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THE MULTIDIMENSIONAL MEASUREMENT OF POVERTY*

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A. INTRODUCTION

There is a growing consensus that countries need multidimensional measurements of poverty to complement the information obtained using conventional methods of measurement based on monetary income.¹ This reflects the influence of various factors, such as the emergence and predominance of new approaches to social development and well-being; a recognition that monetary indicators are an inadequate indicator of living standards; the need for greater alignment between poverty indicators and poverty reduction policies; and the new methodologies of multidimensional poverty measurement.

Nonetheless, constructing an official multidimensional measurement of poverty, whether within countries or regionwide, poses major conceptual, methodological and practical challenges. Accordingly, this note sets forth: (i) several arguments for developing a multidimensional measure of poverty; (ii) a description of the steps involved in producing a multidimensional poverty index, together with a discussion of the difficulties commonly encountered in this process; (iii) a number of recent methodological advances that make it possible to build such an index; and (iv) the challenges and requirements that could be faced by national statistical systems participating directly in the construction of this index, or those providing necessary information.

B. WHY IS A MULTIDIMENSIONAL MEASUREMENT OF POVERTY NEEDED?

The need for a multidimensional approach to measuring poverty has gained traction on policy agendas in recent years. Academic entities and international organizations have intensified work on developing multidimensional poverty indicators; and governments have shown increasing interest in this type of instrument for public policy analysis. In Latin America and other regions, this quest has been driven by the prevalence of new conceptual frameworks for analysing social development and well-being, such as the rights-based and capabilities approaches, which define poverty more broadly than merely in terms of unmet basic needs.

The rights-based approach is grounded in ethical principles such as human dignity, equality, freedom and solidarity, expressed as universal human rights that are binding and enforceable on States.² Rights are indivisible; they encompass different dimensions of human life (food, health, education, social participation and others); and they are all equally important (no rights are more important than others). According to this rationale, human beings are bearers of rights that define access to the resources and freedoms needed to secure an adequate standard of living. Thus, poverty is not defined in terms of deprivation or need, but rather in terms of a lack of access to basic rights and a denial of citizenship.

The capabilities approach (Sen, 1979, 1983, 1985, 1997) criticizes poverty measurements based solely on resources, because resource availability says nothing about what people do—or could do—with those resources. Capabilities therefore indicate people's possibilities or degrees of freedom to satisfy certain

¹ This argument transcends the domain of poverty as such. Proposals have been made to develop indicators that provide a multidimensional view of social progress, in which welfare is viewed in relation to sustainable development (United Nations, 2012; Stiglitz, Sen and Fitoussi, 2009).

² Historical milestones in the development of the rights approach include: (i) the Universal Declaration of Human Rights (1948), (ii) the International Covenant on Economic, Social and Cultural Rights (1966), and (iii) the Millennium Declaration (8 September 2000).

functions, such as being well fed, obtaining employment and education, or living free of any sense of humiliation or shame. In this rationale, poverty is viewed as an inability to achieve certain basic functions.

A second argument justifying the development of multidimensional indicators is that measurements of poverty based solely on monetary incomes do not permit a complete evaluation of living standards. Identifying the poor on the basis of their current incomes approximates the capacity of households to consume through the market; but it does not directly capture access to public goods (such as education, health, basic infrastructure) that are not acquired with income; and this undermines the correlation between income and welfare.

The measurement of poverty is also a basic tool for evaluating poverty reduction policies and programmes; and, as these not only deliver monetary transfers, but also provide education, health, labour-market, and even psychosocial services, poverty indicators confined to the monetary metric do not provide enough information to capture the impact of poverty reduction initiatives. Including non-monetary aspects in the index would produce poverty measurements that are more closely aligned with poverty reduction policies.

C. STEPS IN THE MULTIDIMENSIONAL MEASUREMENT OF POVERTY

Measuring poverty on a multidimensional basis consists of evaluating whether people succeed in achieving minimum thresholds of well-being (or living standards) in each of the dimensions considered. Accordingly, as with the monetary measure, the requisite information must be disaggregated at the individual or household level, such as that obtained from household surveys or population censuses.

In practice, implementing multidimensional poverty measurement entails four steps: selecting the dimensions of well-being to be evaluated; identifying indicators that represent those dimensions; setting minimum thresholds for each indicator; and, possibly, combining the results obtained in the different dimensions into a synthetic indicator. Each of these steps involves conceptual and methodological decisions that are highly complex, politically, conceptually and methodologically speaking.

Before selecting dimensions, indicators and thresholds, the normative approach underlying the measurement must be defined. This is no easy task: first, because there are no conclusive arguments to claim that any given poverty approach is intrinsically superior to any others; and, second, because poverty is measured in a wide variety of settings. This means there is no one-size-fits-all set of dimensions, indicators and thresholds applicable to all contexts. Accordingly, crucially important steps include choosing an approach that is relevant to the reality of poverty in a specific context, identifying potential practices for attaining the thresholds, and clarifying the feasibility of empirically testing whether people actually attain those thresholds.

The rights-based approach itself exemplifies some of the difficulties mentioned in the foregoing paragraph. In addition to the ambiguity of the meaning of rights (what does the right to education actually mean? Does it mean the right to access; or to completion; or to quality education?) there is the economic cost of upholding them; and this will make the normative content of the right conditional upon the practical feasibility (political economy) of guaranteeing it. This dilemma has nothing to do with the nature of the rights; a society could propose guaranteeing the right to a minimum income; but the political difficulties in defining the amount of such an income could be similar to those that arise in defining an educational threshold.

There are various ways to select the dimensions to be measured, none of which is problem-free. One is to prioritize aspects that have an intrinsic value in people's lives. This approach could be difficult to apply in contexts where socioeconomic and cultural conditions vary widely. In view of these difficulties, some authors have proposed reaching agreements through social dialogue.³ This type of exercise is risky, however, because it might bring in aspects whose links to poverty are debatable or which raise operational difficulties. Another approach is based on the population's preferences or opinions (obtained through qualitative surveys or studies). Here, a major challenge arises if the meaning of socially perceived dimensions of poverty varies significantly across different population groups. Moreover, irrespective of the procedure used to select the dimensions, the exclusion of a relevant dimension of poverty means giving it a zero weight, which will result in the number of poor people being underestimated.

When choosing indicators and thresholds, close attention also needs to be paid to whether the relevant information is available in a single source. Regional experience clearly illustrates this need. One of the pioneering initiatives in the multidimensional measurement of poverty was the unmet basic needs (UBN) method which ECLAC adopted in the 1980s as a way of exploiting the information available in population censuses in Latin America. In this method, the choice of dimensions to measure was heavily conditioned by the variables available in censuses. Although it included some dimensions that are important for satisfying needs —such as housing, water and sanitation, education and consumption capacity— it neglected others, such as nutrition, health and employment.

The importance of the information is also related to the capacity of the available indicators to represent the dimensions to be measured in the selected unit of analysis (individuals or households). For example, some indicators considered in UBN measurements, such as housing materials, describe only very extreme situations of deprivation; and the education indicator was based on children's school attendance, so it was of no use for evaluating education levels in households without children.

The information now available from household surveys is superior to census data for the purposes of this multidimensional methodology. Nonetheless, it is often still insufficient, particularly because what people need in order to meet basic needs and participate in society is constantly changing. For example, in the education domain, household surveys offer data on access by the school-age population, but no indicators of adult literacy skills;⁴ in housing, the available indicators are essentially based on the variables and categories contained in the censuses of the 1980s; and several surveys in the region do not touch upon the health sector. In cases where useful variables are available, for example data on child mortality and malnutrition in surveys based on multiple indicators and in demography and health surveys, these are generally not accompanied by other relevant variables (for example, employment status or household incomes).

As a result, the household surveys normally used to measure poverty do not always contain variables that can adequately capture attainment of the minimum thresholds across different dimensions for the whole population. Given these shortcomings, if multidimensional measurement is expected to provide useful information on the different spheres of well-being, it is advisable to check whether the available instruments contain the necessary information.

³ This is the position adopted by Sen.

⁴ In the 1950s, a person was considered literate if he or she had reading and writing skills (elementary literacy). Later, the notion of functional literacy emerged, which relates to cognitive skills in managing the social environment. Nowadays, the concept used is that of literacy skills, which encompasses all aspects needed to participate adequately in modern society (effective use of arithmetic and reading-writing skills needed for the knowledge society).

Once the dimensions, indicators and thresholds have been chosen, the next stage is aggregation, in which a weight (or relative importance) is assigned to each of the dimensions, and cut-off points are specified to distinguish the poor from the non-poor. One of the dilemmas in aggregation stems from the lack of theoretically well-founded criteria for defining the weights of the dimensions, so this exercise can be somewhat arbitrary. One of the most common approaches to aggregating the different dimensions in a poverty index is equal weighting. Weighting the dimensions equally means treating them as all equally important across all geographical and social contexts and at all points in the life cycle; but this could lead to poverty in certain subpopulations being either under- or overestimated.

To identify the poor, the usual method is to count the number of deprivations and select those who have a number above the specified threshold. In a “union” approach, people are considered poor if they have a deprivation in any of the dimensions considered. This procedure was used in the traditional UBN method, such that households with at least one critical need were classified as poor.⁵ This form of aggregation has been criticized on several grounds, both for its inability to represent the number of deprivations (and hence the severity of poverty), and because the results are highly sensitive to the number of dimensions included in the analysis. For example, increasing the number of dimensions increases the risk of classifying people or households as poor when they actually have an adequate standard of living. In contrast, in the “intersection” approach, the poor are defined as people who have unmet needs simultaneously in all dimensions. This option will tend not to identify as poor a group of people whose living standards are inadequate (under-identification risk).

At this point political considerations come back into play. The aggregation procedure needs to be chosen on the basis of social policy aims in the specific context. If a new multidimensional measurement is constructed in a policy framework that prioritizes expanding the target population (in other words the problem to be overcome is under-identification), then it will be advisable to use a less demanding criterion. By contrast, if the aim is to make the social assistance system more efficient (for example, to reduce leakages), a more demanding criterion would be called for.

Another consideration is that the results obtained with the chosen aggregation method need to be different from those obtained with the method normally used to measure poverty (one-dimensional or multidimensional), but not too different. They should be different, for otherwise the cost-benefit ratio of the exercise could be in doubt (why spend millions more on a new method that produces the same result as before?); but not too different, because the new information published needs to have some foundation in pre-existing representations of poverty and its magnitude.

The recent proposals for new forms of aggregation overcome some of the methodological obstacles through more complex indices that reveal existing disparities (for example, the intensity of poverty). Several of these applications adopt an intermediate position between the union and intersection approaches (see section D), such as considering persons with two or more deprivations as poor. Nonetheless, some of the methodological shortcomings of the UBN method are inherent to multidimensional methods in general, such as the identification of poor people based on a deprivations count. Moreover, the new proposals do not address the political complexities associated with constructing a multidimensional poverty index.

⁵ Use of this strict aggregation criterion (strict, because a household must satisfy all needs to be considered non-poor) is justified partly because the thresholds normally used were not very demanding (Rio Group 2007).

D. RECENT METHODOLOGICAL DEVELOPMENTS

Recent years have seen rapid development in the many areas relating to multidimensional poverty measurement. First, the renewed interest in producing multidimensional poverty indices that address the challenges of aggregating dimensions into a single indicator in the best way possible, has given rise to various types of indices and analytical methodologies. The proposals that have gained the widest acceptance are axiom-based and consist of defining a set of desirable properties for the poverty indicators and then developing indicators that satisfy those properties. This group of proposals includes those of Bourguignon and Chakravarty (2003) and Alkire and Foster (2009).⁶

At the same time, practical applications of multidimensional poverty measurement have been created both nationally and internationally. The following paragraphs outline some of these, as an illustration of the strategies used to address the challenges of measurements of this type. These examples are characterized not only by their methodological quality, but also by their status as official measurements, which places them on a different plane from those with solely academic applications.⁷

The multidimensional poverty measurement calculated by the United Nations Human Development Programme (UNDP) was commissioned by the Oxford Poverty & Human Development Initiative (OPHI), to provide complementary information for monitoring the goal of halving extreme poverty set at the Millennium Summit. Unlike other multidimensional indices used by UNDP, such as human development and human poverty, this index is not an aggregate of aggregates (other indicators), but adds dimensions at the household level (and therefore entails working with microdata from household surveys).

The multidimensional poverty index is a measure of acute poverty that reflects shortcomings in access to basic services and in key aspects of the functioning of education, health and living standards for the populations of 104 countries, including those of Latin America and the Caribbean. The dimensions of this index were chosen on the basis of criteria such as parsimony (few dimensions simplify comparisons with the dollar-a-day monetary measurement used by the World Bank); consensus (education, health and living standards possess a widely recognized value); and inclusion of the instrumental and intrinsic aspects of human development (Alkire and Santos, 2010).

Taking the household as the unit of analysis assumes that deprivations are suffered simultaneously by all household members rather than by isolated individuals and also avoids the need to use different thresholds for each household member. Individuals are classified as poor if they live in households that have three or more deprivations, and the dimensions are aggregated on an equally weighted basis.

Table 1 summarizes the indicators used and the deprivation thresholds, together with the relative weight accorded to each one.

⁶ Another possible strategy is empirical, usually through multivariate techniques to reduce the variability of different poverty indicators to a smaller number of dimensions and derive weightings from those empirical structures. This strategy has been much less widely used in official multidimensional poverty measurements.

⁷ Mention should also be made of the multidimensional measurement of child poverty, both worldwide (Gordon and others, 2003) and in Latin America (ECLAC/UNICEF, 2010). As such measurements only refer to a specific age group, they are not covered in this paper.

Table 1
**DIMENSIONS, INDICATORS, THRESHOLDS AND WEIGHTS OF THE MULTIDIMENSIONAL
 POVERTY INDEX OF UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP) AND
 THE OXFORD POVERTY & HUMAN DEVELOPMENT INITIATIVE (OPHI)**

Dimensions	Indicators	Thresholds a person is deprived if...	Relative weight
Education	Completed years of schooling	...no member of the household has completed five years of education.	16.7%
	Children attending school	...at least one school-age child (up to 8th grade) is not attending school.	16.7%
Health	Nutrition	...at least one household member is undernourished.	16.7%
	Infant mortality	...one or more children of the household have died.	16.7%
Standard of living	Electricity	...the household does not have electricity.	5.6%
	Sanitation	...the household does not have access to adequate sanitation.	5.6%
	Water	...the household does not have access to drinking water.	5.6%
	Floor	...the household lives in a home with an earthen floor.	5.6%
	Fuel for cooking	...the household uses a polluting fuel (dung, wood or coal) for cooking.	5.6%
	Goods	...the household does not have a car, truck or other motorized vehicle, and only has one of the following goods: bicycle, motorcycle, radio, refrigerator, telephone or television	5.6%

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Sabina Alkire and María Emma Santos, “Acute Multidimensional Poverty: A New Index for Developing Countries”, 2010 [online] http://www.fundacionpobreza.cl/biblioteca-archivos/acute_multidimensional_poverty.pdf

The multidimensional poverty index is calculated as the adjusted headcount index proposed by Alkire and Foster (2009). It is obtained as the product of two indicators: the headcount index (H), which is the proportion of the population classified as multidimensionally poor, and the intensity of multidimensional poverty (A); in other words the average percentage of deprivations suffered by the poor population.

A second example is Colombia’s multidimensional poverty index (IMPC), which was developed in 2011 by the Colombian National Planning Department (DNP). In this case, the following criteria were used to select the dimensions and define the indicators and their thresholds: (i) the dimensions and key variables of the multidimensional poverty and welfare indices; (ii) the priorities defined in the country’s constitution; (iii) the major variables included in the qualitative study entitled “*Voices of the Poor in Colombia*” (Arboleda, Petesch and Blackburn, 2004); (iv) the thresholds defined at the Millennium Summit; (v) the country’s social policy, prioritizing variables that could be affected by that policy; and (vi) the availability of information in a single source (National Household Survey) (Angulo and others, 2013).

The IMPC contains five dimensions and 15 variables, related to the educational status of the household, conditions of childhood and adolescence, health, employment, and access to basic services and living conditions in the household. As with the multidimensional poverty index, the unit of analysis is the household. In this case, five or more deprivations are needed to be considered poor. The dimensions, and the indicators within each dimension, are aggregated on an equal weighting basis; and the poverty indices are calculated using the Alkire and Foster (2009) methodology.

The multidimensional poverty index used by Mexico since 2010 (CONEVAL, 2010) adopts an approach that is closer to the two-dimensional method, combining the UBN and monetary poverty line approaches. In the classical two-dimensional method, complementarity stems from the fact that each method captures different needs. The monetary metric is associated with short-term deprivation, given the sensitivity of incomes to the business cycle; whereas the UBN approach is related to structural poverty, since its indicators are more stable over time (ECLAC/DGEC, 1988).

Mexico's multidimensional poverty index has two dimensions, one pertaining to rights (deprivations) and the other to well-being (incomes). Rights fulfilment is measured by six indicators: educational backwardness, access to health services, access to social security, the quality of housing spaces, basic housing services and access to food. Premised on the indivisibility of social rights, a person is deemed to be deprived in that dimension if he or she registers at least one of the six social deprivations. The two dimensions are aggregated through cross-tabulation (CONEVAL, 2010) (see table 2).

Table 2

TPOLOGY OF POVERTY BASED ON THE MEXICAN MULTIDIMENSIONAL POVERTY INDEX

Rights and welfare	Households with deprivations	Households without deprivations
Households that are income-poor	Multidimensional poor	Income-vulnerable
Households that are not income-poor	Vulnerable in terms of social deprivations	Not poor and not vulnerable

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of National Social Development Policy Evaluation Council (CONEVAL), "Informe de pobreza multidimensional en México 2008", 2010 [online] http://www.coneval.gob.mx/cmsconeval/rw/resource/coneval/med_pobreza/Informe_pobreza_multidimensional/Informe_de_Pobreza_Multidimensional_en_Mexico_2008_.pdf?view=.

Taken together, these applications raise several points for reflection. The UNDP index is a good example of the challenges inherent in including or excluding dimensions: if the dimension selection criteria proposed by Alkire and Santos (2010) are used, then omitting employment as a dimension of the analysis is debatable. Employment has been recognized as relevant in various international rights-based declarations, including the Millennium Declaration itself; and employment has instrumental and intrinsic importance for people.

The equal weighting of all dimensions is another significant point. This treats the dimensions as equally important throughout the life cycle which, as noted above, can lead to poverty in certain groups being either under- or overestimated (health may be more important in the initial and final stages of the life cycle; and education could be more important for young people). Moreover, when the number of indicators varies from one dimension to another, the equal weighting is lost. This means, for example, that critical manifestations of deprivation, such as overcrowding and lack of a suitable sewage disposal system, have a lower weight than school backwardness or access to formal employment.

Moreover, multidimensional methods can face similar constraints to those of monetary poverty when selecting the unit of analysis, since many indicators of deprivation are defined at the household, not the individual, level. As happens when using per capita income as an indicator of individual welfare, the use of common thresholds for all household members disregards the fact that they do not necessarily have the same preferences; they may not share economic resources; and resource allocation and time use in households reflect power differences between individuals (gender-related, for example).

Lastly, combining monetary and multidimensional measurements poses a not inconsiderable challenge for defining target populations for policies. Based on the typology used in the Mexican measurement, if the multidimensionally poor are defined as the target population, then vulnerable individuals with multiple deprivations will be excluded, as also will households with a very low income but without social deprivations. By contrast, if all three groups are considered targets, a very large proportion of the population could be classified as poor, particularly if the dimensions of deprivation are aggregated on a “union” basis; under this criterion, the multidimensional and one-dimensional poor in Mexico represented 81.7% of the population in 2008 (CONEVAL, 2010).

E. CHALLENGES

Multidimensional measures have the potential to improve the characterization of poverty and provide substantial support for formulating and evaluating social policies. Nonetheless, constructing an official multidimensional poverty measure poses several challenges that need to be addressed by statistical offices and policy oversight bodies. These include choosing dimensions and thresholds of poverty that are suited to the national reality and capable of informing decision-making correctly; defining the relative weights for the different dimensions, and how these interact with income poverty; technically validating the indices; and the communicability and transparency of the results.

Although there are no definitive solutions to these challenges, experience shows that progress can be made in developing an official multidimensional measurement. Two elements seem to be essential in this process. The first is to ensure institutional support for the measurement, whatever the particular scheme adopted. Multidimensional poverty measurement involves a number of decisions for which the theoretical framework or supporting empirical evidence is not always available. In such situations, it is best to base implementation on dialogue with the relevant institutions and social stakeholders, to avoid the validity of the measurement being widely called into question.

The second element is the need to review and fine-tune existing instruments for use in multidimensional poverty measurement. As noted above, household surveys, the tool most widely used in implementing multidimensional measurement methods, often lack the right type of information to indicate certain deprivations or unmet basic needs. It is therefore important to invest more in developing data sources, to encompass a more comprehensive range of dimensions.

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