and individuals	Total poor (by PL and UBN). PL poor only. UBN poor only.	Beccaria & Minujin Kaztman[45] UNDP-LA *DANE*[46]
PL is the cost of those items in SBES (as in PL-SGB) not verified by UBN. UBN: expert and expectation-based as in UBNIMP.	Poor: those having a positive I (IPMM).	Households and individuals	According to I (IPMM): indigent; very poor; moderately poor. According to UBN and PL: Total and partial poor[49]	*Boltvinik* (1992, 1995)
PL: 50–70% of mean income (non-normative). B: enforced lack of necessities (ELI) defined as such by more than 50% of those interviewed.	Below PL *and* one or more ELI (from the basic life-style deprivation indicators only).	Households and individuals	One: consistently poor Analyzed but not considered poor: Deprivation (UBN "poor" only); income (PL) "poor" only.	Whelan & Nolan (1996)
Not defined for poverty line. Expert-based for UBN indicator. And perhaps expectation-based for life indicator.	Poor: all those having negative lifetime well being.	Households and individuals, but final expression at individual level.	Not defined.	M. Desai (1992)

Footnotes

[1] Again, as in the direct approach, which elements are to be considered basic is a contentious issue. See "Poverty in Latin America: a Critical Analysis of Three Studies" in this series.

[2] A possible view is that alcoholics, drug addicts and similar people have different needs, so that the appropriate poverty line would be higher. If one observes unsatisfied needs in these cases the household would be regarded as being poor, regardless of its level of income. In the case of stingy persons this argument cannot be sustained.

[3] National accounts include not only the specific units of goods and services actually transacted in the market, but also those units consumed by the producer itself, as long as there is a market price for them.

[4] "Currently, income is most often used in measuring poverty in developed countries, with expenditures sometimes used as an alternative, while very few studies have sought to identify the poor directly in terms of possessions and activities." Brian Nolan and Christopher T. Whelan, (1996, p. 13).

[5] The World Bank (1990) points out: "Household incomes and expenditures per capita are adequate yardsticks for the standard of living as long as they include own production, which is very important for most of the world's poor" (p. 26). Naturally, this statement is immediately qualified by stating that this measure does not capture well being dimensions like health, life expectancy and access to public goods or common property resources.

[6] The classic study is Oscar Altimir (1979), which uses the procedure devised by Orshansky.

[7] These reports have adopted the Human Development Index as an alternative measure of development. The index is, to express it in a simplified way, an arithmetic mean of one quantity-of-life indicator (life expectancy at birth), one of knowledge (combination of literacy and level of instruction) and one of overall availability of bought-use-values (per capita GDP). By taking the first two indicators in their own measurement units, the index authors recognize implicitly that not everything can be expressed in money-metric terms. The same can be said about the Human Poverty Index. Both will be dealt with in the text explicitly.

[8] "… in a society in which most families own cars, public transport services might be poor, so that a carless family in such a society might be *absolutely poor* in a way it might not have been in a poorer society. To take another example, widespread ownership of refrigerators and freezers in a community might affect the structure of food retailing, thereby making it more difficult in such a society to make do without having these facilities oneself." (Amartya Sen, 1984, p.337)

[9] This text by Amartya Sen has circulated since 1978, with the title, "Three notes on the concept of poverty," ILO, Geneva, 1978.

[10]They and others (see Barreiro, 1992) have observed that at very low levels of income, the Engel Coefficient rises with income and thereafter, starts decreasing, which is the better-known pattern.

[11]These methods are also summarized in the annex tables.

[12]Further subdivisions are described below. The numbers in each branch correspond to the lines in the annex tables.

[13]See COPLAMAR, *Serie Necesidades Esenciales en México*, five volumes: Alimentación ("Food"), Educación ("Education"), Vivienda ("Housing"), Salud ("Health"), and Geografía de la Marginación (Geography of Marginality), 1982. The first four volumes exemplify the sectorial approach, while the fifth one exemplifies the synthetic approach. As can be seen from the title, the deprivation found was construed as marginality and "marginality maps" were produced. Afterwards, Conapo (The National Council for Population) produced similar maps for the 1980 and 1990 censuses (the first one is unpublished and Conapo 1993). For Latin America this fragmentary approach is to be found in Luis Becarria, Julio Boltvinik, Oscar Fresneda, and Amartya Sen, *América Latina: el Reto de la Pobreza* ("Latin America : the Challenge of Poverty"), Regional Project to Overcome Poverty, UNDP, Bogota, 1992, chapters 14 to 16.

[14]As an example, take almost any of the tables at the back of the Human Development Reports, called Human Development Indicators. There is a table, each one with several indicators, for child survival and development, a health profile, food security, education imbalances, etc. These indicators are grouped thematically or sectorially, but there is no attempt to synthesize them in a single sectorial index, nor is any attempt made to bring the different sectors together in a composite index. This is done in parallel to the Human Development Index and other synthetic indices. The same can be said of the text and the tables included in most chapters in the reports which deal with specific, sectorial dimensions of human development. Even when dealing with poverty (i.e., the *World Development Report 1990*) the WB resorts to these sectorial fragmented analyses (see chapter 5 in that report). The WB has recently published Social Development Indicators, which is a good example of this approach.

[15]The weights are automatically determined in the principal components method, the statistical procedure that has been used in Mexico, as it selects the vector (called the principal component) which maximizes the per cent of the total variance explained.

[16]Thus, each dimension of poverty becomes a dichotomic variable with only two options (above the threshold, which can be given a score of 0; and below the threshold, with a score = 1. Townsend gave scores to his dichotomic indicators, and Desai and Shah (1988) have formalized the implicit procedure used by Townsend, but the idea of scores is alien to the UBN-RO tradition.

[17] The first application I have identified is in Chile. See Oficina de Planificación Nacional (ODEPLAN, 1975) and Instituto de Economía of the Universidad de Chile, *Mapa de la extrema pobreza* ("Extreme poverty map"), Santiago de Chile, 1975. Later in the 1980s a poverty map boom took place in Latin America. The original work which served as a methodological guide for most of the following ones, was INDEC (National Census and Statistical Institute), *La pobreza en Argentina* ("Poverty in Argentina"), Buenos Aires, 1984. Most of the UBNRO applications in the 1980s in Latin America, are brought together in Luis Beccaria, Julio Boltvinik, Oscar Fresneda and Amartya Sen (1992). Some of the works quoted there were published by UNDP's Latin American poverty project as part of the collection *La pobreza en América Latina y el Caribe* ("Poverty in Latin America and the Caribbean"), which includes volumes on Peru, Venezuela, Colombia and Argentina. Under UBN Empirical research Studies in the references, I have listed the applications in Latin America brought together in this book. In Mexico, the UBN method was applied by COPLAMAR with a different name. See COPLAMAR (1982). The procedure adopted was called simultaneous satisfaction of basic needs. The results are not comparable to those obtained elsewhere in Latin America as the thresholds were higher in Mexico. On the other hand, COPLAMAR followed a random procedure for the estimation of housing deterioration, which overestimates poverty incidence. This random procedure, correct for the original purpose for which it was devised, namely the estimation of the requirements of housing renewal, resulted in the identification of nonpoor families as housing deprived. The procedure used for the calculation of deteriorated dwellings can be seen in COPLAMAR (1982c, pp. 181–198). A description of the first applications of the UBN methodology can also be found in Luis Beccaria (1994).

[18] Townsend's 1979 approach was classified in the mixed methods, as he uses his deprivation scores (what he calls the deprivation standard) as a way to estimate the poverty line in income terms, which is then regarded as the threshold distinguishing the poor from the nonpoor. Later, Townsend and Gordon (1993) come back to the same idea: deriving the poverty line from the association of deprivation and income. This time this is attempted through discriminant analysis.

[19] The Capability Poverty Measure (CPM) is comprised of the proportion of children under five who are underweight, the proportion of births unattended by trained health personnel and female illiteracy.

[20] UNDP has developed a human capability poverty household survey prototype that will be field tested in 1998.

[21] These measures can be derived from either income or consumption.

[22] Townsend (1954, p.135) suggests selecting, from all those households which satisfy nutritional requirements, the 25 per cent of households which do so at the lowest level of income, and to interpret total average expenditure per household in this group (less some fixed costs), as the poverty line.

[23] See Julio Boltvinik (1986) for a general description of the SBES. The detailed contents of the SBES can be found in COPLAMAR, 1983, Annex II. The poverty line derived from the SBES has been used, besides Boltvinik, by Enrique Hernández Laos, (1992), Santiago Levy (1991) and Nora Lustig (1990).

[24]This is described in N. N. Franklin (1967).

[25]Atkinson (1983, p. 226), analysing absolute poverty, states: "Where precisely the line is drawn depends, therefore, on the judgement of the investigator, and the idea of a purely physiological basis for the poverty criterion is lost." Later on he adds: "In the case of nonfood items, there is an even greater degree of arbitrariness."

[26]In the Mexican Standard Basket of Essential Satisfiers (Coplamar, 1983), the approach adopted in shoes and clothing was a military (or prison) type approach, which estimates the lowest level of the requirement: the wearing of simple clothes and shoes. This might underestimate the real requirements, but it is obviously a smaller error than zero expenditure on shoes and clothes.

[27]Christian Grootaert (1992) presents the conceptual basis for the huge research enterprise by the World Bank known as the Living Standards Measurement Study (LSMS). It is not specifically geared towards poverty, which explains many undefined characteristics of the procedure, as shown in Table 2.

[28]For a detailed criticism see J. Boltvinik, "Poverty in Latin America: A Critical Analysis of Three Studies," in this series.

[29]The conceptual foundation is to be found in Boltvinik (1992); an empirical, fully detailed application can be found in Boltvinik (1994a and 1995a). A comparison of this method (written before any empirical application was carried out) with Desai's Lifetime Deprivation is to be found in Boltvinik (1993 and 1994).

[30]For a comparison of both methods, see Boltvinik 1993 and 1994.

[31]The choice of methods should not be made on the basis of costs considerations. All methods reported require households surveys or census to be carried out, as one needs originally household level (and individual) data for all methods. Even in the case of those methods working with geographical areas as units of observation, a household survey or census was required to perform the calculations that lead to the area level indicators. This represents the highest cost. Including some questions instead of others in the questionnaires, means no additional costs. Additional questions can represent a higher cost by lengthening the time of the interview, but, in general, the difference in length of questionnaire is not that big from one method to the other. Surveys like the Chilean CASE or the World Bank's Living Standards surveys can be used, perhaps with two ot three modifications, to calculate any of the methods described here. Of course the best thing to do is to design a questionnaire for the specific method one is going to use. What is more expensive, and has other problems, is making a long questionnaire for censuses, but then one can do a short census questionnaire complemented by a survey sample with a larger questionnaire. The calculations that have to be performed are very similar for any method that works with household/individuals as the unit of analysis. All that is needed is a desk-top computer (with fairly large storing and processing capabilities, but which are now very common and very cheap) and the appropriate software. The methods that work with geographical areas as units of observation require even less and can, in fact, be processed without a computer once the area indicators have been published.

[32]DANE is the Departamento Administrativo Nacional de Estadística (National Administrative Department of Statistics) of the Government of Colombia.

[33]All variants can be applied, in principle, using both income or consumption expenditure as the observed variable. Although some of the authors included do argue for the use of consumption expenditure, for data availability reasons they end up mostly using income data.

[34]The authors written in italics are the ones whose work has been the basic example for the rest of the columns.

[35]This is the logical procedure, and the one followed by Shari. Nevertheless, it has not been followed by the quoted World Bank study, where a different, more arbitrary procedure is followed. For a criticism of this study see Julio Boltvinik, "Poverty in Latin America: A Critical Analysis of Three Studies" in this series.

[36]Quite aside from Orshansky's original intentions, which, being built on average behaviour, would have tended to change over time, the constancy of the poverty line as applied officially in the USA, makes it an absolute approach.

[37]Although this is the logical consistent position, Orshansky uses to determine the cost of SFB the Department of Agriculture's economy plan, "costing only 75–80 per cent as much as the basic low cost plan," which in turn is adapted to the food patterns of families in the lowest third of the income range" (Orshansky, 1965, p.6). Thus, the economy plan can be interpreted as reflecting the diets of the poorest population.

[38]The reference stratum was selected as the lowest big group (usually comprising 25 per cent of the urban population) which, at the same time, shows a food "intake" slightly above nutritional requirements (CEPAL-UNDP, 1992, p. 343).

[39]The authors in italics are those for which the contents of all the columns apply fully.

[40]Although, as can be seen in the table, the author relies on many basic needs indicators, I have classified the approach as having a potentiality approach to welfare as emphasis is laid on man's capacity to control his living conditions through the access to resources in a broad sense.

[41]In the first Swedish survey in 1968, diet and nutrition indicators were included, whereas in the second and third (1974 and 1981) they were substituted by security of life and property indicators. Erikson, 1993, p. 68.

[42]In the case of GDP per capita, an Atkinson-type step function (similar to the one used in 3.7 Lifetime Deprivation) is used to transform GDP per capita into well being.

[43]An income unit "is defined as any person aged 15 or over, or, if in full-time education, 19 or over, together with husband or wife and any children aged under 15 (or under 19 if in full education)" (p. 179).

[44]Integrated Poverty Measurement Method

[45]Neither Beccaria-Minujin nor Kaztman realized that what they were doing constituted a new method for the measurement of poverty. I was the first to realize this and called it the Integrated Method (Boltvinik, 1990).

[46]DANE stands for Departamento de Asuntos Nacionales de Estadística (Department of National Statistical Affairs) which is the Colombian Government Statistical Office. See DANE 1991.

[47]Amplified potential is used to qualify an approach defined as "a household is poor if, despite an efficient allocation of all the sources of well being, cannot satisfy all his basic needs" (Boltvinik, 1992, p. 364).

[48]The equivalence scales used are based on nutritional requirements only and result in adult men (1.0), adult women (0.76), infants, 1 to 3 years old (0.46 males, 0.43 females), children, 4 to 13 years (0.77 males, 0.69 females). There is no attempt at taking into account other needs or economies of scale.

[49]The same groups as in OIPMM are also formed.

[50]Three alternative equivalence scales are used: 1) Initial adult in the household: 1.0; 0.7 per additional adult, and 0.5 per additional child. 2) 1.0, 0.6 and 0.4 respectively; 3) 1.0, 0.66 and 0.33.

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