Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.4, No.20, 2013

Measuring Poverty: the Methodological Debate

Prince Koranteng Kumi*, Daniel Osabutey, Gorkel Obro-Adibo, Alice Abakah
Accountancy Department, Accra Polytechnic, P. O. Box 561, Accra, Ghana.
E-mail of the corresponding author: pkumi3@yahoo.com.

Abstract
The focus of the international community on poverty reduction has been gaining momentum since the early 1990s. The World Summit for Social Development in Copenhagen (2005) and the subsequent Millennium Summit in New York (2000) provided considerable political will for the reduction of poverty. The debate has been how a multi-dimensional subject like poverty can be measured statistically. Should we continue the single measure using consumption or accept a composite measure; and how would this measure be amenable to quantitative manipulation. This paper traced this methodological debate and offers the contribution that the intensity of poverty can be better measured using a composite income or expenditure metrics that captures expenditure on the individual's basic necessities of life such as food, health, clothing shelter, education etc. This is because changes in income or expenditure have multiplier effects that influence all aspects of the quality of human life, both at the micro and macro levels. Many of the known indices of poverty, such as those mentioned above, are directly or indirectly dependent on income. Even qualitative indicators such as dignity, power and security are better assured to people with higher income to spare.
Keywords: Poverty, Methodological industry, metrics, qualitative, quantitative

1. Introduction

The question that has not been easily answered has been what is poverty? Some people describe poverty as a lack of essential items – such as food, clothing, water, and shelter – needed for proper living. At the UN's World Summit on Social Development, the 'Copenhagen Declaration' described poverty as "…a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information."

The Millennium Development Goals (MDGs) define poverty as the condition of struggling to live on $1 or less per day. The concept of poverty includes material deprivation (i.e. food, shelter) and access to basic services (i.e. health, education). It now also tends to encompass a range of non-material conditions, such as a lack of rights, insecurity, powerlessness and indignity (Vadenberg, 2010).

The International Labour organization (ILO) has also defined poverty as a condition in which people lack satisfactory material resources (food, shelter, clothing, housing), are unable to access basic services (health, education, water, sanitation), and are constrained in their ability to exercise rights, share power and lend their voices to the institutions and processes which affect the social, economic and political environments in which they live and work (ILO SED, 2010).

Thus, Poverty can be defined in many different ways. Some attempt to reduce it to numbers, while others argue that a more ambiguous definition must be used. In the end, a combination of both methods is best. When people are unable to eat, go to school, or have any access to health care, then they can be considered to be in poverty, regardless of their income. To measure poverty in any statistical way, however, more rigid definitions must be used.

1.1 Measuring Poverty

While there are various numerically defined methods to measure and quantify poverty, two are simple enough that they are often used to define poverty: relative poverty measurement and absolute poverty measurement. Both are based on income or consumption values making gathering information to compile statistics on poverty much easier.

Relative poverty measures are the simplest ways to determine the extent of poverty in individual countries. Using this method, the entire population is ranked in order of income per capita. The bottom 10% (or whatever percentage the government chooses to use) is then considered 'poor' or 'impoverished.' This can be fine for country-wide measurements, but it has some major drawbacks in global use. If, say, a 10% relative poverty measurement was applied in a global setting, it would appear that both an industrialized country, such as the U.S., and a sub-Saharan African country had the same 10% poverty rate, even though the conditions of the poor in sub-Saharan Africa are much worse than conditions in the U.S. For this reason, absolute poverty measures are more often used to define poverty on a global scale. Before absolute poverty measures can be used to define poverty however, researchers must first determine if they want to measure income amounts or consumption amounts. Income refers to the amount of money someone makes, while consumption refers to the monetary

value of the goods that person actually consumes. If you earn $4 a day, but are able, through other means, to consume $5 a day, then your yearly income would be $1,460, but your yearly consumption would rise to $1,825. The differences can be significant, because depending on their situation poor people may be able to get goods for less. While it might appear at first glance that income and consumption are the same, closer examination reveals that income is just one factor, although a large one, which determines consumption amounts.

1.1.1 Absolute Poverty

Absolute poverty measures set a 'poverty line' at a certain income amount or consumption amount per year, based on the estimated value of a 'basket of goods' (food, shelter, water, etc.) necessary for proper living. For example, if $5 a day is determined to be the income poverty line in a country, then anyone with annual income of less than $1860 would be considered impoverished. If instead a poverty line based on consumption was used, anyone consuming goods with a monetary value of less than $1860 would be in poverty.

The most commonly used definition of global poverty is the absolute poverty line set by the World Bank. Poverty is set at an income of $2 a day or less, and extreme poverty is set at $1 a day or less. This line was first created in 1990 when the World Bank published its World Development Report and found that most developing countries set their poverty lines at $1 a day. The $2 mark was created for developing nations with slightly better income levels than their $1 a day counterparts. More developed countries are permitted to set their poverty lines elsewhere (it would be funny to assume a statistically significant group of people in the U.S. made less than $1 a day, though there are obviously many impoverished people living there). For highly industrialized countries, such as Britain, Japan, and the U.S., the absolute poverty line is usually set higher (for example, the line has been set at $14.40 in the past). The 2005 poverty line for single individuals in the United States is set at $26.19 a day (Sanjay, 2005).

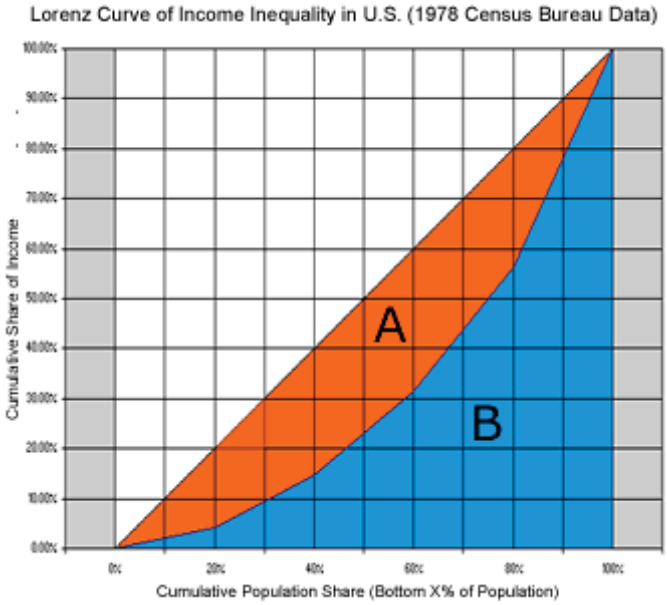
Inequality

One alternative method sometimes used to measure poverty is the measure of inequality in income distribution. This can help show the difference between the richest percentiles of a society and the poorest. While this does not actually show who in the society is truly in poverty by international standards, it can show who is considered poor compared to others in the same society. This is similar to the poverty measures used by the European Union (EU) and the Organization for Economic Cooperation and Development (OECD). In the EU, the income poverty line is set at 60% of the median household income. This would mean that in Britain, for example, where the median household income is about $33,734, any household making less than $20,240 would be considered poor. This is obviously a far cry from people making less than a dollar a day in Africa, but poverty lines based on inequality can be readily used in richer nations, because they show who would be considered 'in poverty' in that nation.

There are two major tools used to help determine the inequality in incomes of people: the Gini-co-efficient and the decile dispersion ratio.

The Gini-coefficient

Gini-coefficients are used in conjunction with a graphical device called a Lorenz curve (see sample curve below) and are the most common method used to evaluate a country's income inequality. A Lorenz curve graphs the share (in percentile form) of the total income the bottom x% of the population receive, ranging from 0% to 100%. For example, if the bottom 10% of the population received only 2% of the total income, it would be represented on a Lorenz curve with a coordinate point of (10, 2). Once data for all percentiles is graphed (the more the better), a '45-degree line' is drawn. This line represents perfect equality – income is equally distributed across the entire population, and can be represented algebraically by the line y=x (this is because in a perfect equality situation, the bottom x% will always have x% of the income). To determine the Gini coefficient using this data, a ratio of the regions formed by a Lorenz curve is used. For example, if the area of the region between the line of equality and the Lorenz curve is called A (represented in red on the sample graph) and the area of the region between the curve and graph's bounds is called B (represented in blue on the sample graph), then the Gini-coefficient would be A/(A+B). For a visual of this information, see the graph of a Lorenz curve based on U.S. inequality statistics from 1978.



Lorenz curve of U.S. inequality statistics, 1978. The Gini-coefficient is calculated by dividing A by A+B.

A typical Gini-coefficient can vary between around 0.24 and 0.71. Often, when countries' inequality measures are compared using Ginis, the coefficient is multiplied by 100 (effectively converting it to a percentage form) and is called a Gini Index. Currently, Denmark has the lowest inequality going by Gini-coefficient – 0.247. Namibia has the highest, with a coefficient of 0.707. The U.S. falls somewhere in the middle, with 0.408, though this puts it behind many other industrialized nations, which typically have coefficients around 0.3 (World Bank, 2010).

The Decile Dispersion Ratio

The decile dispersion ratio is another common method to determine inequality, and in many ways, a much simpler one. In the words of the World Bank, it "expresses the income of the rich as a multiple of that of the poor." To calculate a decile dispersion ratio, the average income of the top 10% of income makers is divided by the average income of the bottom 10% of income makers. This can be computed for any percentile – 5%, 10%, 30%... and is very easy to interpret. If the top 10% of the population make an average of $80,000 a year and the bottom 10% make an average of $15,000 a year, the dispersion ratio is equal to about 5.33 – the rich make about 5.33 times as much as the poor.

1.1.2 Composite measures of Poverty

The United Nation's Human Development Index (HDI) is one of the most common measures of a country's progress, making it an often-used indicator of poverty. The HDI was developed by Indian economist Amartya Sen in conjunction with Pakistani economist Mahbub ul Haq, in order to create a better measure of living standard than the traditional Gross Domestic Product (GDP) per capita measures. The HDI was first calculated for UN countries in 1990, but HDIs have been calculated back to 1975 for many countries, using past data (the UN has not attempted to calculate HDIs before 1975 due to lack of necessary data). The HDI, rather than focusing just on income, uses a variety of variables to determine a country's development progress: life expectancy at birth, education (based on adult literacy rates and school enrollment ratios), and GDP per capita. Using these, a decimal value between 0 and 1 (the HDI) is computed, the closer to one the better. UN countries have been ranked by their HDI since 1975, but changes have since been made to the method of calculation – most notably in 1999, when the income portion of the Index was reworked. This makes it hard to compare HDI data over the years, though the UN published a comparative table of the HDIs of UN countries in 1975, 1980, 1985, 1990, 1995, 2000, and 2002 in their Human Development Report (HDR) 2004.

As of HDR 2005, Norway led the world in human development, with an HDI of 0.963. The United States was 10th, with an HDI of 0.944. At the other end of the spectrum is Niger (in sub-Saharan Africa), with an HDI of 0.281. 30 of the 32 'Low Human Development' countries are in Africa (the exceptions are Haiti in the Caribbean and Yemen in the Middle East). These sub-Saharan states, along with the former Soviet republics, are the only countries in the world that are declining in human development (Geoffrey, 2004).

The Human Poverty Index (HPI) is very similar to the HDI. The only real difference is the variables each uses to compute the final Index. The HDI examines positive signs of development, such as life expectancy, while the HPI looks at negatives. In a nutshell, the HDI increases the more GOOD things a country has, while the HPI decreases the less BAD things a country has. A high HDI is a sign of accomplishment, while a high HPI is a sign of failure. The United Nations Development Programme (UNDP), sums it up like this: "While the HDI measures average achievement, the HPI measures deprivations in the three basic dimensions of human development captured in the HDI."

The HPI is divided into two very different Indexes – the HPI-1 for developing countries, and the HPI-2 for industrialized nations, generally those parts of the Organization for Economic Cooperation and Development (OECD). The HPI-1 uses the probability of not surviving to the age of 40, the adult illiteracy rate, an average of the percentage of the population without clean water, and the percentage of babies born underweight to calculate the final Index, a percent value (such 41.5% for Angola), closer to 0%, the better. The HPI-2, on the other hand, uses the probability of not surviving to age 60, the percentage of adults without functional literacy skills, the percentage of the population below the income poverty line (for the HPI-2, it is set at 50% of the median household income, because most countries for which the HPI-2 is calculated are industrialized), and the long-term unemployment rate. This, too, is used to create a percentage value for the Index, such as 15.4% for the U.S. However, the HPI-1 and HPI-2 CANNOT be directly compared. Right now, Niger has the worst HPI-1 percentage, 64.4%. Of the OECD countries for which the HPI-2 is calculated for, Sweden has the best value, 6.4%. The U.S. is 17th (Sanjay, 2005)

The Oxford Poverty and Human Development Initiative (OPHI) has recently launched a Multidimensional Poverty Index (MPI), and calculated it for over 100 countries. The MPI is a composite of indicators selected for consistency with the UNDP's famous Human Development Index (HDI). The HDI uses aggregate country-level data, while the MPI uses household-level data, which is then aggregated to country level. The index has ten components; two represent health (malnutrition, and child mortality), two are educational achievements (years of schooling and school enrolment), and six aim to capture "living standards" (including both access to services and proxies for household wealth). The three broad categories–health, education, and living standards–are weighted equally (one-third each) to form the composite index.

2.0. The Methodological Debate

There is disagreement between development researchers as to whether poverty can best be defined statistically by using a composite index or we should hold to the age-old income-expenditure measures that are backed by economic theory.

For instance, there is a debate on the precise indicators chosen for the MPI by the Oxford team. For example, the MPI's six "living standard" indicators are likely to be correlated with consumption or income, but they are unlikely to be very responsive to economic fluctuations. The MPI would probably not capture well the impacts on poor people of economic downturns such as the Global Financial Crisis or rapid upswings in macro-economic performance.

The precise indicators used in the MPI were not in fact chosen because they are the best available data on each dimension of poverty. Rather they were chosen because the methodology used by the MPI requires that the analyst has all the indicators for exactly the same sampled household. So they must all come from one survey. There is much better data available on virtually all of the components of the MPI, but these better data can't be used in the MPI since they are only available from different surveys. This aspect of their methodology greatly constrains the exercise. If one chooses not to form the composite at household level but to look instead at the separate dimensions of poverty one is free to choose the best available data on each dimension of poverty.

There is a deeper concern about the MPI, which holds even if the best data all came from just one survey. The index is essentially adding up "apples and oranges" without knowing their relative price. When one measures aggregate consumption from household-survey data for the purpose of measuring poverty, as in the World Bank's "$1 a day" measures, one relies on economic theory, which says that (under certain conditions) market prices provide the correct weights for aggregation. We have no such theory for an index like the MPI. A decision has to be taken, and no consensus exists on how the multiple dimensions should be weighted to form the composite index.

On closer scrutiny, the embedded trade-offs, stemming from the weights chosen by the analyst, can be questioned, and may be unacceptable to many people.

HDI is also criticized on the grounds that by aggregating GDP per capita with life expectancy the HDI implicitly put a value on an extra year of life, and that this value rises from a very low level in poor countries to a

remarkably high level in rich ones (4-5 times GDP per capita). If it was made clearer to users, they would question this trade-off embedded in the HDI.

The MPI index faces the same problem. How can one contend (as the MPI does implicitly) that the death of a child is equivalent to having a dirt floor, cooking with wood, and not having a radio, TV, telephone, bike or car? Or that attaining these material conditions is equivalent to an extra year of schooling (such that someone has at least 5 years) or to not having any malnourished family member? These are highly questionable value judgments. Sometimes such judgments are needed in policy making at country level, but we would not want to have them buried in some aggregate index. Rather, they should be brought out explicitly in the specific country and policy context, which will determine what trade off is considered appropriate; any given dimension of poverty will have higher priority in some countries and for some policy problems than others.

Poverty is indeed multidimensional. But it is not obvious how a composite multidimensional poverty index such as the MPI contributes to better thinking about poverty, or better policies for fighting poverty. Being multidimensional about poverty is not about adding up fundamentally different things in arbitrary ways. Rather it is about explicitly recognizing that there are important aspects of welfare that cannot be captured in a single index."

Those who support the composite measures also criticize the consumption approach spearheaded by the world bank and its allies on the grounds that such a complex phenomenon like poverty cannot be reduced to a mere measure of consumption. The development of a composite index, whatever its flaws, is preferable to this simplistic approach. A composite index, by its very nature, includes multiple aspects of life. This is preferable to covering only ONE highly suspect issue – consumption, taking purchasing power parity (if this exists) into account. The so-called economic theory, which says that "(under certain conditions) market prices provide the correct weights for aggregation" is highly flawed. This reflects neo-liberals ideology rather than proper economic theory. In measuring consumption, the attempts of the World Bank to ascribe a value to a shack where people live, or to home grown produce, comparable throughout the world, are laughable. The GDP itself is a highly questionable index. If one is involved in a car crash, and requires hospitalization, this contributes to GDP! What about quality of life? So the World Bank attempt at measuring poverty should go back to the drawing board. It tells us nothing. Instead, we should consider any measurement which attempts to understand a complex phenomenon through considering a wider range of issues. While there will always be questions regarding the accuracy and relevance of the calculation of an index, surely the debate that this encourages is preferable to promoting a dogma that does not apply in the real human society.

3. Conclusion

Poverty, as a real world phenomenon, is indeed multi-dimensional and no one can run away from that. It is characterized by the deprivation of basic human needs, especially food, safe drinking water, health and education. It also includes a range of non-material conditions, such as a lack of rights, insecurity, powerlessness and indignity. Any policy that does not take all these variations into consideration would not realize any major success. Poverty can also be analyzed from both the individual or micro level and the contextual or macro level. Thus, any method of measurement must take into consideration these different levels. In the individual context, poverty is sometimes a matter individual perception or feeling. For instance, there are people who consider themselves as poor only because they have no children and rich because they have many children. The implication is that not all the characteristics of poverty can be subjected to strict statistical models, especially in a composite form.

The qualitative attributes to poverty can be studied using the normative approach to allow for useful value judgments. The case by case study approach would be very useful. Again, focus group discussions well organized in different context can bring out all the dichotomies in the poverty debate. This will help achieve divergent data to guide policy making.

To provide a strict quantitative model to explain issues in poverty however, the income or expenditure metrics provide a useful starting point. Income changes for instance have multiplier effects that influence all aspects of human life, both at the individual level and the macro level. Income allows consumption which creates a multiplier effect based on the marginal propensity to consume, such as increase in demand, increase in output, increase in employment and a further increase in income ceteris paribus. Thus, All other things being equal, many of the indices of poverty such food, water and nutrition, as well as education and health, are dependent on the individual's income. Dignity, power, and security of the individual in many societies can be assured for the one with higher income to spare. Many people with scanty income have no voice in the society to secure them proper housing, security and dignity. Expenditure is however, a proper measure of poverty than income. In many

less developed societies, individuals manage to do more expenditure than their self-earned income due to the societal support culture of these economies.

Thus, any quantitative measure of poverty at the micro level that adopts an equation to capture expenditure on the individual's basic necessities of life (such as food, health, clothing, shelter, education etc.), could give a significant indicator on the poverty levels of the people. It is important that an amount of expenditure necessary to allow the basic quality of life in different societies is estimated and used as the 'poverty line'. So an Absolute poverty measure that sets a 'poverty line' at a certain consumption amount per year, based on the estimated value of a 'basket of goods and service' (food, shelter, water, health, education etc) would be appropriate to capture the various dimensions of poverty in the society.

References

Ghana Statistical Service (2008): Ghana Living Standard Survey (GLSS 5), Accra.
Gilbert, Geoffry (2004): World Poverty, Santa Barbara: ABC-CLIO.
ILO, SEED (2006): Poverty Reduction through Small Enterprises, Working Paper N.75, ILO, Geneva.
ILO (2003): Working Out of Poverty, ILO, Geneva.
Nabila, J. S. and Fayorsey, C. (1996): Adolescent Fertility and Reproductive Health in Ghana, FADEP Technical Series No. 7, Assemblies of God Press, Accra.
National Development Planning Commission (1997): Ghana Vision 2020, The First Medium-Term Development Plan, 1997 – 2000, Accra.
National Development Planning Commission (2004): Ghana Poverty Reduction Strategy (GPRS II), NDPC, Accra.
Millinium Development Summit (2000), MDG. http://www.undp.org/mdg/basics.
Sanjay, G. (2005): How Not to Count the Poor, Columbia University.
University of Ghana (2005): Economics: Introduction to Economy of Ghana ll, Institute of Adult Education (IAE), Accra.
Vadenberg, P (2006): "Poverty Reduction through Small Enterprises", ILO SED Programme, ILO, Geneva.
World Bank (2004): "World Development Indicators" Washington D.C., USA.