

## **Abstract for “Looking at Pro-poor Growth from an Agricultural Perspective”**

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Pro-poor growth has been identified as one of the most promising pathways to achieve the Millennium Development Goals (MDGs) or any subsequent set of goals aiming to reduce poverty worldwide (e.g. United Nations 2000; World Bank 2000a, b; Ravallion 2001; Klasen 2004). Related research has developed various instruments providing researchers with the possibility to evaluate from an ex-post perspective the extent to which the poor benefited from recent developments in a country (the entity of these instruments is regularly referred to as the “pro-poor growth toolbox”). Most notably, Ravallion and Chen (2003) introduced the growth incidence curve (GIC) which provides income growth rates by quantiles (e.g. vintiles or percentiles) ranked by income.

Although quite powerful, such GICs have the drawback of being exclusively focused on the income dimension, whereas there is nowadays a consensus that poverty is a multidimensional phenomenon (e.g. Sen 1983, 1998). However, Grosse et al. (2008) and Klasen (2008) showed with the so-called non-income growth incidence curve (NIGIC) that the concept of the GIC is also applicable to non-income dimensions of poverty such as education or health. A related approach was further pursued by Ali and Son (2007) who developed the so-called opportunity curves which are likewise focused on non-income dimensions of poverty and plot the level of access to certain social services against the cumulative share of the population ranked by income.

However, all of the above-mentioned tools focus too much on income and non-income dimensions of well-being. One reasonable way to further extend the concept is to examine how pro-poor productivity improvements have been. Given the extraordinary importance of agriculture for poverty reduction worldwide (e.g. World Bank 2007; de Janvry and Sadoulet 2010; Valdés and Foster 2010; Christiaensen et al. 2011), we suggest in this article that it is straightforward to define the “poor” not only in terms of income, education or health, but also in terms of agricultural productivity. Such an approach can be readily implemented in the PPG-toolbox by slightly modifying some of the existing tools which allows us to look at pro-poor growth from a complementary, agricultural productivity-based perspective.

More specifically, we introduce with the so-called “productivity growth incidence curve” (PGIC) a first new tool that is closely related to the “classical” GIC as of Ravallion and Chen (2003) and plots quantiles of the population ranked by their agricultural productivity (either agricultural labor or land productivity) on the horizontal axis against quantile-specific growth rates (and absolute increases) in terms of agricultural productivity on the vertical axis. The resulting curve gives researchers and policy-makers the opportunity to evaluate to what extent the productivity-poor (e.g. in terms of agricultural land productivity) were able to increase their agricultural production per hectare which is – against the background of the increasing problem of land scarcity in numerous SSA countries – a very relevant question. Furthermore, it is not only possible to construct such PGICs using a monetary production aggregate (i.e. total value of a household’s agricultural production), but also focusing on single crops using the physical quantities harvested. The resulting crop-specific PGICs (e.g. for land-productivity)

then allow us to say to what extent the productivity-poor (e.g. in terms of land productivity for beans) were able to increase their (bean) production per hectare.

The second newly-introduced tool relies on the idea of the opportunity curve of Ali and Son (2007) and we therefore call it “productivity opportunity curve” (POC). The POC differs from the “classical” opportunity curve in the sense that we no longer have the cumulated share of the population sorted by income on the horizontal axis, but that quantiles are now sorted by agricultural productivity. Hence, such a POC pursues the question to what extent the productivity-poor were able to increase their levels of access to education or health care. This question is relatively straightforward and quite relevant for policy makers given that there is nowadays a broad literature indicating considerable productivity-increasing effects of improved farmer’s education and health on the micro (e.g. Ali and Flinn 1989; Young and Deng 1999; Alene and Manyong 2006; Asadullah and Rahman 2009 for education and Antle et al. 1998; Croppenstedt and Muller 2000; Loureiro 2009; Ulimwengu 2009; Asenso-Okyere et al. 2011 for health) and the macro level (e.g. Reimers and Klasen 2013). Furthermore, it is also possible to construct a second type of POCs where we have on the horizontal axis the households’ endowment in terms of education or health and on the vertical axis the level of agricultural productivity. These POCs (Type 2) thus allow us to additionally answer the converse question, i.e. in how far the education- or health-poor were able to increase their agricultural productivity levels.

To illustrate the amenities of the existing and new tools, we then apply the entire toolbox to three waves of the nationally-representative EICV household survey from Rwanda (years 1999-2001, 2005-2006 and 2010-2011). Our results indicate that Rwanda achieved in the time period under consideration impressive progress in the income, but also in the education and health dimension which was in many cases even pro-poor in the relative sense. In addition, the new PGICs reveal that productivity-poor households were – in the Rwandan case – able to increase their productivity-levels relatively faster than the productivity-rich; however in absolute terms their increases were smaller (thus indicating a widening of the gap between productivity-poor and -rich in absolute terms). Furthermore, it turns out to be important to look separately at the land- and labor productivity-poor since these two groups correspond in Rwanda not necessarily to the same households. Instead, we find - in line with Byiringiro and Reardon (1996) - evidence for a “bottling up” of labor on small farms which may explain the observed inverse farm size-productivity relationship. Lastly, the POCs provide us with indications that the productivity levels of Rwandan human capital-poor households were below those of human capital-rich households and that their productivity increases were in the time period under consideration conspicuously smaller.