Mapping Multidimensional and Monetary Poverty: The Case of Uganda

Isis Gaddis* and Stephan Klasen**

Abstract: Measures of multidimensional poverty have become increasingly popular amongst researchers and policymakers, complementing traditional money-metric poverty estimates. The most well-known of these, the Multidimensional Poverty Index (Alkire and Santos 2010), was featured prominently in the 2010 Human Development Report (UNDP 2010). Yet many tools developed to assess money-metric poverty cannot be mechanically transferred to the concept of multidimensional poverty, but require methodological adjustments. This paper focuses on small-area estimates of poverty, called poverty maps, which are used widely to design and implement geographically-targeted programs.

This paper makes three important contributions. First, we extend the idea of poverty mapping to the concept of multidimensional poverty and argue that there are substantial advantages to MPI mapping compared to traditional monetary poverty mapping. Second, using data from Uganda, we show that county-level estimates of monetary and multidimensional poverty are strongly correlated, which suggests that the decision between MPI and monetary poverty maps may not lead to radical changes in geographic targeting (though differences can be substantial for specific regions). Third, we assess the micro-relationship between the individual indicators of the composite MPI and consumption per adult. Our analyses show that most of the components of the MPI are empirically strongly related to consumption, but some MPI indicators (adult education, sanitation and bicycle ownership) merit attention as they correlate poorly with money-metric poverty.

Keywords: Poverty Measurement, Multidimensional Poverty Index, Poverty Mapping

* The World Bank, Dar-es-Salaam, Tanzania, igaddis@worldbank.org
** University of Göttingen, Göttingen, Germany, sklasen@uni-goettingen.de

1. Introduction

It is widely acknowledged that poverty is a multifaceted and complex phenomenon, intricately linked to deprivations in various dimensions of welfare. Despite this recognition, poverty has traditionally been measured in money-metric terms (based on income or consumption), capturing (rather narrowly) command over marketed goods and services. More recently, multidimensional indices of poverty have gained prominence, which collapse individual or household-level deprivations across various dimensions of wellbeing into a single poverty indicator (e.g. Bourguignon and Chakravarty 2003, Alkire and Foster 2008). While the basic approach to aggregate deprivations across dimensions is not without criticism – some scholars, such as Ravallion (2011), favor a "dashboard" of indices over a composite scalar index – multidimensional poverty measures are increasingly being used for policy purposes, complementing consumption- or income-based poverty measures.

The Multidimensional Poverty Index (MPI) developed by Alkire and Santos (2010) as a measure of acute poverty is the most well-known in this group of composite poverty indices. The MPI reflects (overlapping) deprivations across three equally-weighted dimensions of well-being (health, education and livings standards), measured by ten indicators, and was featured prominently in the 2010 Human Development Report (UNDP 2010). In addition, countries diverse as Mexico, Colombia and Bhutan have adopted variants of the MPI as official poverty measures, which they use to monitor national poverty trends and the effectiveness of policies on the ground.

Given the recent success of the MPI, it is important to investigate if and how the tools and methods traditionally used to assess income or consumption poverty can be adopted to the concept of multidimensional poverty. In addition there is the need to get a better understanding of the empirical properties of the MPI, and its correspondence to money-metric poverty. This paper makes contributions towards both objectives, with a focus on small-area estimates of poverty, often shown as poverty maps, which are used widely to design and implement geographically-targeted interventions, such as community development funds or transfer programs.

We make three important contributions. First, we extend the idea of poverty mapping to the concept of multidimensional poverty. Second, we compare small area estimates of monetary and multidimensional poverty for the case of Uganda. Third, we assess the micro-relationship between the individual indicators of the composite MPI and consumption per adult. This shows how well the different components of the MPI correlate with consumption-based poverty, and yields important information for future refinements of that index.

This paper argues that there are significant advantages to MPI mapping compared to traditional monetary poverty mapping. This is because many censuses in developing countries capture a sufficiently large number of MPI indicators to compute a 'reduced' variant of the MPI directly from the census. In contrast, there are hardly any census data that collect income or consumption information, which implies that monetary poverty maps have to rely on more complex imputation methods. Multidimensional poverty maps hence also do not suffer from the type of prediction errors typically encountered with monetary poverty maps, and can be disaggregated to any desired geographic level. Second, using data from Uganda, we show that county-level estimates of monetary and multidimensional poverty are strongly correlated, which suggests that the decision between MPI and monetary poverty maps may not lead to radical changes in geographic targeting (though differences can be substantial for specific regions). Finally we show that most of the components of the MPI are empirically strongly related to consumption, but some MPI indicators (adult education, sanitation and bicycle ownership) merit attention as they correlate poorly with money-metric poverty.

The remainder of this paper is structured as follows. Section 2 introduces the literature on multidimensional poverty measurement and small area poverty estimation. Section 3 describes the data sources, as well the approach to generate monetary and multidimensional poverty maps, which is followed by a discussion of the empirical results in section 4. The last section concludes.