Labor productivity and employment gaps in Sub-Saharan Africa

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A B S T R A C T

Drawing on a new set of nationally representative, internationally comparable household surveys, this paper provides an overview of key features of structural transformation – labor allocation and labor productivity – in four African economies. New, micro-based measures of sector labor allocation and cross-sector productivity differentials describe the incentives households face when allocating their labor. These measures are similar to national accounts-based measures that are typically used to characterize structural change. However, because agricultural workers supply far fewer hours of labor per year than do workers in other sectors in all of the countries analyzed, productivity gaps shrink by half, on average, when expressed on a per-hour basis. Underlying the productivity gaps that are prominently reflected in national accounts data are large employment gaps, which call into question the productivity gains that laborers can achieve through structural transformation. Furthermore, agriculture’s continued relevance to structural change in Sub-Saharan Africa is highlighted by the strong linkages observed between rural non-farm activities and primary agricultural production.

1. Introduction

Structural change is integral to economic development. In the development context, it refers both to the reallocation of labor from one low-productivity sector to another, higher-productivity sector, and to the economic growth resulting from this shift. Structural change is a dynamic process powered by several key features – productivity levels within sectors, productivity gaps between them, and the movement of labor from low productivity to high productivity sector(s). The larger the productivity gap between agriculture and other sectors, the larger the opportunity to achieve productivity growth as labor shifts across sectors. In poor economies, agriculture is typically the sector that employs the most people and uses labor least productively. Over time, cross-sector productivity gaps tend to shrink as labor shifts out of agriculture and returns to labor across sectors are equalized through factor markets (Timmer, 1988).

The premise of higher returns to labor outside of agriculture is quite central to structural change. Are these productivity differentials really as high as national accounts data suggest? I use a new micro-level dataset to measure key structural change parameters – sector participation, time use, and labor productivity – from a micro perspective. This paper draws on the Integrated Surveys on Agriculture from the Living Standards Measurement Study group at the World Bank (LSMS-ISA datasets), which explicitly collect information about respondents’ time use across sectors. Particular attention is paid to farm labor, which is often neglected in large scale, multi-topic surveys because of the challenges involved in collecting detailed agricultural data. The analysis includes surveys from Ethiopia, Malawi, Tanzania and Uganda.1 The countries comprising the LSMS-ISA dataset exhibit considerable heterogeneity with respect to GDP per capita, agriculture’s share of the labor force and economy, and productivity gaps (Fig. 1).

Exercising productivity gaps from a micro perspective is informative for several reasons. First, individuals and farm owners making labor allocation decisions in developing countries do so based on the micro incentives that they face. Second, micro datasets contain the variables required to address the validity of assumptions that underlie macro statistics. Third, micro datasets allow for productivity measures to be paired with relevant covariates of labor allocation decisions at the household level. This kind of micro perspective is largely absent from the literature about structural change in African economies. Demographic and
Labor productivity in an economy can be improved either through systematic differences in labor inputs. On a per-hour basis, labor is only 1.4 times as productive outside of agriculture. These results suggest that the forces pulling labor into the industry and service sectors may be weaker than is commonly believed. It also casts doubt on the notion that agriculture is intrinsically less productive than other sectors. Because time inputs in agriculture are generally low, possibly due to biophysical constraints, participation outside of agriculture presents the opportunity to supply more hours of labor per year. It is important to better understand the reasons for low labor supply by agricultural workers in order to identify opportunities to increase annual output per agricultural worker.

2. Background

This paper focuses on Sub-Saharan Africa, the region with the lowest per capita incomes, largest shares of value added captured by agriculture, largest shares of the work force employed in agriculture, and lowest agricultural labor productivity (Fig. 1a) (World Bank Group, 2014). According to national accounts data, labor in developing countries is 4.5 times more productive outside of agriculture than in it. In middle income countries, the ratio is 3.4, and in high income countries, it is 2.2. Within African countries, non-agricultural labor is 6 times more productive outside of agriculture than in it (Fig. 1b) (Gollin et al., 2014b). Other recent studies confirm that large cross-sector productivity differentials persist in Sub-Saharan African countries (McMillan and Harttgen, 2014; Lele et al., 2013).

Labor productivity in an economy can be improved either within sectors (e.g., through technological gains and capital accumulation) or structurally (e.g., by shifting labor out of less-productive activities and into more-productive activities). During the 1990s, African labor entered agriculture rather than exiting it, thereby suppressing overall labor productivity growth (McMillan and Rodrik, 2011). Since 2000, labor productivity growth within agriculture has accelerated in Eastern and Southern Africa, and in Nigeria (Pardey, 2014; Block, 2013). When recent labor productivity growth is decomposed into within- and between-sector growth, labor exits from agriculture account for about half of recent overall labor productivity growth in Africa (McMillan and Harttgen, 2014; McMillan et al., 2014).

Understanding micro level cross-sector productivity differences, and how they relate to sector allocation decisions, is crucial for understanding the forces that power agricultural labor exits. If productivity gaps are indeed as large as African macro statistics suggest, then one must wonder why so much labor remains in rural areas and why rural income diversification remains so low (McMillan and Headey, 2014). One explanation is that, though households may face large productivity gaps, they are not able to diversify because of limited human capital, experience, or financial capital. It is also possible that differences in expected returns between sectors are offset by different levels of risk.

Alternatively, national accounts may mis-measure key components of the productivity equation, namely, labor inputs or returns per worker. After examining many of the assumptions used to calculate sector labor shares, as an alternative to measures based on population censuses or national accounts (e.g., McMillan and Harttgen, 2014; McMillan and Rodrik, 2011). While DHS surveys have very extensive coverage, they cannot be used to generate measures of labor supply beyond participation, nor can they be used to measure returns to sector participation.

I find that, in four Sub-Saharan African countries, the agricultural sector is not a bastion of low productivity but, rather, a large reservoir of underemployed workers. This result emerges when labor inputs are measured more carefully. Using the LSMS-ISA datasets, I replicate common patterns observed in macro statistics – that annual economic output per worker is lower in agriculture than in other sectors and that participation in agriculture is much higher than participation in other sectors. While national statistics suggest that workers in these four countries are 6 times as productive outside of agriculture as in it, I predict the number is closer to 3.4 times on average. This finding is consistent with those of Gollin et al. (2014b), who highlight sources of bias in national accounts measures that lead to under-estimating productivity in agriculture relative to other sectors.

After carefully examining labor inputs, I find that cross-sector productivity gaps observed in national accounts data reflect sectoral differences in employment levels rather than differences in returns per hour worked. Many workers are counted as agricultural

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2 These ratios were calculated using data from Gollin et al. (2014a) and World Bank classifications of countries by income.

3 For a description of how labor productivity growth can be decomposed into share-weighted labor productivity growth and productivity-weighted labor shifts across sectors, see McMillan et al. (2014).
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