

# Urbanization and Poverty Reduction

## The Role of Rural Diversification and Secondary Towns

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## Abstract

A rather unique panel tracking more than 3,300 individuals from households in rural Kagera, Tanzania during 1991/4–2010 shows that about one in two individuals/households who exited poverty did so by transitioning from agriculture into the rural nonfarm economy or secondary towns. Only one in seven exited poverty by migrating to a large city, although those moving to a city experienced on average faster consumption growth. Further analysis of a much larger cross-country panel of 51 developing countries cannot

reject that rural diversification and secondary town development lead to more inclusive growth patterns than metropolitization. Indications are that this follows because more of the poor find their way to the rural nonfarm economy and secondary towns, than to distant cities. The development discourse would benefit from shifting beyond the rural-urban dichotomy and focusing instead more on how best to urbanize and develop the rural nonfarm economy and secondary towns.

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# **Urbanization and Poverty Reduction – The Role of Rural Diversification and Secondary Towns**

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## 1 Introduction

The world is urbanizing rapidly, especially in developing countries, where, by 2020, more than half the population is projected to be urban (United Nations, 2011). This is welcomed as a most positive development by some observers, as exemplified in “*The Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier and Happier*” (Glazer, 2011). The view goes back to longstanding theories of economic development, finding their roots in the work of Arthur Lewis and Simon Kuznets. As people shift out of agriculture to more remunerative activities off the farm and outside the rural areas, a positive virtuous economic dynamic is set in motion, with new opportunities being generated, by attracting poor rural workers who gain directly, and by positively affecting the rural areas indirectly, through remittances and increased demand for their goods, fostering economic growth and reducing poverty.

Others view these developments with more suspicion and see them as a forebear of new sources of poverty. They point to congestion effects hindering growth and the negative externalities from geographically concentrated poverty (such as violence) as well as the irreversibility of urban migration. High migration costs may prevent the poor from returning, locking them in their new informal settings. A larger share of the poor appears indeed to be living in urban areas nowadays, coined the “urbanization of poverty”, even though overall poverty has come down substantially (Ravallion, Chen, and Sangraula, 2007; Chen and Ravallion, 2010).

This paper takes a different view and seeks to shift the dialogue beyond the oft stale dichotomy between rural and urban development communities, drawing attention to the nature of the urbanization process. In particular, not only is the developing world poised to urbanize rapidly (with the urban population expanding by about another one billion people between 2010 and 2025 to 3.6 billion), most of this urbanization is also projected to concentrate in large cities. Only 140 million of the new urban population is expected to reside in secondary towns of 500,000 people or less, while 664 million are projected to join cities of one million or more (UN 2011 World Urbanization Prospects Report).

Compare this with the urbanization patterns during the past 4 decades (1970-2010), when the urban population expanded by about 2 billion, with 1 billion of them joining secondary towns of 500,000 or less. In other words, not only is the overall geographic landscape changing dramatically, with many more people living in urban areas, the urban landscape itself is also undergoing significant change, with 47.6 percent of the urban population in the developing world predicted to be living in cities of one million or more by 2025 (compared with 26.5 percent in 1970).

And just like not all economic growth processes are equally poverty reducing<sup>2</sup>, so may the nature of urbanization and the rural-urban transformation affect the speed of poverty reduction: how the world urbanizes may well be as important as urbanization itself. There are at least three channels that can drive these differences: agglomeration economies, rural off-farm employment, and urbanization externalities. We review each of them in turn.

The clustering of a country's urban population in few localities, known as urban concentration,<sup>3</sup> could generate more economic growth and jobs. The new economic geography literature, for example, emphasizes how urbanization fosters economies of scale and agglomeration, which are found to propel economic growth (World Bank, 2009). The existence of localized external economies of scale has been documented for heavy industries and more modern manufacturing sectors such as transport and high tech. Externalities arising from producers locating close to suppliers and service providers as well as consumers, and knowledge interactions in dense interactive locations can further add economies of agglomeration, especially beneficial to high tech industries (Henderson, 2010). Economies of scale and agglomeration would thus favor urban concentration, provided it also maximizes employment generation for the (unskilled) poor.

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<sup>2</sup> In this, agricultural growth is for example often considered key as driver of growth and poverty reduction early on in the development process. As countries take off and transition through their structural transformation, non-agriculture usually takes over as engine of growth, while agriculture maintains its superior poverty reducing powers, at least for the poorer of the poor (Montalvo and Ravallion, 2010; Loayza and Raddatz, 2010; Christiaensen, Demery, and Kuhl, 2011).

<sup>3</sup> Urban concentration needs to be distinguished from urbanization. While the latter concerns the share of the population residing in urban areas, the former refers to distribution of the urban population across the system of cities, with urban primacy, the share of the urban population living in the largest cities, one common measure of urban concentration.

Secondly, there are positive spillovers of urban centers on the rural hinterlands, through consumption linkages, urban-rural remittances, upward pressure on agricultural wages, and the generation of rural non-farm employment (Lanjouw and Murgai, 2009; Cali and Menon, 2013).<sup>4</sup> This is especially important as 70 percent of the world's poor are estimated to be rural (World Bank, 2008). Whether the positive spillover effects on (aggregate) rural poverty are stronger for metropolises than for secondary towns is not clear *a priori*. The magnitude of the positive spillover effects on rural poverty in the hinterlands of metropolises could for example be larger, while the economic space and population affected by the metropolises may also be smaller than this affected by all the secondary towns taken together.

Finally, another longstanding literature has highlighted the positive role of rural nonfarm activities in poverty reduction, with rural towns, which mediate the flow of inputs, goods and services between rural hinterlands and larger urban centers, seen as the most effective generators of nonfarm employment for the poor (Haggblade, Hazell, and Reardon, 2007). There are a number of reasons to believe off-farm jobs generated in nearby villages or rural towns may be more readily accessible to the poor. First, unskilled and semi-skilled workers often make up the vast majority of the workforce in rural towns, while semi-skilled and skilled workers dominate the workforce in the cities, as observed for example in Ethiopia and Uganda (Dorosh and Thurlow, 2012).

Second, while rural towns have lower wages, they may also have lower unemployment rates. This could be attractive to the poor, who may not be able to afford long spells of unemployment.<sup>5</sup> Even if the likelihood of finding a job is similar—no gradient in ILO defined unemployment rates across city size was observed by Coulombe and Lanjouw (2013) in 12 African countries—lower migration costs and the ability to maintain and exploit closer

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<sup>4</sup> Cali and Menon (2013) estimated the contribution of secondary town spillovers to rural poverty reduction in India during 1983-1999 to be 13 to 25 percent.

<sup>5</sup> Rural unemployment was estimated around 7 percent, urban unemployment around 16 percent and unemployment in Dar es Salaam around 31 percent (Glasser et al., 2008). Introduction of migrant heterogeneity in the standard Harris-Todaro framework, sorting across cities by skill set and easier access to information about jobs, may further explain the lower unemployment rates in secondary towns and larger poverty reduction effects from migration to secondary towns. On the other hand, persisting hope to strand a high paying job or set up a thriving business, coverage of the basic expenses (e.g. housing) by the urban social networks, and the shame associated with admitting failure would all conspire against an early return when unsuccessful, inducing migrants to queue and helping explain the persistence of large informal settlements in many large cities.

social ties with the areas of origin might further favor migration of the rural poor to nearby towns as well as circular migration and commuting to find off-farm employment and exit poverty, as opposed to migration to distant cities.<sup>6</sup> But lower agglomeration economies in rural towns might lead to slower economic growth (and job creation).<sup>7</sup>

Thus, while urban concentration may be more conducive to aggregate economic growth—and important caveats<sup>8</sup> remain—the pro-poor marginal incidence of nonfarm employment expansion may be higher for secondary towns. The indirect effects of more and less concentrated urbanization patterns on rural poverty through positive spillovers on the rural economy are *a priori* unclear.

Overall, the relationship between urbanization and poverty reduction, beyond its effect on growth, remains little studied.<sup>9</sup> Furthermore, metropolitan bias due to rent seeking by the ruling elites (Henderson, 2003; Behrens and Bala, 2013) and the challenges in empirically estimating the diseconomies of scale in urban living due to rising transport and housing costs compound an empirical analysis of the effect of the nature of urbanization on poverty reduction, let alone the channels through which it operates. In explaining the observed association between poverty reduction, growth and urban concentration, the economic forces (agglomeration economies and diseconomies) will need to be separated from the political ones (rent seeking).

At the same time, as illustrated above, the question of urban concentration is pressing, as

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<sup>6</sup> Poncet (2006) documents for example that migration flows in China decrease significantly with the distance between origin and destination locations, with intra-province migration flows substantially higher than inter-province flows and migration to adjacent provinces more common than migration to provinces further away. The literature on the relationship between migration distance and migration flows is longstanding, going back as far as Sjaastad (1962). For a comprehensive review of the determinants of rural-urban migration in developing countries, see Lall, Selod and Shalizi (2006).

<sup>7</sup> However, there are also less scale externalities and knowledge spillovers in traditional industries such as textiles and food processing, which are usually found in smaller towns and cities. As such activities often dominate manufacturing in lower income countries given their comparative advantage in these labor intensive sectors, a more dispersed urbanization process does not necessarily have to come at great expense to economic growth. And great specialization has also been observed in smaller size cities (Henderson, 2010).

<sup>8</sup> As political factors, diseconomies of scale in living and transport and the nature of industrial activities all have to be taken into account in analyzing the relationship between urban concentration and economic growth, important caveats remain regarding its empirical robustness, shape and universal applicability across types of industries and countries (Henderson, 2003; Henderson, 2010; Behrens and Bala, 2013).

<sup>9</sup> Theoretical expositions by Anand and Kanbur (1985), Ravallion (2002) and Fields (2005) and an initial empirical exploration by Ravallion, Chen and Sangraula (2007) are notable exceptions.

policymakers prepare to accommodate the next wave of rural migrants with China and India for example contemplating the development of super-cities (Henderson, 2010) and Africa also urbanizing rapidly, while finding itself already at high levels of urban primacy (Behrens and Bala, 2013). The lock-in of urbanization patterns, including through infrastructural lock-in, adds further urgency.

Building on Ravallion, Chen and Sangraula (2007) and Christiaensen and Todo (2013), this study further illustrates the differential effects on poverty reduction from metropolitization versus rural diversification and development of secondary towns by presenting stylized facts from a rather exceptional survey documenting nearly two decades of spatial and occupational change for a panel of respondents from Kagera, Tanzania. Cross-country analysis using country fixed effect panel estimation techniques applied to 206 poverty spells from 51 developing countries spread across five continents, spanning 1980-2004, is subsequently applied to examine whether broader empirical regularities can be uncovered.

Practically, in both the Tanzania case and the multi-country study, the population is classified into three groups according to their occupation and location: 1) those living in rural areas and employed in agriculture, 2) those living in mega cities and employed in industry and services, and 3) those living in rural areas and secondary cities and employed outside agriculture. The latter group will be referred to as the “middle”, reflecting its operational definition as the residual category between the total population and those employed in agriculture and those living in mega-cities. Hence the study differs conceptually from most of the literature, which typically applies either a spatial (rural-urban) or an occupational (agriculture-non-agriculture) dichotomy.

In Kagera, Tanzania, 1 out of 2 individuals interviewed in 1991/4 that exited poverty by 2010, did so through transition out of agriculture into the middle, 1 out of 3 while continuing as farmers, and only 1 out of 7 through migration to capitals or other big cities (Dar es Salaam, Kampala, and Mwanza). In addition, while unemployment rates were more than three times higher among migrants in the latter group than among those moving to the middle, their



average consumption growth was also 73 percent higher. It was especially the fact that many more of the poor found their way to the middle (4 times more people moved to the middle than to the big cities, labeled the “size effect”) which made the contribution of migration out of agriculture into the middle to poverty reduction so much larger, rather than their higher likelihood of finding jobs in the middle (even at possibly lower wages) (labeled the “Harris-Todaro” effect).

The micro-case study findings, emphasizing the role of the middle in poverty reduction, were echoed at the cross-country level. Rural diversification and secondary town expansion yielded on average faster poverty reduction and more inclusive growth patterns than metropolitization, again largely resulting from the size effect and robust to proxies of political interference and a series of definitional issues and competing hypotheses. While no causality is purported as such, these case study findings and cross-country empirical regularities add a timely, new dimension to the ongoing debates about the role of urbanization in development and its implications for the spatial distribution of portable (education, health) and nonportable (infrastructure) public goods.

The study proceeds by documenting the spatial and occupational change observed in the case study of Kagera, Tanzania in section 2. This further motivates the cross-country analysis, whose empirical methodology is discussed in section 3, while section 4 describes its information base and the empirical insights that emerged. Section 5 concludes.

## **2 Micro-evidence from Kagera, Tanzania**

Kagera is a region in the north-western part of Tanzania. At more than 1,000 km from Dar es Salaam, it is the region furthest removed from the commercial capital of the country. It is overwhelmingly rural, and with more than 80 percent of the region’s economically active population engaged in agriculture (URT, 2006a), agricultural production remains the most important source of income. Bananas, beans, maize, and cassava comprise the main food crops and coffee, tea, and cotton are important cash crops. Over the past decades, some

farmers in Kagera have expanded into new crops, such as cabbages, tomatoes, green peppers and vanilla, while others have diversified into non-farm activities, such as Nile perch fishing, mining, trading and so on (De Weerd, 2010). These sectoral shifts have coincided with substantial migration within and outside the region (Beegle, De Weerd and Dercon, 2011).

Overall, the Kagera population is of diverse ethnic make-up with Haya and Nyambo tribes dominating in the north, and Subi, Sukuma, Zinza and Hangaza in the south. Projections based on the 2002 census put the population of Kagera at a little over 2.5 million people (URT, 2006b). Under half of the population was aged 0–14 years and around 5 percent were over 65 years old. Kagera is known for being one of the early epi-centers of HIV/AIDS with the first cases having been detected at Ndolage Hospital in 1983. Kwasigabo et al. (2005) studied trends in prevalence rates and note their steady decline over the years. While urban Bukoba recorded a peak of 24 percent prevalence in 1987, other districts had figures well below that. The Tanzanian Commission for AIDS (TACAIDS), the National Bureau of Statistics (NBS) and ORC Macro (2005) put the region wide prevalence in 2004 at 3.7 percent of individuals aged 15–49, well below the national average of 7 percent. Finally, in the early nineties the region hosted several hundreds of thousands of refugees from Rwanda and Burundi. The economic impact of this has been described by Baez (2007) and Maystadt (2010).

The baseline Kagera Health and Development Survey (KHDS) consists of 915 households, sampled to be representative of Kagera and interviewed up to four times from autumn 1991 to January 1994 and then twice more in 2004 and 2010. A more formal comparison of the baseline KHDS data with the Tanzania's national 1991/2 Household Budget Survey, shows that across a range of demographic and socio-economic indicators, there is only minimal difference between the Kagera sample and the rest of rural Tanzania (results available upon request). The region also appeared to mirror the rest of the country in terms of growth and poverty reduction: real GDP growth was just under 4 percent per year between 1993 and 2002, while poverty in Kagera is estimated to have fallen from 31 to 29 percent between 1992 and 2001 (Demombynes and Hoogeveen, 2007). The challenges of

poverty reduction in Kagera seem to be representative for rural Tanzania as a whole: only some pockets in Tanzania, such as Dar es Salaam, have had substantial growth and poverty reduction, but this has not spread to other areas. This reflects the typical problem of land-locked, agriculture-based economies: how to deliver poverty reduction if the main engine of growth appears to be elsewhere.

In 2004 and 2010 follow-up surveys aimed to re-interview all individuals that were ever considered a household member in the baseline survey and were alive at the time of re-survey. A full household questionnaire was administered in a household where a panel respondent was found residing. Due to household dynamics, the sample size increased to more than 3,313 households by 2010.<sup>10</sup> Excluding households for which all previous members were deceased (17 households and 27 respondents), the KHDS 2010 field team managed to re-contact 92 percent of the initial households. Table 1 gives further details on the interview status at individual level. Starting from the baseline sample, 11.2% of the individuals were not found, while 0.5% refused to be interviewed. The attrition rates in KHDS are extremely low, even compared to much shorter term panels (Alderman et al., 2001). The average baseline household spawned 4.1 households by 2010, out of which 2.4 were non-migrant and 1.7 were migrant households.

There is occupational data for 1991/94 and 2010. Because the analysis is conducted at the household level, households are classified into farm<sup>11</sup> and non-farm based on the self-reported occupation of the head. In 2010, households were found in three cities: Dar es Salaam, Mwanza and Kampala. This is defining cities as locations with more than 500,000 inhabitants. There are a further 21 respondents who moved to areas that, while administratively recognized within Tanzania as cities, have a population below 500,000 (Arusha, Tanga and Mbeya). Results do not change if we change the definition from a population-based one to an administrative one.<sup>12</sup> The occupational and spatial data are

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<sup>10</sup> De Weerd et al (2012) provide more details.

<sup>11</sup> Farming includes both agriculture and livestock keeping and can be both in self-employment or working for others (typically as a casual labourer).

<sup>12</sup> For Tanzania we use population projections per district based on the 2002 census data (URT, 2006b), which are available at the district level. These include the population living in the 'green belts' around the cities in question. Administratively Tanzania has the following cities (2002 population in brackets): Mbeya (358,939),

combined to create three sectors: farmer, middle and city. The farmer and city categories speak for themselves, while the middle category is a residual category of anyone who is not a farmer and not living in a city. These could be non-agricultural rural dwellers or residents of secondary towns.

The consumption data originate from extensive food and non-food consumption modules in the survey, carefully designed to maintain comparability across survey rounds and controlling for seasonality. The consumption aggregate includes home produced and purchased food and non-food expenditure. The non-food component includes a range of non-food purchases, as well as utilities, expenditure on clothing/personal items, transfers out, and health expenditures. Funeral expenses and health expenses prior to the death of an ill person were excluded. Conservatively, rent is also excluded from the aggregate to avoid large differences in prices for similar quality housing being the driver of any measured urban-rural disparities. The aggregates are temporally and spatially deflated using data from the price questionnaires included in each survey round. As household size may differ between urban and rural households, consumption is expressed in per adult equivalent units rather than per capita. The poverty line is set at 326,474.2 Tanzanian shillings (TSh)<sup>13</sup>, calibrated to yield for our sample of respondents who remained in Kagera the same poverty rate as the 2007 National Household Budget Survey estimate for rural areas (37.6 percent).

Combing the occupational, spatial and consumption changes between 1991/94 and 2010 (Table 2), it emerges that the agricultural share of the sample reduced from 82 percent in 1991/94 to 48 percent in 2010. Tanzania is clearly undergoing a structural transformation.<sup>14</sup> Second, categorizing the households into 6 groups depending on their starting point (farming and middle) and sectoral shifts (farm-farm, farm-middle, farm-city) shows that most people start from farming and remain in farming (1,368 out of 3,301), while the second largest group

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Dar es Salaam (3,118,132, or 2,993,096 excluding more rural areas), Arusha (362,484), Mwanza (596,885, being the sum of Ilemela (331,344) and Nyamagana districts (265,541)), Tanga (298,881). For Uganda UBOS (2012) estimates the total population of Kampala at 1.72 million.

<sup>13</sup> At the time of the survey one US dollar was worth around TSh 1,450.

<sup>14</sup> It is important to note that our panel can inform us on how a representative cross-section of the population in Kagera in 1991/94 fared up until 2010. It is, however, not a representative cross-section of Kagera in 2010. Therefore the 2010 figures should not be confused with regionally representative averages..

starts from farming and moves to the middle (1,107 out of 3,301). Together these two groups comprise 75% of our sample.<sup>15</sup> Or, among those starting out as farm households, 51 percent remain in farming, 41 percent move to the middle and only 8 percent move to cities of 500,000 inhabitants or more. The structural transformation interacts with a spatial one. Among those who found themselves in the middle sector in 1991/94 (rural off-farm and secondary towns), only 15 percent moved to a city.

Turning to the welfare outcomes, the move to a city acts as a catapult for consumption growth, irrespective of where one starts off. Farming households who remained in farming saw their consumption on average grow by 61 percent over 18 years (or 2.7 percent per year), but for those who moved to the city, it grew on average by 233 percent (or 6.9 percent per year). Consumption among those transitioning to the middle grew on average by 134 percent (or 4.8 percent per year). Poverty was virtually eliminated among the city migrants, while it dropped by 39 and 23 percentage points for farmers who transitioned to the middle or remained in farming, respectively. This leaves the latter two groups with 2010 poverty headcounts of 25 and 44 percent, respectively.

These large differences in welfare and poverty changes are all the more striking considering that average baseline consumption per capita was relatively similar across both groups. But these averages are also deceptive as they mask the size of the population that constitutes them. As soon as the averages are combined with the number of people making each of the sectoral shifts, the emerging trends run counter popular perception. First, looking at the share of each group in total growth of the sample (total growth is simply the sum of consumption per capita growth across all household in the sample), it can be seen that 42 percent of total growth of our sample is realized by farmers transitioning to the middle, while those moving to the city contribute only 17 percent. Those remaining in farming contribute 18 percent.

Second, when it comes to poverty reduction, the migrants to the middle contribute an even larger share. To see this, the penultimate column shows the net flow out of poverty for

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<sup>15</sup> McCulloch, Weisbrod and Timmer (2007) find a similar pattern in Indonesia.

households in each group. It is the sum of all households who have crossed the poverty line from below minus the sum of all households who have crossed it from above. Close to half of the poverty reduction realized in the sample (434 out of 945) comes from farmers transitioning to the middle, while 32 percent (304 out of 945) comes from farmers who remain in farming. Only 12 percent comes from farmers moving to cities.

A smaller share of people (18 percent) starts from the middle at baseline. While a larger share of those in the middle (15 percent or 91/607) move to cities (the so-called ladder migration), compared with 8 percent of farmers moving directly to the city, the former group only constitutes 30% of all people moving to the city. Those in the middle are on average also richer and end up higher than those who make a similar shift starting at farming, irrespective of whether they end up in farming, the middle or a city. Overall, while those starting from the middle make up 18% of the sample, they contribute more than their share to overall growth (23 percent), but account for only 10 percent of total poverty reduction. This is largely explained by the low number of households in this group at baseline and the sizeable number of farmers in the middle who appear not to have succeeded in the middle and returned back to farming. While their incomes still grew on average, the average poverty headcount did not decline much. This ability to return (the larger reversibility of urban migration) is at times also mentioned as a reason for larger migration flows to nearby areas, as opposed to distant cities.

The final column in Table 2 shows the share of panel individuals who are neither in school nor employed (not farming, not employed and not self-employed). The survey instrument does not tell whether they are looking for work, so they are labelled jobless rather than unemployed. There are striking differences across the 6 groups. Joblessness is 5 percent on average, but it is as high as 16% among city dwellers and only 3 to 4 percent among farmers. While a move to the city is, on average, lucrative, the flip side is higher joblessness, as described in Harris-Todaro.

In sum, the descriptive findings suggest that the direct contribution to poverty reduction among rural households of migration to the middle (i.e. rural diversification and movement to

secondary towns) was substantially larger than the contribution of migration to big cities. Even though incomes rose substantially faster in the latter group, there are much fewer people making this move, seriously reducing the overall direct effect.<sup>16</sup>

The study now turns to the multivariate approach in a cross-country setting to further examine whether there is any wider empirical regularity to the observed finding from this rather unique individual tracking exercise in Tanzania and to also explore some of the possible proximate channels. The high distance premium for rural-urban migrants documented in China (Zhang and Zhao, 2013), the predominance of within province migration or migration to more proximate areas and the critical importance of non-agricultural activities in rural and urban areas as pathway out of poverty in Indonesia described by McCulloch, Weisbrod and Timmer (2007) point already in the same direction.

### **3 Toward a multi-variate approach – Methodological considerations**

To explore whether different types of spatial and occupational transformation affect the rate of poverty reduction differently, the empirical framework developed by Ravallion, Chen and Sangraula (2007) and Christiaensen and Todo (2013) is followed. The former authors examine whether urbanization affects the rate of poverty reduction independent of overall growth in mean consumption, in effect exploring the distributional effects of urbanization. To do so, they regress the log national headcount index on a quadratic function of both the log consumption mean and the urban population share augmented with country fixed effects.

The latter authors extend the approach and split the population up in three groups: those in agriculture, those in metropolises, and those in the middle, i.e. in the rural nonfarm sector

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<sup>16</sup> To be sure, this decomposition abstracts from the poverty or welfare changes that different groups have on each other. As mentioned in the introduction, those who transition to the middle and into the cities also raise for example the land to labour ratio among those staying behind and increase the (urban) demand for food. There may also be agglomeration effects of people moving to the city, which may have economy-wide implications. Internal migration may further affect support networks among extended family members, as analyzed for this sample by De Weerd and Hirvonen (2013). This is not a counter-factual analysis and cannot tell us what would have happened to any of the groups in the absence of the other groups. To what extent linkages between the different groups are at play and can explain some of the welfare trajectories will be the subject of future work.

and secondary towns, instead of looking at urbanization as such. They subsequently examine whether the occupational and/or spatial migration out of agriculture into the middle has an additional and different effect on poverty than movement into the metropolises using the following specification:

$$\frac{dP_{it}}{P_{it}} = \beta_U \frac{ds_{Uit}}{s_{Uit}} + \beta_N \frac{ds_{Nit}}{s_{Nit}} + \gamma \frac{dy_{it}}{y_{it}} + \sum_t t + v_i + \varepsilon_{it} \quad (1)$$

with  $P$  representing a decomposable poverty measure, and  $S_{Uit}$  and  $S_{Nit}$  the share of the population of country  $i$  at time  $t$  living in the metropolis and in the middle (rural nonfarm and secondary towns) respectively. The change in income is represented by  $dy/y$ , while  $v_i$  and  $t$  are country ( $v_i$ ) and time ( $t$ ) specific dummies that help control for (unobserved) country-specific and global year-specific effects. Finally, a white noise error term ( $\varepsilon$ ) was added to account for the different origins of the data on poverty and economic growth.

Christiaensen and Todo (2013) further show that the coefficient on the change rate of the share of urban population,  $\beta_U$ , represents the effects on poverty of the transformation from agriculture to metropolitan manufacturing and service activities through changes in the income distribution (controlling for the impact of changes in income levels ( $dy/y$ )). Correspondingly, the coefficient on the change rate of the share of rural nonfarm employment,  $\beta_N$ , indicates income-distribution effects on poverty of transformation from (rural) agriculture to rural nonfarm activities.

Equation (1) also forms the base specification, here, on which the study builds in several ways. It is first estimated using ordinary least squares with heteroskedastically robust standard errors and with the variables expressed in log differences.<sup>17</sup> By testing whether  $\beta_U = \beta_N$ , it is explored whether the poverty reducing effects of movement out of agriculture into the middle and large cities differ, beyond their potential effect on growth. The robustness of the results is then tested against inclusion of the nature of political regimes and population growth.

Regarding the latter, the population share of mega cities tends to grow as the population

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<sup>17</sup> All results are also robust to the use of cluster robust error terms at the country level.



becomes larger, while fast population growth affects the dependency ratio and thus also poverty. Regarding the former, as underscored by Henderson (2003) and Behrens and Bala (2013), political interference and rent seeking by the ruling elite often favors urban primacy over more dispersed urbanization patterns. Favoritism, as in Indonesia (Henderson and Kuncoro, 1996), could for example involve restrictions in capital markets and export/import licensing, all favoring firms that locate in the capital, and helping central bureaucrats and politicians to extract rents when allocating loans and licenses, without competition from lower ranked bureaucrats in other locations. Similar considerations could lead national governments to underinvest in interregional transport and telecommunications, favoring producers and investors in the capital over those in the hinterlands. Yet, rent seeking may also be related with other interventions that affect changes in poverty. It may for example decrease the likelihood of redistributive programs such as Bolsa Familia in Brazil, which proved to have important poverty reducing effects (Ferreira, Leite, and Ravallion, 2010). Henderson (2003) finds democratic regimes to display less concentrated urbanization patterns.

Second, as exemplified in the Kagera case study, both differential unemployment rates (labeled here the Harris-Todaro effect) as well as differential opportunities and ability to move to proximate versus more distant sources of growth (the size effect) may explain potential differences in the poverty reducing effect of the transition to non-farm activities and secondary towns versus the poverty reducing effect of migration to metropolises. One way to explore this is to control for the relative size of the middle and the metropolises:

$$\frac{dP_{it}}{P_{it}} = \tilde{\beta}_U \frac{s_{Uit}}{s_{Uit} + s_{Nit}} \frac{ds_{Uit}}{s_{Uit}} + \tilde{\beta}_N \frac{s_{Nit}}{s_{Uit} + s_{Nit}} \frac{ds_{Nit}}{s_{Nit}} + \gamma \frac{dy_{it}}{y_{it}} + \sum_t t + v_i + \varepsilon_{it} \quad (2)$$

and test whether  $\tilde{\beta}_U = \tilde{\beta}_N$ . If the latter is still bigger than the former, as hypothesized before, then substantial Harris-Todaro effects are still possible. If they are no longer different, the size effect is likely dominant. Any advantage from one sector over the other would then, for example, come from the fact that the poor are better able to move to the middle instead of to

the metropolises or vice versa. Once there, they would stand a similar chance of escaping poverty. The differential ability in migrating out of agriculture into the different sectors may for example be due to lower migration costs and lack of credit, better ability to maintain links with the location of origin to safeguard land possessions and social safety nets (including through commuting), or simply preferences as suggested (not proven) by the distance penalty of migration observed in China by Zhang and Zhao (2013). The specification is similar in spirit to the one used by Datt and Ravallion (1996) in studying the poverty reducing effect of different sources of growth.<sup>18</sup>

The robustness of the findings is then tested against the use of different metrics of poverty and alternative size definitions of a metropolis as well as the static nature of the specification. High initial poverty and shocks may induce people to leave agriculture and/or the countryside in search for non-agricultural employment. If, for example, the propensity to move to metropolises in response to initial poverty and/or shocks is larger than the propensity to move to the middle, and initial poverty and/or shocks attenuate the rate of poverty reduction (Ravallion, 2012), then the effect of metropolization on poverty reduction may be underestimated. The number of shocks during the spell is included to check the robustness of the findings and a dynamic specification, including initial poverty, is further applied.<sup>19</sup>

Finally, it is only the effect of differential occupational and spatial transformation patterns through their effect on inequality that has been examined so far. However, as emphasized in the literature,  $y$  is likely also a function of  $s_i$ , for example, because sectoral production is

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<sup>18</sup> Christiaensen, Demery and Kuhl (2011) provide a more elaborate discussion of the effect of the size of the sector in analyzing the poverty reducing effects of growth in different sectors.

<sup>19</sup> Ideally, initial poverty should be included with a lag to control for possible endogeneity bias due to measurement error. However, doing so, dramatically reduces the sample size as four observations would be needed per country. The sample is not large enough to support this.

characterized by increasing returns to scale and knowledge externalities, so that  $y_i$  is increasing in  $s_i$ . Alternatively, too much congestion in a sector may lower the sectoral productivity, so that  $y_i$  is decreasing in  $s_i$  (Fujita and Thisse, 2002). As a descriptive starting point, this could be examined by allowing the rate of poverty reduction to depend only on the share weighted change rates in the share of the middle and the metropolises, i.e. by estimating a reduced version of equation (2):

$$\frac{dP_{it}}{P_{it}} = \hat{\beta}_U \frac{s_{Uit}}{s_{Uit} + s_{Nit}} \frac{ds_{Uit}}{s_{Uit}} + \hat{\beta}_N \frac{s_{Nit}}{s_{Uit} + s_{Nit}} \frac{ds_{Nit}}{s_{Nit}} + \sum_t t + v_i + \varepsilon_{it} \quad (3)$$

In this equation,  $\hat{\beta}_U$  and  $\hat{\beta}_N$  capture both the direct effects of the sectoral transformation on poverty through changes in the income distribution and the indirect effects through changes in the income levels, each time controlling for the relative size of the sector. By comparing the share weighted change rate of the metropolitan share of the population and the share weighted change rate of the share of those living in the intermediate space with and without controlling for income growth, it can be explored whether and how the patterns of spatial and occupational transformation matter for poverty reduction.

#### 4 Poverty, occupational, and spatial transformation in 1980-2004 – The information base

The World Bank's POVCAL data are used to construct the poverty spells and the rate of poverty reduction.<sup>20</sup> The \$1-day and \$2-day poverty headcount ratios are taken as measure of poverty,  $P$ . Real GDP per worker (in thousand PPP US dollars) is taken from WDI. The annual change rate of each variable  $x$ ,  $dx/x$ , is given by  $(\ln x_t - \ln x_{t-\tau})/\tau$ , where  $t-\tau$  and  $t$  are the initial and the final year of the period, respectively.

The metropolitan share of the population,  $s_U$ , is represented by the share (in %) of the

<sup>20</sup> <http://iresearch.worldbank.org/PovcalNet/> April, 2008 (i.e. before the latest revisions of the poverty numbers using the 2005 poverty purchasing power corrections).

population living in cities with one million or more taken from the United Nations' *World Urbanization Prospects (UNWUP)*. To check for robustness, the 750,000 cut-off will also be used.<sup>21</sup> In the UNWUP, the population data are available every five years. The data for other years are interpolated, assuming a constant growth rate during each 5-year period. Two sources of data are used to calculate the share (in %) of people in agriculture,  $s_A$ : FAO's database and the World Bank's *World Development Indicators (WDI)*. The coverage of FAO's database is larger than that of WDI, and the FAO data are used whenever they are available. The share of the population engaged in non-farm activities located in the intermediate space or the "middle",  $s_N$ , is defined as the residual, i.e.  $s_N = 100 - s_U - s_A$ . Given the (deliberately) narrow definition of urban areas (i.e. only the mega cities),  $s_N$  includes people living and employed in secondary towns as well as those engaged in off-farm employment in rural villages.<sup>22</sup>

The number of floods during the spell are taken from the International Emergency Database (EMDAT)<sup>23</sup> and included to control for possible differences in migration patterns to metropolises and the middle in response to natural hazards. The composite polity indicator compiled by the Polity IV project of the Center for Systemic Peace (Marshall, Jaggers, and Gurr) is used to reflect the autocratic/democratic nature of the political regime. The indicator takes on values between -10 (autocratic) and +10 (democratic).<sup>24</sup>

The sample is limited to low and middle-income countries according to the World Bank's classification in 2008 and spans about a quarter of a century, from 1980-2004. The complete list of available poverty spell observations in *Povcal* at that time consists of 52 countries and 219 country-spell observations. As poverty measures fluctuate substantially in some

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<sup>21</sup> <http://esa.un.org/unup/>. April, 2008. In the urban economics literature, urban concentration is often measured by urban primacy—the share of the urban population living in the largest city. This is adequate when most data points are small countries. The approach is too limited when the spells cover many large countries, which have more than one metro area, as is the case here (Henderson, 2010).

<sup>22</sup> By using the one million or more as cut-off to define a metropolis, measurement challenges in consistently defining rural and urban areas across countries are also circumvented (Ravallion, Chen, Sangraula, 2007). Nonetheless, noise in the data cannot be denied, also when categorizing the population in agricultural and nonagricultural categories, instead of rural and urban. In depth analysis by Christiaensen and Todo (2013) shows that the measurement error is neither systematic nor systematically correlated with changes in poverty.

<sup>23</sup> <http://www.emdat.be/>, June 2009.

<sup>24</sup> <http://www.systemicpeace.org/inscr/p4manualv2010.pdf>

countries, country-spell observations, for which the change rate of the poverty headcount ratio at \$1 a day is in the top 1 or bottom 1 percent of the sample, are dropped. Missing observations on agricultural employment further reduce the sample, resulting in a sample of 206 poverty spells covering 51 countries from across the world (Table 3).

On average about two fifths of the population are in agriculture, two fifths are in the middle and one fifth reside in cities above 1 million inhabitants (Table 4; see Christiaensen and Todo (2013) for details by country). The share of people employed in agriculture declines on average at 2 percent per year in our sample, with the share of people engaged in nonagricultural activities in the middle on average increasing at 1.2 percent and the share of people in mega cities increasing at 0.8 percent. There is, however, substantial variation in these patterns across the different spells as indicated by the standard deviations and the min-max ranges. Average annual GDP per capita growth was 2.2 percent across our sample and \$1-day poverty declined on average by 5.5 percent (not percentage points).

## **5 The role of the middle - Uncovering empirical regularities**

Using ordinary least squares with appropriate corrections for heteroskedasticity and controls for (unobserved) country-specific and year-specific effects, the change rates of \$1 and \$2-day poverty headcount ratios are first regressed against GDP growth per capita, the change rate of the population in the middle and the change rate of the share of the metropolitan population (Table 5, columns 1 and 2). Unlike most of the poverty to GDP elasticities in the literature so far, the findings here are thus controlled both for unobserved country effects in levels *and* changes.

The results indicate that controlling for overall growth in the economy, diversification into rural nonfarm employment and secondary towns is associated with poverty reduction, while agglomeration in mega cities is not. This holds both when considering the \$1-day and the \$2-day poverty head count rates. These effects are in addition to the poverty reducing

effects of economic growth. In other words, were two countries to grow at the same rate, poverty would come down faster in a country following rural nonfarm diversification and secondary town development than in a country following rapid metropolization. The findings thus suggest that rural diversification and less concentrated urbanization lead to more inclusive growth patterns.

The results in columns 3 and 4 of Table 5 further show that these empirical regularities are robust to controls for political regimes as well as population growth.<sup>25</sup> Given that the results are also controlled for differences in initial conditions (such as land inequality, institutional and political arrangements) through the inclusion of country specific dummies, this is a striking result. Yet it resonates with the findings from the 1991/4-2010 tracking case study from Tanzania as well as those from the comparative historical analysis of the evolution of inequality and growth in Taiwan, China, and South Korea in relation to their spatial development during 1965-1990 (Otsuka, 2007).<sup>26</sup> During 1984-2002, Suryahadi, Suryadarma, and Sumarto (2009) also found growth in rural and urban services in Indonesia to be equally important as growth originating in agriculture for poverty reduction, highlighting the importance of the development of the middle for poverty reduction in this transforming economy.<sup>27</sup> Clearly, the poverty reducing effect of diversifying into rural nonfarm and secondary town activities on poverty reduction can be substantial.

Turning to the channels, the estimation of equation (1) is repeated though this time using share weighted changes in the share of the middle and the metropolises, i.e. equation (2) (Table 6, columns (1) and (2)). These represent in effect the percent change in the non-agricultural

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<sup>25</sup> This is in addition to being robust against different measurement issues, including different metrics for poverty (poverty gaps, percentage point changes) and metropolises (750,000 inhabitants instead of 1 million as cut-off), as well as the decomposition of growth in its sources (agriculture and non-agriculture) and non-linearity in the population shares (Christiaensen and Todo, 2013).

<sup>26</sup> Taiwan, China, and South Korea experienced for example a similar per capita GDP growth of 7.1 percent between 1965 and 1990. Both countries also started at similar levels of inequality (a Gini of about 0.32). Yet throughout the subsequent decades inequality has been lower in Taiwan, China, and higher in South Korea. Taiwan's economic development has been based on the development of more labor intensive small and medium enterprises located in rural and suburban areas, while South Korea's development has been led by more capital intensive urban based, large enterprises.

<sup>27</sup> Similar to Datt and Ravallion's (1996) analysis of Indian data, they also relate the effect of urban service growth on poverty to the more labor-intensive, low capital, lower skilled part of the urban service sector.

share of the population coming from the change in the share of the middle and the change in the share of the metropolises respectively. Consistent with the findings in Table 5 (columns (1) and (2)), only rural diversification and migration to secondary towns is statistically contributing to poverty reduction, while migration to the metropolises is not. These results are also robust against the use of different definitions of poverty (Table 6, columns (3) and (4)), the level of initial poverty (Table 6, columns (5) and (6)), non-linear specifications of changes in the shares, and the inclusion of population growth, the polity indicators and the sources of growth.<sup>28</sup>

Nonetheless, while not statistically significant, further inspection also shows that the size of the coefficient on the (share weighted) change rate of the metropolitan share increased, approaching (or for the \$2-day poverty headcount even exceeding) the size of the (share weighted) coefficient of the change rate of the middle. Moreover, when another definition of metropolis is used, such as the population in cities with population of 750,000 or more in 2007 instead of 1 million or more at the time of the spell<sup>29</sup> (Table 6, columns (7) and (8)), migration to the metropolises contributes as much to poverty reduction as transition into the middle (the coefficients are not statistically different).

Together these findings resonate with those of the Tanzania case study. They are seen as indications that it is especially the size effect which is important in understanding the advantage of the middle, i.e. the greater ability of poorer households to exit poverty by diversifying in the rural economy and connecting with secondary towns, and maybe less the larger ability to find a job as such, once in these locations. While unemployment was higher among the migrants in Dar es Salaam, the premium needed to compensate for this and equalize expected consumption was well below the difference in average consumption levels observed (Table 2). When looking again at the \$1-day poverty gap results (Table 6, columns (3) and (4)), there is a larger difference between the two coefficients, suggesting that other

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<sup>28</sup> To save space and maintain focus, the latter robustness tests have been reported. They are available upon request from the authors.

<sup>29</sup> This avoids discontinuous jumps as cities grow beyond one million during the period of the sample. A disadvantage of this definition is that even if a city has a population of more than 750,000 in 2007, it may not have been large ten years ago.

factors may be at play as well when it comes to the poorer of the poor.

The results discussed so far are conditional on the growth rates being the same across the different transformational patterns. Yet, as highlighted in the introduction, the new economic geography emphasizes the critical importance of economic density and agglomeration economies in fostering growth (World Bank, 2009). As a result, metropolitization may well put countries on a much faster growth path, which could over time offset the less inclusive nature of its growth pattern in terms of poverty reduction. One simple test of this proposition would be to re-estimate equation (2) excluding GDP per capita growth (i.e. estimating equation (3)). By so doing, the total effect of the transformation from agriculture to rural nonfarm and metropolitan activities on poverty is estimated, including the indirect effects through changes in the aggregate income level.

The overall impact of rural nonfarm activities is negative and significant as before (Table 7, columns (1) and (2)), whereas the overall impact of the urban share remains insignificant (and substantially smaller). The coefficients on the (share weighted) change rate of the share of rural nonfarm activities are only slightly larger in absolute terms than the benchmark results in columns (1) and (2) of Table 6, suggesting that the effects of rural diversification on poverty reduction mainly work through the income distribution channel. The reduced form specifications, excluding growth, further suggest that the negative effects on poverty reduction from rising income inequality associated with metropolitization are not offset by the that larger growth agglomeration in mega cities may generate. Christiaensen and Todo (2013) explore this further by regressing income inequality and economic growth as such on the change rates in the middle and the metropolises controlling for a series of factors. They find that agglomeration in mega cities is on average associated with faster growth (as observed among the big city migrants from Kagera, Tanzania) and higher income inequality, while diversification into rural nonfarm and secondary town activities typically facilitates a more inclusive but slower, growth process.



## 6 Concluding remarks

Agnostic about the pros and cons of urbanization per se, this paper starts from the observation that the next wave of urban expansion is predicted to be concentrated in large cities (1 million plus) (UN, 2011) and explores whether the nature of the occupational and spatial transformation matters for poverty reduction (as opposed to growth alone). In so doing, the study differentiates itself from most of the literature which usually only applies a sectoral (agriculture versus non-agriculture) or spatial (rural versus urban) lens and draws attention to that the fact that the urbanization pattern may be more important for poverty reduction than urbanization itself.

The study starts from a rather unique panel of individuals from Kagera, Tanzania who have been tracked over more than 15 years (1991/4 – 2010). Poverty among these individuals almost halved (from 58 percent to 30 percent) and almost half of the poverty decline could be attributed to rural diversification and migration to small towns (i.e. the transition out of agriculture into the middle). Only 1 in 7 of the people who exited poverty, did so through migration to the larger cities. The remainder did so while remaining in farming, underscoring the continuing importance of increasing agricultural productivity in poor settings such as Kagera. But, the case study findings point especially to the importance of rural diversification and the better ability of poor rural households to connect with the rural economy and smaller towns in exiting poverty (the size effect), even though average consumption growth was substantially higher among those moving to the big cities, albeit at the expense of higher joblessness.

Cross-country panel data analysis for developing countries (including Sub-Saharan Africa) further suggested a broader empirical regularity to these phenomena observed in the micro-data. Transitioning out of agriculture into the middle was associated with faster poverty reduction, while agglomeration in large cities was not. The results were robust to controls for political regimes as well as a series of other measurement issues and other competing hypotheses. They also suggested that these superior poverty reducing effects of the

middle were mainly due to the size effect, i.e. the greater number of poor people that exited poverty by connecting with growth in the middle (through non-farm activities in rural areas and secondary towns - which may entail physical migration, but could also happen for example through commuting or simply switching occupations locally).

Together these case study and cross-country results call attention to the spatial allocation and orientation of infrastructure and policies in steering the world's ongoing urbanization and development. As most recently documented by Ferré, Ferreira and Lanjouw (2012) in 8 countries across the world and Coulombe and Lanjouw (2013) in 12 Sub-Saharan African countries, secondary towns continue to enjoy much lower access to basic infrastructure services than the metropolises, prompting them to voice the possible existence of a "metropolitan bias", not unlike Behrens and Bala (2013). While the results presented here do not purport to establish causality as such, the findings are consistent with the call for spatially blind provision of social services and infrastructure advocated by the World Bank's 2009 World Development Report "Reshaping Economic Geography" (World Bank, 2009), so that migration is only motivated by economic opportunities and not by the search for better amenities.

They further suggest that growth promoting interventions that enable poor people to access growth and basic infrastructure services more directly (as through rural diversification and secondary town development) are also more likely to lift more of them out of poverty, than when the benefits of growth have to spatially trickle down from the metropolises. But most importantly, the empirical regularity with which these relations have been observed, and their robustness against a series of alternative hypotheses, underscore the pertinence of the question and call for much deeper reflection about the optimality of the ongoing urbanization processes, not least in areas where urban concentration is already high (as in Sub-Saharan Africa).

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Table 1: Interview status KDHS in 2010

<b>Status 2010</b>	<b>N</b>	
Interviewed	4,334	68.2%
Deceased	1,275	20.1%
Not found	709	11.2%
Found but refused	33	0.5%
Total	6,351	

Table 2: Welfare and poverty trends for household, by 6 types of sectoral shifts made between 1991/94 and 2010.

<b>Sectoral shift from 1991/94 to 2010</b>	<b>N</b>	<b>Cons 1991/94</b>	<b>Cons 2010</b>	<b>Average cons growth (%)</b>	<b>Share in total cons growth of sample</b>	<b>Poverty headcount 1991/94 (%)</b>	<b>Poverty headcount 2010</b>	<b>Net flow out of poverty</b>	<b>Share of jobless panel respondents</b>
Farm -> farm	1,369	394,393	540,415	61	0.18	0.67	0.44	304	0.03
Farm -> middle	1,106	408,169	834,882	134	0.42	0.64	0.25	434	0.05
Farm -> city	219	451,575	1,347,131	233	0.17	0.53	0.02	113	0.16
Middle -> farm	210	584,131	788,200	48	0.04	0.36	0.25	22	0.04
Middle -> middle	306	601,901	1,011,799	99	0.11	0.29	0.13	48	0.08
Middle -> city	91	610,934	1,565,015	234	0.08	0.32	0.05	24	0.16
Total	3301	440,677	780,302	1.04	1.00	0.58	0.30	945	0.05

Note: *Cons* is consumption per adult equivalent unit. *Farming* households are those where the main occupation of the head is farming. *City* households are those who live in cities with a population over 500,000, while *middle* refers to the rest category of those who do not live in cities and are not engaged in farming. They work in the non-agricultural sector outside the cities. *Share in total sample cons pc growth* is the total consumption growth of the category divided by the total consumption growth of the sample. *Net flow out of poverty* is the total number of households who moved out of poverty in each category, subtracting those who crossed the poverty line in the other direction. *Share of jobless panel respondents* is the share of panel individuals who are neither in school, nor employed (not farming, not employed and not self-employed). This table is based on 3,301 households as 12 households needed to be dropped due to missing data.



Table 3: Geographical Coverage of Poverty Data

	Number of countries	Number of survey periods	Percent of survey periods
Sub-Saharan Africa	14	34	16.5
South Asia	3	17	8.3
East Asia and Pacific	6	34	16.5
East Europe and Central Asia	10	31	15.1
Latin America and the Caribbean	13	81	39.3
Middle East and North Africa	5	9	4.4
Total	51	206	100.0

Table 4: Poverty, occupational and spatial transformation

Variable	N	Mean	S. D.	Min.	Max.	10%	25%	50%	75%	90%
Poverty headcount ratio at \$1 a day (%)	206	17.13	20.07	0.09	90.26	0.9	2.7	9.4	20.8	47.7
Poverty headcount ratio at \$2 a day (%)	206	39.88	27.45	1.16	98.07	10.8	16.8	32.3	59.7	85.3
Poverty gap ratio at \$1 a day (%)	206	6.19	9.75	0.01	52.08	0.2	0.6	2.5	7.4	15.3
Poverty gap ratio at \$2 a day (%)	206	17.73	16.65	0.23	73.83	3.0	5.1	11.9	23.1	43.0
Gini coefficient	206	44.15	9.64	27.16	63.42	31.3	34.5	44.3	52.0	57.9
Share of agriculture employment (%)	206	38.60	21.38	6.60	84.00	14.4	20.4	32.5	56.5	70.4
Share of rural nonfarm and secondary towns (%)	206	41.86	17.70	6.85	79.02	16.6	27.9	43.7	51.5	71.2
Share of metropolitan population (%)	206	19.54	9.93	3.88	37.11	7.6	10.3	18.1	26.9	34.7
Share of rural nonfarm and secondary towns (alt. def., %)	199	39.80	17.45	6.07	79.20	14.7	26.4	40.2	48.5	68.6
Share of metropolitan population (alt. def., %)	199	20.91	10.24	3.88	40.59	8.7	11.1	18.5	30.0	36.0
GDP per capita (constant PPP, \$1000)	206	4.34	2.37	0.68	10.88	1.2	2.1	4.6	6.2	7.1
Number of floods (annual average)	206	1.45	1.58	0.00	9.00	0.00	0.29	1.00	2.29	3.50
Democracy indicator (10 [democratic] to -10 [autocratic])	204	4.43	5.73	-9	10	-6	1.5	7	8	9
Percentage change of										
Poverty headcount ratio at \$1 a day	206	-5.48	29.60	-124.52	82.17	-40.26	-15.28	-2.42	7.03	26.34
Poverty headcount ratio at \$2 a day	206	-2.30	12.10	-61.35	38.95	-16.00	-5.90	-1.16	2.52	9.51
Poverty gap ratio at \$1 a day	205	-6.86	41.52	-174.51	139.36	-51.52	-21.54	-3.27	10.67	38.01
Poverty gap ratio at \$2 a day	206	-3.28	17.78	-77.23	49.79	-23.39	-10.75	-1.32	4.41	14.37
GDP per capita (constant PPP)	206	2.20	3.50	-9.65	13.52	-1.68	0.18	2.18	4.38	6.49
Share of agriculture employment	206	-2.00	1.70	-7.76	6.27	-4.09	-3.18	-1.73	-0.79	-0.44
Share of rural nonfarm and secondary towns	206	1.21	1.36	-4.44	4.73	-0.05	0.47	1.09	1.97	2.92
Share of metropolitan population	206	0.80	0.83	-1.05	3.42	-0.21	0.31	0.68	1.23	1.89
Share of rural nonfarm and secondary towns (alt. def., %)	199	1.34	1.49	-5.30	8.57	0.16	0.64	1.16	2.06	3.05
Share of metropolitan population (alt. def., %)	199	0.60	1.17	-12.42	3.38	-0.30	0.23	0.66	1.04	1.40

Note: Metropolitan if living in city of 1 million or more. Alternative definition of metropolis is based on the share of the population in urban agglomerations with 750,000 or more in 2007.

Table 5: Migration out of agriculture into the missing middle is more poverty reducing.

Change rate of the poverty headcount ratio	(1)	(2)	(3)	(4)
Poverty line	\$1	\$2	\$1	\$2
Change rate of the share of the middle	-9.705*** (3.400)	-3.355*** (1.148)	-9.919*** (3.521)	-3.525*** (1.211)
Change rate of the share of metropolises	-5.415 (6.066)	-2.970 (2.148)	-0.460 (6.641)	-2.345 (2.517)
Growth rate of GDP per capita	-2.347** (1.064)	-1.438*** (0.461)	-2.014* (1.058)	-1.533*** (0.491)
Number of floods	6.426** (3.163)	1.843* (1.016)	6.717** (3.331)	1.804* (1.066)
Growth rate of population in the year before the initial year of the spell	-	-	13.01 (8.104)	-0.550 (3.196)
Change in the polity index in the year before the initial year of the spell	-	-	-0.979 (0.883)	-0.0766 (0.361)
Observations	206	206	199	199
R-squared	0.478	0.457	0.496	0.464
Adjusted R-squared	0.189	0.156	0.195	0.144
Year dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes

Notes: This table shows results from OLS estimations. Robust standard errors are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1-, 5-, and 10-percent level, respectively.

Table 6: The size effect is important in understanding the superior poverty reducing effects from migration out of agriculture into the middle.

	Poverty head count		Poverty gap		Dynamic		Alternative definition	
Change rate of the population headcount (%)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Poverty line)	\$1	\$2	\$1	\$2	\$1	\$2	\$1	\$2
change rate in share of middle (share weighted)	-12.91** (5.341)	-4.417*** (1.671)	-17.47** (7.863)	-7.593** (2.982)	-11.80** (5.119)	-3.926** (5.309)	-12.62** (1.674)	-4.243** (1.682)
change rate in share of urban (share weighted)	-11.75 (16.73)	-6.303 (6.340)	-12.86 (26.02)	-8.510 (9.708)	-12.13 (16.12)	-5.106 (6.303)	-15.00** (2.221)	-4.941** (2.234)
growth in GDP per capita	-2.206** (1.020)	-1.372*** (0.440)	-2.073 (1.404)	-1.509** (0.639)	-1.951* (1.015)	-1.204** (0.973)	-2.175** (0.409)	-1.384*** (0.436)
# of flood	5.994* (3.200)	1.710 (1.045)	9.266** (4.598)	3.033* (1.743)	5.966* (3.052)	1.386 (3.171)	6.284** (1.047)	1.811* (1.052)
initial poverty	-	-	-	-	-0.919** (0.370)	-0.396** (0.178)	-	-
Observations	204	204	203	203	204	204	197	197
R-squared	0.474	0.448	0.415	0.455	0.501	0.475	0.520	0.482
Adjusted R-squared	0.179	0.139	0.084	0.146	0.214	0.174	0.242	0.182
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table shows results from OLS estimations. Robust standard errors are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1-, 5-, and 10-percent level, respectively. Alternative definition of metropolis is based on the share of the population in urban agglomerations with 750,000 or more in 2007.

Table 7: Also when accounting for differential effects on growth is migration out of agriculture into the middle more poverty reducing.

	(1)	(2)
Change rate of the poverty headcount ratio (Poverty line)	\$1	\$2
Share weighted change rate of the share of the middle	-14.30*** (5.055)	-5.282*** (1.590)
Share weighted change rate of the share of metropolises	-5.049 (15.67)	-2.135 (5.846)
Number of floods	6.877** (2.918)	2.259** (0.984)
Observations	204	204
R-squared	0.445	0.381
Adjusted R-squared	0.140	0.041
Year dummies	Yes	Yes
Country dummies	Yes	Yes

Notes: This table shows results from OLS estimations. Robust standard errors are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1-, 5-, and 10-percent level, respectively.