



ELSEVIER

www.elsevier.com/locate/worlddev

World Development Vol. 44, pp. 1–13, 2013
© 2012 Elsevier Ltd. All rights reserved
0305-750X/\$ - see front matter

<http://dx.doi.org/10.1016/j.worlddev.2012.12.010>

Global Poverty Estimates: A Sensitivity Analysis

SHATAKSHEE DHONGDE

Georgia Institute of Technology, Atlanta, GA, USA

and

CAMELIA MINOIU*

International Monetary Fund, Washington, DC, USA

Summary. — Current estimates of global poverty vary substantially across studies. We undertake a sensitivity analysis to highlight the importance of methodological choices by measuring global poverty using different data sources, parametric and nonparametric estimation methods, and multiple poverty lines. Our results indicate that estimates of global poverty vary significantly when they are based alternately on data from household surveys *versus* national accounts but are relatively consistent across estimation methods. The decline in poverty over the past decade is found to be robust across methodological choices.

© 2012 Elsevier Ltd. All rights reserved.

Key words — global poverty, sensitivity analysis, household surveys, national accounts, nonparametrics, income distribution

1. INTRODUCTION

Global poverty monitoring has been brought to the forefront of the international policy arena with the adoption of the Millennium Development Goals (MDGs) by the United Nations. The first of the eight MDGs proposes reducing global poverty by the year 2015 and is stated as “halving the proportion of people with an income level below \$1/day during 1990–2015” (United Nations, 2000). Progress toward attaining this MDG is monitored using global poverty estimates published by the World Bank and a number of independent scholars. The process is not only expensive (Moss, 2010) but also mired with conceptual, methodological, and data-related problems (Klasen, 2009).

Estimates of global poverty differ significantly in magnitude as well as in the rate of change in poverty. Consider, for instance, Chen and Ravallion (2010) and Pinkovskiy and Sala-i-Martin (2009)—two studies that estimate global poverty using the international poverty line of \$1/day (see Figure 1). Chen and Ravallion (2010) find that during 1981–2005 the global poverty rate fell from 51.8% to 25.2%. Pinkovskiy and Sala-i-Martin (2009) show that the global poverty rate over the same period declined from 4.4% to 2.4%. Although there is general agreement in the literature that global poverty has decreased over time, the estimated level of poverty and the rate of poverty decline vary substantially across studies.

This paper aims to contribute to the debate on global poverty not by providing a new set of estimates but by addressing two important questions. First, we ask why estimates from different studies differ so much. As we unravel the various assumptions made by researchers, we realize that global poverty estimates are simply not comparable across studies. For instance, they differ in terms of underlying data sources, number of countries included, welfare metric, adjustments to mean incomes, and statistical methods employed to estimate the income distribution. Given this variety of methodological choices, we arrive at our second question: Can we assess the impact of different approaches on the resulting poverty estimates? Since global poverty estimation requires making multiple assumptions simultaneously, we isolate and measure

separately the relative importance of each such assumption by undertaking a sensitivity analysis. The paper documents how sensitive global poverty estimates are to underlying assumptions.

A key methodological choice made when estimating global poverty is whether to use data from household surveys (HS) or national account statistics (NAS) or whether to combine data from the two sources. Data on income are typically collected through HS of nationally representative samples. In fact HS data are the only source of information on the relative distribution of incomes, that is, on the share of income or consumption possessed by population quintiles or deciles in a country. Distributional data can be scaled by mean income or consumption from HS or from NAS. HS means are the most natural choice; the World Bank estimates global poverty largely based on data from HS (Chen & Ravallion, 2001, 2004, 2010). But HS-based estimates of mean income or consumption are not available for all countries and years, primarily because they are not published by statistical agencies. To overcome this limitation, researchers often replace HS means with estimates from NAS (Ahluwalia, Carter, & Chenery, 1979; Bhalla, 2002; Pinkovskiy & Sala-i-Martin, 2009; Sala-i-Martin, 2006). NAS data are a more readily-accessible and consistently-recorded source of information on average incomes, and are available for most countries on a yearly basis. However, rescaling distributional data from HS with means from NAS has been criticized because it implicitly assumes that the discrepancy between the two data sources is

* We are grateful for valuable suggestions to Florent Bresson, Gaston Gelos, Richard Palmer Jones, Mahvash Qureshi, Sanjay Reddy, Guanghua Wan, and conference participants at the “Ten Years of War Against Poverty” Conference, Brooks World Poverty Institute, Manchester (2010), and the Southern Economic Association Meeting, Atlanta (2010). We also thank three anonymous referees for providing useful comments and suggestions that improved significantly the quality of the paper. The views expressed in the paper are those of the authors and do not necessarily represent those of the IMF or IMF policy. All remaining errors are our own. Final revision accepted: December 13, 2012.

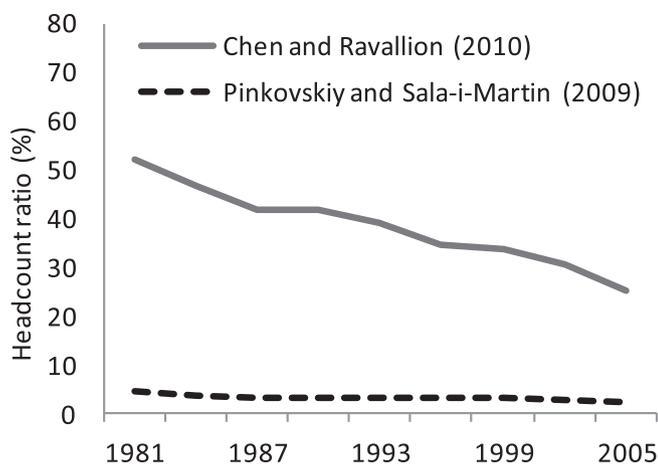


Figure 1. Estimates of global poverty during 1981–2005. Notes: The poverty rates are based on 2005 PPPs but are not strictly comparable across studies because of differences in methodological approach (see Section 2(c)).

distribution-neutral (Bourguignon, 2005; Chen & Ravallion, 2010; Deaton, 2005).

The choice between HS and NAS data generates significantly different poverty estimates, as shown in Figure 1 and documented in the paper. However, these differences cannot be entirely attributed to this particular choice, since studies also differ in other aspects, such as the number of countries covered, the choice of welfare metric (income or consumption), and the statistical techniques used to estimate the income distribution. Given the variety of methodological approaches proposed in the literature on global poverty, our main goal is to assess the relative significance of these choices. We do so by means of a sensitivity analysis. We start with a benchmark poverty estimate based *entirely* on HS data and quantify the extent to which poverty estimates vary when the relative distribution is anchored alternately to mean income or consumption from NAS. This is our first sensitivity exercise.

The second sensitivity exercise concerns the choice of statistical method used to estimate income distributions from grouped data representing income shares of population deciles. We measure global poverty by estimating each country's distribution using different methods employed in the literature. These include the General Quadratic (GQ) Lorenz curve, the Beta Lorenz curve, the lognormal density function, and the Singh–Maddala density function.¹ In addition to these parametric specifications, we consider the nonparametric kernel density method whose performance we assess in conjunction with four different bandwidths—a parameter that controls the smoothness of the income distribution.

As a benchmark, we follow the World Bank methodology to the extent possible and estimate global poverty in 1995 and 2005—the latest year for which data are available for many countries. We collect distributional data for 65 countries from the World Bank's poverty monitoring website PovcalNet. Our sample covers almost 90% of the developing world population and includes all countries for which HS and NAS data are available in *both* years. Global poverty is estimated using poverty lines ranging from \$1/day to \$2.5/day. By using a range of poverty lines, we are able to determine how methodological choices impact poverty rates at different income cutoffs. Furthermore, we take into account the fact that the \$1/day inter-

national poverty line is relatively low compared to the average standard of living in developing countries.

Our results are twofold. First, a large share of the variation in estimated poverty levels and trends can be attributed to the choice between HS and NAS means. Global poverty estimates vary not only in terms of the proportion of the poor, and correspondingly the number of poor, but also in terms of the rates of poverty reduction. Poverty estimates based on HS and NAS do not tend to converge in higher income countries. Second, the choice of statistical method used to estimate the income distribution affects poverty levels to a lesser extent. A comparison of poverty estimates across parametric and nonparametric techniques reveals that the commonly-used lognormal specification consistently underestimates poverty levels. While there is little doubt that the proportion of poor declined during 1995–2005, our results underscore the fact that global poverty counts are highly sensitive to the methodological approach.

The remainder of the paper is structured as follows. Section 2 consists of a review of the literature on global poverty. We describe the sensitivity analysis and the data in Section 3, and the results in Section 4. Conclusions are presented in Section 5. The statistical techniques used in the exercise are described in the Appendix.

2. LITERATURE REVIEW

There is a large and diverse body of literature on global poverty. We have compiled this literature in two broad categories. The first consists of studies discussing conceptual and methodological challenges in defining poverty; the second includes studies mainly focused on providing estimates of global poverty. There is considerable overlap between the two types, with some studies falling in both categories.

(a) Conceptualizing global poverty

A number of conceptual issues, which we briefly review here, are at the core of global poverty analysis.² Measuring poverty inherently involves choosing between alternate notions of poverty. The subjective approach defines poverty using an individual's perception of own well-being and utilizes data from self-reported assessments of living conditions.³ The subjective approach involves a value judgment as to what it means to be poor. In contrast, the objective approach defines poverty based on quantifiable dimensions of well-being. Global poverty has traditionally been defined in terms of deprivation in a single dimension, namely income or consumption. Further, it has been measured either in absolute terms, using a pre-defined poverty line based on the cost of living (Chen & Ravallion, 2001, 2004, 2010), or in relative terms, by anchoring the poverty line to mean or median income levels (Chen & Ravallion, 2012; Nielsen, 2009; Ravallion & Chen, 2011). However, based on Amartya Sen's broader notion of capabilities (Sen, 1976, 1993), recent efforts have been aimed at estimating global poverty using multiple dimensions such as access to basic public services (e.g., clean drinking water and electricity), educational attainment, and health status. The United Nations Development Programme's multidimensional poverty index measures global poverty as a combination of deprivation in three dimensions using ten indicators of well-being. Based on this index, the *Human Development Report (2010)* estimates that nearly 1.7 billion people in 109 countries live in multidimensional poverty, i.e., they experience acute deprivation in health, education, and standard of living.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات