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POVERTY REDUCTION AND ECONOMIC STRUCTURE: COMPARATIVE PATH ANALYSIS FOR MOZAMBIQUE AND VIETNAM

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While economic growth generally reduces income poverty, there are pronounced differences in the strength of this relationship across countries. Typical explanations for this variation include measurement errors in growth–poverty accounting and different compositions of economic growth. We explore the additional influence of economic structure in determining a country's growth–poverty relationship and performance. Using structural path analysis, we compare the experiences of Mozambique and Vietnam—two countries with similar levels and compositions of economic growth but divergent poverty outcomes. We find that the structure of the Vietnamese economy more naturally lends itself to generating broad-based growth. A given agricultural demand expansion in Mozambique will, ceteris paribus, achieve much less rural income growth than in Vietnam. Inadequate education, trade and transport systems are found to be more severe structural constraints to poverty reduction in Mozambique than in Vietnam. Investing in these areas can significantly enhance the effectiveness of Mozambican growth to reduce poverty.

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1. Introduction

Economic growth is generally thought to reduce poverty—a relationship supported by cross-country empirical studies. However, global averages conceal wide variation at the country-level, where even rapid growth may not signifi-

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cantly improve the incomes of the poor (see Ravallion, 2001). Thus while fast growing Asian economies like China and Vietnam have generated substantial declines in poverty, there are equally fast growing countries like India where poverty has fallen far more modestly (World Bank, 2010).[1] More troubling is that poverty rates have remained virtually unchanged over recent periods in some of Sub-Saharan Africa's fastest growing countries, like Mozambique and Tanzania (NBS, 2008; DNEAP, 2010). These instances of "growth *without* poverty reduction" raise concerns over the desirability of more growth-oriented development strategies.

One explanation for a weak relationship between growth and poverty outcomes is differences in the methods and accuracy of national growth and poverty accounting. Numerous studies have examined various aspects of these measurement issues (see Deaton, 2001, 2005) and how they might lead to different poverty trends (Sala-i-Martin and Pinkovskiy, 2010). However, Ravallion (2003) concludes that, while consumption *levels* do vary between national accounts and expenditure-based household surveys, their growth rates are correlated in most developing countries. A second explanation lies in the *composition* of economic growth. To illustrate, agricultural growth is typically more poverty-reducing than other sources of growth (Ravallion and Datt, 2002; Diao *et al*., 2010). Differences in countries' sectoral growth patterns may, therefore, lead to different national poverty-growth elasticities (PGE) and thus explain why countries with similar growth rates generate different rates of poverty reduction. A third and related explanation lies in a country's *structural characteristics*, which define the size and nature of economic linkages between productive sectors and households' incomes (Thorbecke and Jung, 1996). Even when two countries have similar levels and compositions of growth their economic structures may produce different poverty outcomes.

In this paper we examine the role of economic structure in determining poor households' incomes. We take Mozambique and Vietnam as case studies, given their equally strong growth performance over the last decade; their similar sectoral composition of economic growth; and yet their widely different successes in reducing poverty. Section 2 considers our two case studies' comparability in light of their economic histories, structure, and performance. We then use two comparable social accounting matrices (SAMs) to decompose the growth linkages (or multipliers) of Mozambique and Vietnam using structural path analysis (SPA). Section 3 describes this methodology and our databases, and Section 4 presents the results of our analysis. We find that Vietnam's economic structure more readily lends itself to generating broad-based growth. A similar expansion of agricultural demand in Mozambique will, ceteris paribus, achieve far less rural income growth than in Vietnam. We conclude that structural characteristics explain at least some of the variation in the growth–poverty relationships observed across countries. The final section summarizes our findings and their policy recommendations.

[1]Based on the 1 US$-a-day poverty line and gross domestic product (GDP) adjusted for purchasing power, the Chinese and Vietnamese poverty-growth-elasticities have been estimated at –0.76 (1981–2005) and –1.31 (1983–2006), respectively, while that for India was –0.44 (1993–2006) (World Bank, 2010).

2. Case Study Countries: Mozambique and Vietnam

The economic histories of Vietnam and Mozambique have much in common. After gaining independence from colonial rule (in 1954 for Vietnam and 1975 for Mozambique), both countries underwent 15 years of war and destruction (i.e. 1959–75 in Vietnam and 1977–92 in Mozambique). Emerging from war, both countries faced the enormous challenge of reconstruction and development. Although the initial national strategies of both countries were inspired by socialist central planning and the administrative allocation of resources, their recent strategies have been characterized by more market-oriented approaches.

In Vietnam, fundamental post-war economic reorientation started with a comprehensive reform program launched in 1986 known as "doi moi" (renovation). These reforms sought to create a "socialist-oriented market economy" by introducing land tenure rights, market-based prices and competition, financial sector reform, and enterprise law targeted toward private sector development. Access to international markets also improved consistently after 1993, when the U.S. lifted its trade embargo, culminating in Vietnam's accession to the World Trade Organization in 2007. In Mozambique, economic reforms also began in 1986 under the "Program for Economic Rehabilitation." However, war was still widespread and it was only after the 1992 peace agreement that recovery began in earnest. Like Vietnam, Mozambique has opened itself to foreign trade and has been a major recipient of foreign direct investment. Other external resources have also played important roles in both countries.[2]

It is not only the economic histories of Mozambique and Vietnam that are similar. As shown in Table 1, more than 70 percent of their populations were defined as living in rural areas at the end of the 1990s. The definition of rural and urban between the two countries differs, but relying on each country's definition, poverty within Mozambique and Vietnam has become increasingly concentrated in rural areas and so agriculture remains a key economic sector. However, it has been the industrial sector that has grown the fastest at over 7 percent per year in both countries. Services has also expanded at similar rates and given the sector's large contributions to overall GDP it has been the main source of economic growth over the last decade. Overall, per capita GDP grew at 4.9 and 5.9 percent in Mozambique and Vietnam, respectively, reflecting their strong economic performances since the late 1990s.

Although the levels and broad compositions of economic growth in Mozambique and Vietnam appear to be similar, the two countries have not experienced similar reductions in poverty. National poverty rates fell in both countries, yet poverty reductions were much more marked in Vietnam in both relative and absolute terms. More specifically, the share of the population categorized as "absolutely poor" using an expenditure-based "cost of basic needs" approach fell

[2]Mozambique has been, since the early 1990s, one of the largest aid recipients in the world on a per capita basis. Vietnam has been a large aid recipient in absolute terms. When aid is combined with offshore oil revenues, the per capita value of external resources has been similar.

TABLE 1
KEY STATISTICS FOR MOZAMBIQUE AND VIETNAM

	Mozambique			Vietnam		
	Values or Shares		Average Annual	Values or Shares		Average Annual
	1997	2009	Change (%)	1998	2008	Change (%)
Population (1000s)	16,888	22,894	2.6	76,520	86,211	1.2
Rural share (%)	72.0	62.4	–	76.5	71.7	–
Poverty headcount rate (%)	69.4	55.2	–1.2	37.4	13.0	–2.4
Real GDP per capita (US$)	208	371	4.9	364	647	5.9
Agriculture	72	108	3.4	94	141	4.2
Manufacturing	20	48	7.4	62	132	7.8
Other industry	17	40	7.6	56	123	8.2
Services	98	175	4.9	152	251	5.2
GDP share (%)	100.0	100.0	–	100.0	100.0	–
Agriculture	34.9	29.2	–	25.8	21.9	–
Manufacturing	9.8	12.9	–	17.1	20.4	–
Other industry	8.0	10.7	–	15.3	18.9	–
Services	47.4	47.2	–	41.7	38.8	–

Source: Own calculations using World Bank (2010) and nationally representative household surveys for poverty estimates for 2009 in Mozambique and 2008 in Vietnam (GSO, 2009; DNEAP, 2010).

from 69 to 55 percent during 1997–2009 in Mozambique, and from 37 to 13 percent during 1998–2008 in Vietnam.[3] These divergent poverty outcomes are reflected in the two countries' PGEs, which show the percentage change in the poverty rate divided by the percentage change in per capita GDP. Mozambique's PGE was –0.38 during 1997–2009 while Vietnam's was –1.69 for 1998–2008.[4] This means that a 1 percent increase in national GDP lowered the poverty headcount rate by about 0.4 percent in Mozambique as opposed to 1.7 percent in Vietnam. Economic growth has therefore been far more "pro-poor" in Vietnam than in Mozambique, despite similar levels of growth.

While broadly similar, there are some differences in the composition of growth. Table 1 illustrates that agricultural sector growth was more rapid in Vietnam than in Mozambique. This gap will increase when downwards revisions in the official rate of growth of agricultural production are incorporated into national accounts statistics in Mozambique. These revisions will also reduce the overall growth rate in per capita income somewhat though the rate will remain rapid and comparable to Vietnam. More rapid growth in the agricultural sector in Vietnam may account for some of the differences in poverty reduction; nevertheless, other factors may also be at play. In particular, structural differences may exist between the two countries that contributed materially to the divergence in

[3]Trends in inequality are somewhat less clear due to a variety of measurement issues. In both countries, inequality appears to have deteriorated over the period with the likelihood of more substantial increases in the Gini-coefficient in Mozambique.

[4]PGE calculations are sensitive to the beginning and end year GDP and poverty estimates. Mozambique's PGE may be underestimated given the detrimental effects of high food and oil prices during 2008 (Arndt *et al*., 2008; DNEAP, 2010).

poverty outcomes. In what follows, we examine this possibility using multiplier and structural path analysis.

3. Methodology

3.1. *SAM Multipliers*

A SAM is an economy-wide database capturing all income and expenditure flows between economic institutions (or accounts) during a given year, including production activities, households, government, and the rest of the world (Pyatt and Round, 1979; Stone, 1985). A SAM is square matrix with expenditures along columns and receipts along rows, as shown below for a SAM S containing n accounts:

$$S_n = \begin{bmatrix} T_{aa} & 0 & T_{ah} & T_{ax} \\ T_{fa} & 0 & 0 & T_{fx} \\ 0 & T_{hf} & T_{hh} & T_{hx} \\ T_{xa} & T_{xf} & T_{xh} & T_{xx} \end{bmatrix} \quad a, f, h, x \subset n$$

Each sub-matrix T represents a payment from one account to another. For example, the cell T_{fa} shows payments from activities a (e.g. agriculture) to factors of production f (e.g. land and labor). These factor earnings are then paid to households h (in cell T_{hf}) or to the government as factor taxes (as part of T_{xf}). Households then purchase the output of activities (T_{ah}) and make transfers to other households (T_{hh}) and accounts (T_{xh}) (e.g. direct taxes paid to government). Row and column totals in the SAM are equal. One account's expenditure is another's receipt. This identity can be expressed as follows, where y_n is total income for each account:

$$y_n = \sum_m T_{nm} = \sum_m T_{mn} \quad m = n.$$

The SAM can be separated into two broad sets of accounts. Exogenous accounts x include the government, investment (or capital), and the rest of world. They are exogenous because their flows are assumed to be determined outside of the multiplier framework. The remaining endogenous accounts i include activities, factors, and households (i.e. $i = a \cup f \cup h$). Average expenditure shares a_{ij} are derived by dividing each column entry by its total income:

$$a_{ij} = t_{ij}\hat{y}_i^{-1} \quad j = i \tag{1}$$

where t_{ij} is an individual element of S_n and $\hat{y}_i$ is a diagonal matrix with entries y_i. The resulting matrix A_i refers only to endogenous accounts:

$$A_i = \begin{bmatrix} A_{aa} & 0 & A_{ah} \\ A_{fa} & 0 & 0 \\ 0 & A_{hf} & A_{hh} \end{bmatrix}. \tag{2}$$

Endogenous total incomes y_i can then be derived by multiplying expenditure propensities in each row from equation (2) by total income and adding exogenous income e_i:

$$y_i = A_i y_i + e_i \quad \text{where} \quad e_i = \sum_x T_{ix}.$$

This equation can be rearranged to derive the well-known multiplier matrix M_i:

$$y_i = (I - A_i)^{-1} e_i = M_i e_i. \tag{3}$$

This means that changes in total endogenous income y_i for each account can be derived by multiplying M_i by the change in the exogenous injection e_i.

Equation (3) captures the direct *and* indirect effects arising via endogenous account interactions. When agricultural demand expands it not only raises agricultural production but also household incomes, thereby generating additional demand for agricultural products. However, multiplier analysis assumes that there are sufficient factor resources (or excess capacity) to allow production to expand in response to higher demand (i.e. underutilized land and underemployed labor are readily available to agricultural producers). If resources are constrained then changes in production and incomes cannot be interpreted as *real* changes, but may reflect changes in factor and product prices. While fixed-price multipliers are suitable for examining structural characteristics across sectors, caution should be exercised when comparing countries with very different resource constraints. A further characteristic of multiplier analysis is that it estimates the final economy-wide effect of an exogenous change in demand. It does not decompose the indirect impact channels causing the income change. However, this can be addressed by decomposing multipliers using structural path analysis.[5]

3.2. *Structural Path Analysis*

SAM-based SPA was first introduced by Defourny and Thorbecke (1984). The intent of SPA is to reveal in a transparent way the network of channels through which the socio-economic system is influenced as reflected by the SAM. As shown by Thorbecke and Jung (1996), SPA is fully general. As such, any multiplier decomposition can be viewed as a special case of SPA. SPA interprets the expenditure share a_{ji} calculated from the SAM in equation (1) as being the magnitude or intensity of the "influence" along the arc linking account i to account j (i.e. the direction of the expenditure flow). A "path" consists of one or more consecutive arcs connecting the account where the exogenous shock takes place (i.e. "pole of origin") to the final account where income changes are evaluated (i.e. "pole of destination"). We distinguish between direct influences, total influences, and global influences.

Direct influence measures the change in income or production caused by a change in exogenous demand along a single path holding all other (indirect) paths

[5]Accounting multipliers are derived from the matrix of average expenditure propensities, which can be a disadvantage when marginal expenditure propensities differ significantly from the average.

constant (i.e. ceteris paribus). For an elementary path containing a single arc $(i \rightarrow j)$ the direct influence I^D is the expenditure coefficient a_{ji} drawn from A_i in equation (3), as follows:

$$I^D_{(i \rightarrow j)} = a_{ji}.$$

For more complex paths containing multiple arcs between poles i and j, the direct influence is equal to the product of the intensities of the component arcs along the path:

$$I^D_{(i \rightarrow j)_p} = I^D_{(i \ldots j)} = a_{jn} \ldots a_{mi}.$$

Total influence is a broader measure capturing how the direct influence of a path p is amplified by indirect linkages *immediately adjacent* to the path (Lantner, 1974). The formula for total influence I^T is:

$$I^T_{(i \rightarrow j)_p} = I^D_{(i \rightarrow j)_p} M_p$$

where $I^D_{(i \rightarrow j)_p}$ is the direct influence of path p, and M_p is the "path multiplier." The path multiplier capturing indirect effects is the ratio of two determinants:

$$M_p = \frac{\Delta_p}{|I - A_i|}$$

where $|I - A_i|$ is the determinant of the structure represented by the SAM and Δ_p is the determinant of the structure excluding the poles constituting path p (see Defourny and Thorbecke, 1984).

Finally, *global influence* is analogous to the full multiplier effects in that the global influence $I^G_{(i \rightarrow j)}$ is equal to the element m_{ji} from the multiplier matrix M_i in equation (3), as follows:

$$I^G_{(i \rightarrow j)} = m_{ji} = \sum_{p=1}^{n} I^T_{(i \rightarrow j)_p}.$$

Importantly, the global influence of a path can be decomposed into a series of total influences transmitted along each elementary paths connecting i and j (where $p = 1 \ldots n$).

By decomposing multiplier effects into their component influences, SPA allows us to examine why differing structural characteristics may lead to different multiplier effects on selected outcomes. In Section 4 we combine multiplier and SPA to investigate why similar exogenous expansions in demand in Mozambique and Vietnam led to different income changes for poor households.

3.3. *Mozambique and Vietnam SAMs*

To capture the economic structures of our two case study countries, we developed comparable SAMs for each country for the same base year, 2003. These

TABLE 2
ENDOGENOUS ACCOUNTS IN THE MOZAMBIQUE AND VIETNAM SAMS

Activities (*a*)		Activities (*a*) (continued)		Factors (*f*)	
AGRI	Agriculture	NMET	Non-metal minerals	FLND	Crop land
LVSK	Livestock	MACH	Machinery	FLAB_L	Low skilled labor
FORE	Forestry	CONS	Construction	FLAB_M	Medium skilled labor
FISH	Fisheries	UTIL	Utilities	FLAB_H	High skilled labor
MINE	Mining	TRAD	Trade	FCAP	Capital
FOOD	Processed foods	HOTL	Hotels and catering		
TEXT	Textiles	TRAN	Transportation	*Institutions* (***h***)	
WOOD	Wood	FINB	Finance and business	ENT	Enterprises
FUEL	Fuel	GOVN	Government services	HHD_R	Rural households
CHEM	Chemicals	OSRV	Other services	HHD_U	Urban households

SAMs were drawn together in collaboration with official statistics agencies and are the best possible summary representations of the economies during that year (see Jensen and Tarp, 2007; McCool *et al*., 2009).[6]

The main data source for the SAMs is official supply–use tables (SUTs). We selected 2003 as a base year since both countries had estimated SUTs in that year.[7] Constructing a SUT is similar to rebasing national accounts and ensures production- and demand-side consistency for individual industries and products. Due to data limitations, however, the technical coefficients of the input–output table (i.e. production technologies) were drawn from different years: 1995 for Mozambique and 2000 for Vietnam. Vietnam's SAM may therefore more accurately reflect production linkages. The SUTs also estimate transaction margins for each product, i.e. trade and transport costs incurred when moving products from producers/borders to the market. In both countries transaction margins were estimated using the differences in producer and consumer prices captured by market surveys.

The two country-SAMs were aggregated to have identical dimensions and accounts: 20 production activities, 5 factors, and 3 institutions (see Table 2). This was facilitated by the use of standard industry/product classifications. Nationally-representative household surveys were used to disaggregate labor compensation by worker education levels (i.e. years of schooling).[8] The surveys were also used to separate household incomes and expenditures across urban and rural areas according to official urban classifications (i.e. the 1997 and 1999 population census definitions for Mozambique and Vietnam, respectively).

The Mozambique and Vietnam SAMs employ consistent industry/product definitions; have the same SUT benchmark years; and use similar methods to reconcile demand/supply balances and estimate trade margins. Moreover, 2003 was a "typical" year, with normal weather conditions and commodity prices prevailing in both countries. As such, differences between the two SAMs are

[6]The SAMs are available upon request.

[7]Mozambique's SUT was first estimated for 2002 and then updated to 2003 by the national statistics agency.

[8]The selected surveys were the 2002/2003 "Inquérito Nacional aos Agregados Familiares Sobre Orçamento Familiar" (IAF) for Mozambique and the 1998/1999 "Vietnam Household Living Standard Survey" for Vietnam.

TABLE 3
RANKING OF SECTORS BY GDP AT FACTOR COST

		Rank (largest to smallest)	
		Mozambique, 2003	Vietnam, 2003
AGRI	Agriculture	1	1
LVSK	Livestock	14	13
FORE	Forestry	10	20
FISH	Fisheries	12	10
MINE	Mining	19	2
FOOD	Processed foods	6	5
TEXT	Textiles	15	8
WOOD	Wood	16	19
FUEL	Fuel	20	18
CHEM	Chemicals	18	12
NMET	Non-metal minerals	17	15
MACH	Machinery	8	4
CONS	Construction	5	6
UTIL	Utilities	13	11
TRAD	Trade	2	17
HOTL	Hotels and catering	9	16
TRAN	Transportation	3	9
FINB	Finance and business	11	7
GOVN	Government services	4	3
OSRV	Other services	7	14

Source: Own calculations using the Mozambique and Vietnam SAMs.

unlikely to be driven by differences in national accounting procedures or by external shocks. Rather, they reflect differences in economic structure and provide a suitable base year for the growth periods under analysis (i.e. 1997–2009 for Mozambique and 1998–2008 for Vietnam).

Table 3 lists the 20 production accounts ranked according to their contribution to total GDP at factor cost. According to these rankings, agriculture is the major sector in both Mozambique and Vietnam.[9] However, mining is an important sector only in Vietnam, while trade services is a major sector in Mozambique.

4. RESULTS

Three distinguishing features of our case study countries are particularly relevant for interpreting the results from our multiplier and path analysis. First, Vietnam is one of the world's most densely populated countries with 259 people per square kilometer, while Mozambique is sparsely populated with only about 27 persons per square kilometer (World Bank, 2010). Moreover, rural populations in Mozambique do not exhibit any strong tendency to agglomerate within certain localities. Accordingly, national population density statistics provide insight into the wide differences in spatial relationships between the two countries. Second, while population density is higher in Vietnam, average household size is smaller.

[9]Metals (included in machinery or MACH) are important in Mozambique in GDP terms but of little relevance in GNP terms due to high levels of capital intensity and foreign ownership.

Rural households in Vietnam consist of 3.9 persons on average, while the corresponding figure for Mozambique is 4.6 (INE, 2007; GSO, 2009). Finally, educational attainment is much higher in Vietnam. Some 94 percent of the adult population in Vietnam is considered literate, while the figure for Mozambique is below 50 percent (World Bank, 2010). This difference in education levels reflects long-run historical factors and the fact that war ended in 1975 in Vietnam compared to 1992 in Mozambique.

4.1. *Rural versus Urban Household Income Multipliers*

The absolute values of the aggregate rural and urban household income multipliers are shown in Table 4. In Vietnam, rural households have consistently larger income multipliers than urban households. The reverse is true in Mozambique. For agriculture, the ratio of the rural to the urban multiplier is 1.92 in Vietnam and 0.85 in Mozambique (i.e. 0.71/0.37 and 0.99/1.16, respectively). For the weighted average for the 20 sectors (using value added shares), the equivalent ratios are 1.38 in Vietnam and 0.60 in Mozambique. Rural households in Vietnam therefore benefit relatively more than urban households from economic expansion anywhere in the economy. The opposite is true in Mozambique, where urban households benefit relatively more than rural households. Given that a vast

TABLE 4
Rural and Urban Household Income Multipliers

		Mozambique		Vietnam	
		Rural	Urban	Rural	Urban
AGRI	Agriculture	0.99	1.16	0.71	0.37
LVSK	Livestock	0.90	1.18	0.70	0.40
FORE	Forestry	0.77	1.21	0.42	0.29
FISH	Fisheries	0.83	1.20	0.58	0.41
MINE	Mining	0.49	0.96	0.45	0.40
FOOD	Processed foods	0.54	0.87	0.48	0.32
TEXT	Textiles	0.39	0.70	0.20	0.17
WOOD	Wood	0.43	0.81	0.25	0.21
FUEL	Fuel	0.24	0.43	0.14	0.12
CHEM	Chemicals	0.17	0.32	0.21	0.17
NMET	Non-metal minerals	0.32	0.66	0.34	0.29
MACH	Machinery	0.25	0.52	0.14	0.11
CONS	Construction	0.43	0.90	0.34	0.29
UTIL	Utilities	0.30	0.62	0.45	0.40
TRAD	Trade	0.69	1.21	0.37	0.31
HOTL	Hotels and catering	0.51	1.09	0.35	0.29
TRAN	Transportation	0.47	0.95	0.31	0.27
FINB	Finance and business	0.19	0.39	0.37	0.32
GOVN	Government services	0.68	1.38	0.54	0.41
OSRV	Other services	0.67	1.32	0.43	0.35
	Weighted average	0.64	1.06	0.44	0.32

Note: Value added shares are used to obtain the weighted average.
Source: Multiplier results using the Mozambique and Vietnam SAMs.

TABLE 5
SOURCES OF HOUSEHOLD INCOME (SHARE OF TOTAL INCOME)

	Mozambique, 2003		Vietnam, 2003	
	Rural	Urban	Rural	Urban
High-skilled labor	0.0	21.6	0.8	7.8
Medium-skilled labor	4.8	21.9	7.8	14.5
Low-skilled labor	66.5	25.8	56.0	31.3
Land	19.9	0.0	8.5	0.3
Capital	8.6	29.6	12.6	27.6
Government transfers	0.2	0.2	10.6	8.9
Foreign transfers	0.0	0.8	3.5	9.7
Total income	100	100	100	100

Source: Own calculations using the Mozambique and Vietnam SAMs.

majority of the poor in both countries live in rural areas, this explains some of Vietnam's greater success of reducing poverty.[10]

A few additional observations are informative at this point. First, Table 5 illustrates sources of factor income by household type. Urban households in Vietnam are more dependent on transfers from the government and abroad (18.6 percent of total income) than Mozambican households (1.0 percent). This helps explain the rural/urban dichotomy. Since these transfers or accounts are *exogenous* in our analysis, they tend to reduce urban households' income multipliers in Vietnam relative to those of rural households.

Second, the structure of income in the two countries differs vis-à-vis the role of skills in generating labor income, particularly in urban areas. In Mozambique, urban households are much more dependent on returns to skilled labor as a share of their total income despite their lower educational attainment relative to Vietnam. This reflects much higher premiums to skilled versus unskilled labor in Mozambique as compared with Vietnam. This is shown in Table 6. Medium-skilled workers earn 65 percent more than low-skilled workers in Mozambique but only 33 percent more in Vietnam. Similarly, high-skilled workers in Mozambique earn 180 percent more than medium-skilled workers, while skilled workers in Vietnam earn only 70 percent more. The premium for high skilled labor in Mozambique, relative to the unskilled wage, is more than twice as large as in Vietnam. Finally, note that, while skills premiums are lower, average wages are higher in Vietnam, reflecting the much larger stock of skilled labor.

Table 7 shows the weighted average of the ratio of factor multipliers to the low-skilled labor multiplier obtained for each sector. To illustrate, if there is a one unit injection of demand for agriculture in Mozambique, this results in a multiplier for high-skilled labor of 0.142 and 1.064 for low skilled labor (see Table A1 in the

[10]Marginal expenditure propensities may differ from average expenditure propensities. On the basis of Engel's Law, we expect this to be true for households. Using econometrically estimated expenditure elasticities for food products and employing plausible values for expenditure elasticities for non-food products, the sensitivity of the results presented in Table 4 (as well as in other tables) was considered. We find that qualitative conclusions hold. For reasons of simplicity, we elect to present detailed analysis of the accounting multipliers. We do note in what follows that the path decomposition from urban to rural households, as represented by Figure 3, becomes qualitatively more complex.

TABLE 6

Non-Farm Wage Ratios by Labor Skill Groups (relative to low-skilled labor)

	Vietnam, 2004 (1)	Mozambique, 2002 (2)	Country Ratio (2) / (1)
All workers	1.70	1.44	0.85
High-skilled labor	2.26	4.62	2.05
Medium-skilled labor	1.33	1.65	1.25
Low-skilled labor	1.00	1.00	1.00

Source: Own calculations using the 2002/03 and 2004 household surveys for Mozambique and Vietnam, respectively (INE, 2003; GSO, 2006).

TABLE 7

Ratio of Factor Multipliers to Low-Skilled Labor Multiplier (weighted averages across sectors)

	Mozambique, 2003 (2)	Vietnam, 2003 (1)	Country Ratio (2) / (1)
High-skilled labor	0.26	0.09	2.91
Medium-skilled labor	0.38	0.24	1.59
Land	0.18	0.15	1.15
Capital	0.74	0.81	0.92

Note: Value added shares are used as weights.
Source: Multiplier results using the Mozambique and Vietnam SAMs.

Appendix). The ratio of the high-skilled to low-skilled labor multipliers is therefore 0.13. Using value added shares as weights to obtain an average across all sectors, the table presents these average ratios by factor type for the two countries. Similar calculations are performed for Vietnam (using Table A2 in the Appendix).

The table shows that multipliers for high- and medium-skilled labor (relative to low-skilled) in Mozambique are much higher than the corresponding values for Vietnam. By contrast, relative to low-skilled labor, the land and capital multipliers are quite similar between the two countries.

In summary, rural households in Mozambique earn relatively little from the ownership of high-skilled labor. This reflects very low educational attainment in rural areas. In contrast, returns to skills account for 44 percent of urban households' total income (see Table 5). In addition, the structure of the economy channels factor incomes toward higher-skilled labor (see Table 6). As a result, urban households tend to have relatively larger multipliers in Mozambique. The inverse is true in Vietnam. Part of the difference stems as already alluded to from a lower dependence on transfers (particularly transfers from abroad) in rural households compared with urban households. In terms of the magnitude of household multipliers, this different degree of dependence on (exogenous) income transfers tends to inflate rural household multipliers relative to urban multipliers. Rural multipliers in Vietnam are also favored by relatively high low-skilled wages (compared to skilled wages) (see Table 6) and an economy that channels factor income more toward low-skilled labor (see Table 7), which rural households own in relative abundance.

The different composition of household incomes in combination with different returns to skills helps to explain why economic expansion will tend to favor poorer rural households in Vietnam and urban households in Mozambique. Ceteris paribus, for a given demand expansion, poverty will inherently tend to fall more in Vietnam than in Mozambique.

4.2. *Multiplier Normalization*

Referring back to Table 4, we see that the absolute sector multipliers in Mozambique are systematically greater than in Vietnam for both rural and urban households. As indicated earlier, it is important to bear in mind that the magnitude of the absolute multipliers is dependent on the relative size of the endogenous and exogenous sectors in the two countries. Vietnam is a more open economy (higher trade shares) with higher levels of investment. At the same time, the government is somewhat larger in Mozambique. Overall, the relative size of the exogenous accounts is larger in Vietnam, which leads to more leakages and lower multipliers compared to Mozambique.

In order to facilitate comparison of the multiplier magnitudes across the two countries, we "normalize" the multipliers by dividing each sector's accounting multiplier by the weighted average (with value added shares as the weights) of these multipliers. Table 8 presents normalized income multipliers for rural and urban households. The columns of the table are the values from Table 4 divided by the weighted average presented in the bottom row of Table 4. Normalization allows us to focus on the size of multipliers of either urban or rural incomes in each

TABLE 8

Normalized SAM Multipliers for Urban and Rural Households

		Mozambique		Vietnam	
		Rural	Urban	Rural	Urban
AGRI	Agriculture	1.55	1.09	1.62	1.18
LVSK	Livestock	1.39	1.11	1.61	1.26
FORE	Forestry	1.20	1.14	0.97	0.93
FISH	Fisheries	1.29	1.13	1.32	1.29
MINE	Mining	0.77	0.90	1.02	1.26
FOOD	Processed foods	0.84	0.82	1.10	1.00
TEXT	Textiles	0.60	0.66	0.46	0.54
WOOD	Wood	0.67	0.76	0.58	0.65
FUEL	Fuel	0.38	0.40	0.32	0.37
CHEM	Chemicals	0.26	0.30	0.47	0.53
NMET	Non-metals	0.50	0.62	0.77	0.91
MACH	Machinery	0.38	0.49	0.31	0.36
CONS	Construction	0.66	0.85	0.79	0.92
UTIL	Utilities	0.46	0.59	1.04	1.27
TRAD	Trade	1.07	1.14	0.85	0.98
HOTL	Hotels and catering	0.80	1.03	0.79	0.92
TRAN	Transportation	0.73	0.90	0.70	0.86
FINB	Finance and business	0.29	0.37	0.85	1.02
GOVN	Government services	1.06	1.30	1.23	1.30
OSRV	Other services	1.05	1.24	0.99	1.10

Source: Multiplier results using the Mozambique and Vietnam SAMs.

country relative to the economy-wide average across sectors.[11] A normalized multiplier with a value greater than one is larger than the economy-wide average multiplier.

The largest normalized household income multipliers in both countries are in agriculture, fisheries and livestock. Furthermore, the normalized multipliers are similar between the two countries.[12] We also see that, once normalized, injections into typically rural-based sectors (agriculture, livestock, forestry, and fisheries) provide greater relative rural income benefits compared with other sectors in both Vietnam and Mozambique. In addition, in both cases, injections into these rural-based sectors provide stronger normalized multipliers to rural households compared with urban households. Similarly, normalized multipliers for industry and services tend to be higher for urban households in both countries.

Taken together, this implies that an exogenous increase in demand for agriculture (and other natural resource dependent sectors) is relatively large in both economies, and that agricultural growth will have disproportionately large impacts on rural incomes in both countries. This confirms the strategic role of the agricultural sector in economic development and poverty reduction in both Vietnam and Mozambique and indicates that the better performance of agriculture likely contributed to the more rapid reductions in poverty experienced in Vietnam. This observation is reinforced in Table 9, which presents normalized SAM multipliers for output and value added for the two countries.

In Vietnam, and especially in Mozambique, output and valued-added (or GDP) multipliers are strongly correlated. In Vietnam, the agricultural sector has the second largest value-added multiplier (livestock is slightly larger), while in Mozambique, the agriculture value-added multiplier is the largest. Other primary extractive sectors, such as fisheries (in both cases), forestry (in Mozambique), and mining (in Vietnam) also have relatively large value-added multipliers, again underscoring the key roles played by agriculture and resource extraction in both economies. Outside of these sectors, notable differences in the relative magnitudes of multipliers between the two countries exist in processed foods, trade, and utilities.

In addition, for other highly-ranked sectors (see Table 3), we note that the construction sector in Vietnam generates a normalized value-added multiplier of 0.88 compared with 0.80 for Mozambique. In both countries, these are reasonably strong multipliers relative to other non-extractive sectors. The importance of government services for both countries is also confirmed by strong normalized income multipliers (especially for urban households) (Table 8) and value-added multipliers (Table 9). Finally, in comparison to Vietnam, rural households in Mozambique appear to be less well integrated with respect to government expenditure (Table 8).

[11]Since the rural and urban multipliers are normalized by their respective average multiplier, it is not possible to compare rural and urban multipliers within each country. Normalization does, however, allow us to compare rural or urban multipliers across Mozambique and Vietnam.

[12]The correlation coefficient between rural multipliers is 0.82 while the coefficient between urban multipliers is 0.65.

TABLE 9
NORMALIZED SAM MULTIPLIERS FOR OUTPUT AND GDP

		Mozambique		Vietnam	
		Output	GDP	Output	GDP
AGRI	Agriculture	1.13	1.24	1.11	1.37
LVSK	Livestock	1.10	1.21	1.25	1.39
FORE	Forestry	1.14	1.17	0.93	0.94
FISH	Fisheries	1.16	1.18	1.11	1.27
MINE	Mining	0.99	0.88	1.00	1.22
FOOD	Processed foods	0.96	0.83	1.19	1.04
TEXT	Textiles	0.76	0.63	0.97	0.52
WOOD	Wood	0.87	0.73	0.91	0.63
FUEL	Fuel	0.59	0.39	0.60	0.35
CHEM	Chemicals	0.49	0.29	0.79	0.51
NMET	Non-metals	0.73	0.60	1.10	0.87
MACH	Machinery	0.61	0.48	0.69	0.34
CONS	Construction	0.94	0.80	1.12	0.88
UTIL	Utilities	0.64	0.57	0.98	1.20
TRAD	Trade	1.06	1.11	0.98	0.92
HOTL	Hotels and catering	0.96	1.00	0.93	0.87
TRAN	Transportation	0.92	0.85	0.84	0.82
FINB	Finance and business	0.46	0.33	0.89	0.94
GOVN	Government services	1.15	1.18	1.07	1.19
OSRV	Other services	1.08	1.15	0.91	1.00

Source: Multiplier results using the Mozambique and Vietnam SAMs.

4.3. *Detailed Structural Path Analysis*

Next we decompose the multiplier effects using SPA to evaluate differences in the impact channels through which income flows to rural households in Mozambique and Vietnam. In what follows, we focus on two key sectors for our case study countries identified in Table 3, namely agriculture and construction, and examine the paths linking these sectors to rural household incomes. We also consider the linkages between urban consumer demand and rural households.

SPA results are typically presented in table format. Table 10 reports the pathways through which agricultural activity influences the incomes of rural households in Mozambique. The origin pole is agriculture (AGRI) and the destination pole is rural households (HHD_R). The global influence of 0.99 corresponds to the income multiplier between these two poles (see Table 4). In other words, a one dollar increase in exogenous agricultural demand leads to a 0.99 dollar increase in rural household incomes.

The table shows the 17 most important paths, which cover approximately 95 percent of the global influence. SPA decomposes the total (global) multiplier effect into different paths. In this case, more than 40 percent of the increase in rural household incomes (HHD_R) from a stimulus to agricultural activity (AGRI) is channeled directly through an increase in the demand for low-skilled labor (FLAB_L). Similarly, the second most important channel is the returns to land (FLND), which, in our SAMs, is entirely owned by rural households.

We graphically represent the channels through which shocks are transmitted as well as their relative contribution to the global influence or multiplier effect. The

TABLE 10

PATH ANALYSIS FROM AGRICULTURE TO RURAL HOUSEHOLDS IN MOZAMBIQUE

Overall Path Details	Structural Paths (excluding origin and destination poles)	Direct Influence $I^D_{(i\to j)_p}$	Path Multiplier M_p	Total Influence $I^T_{(i\to j)_p}$	Share of Global Influence (%)	Cumulative Share (%)
	FLAB_L	0.2017	2.0513	0.4137	41.62	41.62
Origin	FLND	0.1974	1.8825	0.3716	37.39	79.01
pole (i):	TRAD → FLAB_L	0.0470	2.3196	0.1091	10.98	89.99
AGRI	FCAP → ENT	0.0069	2.1006	0.0145	1.46	91.45
	TRAD → FLAB_M	0.0046	2.3150	0.0106	1.06	92.51
Destination	TRAD → TRAN → FLAB_L	0.0031	2.5759	0.0079	0.79	93.30
pole (j):	TRAD → FCAP → ENT	0.0028	2.3855	0.0067	0.68	93.98
HHD_R	TRAD → FINB → FLAB_L	0.0011	2.3891	0.0027	0.27	94.25
	FLAB_M	0.0008	2.0584	0.0016	0.16	94.41
Global	TRAD → HOTL → FLAB_L	0.0005	2.5830	0.0012	0.12	94.53
influence:	TRAD → TRAN → FLAB_M	0.0005	2.5537	0.0012	0.12	94.65
0.994	TRAD → OSRV → FLAB_L	0.0003	2.4214	0.0007	0.07	94.72
	TEXT → TRAD → FLAB_L	0.0002	2.6313	0.0006	0.06	94.78
	TEXT → FLAB_L	0.0002	2.3368	0.0005	0.05	94.83
	FUEL → TRAD → FLAB_L	0.0002	2.3224	0.0004	0.04	94.88
	TRAD → FINB → FLAB_M	0.0002	2.3815	0.0004	0.04	94.92
	FINB → FLAB_L	0.0001	2.1269	0.0003	0.03	94.94

Source: Structural path analysis results using the Mozambique SAM.

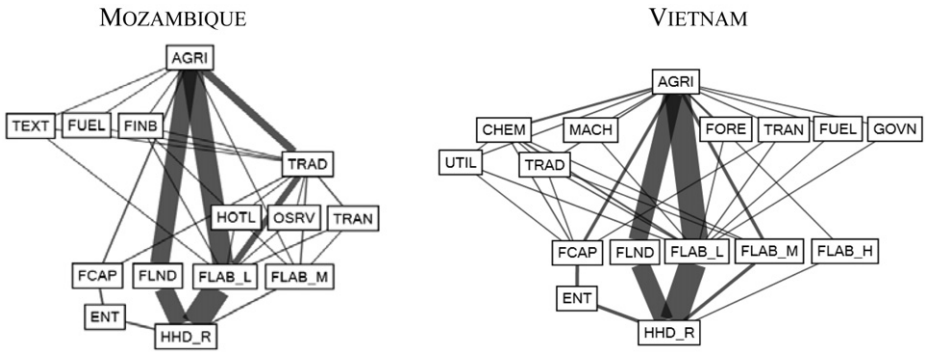

Figure 1. Income Flows to Rural Households from an Exogenous Increase in Agricultural Demand

left hand side of Figure 1 corresponds to the SPA results for Mozambique from Table 10. The flows in the figure represent the channels through which income moves between production activities, production factors, households, and enterprises. The thickness of each flow represents the share of global influence (or total income change) passing through that particular path.

For example, the fourth row in Table 10 (AGRI→FCAP→ENT→HHD_R) is represented in the figure by the line connecting the four accounts: agriculture (AGRI), factor-capital (FCAP), enterprise (ENT), and rural household (HHD_R). The line is narrow since this impact channel accounts for only 1.46 percent of the total (global) income flow. By contrast, the line connecting land (FLND) and rural households (HHD_R) represents 37.39 percent of the total income flow, and so is represented by a much thicker line. This graphical representation provides an indication of the differences in economic structure across our two case studies.

Table A3 in the Appendix presents the data for Vietnam underlying Figure 1. The figure clearly shows the overwhelming importance in both countries of the impact channels running from agriculture directly through land and low-skilled labor to rural household incomes. This commonality aside, the role of trade is somewhat different, with a more significant share of income flowing through this sector in Mozambique. This reflects the larger transaction costs in Mozambique compared to Vietnam. In other words, reflecting large distances and low population densities, a larger share of agricultural demand is directed toward covering the cost of transporting goods from farm gate to consumer. Another difference between countries is the larger number of channels through which income flows in Vietnam, reflecting a more complex agricultural structure (i.e. more production and demand linkages).

Figure 2 shows the weighted impact channels linking construction to rural household incomes.[13] The figure shows that the returns from low-skilled labor and

[13]The tabulated results for Figures 2 and 3 are presented in Tables A4–A5 and A6–A7 in the Appendix, respectively.

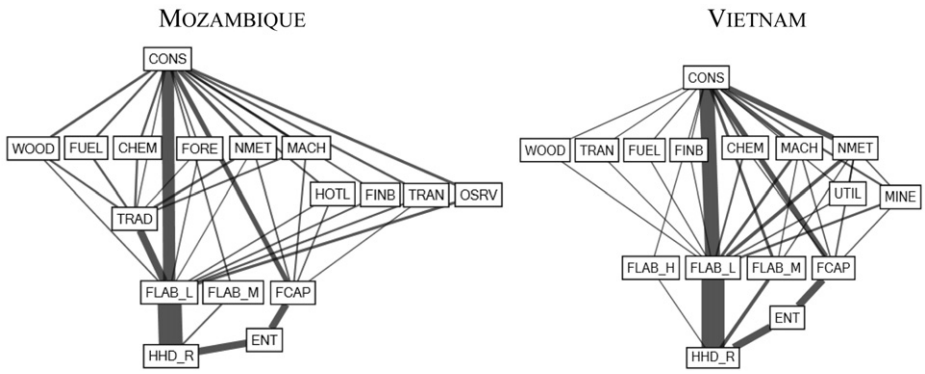

Figure 2. Income Flows to Rural Households from an Exogenous Increase in Construction

factor capital are the most important sources of income for rural households in both Vietnam and Mozambique. Again, the trade sector plays a more important role for income transmission in Mozambique, while returns from medium- and high-skilled labor are relatively more important in Vietnam. While the graphical depiction of SPA for construction looks very similar for both countries, the shares of the top five paths in the global influence differ between Vietnam and Mozambique (see Appendix Tables A4 and A5). In Mozambique, the top five paths account for about 3 percent of the total influence while in Vietnam the corresponding value is about 60 percent. The principal source of difference is the much weaker link via labor (about one third of influence in Vietnam and one sixth in Mozambique) followed by weaker links to capital earnings (one tenth versus one twentieth).[14]

Finally, we consider the connections between urban and rural households, as shown in Figure 3. In both countries, the food and agricultural sectors are important channels for distribution of the benefits to rural households of a demand stimulus from an extra unit of income to urban households.[15] Again, one of the main differences is the greater role of trade in Mozambique reflecting the country's higher transaction costs in the food and agricultural sectors.

In each of the three SPAs presented in this section, it is clear that the transmission channels of exogenous shocks to the economy in Vietnam and Mozambique are very similar. The only consistent difference lies in the more prominent role played by trade in Mozambique. As the detailed accounting multipliers in the Appendix illustrate, a demand shock to agriculture, construction, or

[14]In addition, due to the lower overall level of leakages in the Mozambique SAM, the magnitudes of influence accorded to small flows tend to be higher. When the global influence is small, the share of small flows tends to be large.

[15]If marginal household expenditure shares are applied, the relative importance of other paths beyond food and agriculture expands considerably in both countries though food and agriculture remain very important. Trade remains a far more important transmission channel in Mozambique as compared with Vietnam.

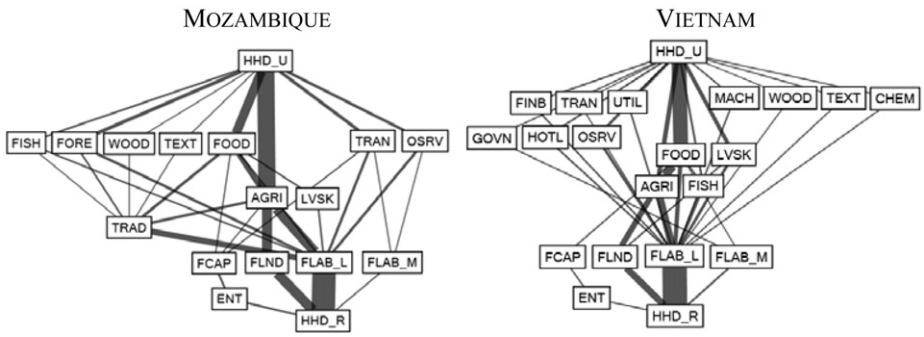

Figure 3. Income Flows to Rural Households from an Exogenous Increase in Urban Household Income

urban households implies a substantial stimulus to the trading sector in Mozambique. The same is true for transport services, albeit to a lesser extent. The rural income multipliers in Table 4 showed that expanding demand for trade services favors the incomes of urban rather than rural households in Mozambique, while the opposite is true in Vietnam. The high trade margins associated with Mozambique thus act as a "leakage" from the rural economy, and reduce the benefits accruing to rural households from an expansion in agricultural demand.

As an illustration, indirect demand for foodstuffs generated by urban households in Mozambique is strongly biased toward the capital, Maputo. Maputo is both the seat of the national government, with commensurately high levels of government employment, and the major business centre in the country. At the same time, Maputo is located relatively far from the productive regions of Mozambique but close to South Africa, so food expenditure of residents in the principal urban growth pole is directed substantially toward imports, particularly from South Africa. This weakens the linkages between key sectors, such as government and services, and the sector of greatest relevance to poverty reduction, namely agriculture. By contrast, in Vietnam the two major urban poles of demand, Ho Chi Minh City and Hanoi, are located near principal zones of agricultural production. As a result, household expenditures on food in these urban growth poles are largely channeled back into rural areas.

5. Conclusions

Although economic growth is usually associated with reductions in income-based poverty, the strength of this relationship varies widely across countries. This variation can be partly explained by differences in growth and poverty measurement and in the sectoral composition of growth. In this paper, we focused on how differences between economic structures may also influence the growth–poverty relationship. Mozambique and Vietnam were selected as case studies. They have experienced similar levels and broadly similar compositions of economic growth, and yet Vietnam has been far more successful at reducing poverty. Drawing on comparable databases, we conducted multiplier and structural path analysis to

evaluate how structural differences can determine the ability of growth (or a demand expansion) to reduce poverty (or raise rural incomes).

Variation in multipliers across sectors indicates that the composition of growth is an important determinant of the growth–poverty relationship. Our analysis revealed that multipliers are highest in agriculture for both countries, thus highlighting the key role that this sector plays in raising incomes, especially for rural households. More rapid growth in agriculture forms part of the explanation behind Vietnam's more rapid rate of poverty reduction. More detailed analysis of variation in the size of the individual sector multipliers between Mozambique and Vietnam (before and after normalization) suggests that there are also important structural differences within sectors between the two countries. Specifically, multipliers were found to be higher for the incomes of rural than urban households in Vietnam, whereas the reverse was true for Mozambique. This implies that a demand expansion, even in agriculture, favors urban households in Mozambique and helps explain why growth does not generate as much poverty reduction.

We then used structural path analysis to decompose the multipliers into their various impact channels, and found that trade and transport plays a larger role in income transmission in Mozambique. Marketing systems and infrastructure are more developed in Vietnam and the locations of principal urban growth poles are closer to major agricultural production zones, implying that each increment in food demand requires fewer resources be allocated to covering transaction costs. Since a demand expansion for trade and transport services in Mozambique favors urban households, the higher transaction costs means that fewer of the income gains from agricultural growth accrue to rural households. Vietnam's ability to move goods efficiently between producers and consumers translates into more direct effects on poverty.

Overall, we find that the structure of the Vietnamese economy more naturally lends itself to generating broad-based growth. In addition, our case studies reveal that countries with similar levels and compositions of economic growth may still generate different poverty outcomes due to differences in economic structure within sectors.

Three policy implications emerge. First, inadequate education levels and high-skill premiums at least partly explain why a demand expansion in Mozambique does not generate broad-based income gains. A continuation of existing policies to promote widespread education in Mozambique would therefore narrow the skills premium currently earned mainly by urban households, while also enabling poorer rural households to participate more in the growth process. Though it is inappropriate to state "ceteris paribus" with respect to a structural change such as a broad-based increase in educational attainment, intuition and our results suggest that improved educational attainment would tend to raise rural income multipliers in Mozambique. Second, high transaction costs in Mozambique reduce the gains from economic growth accruing to rural households. Investing in rural infrastructure and institutions to reduce these transaction costs would reduce some of the existing leakages from rural to urban economies, thereby raising rural income multipliers. In addition, efforts to foment urban growth poles beyond the southern regions of the country would generate more favorable urban-

to-rural growth linkages as the more productive agricultural regions of Mozambique would be more proximate and would naturally supply these urban growth poles. Finally, the importance of agriculture for poverty reduction confirms the need for investment in and attention to this sector, particularly in Mozambique. While far from exhaustive, our analysis suggests that this combination of interventions is needed to overcome the structural barriers to poverty reduction in low-income countries.

References

Arndt, C., R. Benfica, N. Maximiano, A. Nucifora, and J. Thurlow, "Higher Fuel and Food Prices: Impacts and Responses for Mozambique," *Agricultural Economics*, 39, 497–511, 2008.

Deaton, A., "Counting the World's Poor: Problems and Possible Solutions," *World Bank Research Observer*, 16, 125–47, 2001.

———, "Measuring Poverty in a Growing World (or Measuring Growth in a Poor World)," *Review of Economics and Statistics*, 57, 1–19, 2005.

Defourny, J. and E. Thorbecke, "Structural Path Analysis and Multiplier Decomposition within a Social Accounting Matrix," *Economic Journal*, 94, 111–36, 1984.

Diao, X., P. Hazell, and J. Thurlow, "The Role of Agriculture in African Development," *World Development*, 38, 1375–83, 2010.

DNEAP, *Poverty and Well Being in Mozambique: The Third National Assessment*, National Directorate of Poverty Analysis and Studies, Ministry of Planning and Development, Maputo, 2010.

GSO, *Vietnam Household Living Standards Survey 2006*, General Statistics Office, Government of Vietnam, Hanoi, 2006.

GSO, *Vietnam Household Living Standards Survey 2008 Electronic Data*, General Statistics Office, Government of Vietnam, Hanoi, 2009.

INE (National Institute of Statistics), *Household Consumption Survey 2002–03*, electronic data, Government of Mozambique, Maputo, 2003.

INE (National Institute of Statistics), *National Census*, Government of Mozambique, Maputo, 2007.

Jensen, H. T. and F. Tarp, "A Vietnam Social Accounting Matrix (SAM) for the Year 2003," Central Institute for Economic Management, Hanoi, Vietnam; and the Development Economics Research Group, University of Copenhagen, Denmark, 2007.

Lantner, R., *Théorie de la économique*, Dunod, Paris, 1974.

McCool, C., J. Thurlow, and C. Arndt, "Documentation of Social Accounting Matrix (SAM) Development," in C. Arndt and F. Tarp (eds), *Taxation in a Low-Income Economy: The Case of Mozambique*, Routledge, New York, 2009.

NBS, *Household Budget Survey 2007—Tanzania Mainland*, National Bureau of Statistics, Dar es Salaam, Tanzania, 2008.

Pyatt, G. and J. I. Round, "Accounting and Fixed Price Multipliers in a SAM Framework," *Economic Journal*, 89, 850–73, 1979.

Ravallion, M., "Growth, Inequality and Poverty: Looking Beyond the Averages," *World Development*, 29, 1803–15, 2001.

———, "Measuring Aggregate Welfare in Developing Countries: How Well Do National Accounts and Surveys Agree?" *Review of Economics and Statistics*, 85, 645–52, 2003.

Ravallion, M. and G. Datt, "Why Has Economic Growth Been More Pro-Poor in Some States of India than Others?" *Journal of Development Economics*, 68, 381–400, 2002.

Sala-i-Martin, X. and M. Pinkovskiy, "African Poverty is Falling . . . Much Faster Than You Think!" Working Paper 15775, National Bureau of Economic Research, 2010.

Stone, J. R. N., "The Disaggregation of the Household Sector in the National Accounts," in G. Pyatt and J. I. Round (eds), *Social Accounting Matrices: A Basis for Planning*, World Bank, Washington DC, 1985.

Thorbecke, E. and H-S. Jung, "A Multiplier Decomposition Method to Analyze Poverty Alleviation," *Journal of Development Economics*, 48, 279–300, 1996.

World Bank, *World Development Indicators Online Database*, Washington DC, 2010 (available at: data.worldbank.org/indicator; accessed October 28, 2010).

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table A1: Detailed SAM Multipliers for Mozambique
Table A2: Detailed SAM Multipliers for Vietnam
Table A3: Path Analysis from Agriculture to Rural Households in Vietnam
Table A4: Path Analysis from Construction to Rural Households in Mozambique
Table A5: Path Analysis from Construction to Rural Households in Vietnam
Table A6: Path Analysis from Urban Households to Rural Households in Mozambique
Table A7: Path Analysis from Urban Households to Rural Households in Vietnam

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