



Beyond Agriculture *Versus* Non-Agriculture: Decomposing Sectoral Growth–Poverty Linkages in Five African Countries

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Summary. — Africa’s development debate is often cast as “agriculture *versus* non-agriculture”, with agriculture’s proponents arguing that agricultural growth is more effective at reducing poverty. This “dual economy” perspective overlooks the heterogeneity within and synergies between these two broad sectors. Recent studies decompose agriculture into subsectors and find that agricultural growth led by smallholder farmers is even more effective at reducing poverty than larger-scale estate farms. In contrast, few studies estimate subsectoral growth–poverty linkages for non-agriculture. Yet we strongly expect, for example, that growth led by informal traders or foreign-owned mining companies will have quite different implications for poverty reduction. Different perspectives on what constitutes “non-agriculture” might therefore explain divergent views on its relative importance for poverty reduction. To address this gap in our understanding, we estimate sectoral poverty–growth elasticities using economy-wide models for five African countries. While our estimated elasticities are higher for agriculture than for non-agriculture as a whole, the extent to which this is true varies considerably across nonagricultural subsectors (and across countries). We find that the poverty–growth elasticities for trade and transport services and manufacturing, especially agro-processing, are often close to, and sometimes exceed, agriculture’s. This means that growth led by these nonagricultural subsectors might be as effective as agriculture at reaching the poor. This confirms the need for a more nuanced treatment of non-agriculture in Africa’s policy debate, and may explain conflicting perspectives on agriculture’s role vis-à-vis non-agriculture.
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1. INTRODUCTION

The traditional dual economy perspective, i.e., agriculture *versus* non-agriculture, still underpins much of the debate over which sources of economic growth are most important for poverty reduction in Sub-Saharan Africa (see, for example, Collier & Dercon, 2014; Dercon, 2009; Diao, Hazell, & Thurlow, 2010). This debate is supported by an extensive empirical literature that uses various methods to compare agriculture’s growth linkages and poverty–growth elasticities (PGEs) with those of non-agriculture (see, for example, Christiaensen, Demery, & Kuhl, 2011; De Janvry & Sadoulet, 2010; Diao *et al.*, 2010; Loayza & Raddatz, 2010; Thirtle, Lin, & Piesse, 2003). These studies usually find that agricultural growth in developing countries has larger economy-wide multiplier effects and stronger linkages to poverty reduction than non-agricultural growth (Bezemer & Headey, 2008).

The debate over the role of agriculture became more nuanced over time—focusing now on whether policies should prioritize smallholder or large-scale plantation farming (Collier & Dercon, 2014; Hazell, 2013; Hazell, Poulton, Wiggins, & Dorward, 2010). Recent empirical studies disaggregate agriculture in order to compare the poverty reducing effects of *subsectoral* growth. The authors in Diao, Thurlow, Benin, and Fan (2012), for example, find that, in ten African countries, agricultural growth led by food crops is more poverty-reducing than growth led by export-oriented crops. Since smallholders are more intensively engaged in food production, the authors infer that improving smallholder farming is a priority for poverty reduction. Studies that explicitly compare smallholder and plantation farming reach similar conclusions (see, for example, Arndt, Benfica, Tarp, Thurlow, & Uaiene, 2010). Although these studies have limitations (see Collier & Dercon, 2014; Dercon, 2009; Dercon & Gollin, 2014), their more nuanced perspective on

what constitutes “agriculture” is a definite advance in the debate.

There is less of an advance in our understanding of the effects of nonagricultural growth on poverty reduction. Treating non-agriculture as a single aggregate sector is problematic for at least two reasons. First, most of Sub-Saharan Africa’s economy is classified as “non-agriculture” and includes such diverse activities as foreign-owned mining and informal trading. We expect there to be similar, if not greater, heterogeneity in growth–poverty linkages within non-agriculture as there are within agriculture. If this is the case, then different perspectives on what constitutes “non-agriculture” might explain divergent views on its relative importance. For instance, agriculture’s proponents may compare farming to mining, while its detractors emphasize labor-intensive manufacturing. Secondly, nonagricultural growth in Africa is uneven. Trade and transport services, for example, accounted for a third of Sub-Saharan Africa’s economic growth over the last decade, which is much larger than its share of the economy.¹ This uneven pattern of growth implies that non-agriculture’s aggregate growth–poverty relationship may change over time, thus cautioning against broad sectoral comparisons based on long-run historical relationships. Quantitative evidence is needed to gauge the importance of different perspectives on non-agriculture and its evolving growth–poverty relationship.

Numerous studies measure growth multipliers for different nonagricultural subsectors (see Haggblade, Hazell, & Dorosh, 2007 for a review), and recent studies distinguish between rural areas, towns, and cities (Adam, Bevan, &

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Gollin, 2016; Dorosh & Thurlow, 2013, 2014). There are fewer studies, however, that explicitly estimate PGEs within non-agriculture. One study by Thirtle *et al.* (2003) disaggregates non-agriculture and finds that, unlike for agriculture, there is no significant relationship between poverty reduction and growth in either industry or services. This suggests that separating non-agriculture may be unnecessary. However, Loayza and Raddatz (2010) disaggregate industry, and find a significant relationship between growth and poverty for labor-intensive manufacturing and construction, but not for mining. Similarly, Suryahadi, Suryadarma, and Sumarto's (2009) study of Indonesia finds that while rural agricultural growth is strongly linked to poverty reduction, so too is growth in urban services. These heterogeneous outcomes at the subsectoral level confirm the need for more detailed analysis of non-agriculture and its linkages to poverty.

In this paper we complement the expanding literature on agricultural growth and poverty by estimating PGEs for different nonagricultural subsectors. This is done using dynamic computable general equilibrium (CGE) models of five low-income African countries, which reflect a range of initial conditions, including a varying importance and composition of agriculture, industry, and services. The models allow us to experiment with alternative patterns of growth and to link growth to poverty using a consistent macro-micro framework. In order to permit cross-country comparisons, the model's databases are constructed for a common base year and poverty is defined using a common poverty line. Changes in poverty are measured using micro-simulation techniques. The next two sections present our case study countries and describe the models. We then present our simulation results and conclude by summarizing their implications.

2. CASE STUDY COUNTRIES

Our analysis is based on five African countries: Malawi (MAL), Mozambique (MOZ), Tanzania (TZA), Uganda (UGA), and Zambia (ZAM). Table 1 reports these countries' economic and demographic characteristics for 2007, which is the base year for the economy-wide models. The table also

includes statistics for all low-income countries in Sub-Saharan Africa (SSA).

The five case studies were selected because detailed social accounting matrices (SAMs) are available for these countries for a common base year. Although our small sample of countries accounts for only a fifth of low-income Africa's total population, it still reflects the subcontinent's diversity. Malawi and Zambia offer the widest contrast for many of the indicators shown in the table. Malawi's population is overwhelmingly rural, whereas Zambia is one of Africa's most urbanized countries. GDP per capita is seven times higher in Zambia (US \$950) than it is in Malawi (US\$133), and is still more than three times higher after adjusting for purchasing power parity (PPP). Zambia has a large mining sector, which produces three quarters of the countries' exports. In contrast, agriculture accounts for three quarters of Malawi's exports and a third of its GDP. Agro-processing, which falls under manufacturing and includes the production of food, beverages, and tobacco, is also more important for Malawi than it is for Zambia.² Overall, the sample includes two predominantly agrarian countries (Malawi and Tanzania) and two countries where mining and heavy industry play more important roles (Mozambique and Zambia). Finally, Uganda is more dependent on construction and services.

The table also reports poverty headcount rates, which measure the share of the population whose daily expenditures fall below the US\$1.25 and US\$0.75 poverty lines (measured in 2005 PPP-adjusted dollars). Again, the case studies reflect a range of initial conditions. Uganda has the lowest poverty rate in our sample (50.3%) due to its higher per capita consumption spending (US\$632 per year according to survey data). Conversely, Tanzania has a higher poverty rate (69.9%) and lower per capita consumption (US\$441 per year). Average consumption measures hide differences in income inequality. Zambia has the most unequal expenditure distribution, i.e., the highest Gini coefficient. This explains why Malawi and Zambia have similar poverty rates, despite Malawi's much lower per capita consumption.

The structural heterogeneity discussed above is central to our analysis of growth-poverty linkages. Differing compositions of non-agriculture across countries can cause their aggregate growth-poverty relationships to vary. Mozambique and

Table 1. *Country case study characteristics, 2007*

	SSA	MAL	MOZ	TZA	UGA	ZAM
Population (million)	497.0	12.2	21.5	31.7	27.2	11.7
Rural (%)	73.3	88.7	69.6	75.0	84.6	65.1
GDP per capita (\$)	393	133	342	481	455	950
PPP-adjusted	1,011	358	718	1,402	1,263	1,309
Survey consumption per capita (\$)	n/a	409	558	441	632	509
Gini coefficient	n/a	43.9	45.7	37.6	42.6	54.6
Poverty headcount rate, \$1.25 (%)	50.4	73.9	59.6	69.9	50.3	68.5
\$0.75	23.2	42.7	28.6	41.3	20.2	48.2
Share of total GDP (%)	100	100	100	100	100	100
Agriculture	31.7	32.2	27.7	31.8	21.6	20.1
Mining and utilities	7.4	2.8	7.5	6.5	5.3	8.1
Manufacturing	8.5	11.3	15.4	8.8	7.8	9.7
of which Agro-processing	n/a	6.5	4.2	5.6	3.5	5.9
Construction	5.9	3.9	3.1	7.8	15.8	12.0
Trade and transport	24.7	27.6	24.2	21.9	23.8	29.5
Other services	21.8	22.3	22.1	23.2	25.7	20.6

Source: Own calculations using national social accounting matrices, UNSD (2013) and World Bank (2013, 2014).

Notes: SSA is low-income Sub-Saharan Africa; MAL is Malawi; MOZ is Mozambique; TZA is Tanzania; UGA is Uganda; and ZAM is Zambia. Poverty rates use dollar-a-day poverty line adjusted for purchasing power parity (PPP). Consumption and poverty estimates from the survey year closest to 2007 (SSA: 2005; MAL: 2004-05; MOZ: 2008-09; TZA: 2007; UGA: 2005-06; ZAM: 2006).

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