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Poverty Reduction during the Rural-Urban Transformation

The Role of the Missing Middle

Luc Christiaensen
Yasuyuki Todo

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Abstract

As countries develop, they restructure away from agriculture and urbanize. But structural transformation and urbanization patterns differ substantially, with some countries fostering migration out of agriculture into rural off farm activities and secondary towns, and others undergoing rapid agglomeration in mega cities. Using cross-country panel data for developing countries spanning 1980–2004, the analysis in this paper finds that migration out of agriculture into the missing middle (the rural nonfarm economy and secondary towns) yields more inclusive growth patterns and faster poverty reduction than agglomeration in mega cities. This suggests that patterns of urbanization deserve much more attention when striving for faster poverty reduction.

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Poverty Reduction during the Rural-Urban Transformation - The Role of the Missing Middle[1]

Luc Christiaensen Yasuyuki Todo

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[1] Luc Christiaensen (lchristiaensen@worldbank.org) and Yasuyuki Todo (yastodo@k.u-tokyo.ac.jp) are Senior Economist at the World Bank and Professor at the Graduate School of Frontier Sciences of the University of Tokyo respectively. Funding by the Japanese Consultancy Trust Fund is gratefully acknowledged. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

1 Introduction

As countries grow and develop, their economies restructure away from agriculture into manufacturing and services.[2] Accompanying this process is an occupational shift towards more remunerative non-farm activities, though usually only with a lag, instigating inequality (World Bank, 2008). Historically, great diversity has been observed in these processes and much has been written about how the nature and speed of countries' sectoral and occupational diversification, i.e. their structural transformation, affects economic growth and the speed of poverty reduction (Timmer, 2009; Szirmai, 2012).

Along with countries' structural transformation usually also comes urbanization, i.e. a spatial transformation, with people relocating from rural to urban areas. Great diversity also exists in how these structural and spatial transformation processes interact. In some countries, the structural transformation goes along with rapid agglomeration in mega cities (as for example in South Korea and the Philippines), while in others, people diversify out of agriculture into the rural nonfarm economy and secondary towns (e.g. Taiwan, China, and Thailand) (Otsuka, 2007; Christiaensen, 2007). And just like different processes of economic growth and structural transformation may yield quite different distributional and poverty outcomes[3], so, different patterns of rural-urban transformation may be associated with different rates of economic growth, and especially poverty reduction.

The clustering of a country's urban population in few localities, known as urban concentration[4], could for example generate more economic growth and jobs given economies of scale and agglomeration (World Bank, 2009). On the other hand, off-farm jobs generated in

[2] The process mirrors people's income inelastic demand for agricultural products (Engel's Law). Nonetheless, it is important to note that when the process is successful, the absolute size of agriculture continues to grow, even though its share in the economy declines,

[3] In this, agricultural growth is for example often considered key as driver of growth and poverty reduction early on in the development process. However, 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).

[4] 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.

nearby villages or rural towns may be more readily accessible to the poor given lower thresholds to migrate and better compatibility with their skill sets (because of higher local demand for unskilled and semi-skilled versus skilled labor). In addition, urbanization affects poverty also indirectly, through positive spillovers on the rural economy. There is, *a priori*, no reason to believe that these indirect effects of urbanization on rural poverty would be the same for less and more concentrated urbanization patterns.

Different literatures have so far focused on subsets of these three channels (agglomeration economies, rural off-farm employment, and urbanization externalities) and their effects on either growth or poverty, but typically not both, and not in a comparative or comprehensive framework. The new economic geography literature, for example, emphasizes how urbanization fosters economies of scale and agglomeration, which in turn are found to spiral economic growth (World Bank, 2009). The existence of localized external economies of scale has been documented for several industries such as 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, especially for the (unskilled) poor.

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 large urban centers, seen as the most effective generators of nonfarm employment for the poor (Haggblade, Hazell, and Reardon, 2007; Lanjouw and Murgai, 2009). Faster rates of poverty reduction from secondary town development than from metropolitization might be understood within the standard Harris-Todaro (H-T) framework,[5] if for example, the probability of being employed for the

[5] In the Harris-Todaro framework people migrate based on their (discounted) expected income streams (correcting for migration costs).

poor is higher in secondary towns than in mega cities, as observed in Tanzania[6]. Put differently, even though they may on average earn less (the wage distributions in secondary towns being more compressed), the higher likelihood of finding a job (given higher demand for unskilled and semi-skilled labor)[7] may give them a higher chance of exiting poverty. On the supply side, lower migration costs and the ability to maintain and exploit closer social ties with the areas of origin might further favor migration of the rural poor to nearby towns to find off-farm employment and exit poverty, as opposed to distant cities.[8] But lower agglomeration economies in rural towns might also lead to slower economic growth (and job creation), possibly inducing a growth-equity trade-off.

In addition to the direct impact on poverty from rural-urban migration by the rural poor, there are also positive spillovers of urban centers on the rural hinterlands, through consumption linkages, urban-rural remittances, the upward pressure on agricultural wages, and the generation of rural non-farm employment[9] (Lanjouw and Murgai, 2009; Cali and Menon, 2013).[10] 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 metropoles than for secondary towns is not clear *a priori*. The magnitude of the positive spillover effects on rural poverty in the hinterlands of metropoles

[6] 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).

[7] 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). Introduction of migrant heterogeneity in the standard H-T 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.

[8] For an excellent comprehensive theoretical and empirical survey of the determinants of rural-urban migration in developing countries, see Lall, Selod and Shalizi (2006).

[9] Rural off-farm employment generation can reduce (rural) poverty directly through the provision of additional income (Owusu, Abdulai, and Abdul Rahman, 2011) or indirectly by alleviating credit and liquidity constraints enabling the adoption of more remunerative agronomic practices as well as by helping farmers preserve their productive assets and smooth their consumption (Barrett, Reardon and Webb, 2001). This also highlights the continuing importance of agricultural growth for poverty reduction

[10] 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.

could for example be larger, while the space and population affected by the metropoles may also be smaller than this affected by all the secondary towns taken together.

Thus, while urban concentration may be more conducive to aggregate economic growth—and important caveats[11] remain—the pro-poor marginal incidence of nonfarm employment expansion may be higher for secondary towns. Overall, the relationship between urbanization and poverty reduction, beyond its effect on growth, remains little studied, with theoretical expositions by Anand and Kanbur (1985), Ravallion (2002) and Fields (2005) and an initial empirical exploration by Ravallion, Chen and Sangraula (2007) being notable exceptions. Nonetheless, the question of urban concentration is pressing, as policymakers prepare to accommodate the next wave of rural migrants as the structural transformation proceeds, with China and India for example both contemplating the development of supercities (Henderson, 2010) and Africa also thought to be urbanizing rapidly[12], 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 also drawing on the global cross-country experience, this study takes a comprehensive and comparative perspective and empirically examines whether the nature of the rural-urban transformation process (i.e. urban concentration versus rural diversification and secondary town development, as opposed to urbanization per se) matters for the speed of poverty reduction. In doing so, it does not seek to establish causality as such, but rather explores whether worldwide, empirical regularities along these lines can be uncovered.

To do so, the population in each country 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

[11] 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).

[12] See Potts (2012) for a critical discussion.

the “missing 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 this study differs conceptually from most of the literature, which typically applies either a spatial (rural-urban) or an occupational (agriculture-non-agriculture) dichotomy. The empirical application, using country fixed effect panel estimation techniques, is to 206 poverty spells from 51 developing countries spread across five continents, spanning 1980-2004.

The empirical findings suggest that migration out of agriculture into rural nonfarm activities and secondary towns is associated with a reduction of poverty, while no statistically significant effect on the rate of poverty reduction was found from agglomeration in mega cities. Further exploration of the channels indicates that rural diversification and secondary town expansion yield on average more inclusive growth patterns. In contrast, mega-city agglomeration yields faster income growth, but also comes with higher income inequality, which appears to offset its potential impact on overall poverty. While still no causality is purported as such, these empirical regularities are robust to a series of definitional issues and competing hypotheses. Together they add a new and timely 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.

In what follows, section 2 presents the analytical framework underpinning the estimation equations. The data are reviewed in section 3 and the empirical findings, including a series of robustness tests, are discussed in section 4. Section 5 concludes.

2 Analytical Framework and Empirical Strategy

Denote by A the (rural) agriculture sector, by U the (urban) metropolitan sector, and by N the nonfarm sector in rural areas and secondary towns, i.e. the missing middle. Building on the conceptual framework developed in Ravallion and Datt (1996) and Ravallion (2002), the aggregate, decomposable poverty measure, *P*, is then decomposed as:

$$P = s_U P_U + s_N P_N + s_A P_A \tag{1}$$

where s_i and P_i are the share of the population and the poverty headcount ratio of sector i, respectively. Total differentiation of equation (1) leads to:

$$\frac{dP}{P} = \frac{s_U P_U}{P}\left(\frac{ds_U}{s_U} + \frac{dP_U}{P_U}\right) + \frac{s_N P_N}{P}\left(\frac{ds_N}{s_N} + \frac{dP_N}{P_N}\right) + \frac{s_A P_A}{P}\left(\frac{ds_A}{s_A} + \frac{dP_A}{P_A}\right) \tag{2}$$

Assume that the poverty measure P_i is a function of the average income (y_i) and the population share (s_i) of the sector:

$$P_i = f_i(y_i,\ s_i) \quad \text{for } i = U,\ N,\ A, \tag{3}$$

A distribution neutral increase in average income (y_i) shifts the income distribution of each sector i to the right and reduces poverty, which is termed the "*income-level effect"*. Following Ravallion (2002), it is assumed that an increase in the population share of the sector may change its income distribution (holding average income constant), which is termed the "*income-distribution effect"*. If the income distribution becomes less equal, the concentration in the sector changes its poverty level. This essentially allows for deviations from the "Kuznets process" of urbanization, whereby a representative slice of the rural income distribution is transformed into a representative slice of the urban income distribution. The observation that poverty is urbanizing, i.e. that the poor are urbanizing faster than the population as a whole, which can be interpreted as the outcome of a "mixed Kuznets process",[13] motivates the relaxation of the "Kuznets assumption" (Ravallion, Chen, and Sangraula, 2007).

The framework developed here thus combines the insights from Ravallion and Datt (1996) and Christiaensen, Demery and Kuhl (2011), who focus on the income effects, with

[13] Intuitively, note that the urban poverty headcount (and urban inequality and the urban poverty share) increases if for example only a fraction of the rural-urban migrants takes on the original urban income distribution, while the others retain the rural income distribution. Or, allowing for (urban) income growth, if the direct gains from urbanization (i.e. those pertaining directly to the migrants) are not large enough for all previously poor new rural residents to escape poverty, the urbanization process may slow down the decline in urban poverty incidence, even though rural poverty and national poverty are falling. This also entails a shift in the initial urban income distribution following migration.

those from Ravallion (2002) and Ravallion, Chen, and Sangraula (2007), who focus on the distribution effects. Combining equations (2) and (3) yields:

$$\frac{dP}{P}=\frac{s_U P_U}{P}\left(1+\frac{s_U}{P_U}\frac{\partial P_U}{\partial s_U}\right)\frac{ds_U}{s_U}+\frac{s_N P_N}{P}\left(1+\frac{s_N}{P_N}\frac{\partial P_N}{\partial s_N}\right)\frac{ds_N}{s_N}+\frac{s_A P_A}{P}\left(1+\frac{s_A}{P_A}\frac{\partial P_A}{\partial s_A}\right)\frac{ds_A}{s_A}$$
$$+\frac{y_U}{P}\frac{\partial P_U}{\partial y_U}s_U\frac{dy_U}{y_U}+\frac{y_N}{P}\frac{\partial P_N}{\partial y_N}s_N\frac{dy_N}{y_N}+\frac{y_A}{P}\frac{\partial P_A}{\partial y_A}s_A\frac{dy_A}{y_A}. \quad (4)$$

Since $s_U+s_N+s_A=1$ and hence $ds_U+ds_N+ds_A=0$, equation (4) can be rewritten as

$$\frac{dP}{P}=\frac{s_U}{P}\left[\left(P_U+s_U\frac{\partial P_U}{\partial s_U}\right)-\left(P_A+s_A\frac{\partial P_A}{\partial s_A}\right)\right]\frac{ds_U}{s_U}$$
$$+\frac{s_N}{P}\left[\left(P_N+s_N\frac{\partial P_N}{\partial s_N}\right)-\left(P_A+s_A\frac{\partial P_A}{\partial s_A}\right)\right]\frac{ds_N}{s_N} \quad (5)$$
$$+\frac{y_U}{P}\frac{\partial P_U}{\partial y_U}s_U\frac{dy_U}{y_U}+\frac{y_N}{P}\frac{\partial P_N}{\partial y_N}s_N\frac{dy_N}{y_N}+\frac{y_A}{P}\frac{\partial P_A}{\partial y_A}s_A\frac{dy_A}{y_A}.$$

To estimate equation (5), data is needed on the average income in each of the three sectors which is only available for a limited set of countries and time periods. Consequently, equation (5) is simplified to:

$$\frac{dP}{P}=\beta_U\frac{ds_U}{s_U}+\beta_N\frac{ds_N}{s_N}+\gamma\frac{dy}{y} \quad (6)$$

where *y* denotes the average income of the whole economy, represented by GDP per capita.

To help interpret the impact of urban agglomeration on poverty, the terms in the expression in the brackets of coefficient β_U in equation (5) are rearranged: $(P_U-P_A)+(s_U\partial P_U/\partial s_U-s_A\partial P_A/\partial s_A)$. The first term, (P_U-P_A), represents a "ceteris-paribus" effect of transformation from agriculture to metropolitan activities equal to the intersectoral difference in current poverty levels. It could be seen to reflect the Kuznets process, affecting overall inequality, if the sectoral inequalities differ. The second term, $(s_U\partial P_U/\partial s_U-s_A\partial P_A/\partial s_A)$, corresponds to the change in the poverty level due to the effects of sectoral concentration on within sectoral poverty, i.e. the intra-sectoral income distributions. In other words, the coefficient on the change rate of the share of urban population, β_U,

represents 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, β_N, indicates income-distribution effects on poverty of transformation from (rural) agriculture to rural nonfarm activities.

To estimate whether the patterns of occupational and spatial transformation matter, a white noise error term (ε) is added to equation (6) accounting for the different origins of the data on poverty and economic growth, as well as country (v_i) and time (t) specific dummies to control for (unobserved) country specific and global year-specific effects:

$$\frac{dP_{it}}{P_{it}} = \beta_U \frac{ds_{Uit}}{s_{Uit}} + \beta_N \frac{ds_{Nit}}{s_{Nit}} + \gamma \frac{dy_{it}}{y_{it}} + \sum_t t + v_i + \varepsilon_{it} \quad (7)$$

Equation (7) is estimated using ordinary least squares with heteroskedastically robust standard errors and with the variables expressed in log differences.[14] By testing whether $\beta_U=\beta_N$, it can subsequently be seen whether the poverty reducing effects of movement out of agriculture into the missing middle and large cities differ, beyond their potential effect on growth.

The robustness of the finding against a series of competing hypotheses is further examined. First, a large literature exists documenting that growth originating in agriculture is more poverty-reducing than growth originating outside agriculture (Ravallion and Chen, 2007; Loayza and Raddatz; 2010; Christiaensen, Demery, and Kuhl, 2011). As specified, equation (7) does not control for the sources of growth. If the move to the missing middle largely results from (rural) non-agricultural employment generated off the farm following growth in the agricultural sector, then the coefficient (β_N) may simply be capturing the larger poverty reducing effects of agricultural growth, as opposed to differences in the ability of the

[14] All results are also robust to the use of cluster robust error terms at the country level.

poor to benefit from growth generated in the missing middle versus growth generated in the metropoles. To test for this, aggregate per capita economic GDP growth will be included separately by its components, i.e. as the sum of share weighted agricultural and nonagricultural growth, allowing for differential poverty reducing effects.

Similarly, it could be argued that it is the source of nonagricultural growth, in particular excessive mineral wealth, as in some African countries, which is explaining the absence of poverty reduction from metropolitization. While excessive reliance on extractive industries has been argued to foster metropolitization and the creation of "consumption cities", leading to urbanization without structural transformation (Gollin, Jedwab, Vollrath, 2013), this is controlled for through the inclusion of country fixed effects (the predominance of extractive industries in an economy does typically not change rapidly over the relatively short periods of time represented by our data).

Second, 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 metropoles in response to initial poverty and/or shocks is larger than the propensity to move to the missing middle, and initial poverty and/or shocks attenuate the rate of poverty reduction (Ravallion, 2012), then the effect of metropolitization 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.[15]

So far, it is only the effect of differential occupational and spatial transformation patterns through their effect on inequality that is examined. However, as emphasized in the literature, *y*

[15] 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.

is likely also a function of s_i, for example, because sectoral production is 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 change rates in the share of the missing middle and the metropoles, i.e. by estimating an even more reduced version of equation (7):

$$\frac{dP_{it}}{P_{it}} = \tilde{\beta}_U \frac{ds_{Uit}}{s_{Uit}} + \tilde{\beta}_N \frac{ds_{Nit}}{s_{Nit}} + \sum_t t + \nu_i + \varepsilon_{it} \qquad (8)$$

In this equation, $\tilde{\beta}_U$ and $\tilde{\beta}_N$ include 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. By comparing the coefficients on the change rate of the metropolitan share of the population and the change rate of the share of those living in the intermediate "missing middle" space it can be explored whether and how the patterns of spatial and occupational transformation matter for poverty reduction.

To shed further light on the differences in their effect, the channels through which changes in the sectoral shares affect poverty reduction (economic growth and inequality) will further be explored by linking economic growth and inequality directly to the change rates in the shares. This way, possible growth-equity trade-offs may also be uncovered.

3 Poverty, Occupational and Spatial Transformation 1980-2004

The World Bank's POVCAL data are used to construct the poverty spells and the rate of poverty reduction.[16] The $1-day and $2-day poverty headcount ratios are taken as measure of

[16] http://iresearch.worldbank.org/PovcalNet/ April, 2008 (i.e. before the latest revisions of the poverty numbers using the 2005 poverty purchasing power corrections).

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-τ and t are the initial and the final year of the period, respectively. The number of floods during the spell is used to control for possible differences in migration patterns to metropoles and the missing middle in response to natural hazards.[17]

The metropolitan share of the population, s_U, is represented by the share (in %) of the 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.[18] 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 "missing 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.

It is worth highlighting that the study differs herein conceptually from the literature, which typically deploys either a spatial (rural-urban) or an occupational (agriculture-nonagriculture) dichotomy. Here it is the combined effect of occupational and spatial mobility that is considered, allowing each of them to occur separately or jointly. As highlighted by Beegle, De Weerdt, and Dercon (2012), both occupational and spatial mobility matter for poverty reduction. Yet, in the absence of individual tracking data, separating them becomes difficult, as some people in rural areas are already mainly engaged in rural nonfarm

[17] http://www.emdat.be/, June 2009.

[18] 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, as is the case here (Henderson, 2010). They often have more than one metro area.

activities, while some people in rural towns may continue to obtain the bulk of their income from agriculture. Only minor inaccuracy is introduced in assuming that those in mega-cities derive their income almost exclusively from non-agricultural sources.[19] Furthermore, 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 (Ravallion, Chen, Sangraula, 2007) are also circumvented.

Nonetheless, noise in the data cannot be denied, also when categorizing the population in agricultural and nonagricultural categories, instead of rural and urban (Headey, Bezemer, and Hazell). This would pose a problem, especially if such measurement error is systematic in the sample and correlated with the change in poverty. No such trends were uncovered.[20] Further robustness tests are undertaken by dropping observations for which there is a large difference between the nonagricultural employment share reported in FAO and the share calculated from the corresponding Demographic Health Survey.

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* consists of 52 countries and 219 country-spell observations. As poverty measures fluctuate substantially in some 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 1).

[19] For example, according to Dorosh and Thurlow (2012), less than 0.1 percent of agricultural GDP was generated in their category of Ethiopian and Ugandan cities (which included large urban centers beyond Addis Ababa and Kampala), while 17.9 and 5.3 percent of agricultural GDP was generated in Ethiopia's and Uganda's rural towns respectively.

[20] Following Headey, Bezemer and Hazell (2010), who explore this in the context of nonagricultural employment shares in Asia and Africa,[20] the nonagricultural employment shares reported by FAO are compared with the nonagricultural employment shares of men reported in the Demographic Health Surveys (DHS) for each country/year in the sample where there was a match. Even though the differences were at times substantial—FAO reporting 32.8 and 20.4 percentage points more people employed in non-agriculture than DHS in Kazakhstan and Nigeria respectively and 25.4 and 19.7 percentage points less in Kenya and Senegal respectively—there were about as many positive as negative deviations and the correlation coefficients between both series was 0.67. Furthermore, when regressing the change in headcount poverty on the observed difference in nonagricultural employment share between FAO and DHS estimates, there was no correlation.

On average about two-fifths of the population are in agriculture, two-fifths are in the missing middle and one fifth reside in cities above 1 million inhabitants (Table 2; see Appendix 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 missing 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. For the African countries in the sample, these changes are -1.1, 2.2 and 1.0 respectively. 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).

4 Estimation Results

Benchmark findings

To benchmark our sample, the change rates of $1 and $2-day poverty headcount ratios are regressed against GDP growth per capita using ordinary least squares with appropriate corrections for heteroskedasticity and controls for (unobserved) country-specific and year-specific effects. Unlike most of the poverty to GDP elasticity literature so far, the findings presented here thus control both for unobserved country effects in levels *and* changes. The results confirm the critical importance of GDP growth for poverty reduction (Dollar and Kraay, 2002), with poverty to GDP elasticities of 2.7 and 1.5 respectively (Table 3, columns (1) and (2)).[21]

To explore whether the spatial dynamics of the transformation affect the rate of poverty reduction, columns (1) and (2) are augmented with the change rate of the population in the missing middle and the change rate of the share of the metropolitan population (Table 3, columns (3) and (4)). The results indicate that controlling for overall growth in the economy,

[21] This is commonly referred to as the "growth elasticity of poverty". In analogy with the price elasticity of demand, the technically correct term is the GDP elasticity of poverty.

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. Given that the results are 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.

Recall from the analytical exposition in Section 2 that the coefficient on the sectoral share can be interpreted as the impact of the sectoral transformation on poverty through the income distribution. The findings thus suggest that rural diversification and less concentrated urbanization lead to more inclusive growth patterns. This empirical regularity resonates with the findings from historical, comparative country case studies in East Asia (Otsuka, 2007). 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, China'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.

The cross-country results also find support in recent micro-evidence from Africa. Tracking a representative sample of 3,301 rural individuals in Kagera, Tanzania, between 1991-94 and 2010, Christiaensen, De Weerdt and Todo (2013) find that the poverty headcount declined from 53 to 29.6 percent and that the number of poor people declined from 1,747 in 1991-94 to 979 in 2010. About half of the people who exited poverty did so shifting to rural nonfarm activities as their main occupation and/or by moving to secondary towns; about 30 percent escaped poverty while staying in agriculture and only 1 in 6 by migrating to one of

the big cities (Dar es Salaam, Mwanza and Kampala). While annual consumption of the latter group grew about 1.6 times faster than the incomes of those moving to the middle (6.7 percent per year versus 4.2 percent), the middle contributed most to poverty reduction, even though a smaller share of them exited poverty (the headcount reduced from 58 to 25 percent while poverty among those who moved to the big city dropped from 51 to 2 percent) because more than 4 times more villagers moved to the middle. It is the greater ability of the poor to connect to growth in the rural non-farm economy and secondary towns that appears to have driven poverty reduction in this case study. Average consumption and poverty levels among the different groups were similar at the outset.

Robustness checks

Robustness checks of the results against the choice of the metric of the regression variables and the linear form of the specification as well as against a series of competing hypotheses are presented in Tables 4 and 5 respectively. The robustness against different measures of poverty is explored first. In particular, to better capture the effects through the distribution channel, the more distribution sensitive poverty *gap* measures are used in columns 1 and 2 of Table 4, rather than the poverty headcount ratios, which do not account for the depth of shortfall from the poverty line. In addition, instead of using the percent change in the poverty headcount as dependent variable, the percentage point change is used (including for the population shares, columns 3 and 4, Table 4). This could be intuitively more appealing and easier to understand for poverty practitioners—a 1 percentage point growth in GDP per capita yields x percentage points change in poverty—and can help avoid some of the numerical anomalies that are introduced when changing poverty at low levels, with small percentage point changes translating into high percentage changes (Klasen and Misselhorn, 2006). The core finding, that rural diversification and migration to secondary towns is more poverty reducing, is essentially robust against these different metrics of

poverty.[22]

Second, another definition of metropolis is used, i.e. 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 (Table 4, columns 5 and 6). 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. Unlike in the base specification, metropolitization was also associated with poverty reduction, though the effects on poverty reduction from rural diversification were quantitatively at least 50 percent larger. This also held when GDP growth was excluded, to which we return below.

Third, to further examine whether definitional issues related to the delineation of the nonagricultural population affect the results, even though no systematic relation was observed in the differences between DHS and FAO estimates nor a correlation between the observed difference in the nonfarm employment shares from both sources and the change in poverty, equation (7) was re-estimated dropping those countries where the observed difference was largest. As observed in columns (7) and (8), doing so did not affect the core finding of superior poverty reduction from movements out of agriculture to the missing middle.

Finally, when augmenting the regressions with a quadratic term of the change rate of the sectoral shares to allow for nonlinearity in the impact of the sectoral transformations (Table 4, columns (9) and (10)), no effect of metropolitization on poverty is found. The findings on rural diversification and secondary town expansion remain robust, with a strong poverty reducing effect at first, which declines as the migration rate to the missing middle increases. In sum, the core findings are qualitatively robust against the use of alternative metrics and non-linear specifications. Looking across the different columns, they are also quantitatively quite similar to the benchmark results.

Turning to the robustness against competing hypotheses, Table 5 examines whether the

[22] Note that the effect of the change rate in the missing middle is also negative and larger than the effect of metropolitization when using percentage point changes in $1-day poverty, even though it is estimated with imprecision. When entered quadratically, the coefficient on the missing middle share is also statistically significant and negative, while there remains no statistically significant effect of metropolitization, pointing to the possibility of a non-linear effect, as examined further below.

findings are robust to the sectoral composition of growth and potential poverty induced migration effects. To benchmark the findings, columns 1 and 2 first present the estimated effects of (share weighted) agricultural and nonagricultural growth on poverty. Consistent with the literature, growth originating in agriculture is found to be more poverty reducing than growth originating outside agriculture, an advantage that becomes quite small however when it comes to $2-day poverty, as has also been reported by Christiaensen, Demery and Kuhl (2011). Controlling for both sources of growth separately (Table 5, columns 3 and 4), movement from agriculture to the missing middle continues to yield an extra poverty reducing effect (of a slightly larger magnitude than before), while metropolitization does not add to poverty reduction (as before). Agricultural growth appears not to be driving the results. If so, the coefficient on rural diversification and secondary town expansion should be no longer statistically significant, after controlling for the sources of growth.

The results further suggest that part of the poverty reducing powers of agricultural growth appear to derive from its interactions with the rural nonfarm sector and secondary towns (with the effects likely going in both directions), as agriculture seems to lose most of its edge over non-agriculture in reducing poverty after inclusion of the expansion rate of the rural nonfarm and small town populations. The coefficient on agriculture is now only slightly larger (and somewhat imprecisely estimated—t-value of 1.6) than the coefficient on GDP growth originating in nonagriculture. This does not invalidate the core insight that growth in agriculture is effective at reducing poverty—a 1 percentage point GDP growth originating in agriculture has on average still similar effects on poverty as a 1 percentage point GDP growth originating outside agriculture. It rather indicates that where the nonagricultural sector expands into (in the rural nonfarm sector and the secondary towns versus the metropoles), has also important additional implications for the overall effect of growth on poverty through the income distribution channel. It helps more of the poor benefit from growth outside agriculture by switching occupation as well as complementing their agricultural incomes for those who do not move.

These considerations of how the population exits agriculture become even more

important as nonagriculture starts to drive economic growth and countries start to progress through their occupational and spatial transformation. From columns 3 and 4 in Table 5 it can be seen that at the margin (and controlling for growth and its sectoral sources), a 1 percent increase in the population share in the missing middle yields on average quite a bit more national poverty reduction than a 1 percentage point increase in the amount of aggregated (share weighted) per capita GDP growth originating in agriculture. This is very much like the detailed country case findings reported by Suryahadi, Suryadarma, and Sumarto (2009) for Indonesia, a transforming country.[23] Using 4 period provincial panel data spanning 1984-2002, they estimate that 1 percentage point aggregate GDP growth originating in rural services yielded about the same decline in rural poverty as 1 percentage point aggregate GDP growth originating in agriculture, highlighting the importance of the rural nonfarm economy in this transforming economy. In addition, they report a similar size effect on rural poverty from a 1 percentage point aggregate GDP growth originating in urban services.[24] Similar to Ravallion and Datt's (1996) analysis of Indian data, they also relate the effect of the latter to the more labor-intensive, low capital, lower skilled part of the urban service sector. Clearly, the effect of diversifying into rural nonfarm and secondary town activities on poverty reduction can be substantial.

Turning to the second robustness test (Table 5, columns 5 and 6), the estimated coefficients remain also virtually unchanged when initial poverty is included. This provides confidence that it is not poverty induced migration that is behind the observed empirical regularities. Together these robustness tests for different metrics, specifications and competing hypotheses provide support for the notion that, controlling for growth, rural diversification and secondary town development are on average associated with more inclusive growth

[23] During 1984-2002, the period of their study, overall GDP growth in Indonesia was no longer driven by agriculture. It was on average only 15 percent of the economy. People exited agriculture into the missing middle at 1.08 per cent per year, while poverty remained predominantly a rural phenomenon, with more than 80 percent of the poor living in rural areas and about two thirds of them deriving the bulk of their income from agriculture.

[24] Accounting for their respective shares in the economy, 10 percent GDP growth in rural services was found to reduce rural poverty by 0.8 percentage points, similar as a 10 percent agricultural GDP increase, which reduced rural poverty by 0.7 percentage points. The effect of 10 percent growth in urban services was twice as large (1.5 percentage points) (reflecting its size in the economy which was on average 36.35 percent during the study period, compared with 15.4 percent for agriculture and 14.7 percent for rural services).

patterns and more rapid poverty reduction than rapid metropolitization.

Lower inequality, slower growth and faster poverty reduction

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 (7) excluding GDP per capita growth (i.e. estimating equation (8)). 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 changing the aggregate income level.

The results presented in columns 1 and 2 of Table 6 show that the overall impact of rural nonfarm activities is negative and significant as before, whereas the overall impact of the urban share remains insignificant. The coefficient on the share of rural nonfarm activities in columns 1 and 2 of Table 6 are only slightly larger in absolute terms than the benchmark results in columns (3) and (4) of Table 3, 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.

To explore the channels through which rural diversification and metropolitization affect poverty reduction further, Table 7 presents regression results exploring the relation between income inequality (as captured by the Gini coefficient) and the distribution of people across space, controlling for GDP per capita (and its square). GDP per capita regressors are included, as an inverted relation between income and inequality, known as the Kuznets curve,

is often observed. Ideally, *changes* in income inequality are regressed on *changes* in the share of people in the missing middle and *changes* in the metropolitan share of the population to control for unobserved country effects.

Doing so does not yield any statistically significant results (Table 7, column 1). As Kraay (2006) explains in his exploration of the sources of pro-poor growth (growth in average income and changes in relative incomes), there is likely substantial measurement error in the measures of distributional change. While classical measurement error in the dependent variable does not lead to biased estimates, it inflates standard errors and reduces the significance of the estimated coefficients. With relatively few spells per country, identification from within-country variation thus becomes difficult. This also highlights the power of the results obtained in the poverty regressions above, which do control for unobserved country effects.

Pursuing the more modest objective of exploring correlations between income inequality and occupational and spatial settlement patterns, column (2) presents the OLS regression results of the level equations. Consistent with the insights derived from the poverty regressions above, rural diversification is associated with a decline in income inequality, while agglomeration in mega cities is strongly associated with higher income inequality. Both results are statistically significant at the 1 percent level.

Including regional dummies in an attempt to control for some of the unobserved country specific characteristics (such as characteristically higher inequality in Latin America) yields similar results (column 3). Metropolitization remains strongly associated with higher income inequality, while rural diversification remains negatively associated, even though the association weakens substantially quantitatively. Similar results are obtained using the mean log deviation (the mean across the population of the log of the mean divided by individual income) or the ratio of the average income of the richest 20 percent to that of the poorest 20 percent as measures of inequality (not reported here).

Furthermore, two specifications are used to explore the effect of the patterns of the spatial and occupational transformation on GDP per capita growth (Table 8). In column (1) the

average annual growth rate of GDP per capita during 5 year periods is regressed on the average annual change rate of the sectoral shares during the same 5 year periods (t to t-5). In column (2), initial GDP per capita is added as an additional regressor to allow for convergence following the tradition in growth empirics. Period effects are further incorporated to control for global shocks and country fixed effects are included to control for unobserved (time invariant) country characteristics. Since the focus is on the impact of the patterns of spatial transformation and given that the impact of many other potential determinants of GDP growth remains disputed (Durlauf et al., 2005), no other regressors have been considered.

OLS estimation of these specifications may be biased due to reverse causality. If, for example, income growth affects the spatial transformation (e.g. by fostering migration to the metropolis), this reverse causality would introduce endogeneity bias. Following Caselli, Esquivel and Lefort (1996), a two-stage least squares (2SLS) estimation is performed using the *levels* of the share of the population employed in the missing middle and the metropolitan population share in the previous period (t-10) as well as the initial GDP per capita in the previous period (i.e. t-10) as instruments. These lagged variables are likely to be correlated with the regressors, while unrelated to the contemporaneous error term. This strategy is akin to the difference Generalized Method of Moments proposed by Arellano and Bond (1991). Their dynamic panel data estimator was not used here given the limited number of time periods considered (1980-2000). As the data for the period 1980-1985 are used only for instruments, only 3 observations per country are left.

As predicted by the new economic geography literature, metropolitization has a large positive effect on GDP per capita growth (Table 8, column (1)). A 1 percent increase in the metropolitan share of the population is associated with a 1.16 percentage point increase in GDP per capita. This holds when controlling for the initial income level (column 2). Rural diversification also positively affects income growth, after controlling for the initial income level, though it is slightly less precisely estimated, and at 0.6 percentage point per capita GDP growth per percent change in the population share of the missing middle, the growth effect is

substantially smaller.

5 Concluding Remarks

This paper examines whether the nature of the spatial transformation affects the rate of poverty reduction, using cross-country panel data for developing countries (including countries in Sub-Saharan Africa). It is found that agglomeration in mega cities is on average associated with faster growth and higher income inequality, while diversification into rural nonfarm and secondary town activities typically facilitates a more inclusive but slower, growth process. Secondary towns are also where most of the urban poor live and where access to basic infrastructure services is lowest (compared with the metropoles) (Ferré, Ferreira and Lanjouw, 2012). Growth promoting interventions that enable poor people to access this growth and basic infrastructure services more directly are thus also more likely to lift more of them out of poverty, than when the benefits of growth have to spatially trickle down from the metropoles.

Joint evaluation of the trade-offs between these two counteracting forces (higher/lower average income growth and more unequal/equal income distribution) suggests indeed that migration out of agriculture into the rural economy and secondary towns is substantially more poverty reducing than rapid metropolitization. In effect, no statistical association could be established between metropolitization and poverty reduction. The empirical regularities suggest that the nature of the spatial transformation matters for the rate of economic growth and poverty reduction observed during the spatial and structural transformation. When fostering overall economic growth is taken as key target, the balance of public investment and policy choice should be shifted in favor of more rapid urbanization and mega city development. However, when rapid poverty reduction is the primary objective, more attention should be given to fostering rural diversification and secondary town development.

While more investigation is clearly needed to firmly establish causality, the empirical regularity with which these relations have been observed in this dataset, and their robustness against a series of alternative hypotheses, measurement issues and non-linearity, underscore

the pertinence of the question. The results also warn against overinterpretation of the static finding that poverty rates are higher in rural areas and secondary towns than in metropoles, and call for deeper reflection about the optimality of ongoing urbanization processes, especially in areas where urban concentration is already high (as in Sub-Saharan Africa). In depth, comparative historical country case studies, including about the political economy of urban concentration, as well as theoretical and empirical analyses to better unpack the channels will prove extremely valuable.

References

Anand, Sudhir, and Ravi, Kanbur, 1985. Poverty under the Kuznets Process, Economic Journal, 95(380a): 42-50.

Arellano, Manuel and Stephen, Bond, 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *Review of Economic Studies* 58(2): 277-97.

Barrett, C.B., Reardon, T., Webb, P., 2001. Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics and policy implications. *Food Policy* 26: 315–331.

Beegle, Kathleen, Joachim, De Weerdt, and Stefan Dercon, 2012. Migration and Economic Mobility in Tanzania: Evidence from a Tracking Survey. *Review of Economics and Statistics*, 93-3: 1010-1033.

Behrens, Kristian, and Alain Pholo, Bala, 2013, Do Rent-Seeking and Interregional Transfers Contribute to Urban Primacy in Sub-Saharan Africa? *Papers in Regional Science*: 92-1: 163-195.

Cali, Massimiliano, and Carlo, Menon, 2013. Does Urbanization Affect Rural Poverty? Evidence from Indian Districts, *World Bank Economic Review*, forthcoming.

Caselli, Francesco, Gerardo, Esquivel, and Fernando, Lefort, Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics, *Journal of Economic Growth*, 1-3: 363-89.

Christiaensen, Luc, 2007, *Agriculture for Development in East Asia: Lessons from the World Development Report 2008, Special Focus in East Asia and Pacific Update*, November 2007: World Bank: Washington.

Christiaensen, Luc, Lionel Demery, and Jesper, Kuhl, 2011, The (Evolving) Role of Agriculture in Poverty Reduction. *Journal of Development Economics*, 96-2: 239-254.

Christiaensen, Luc, Joachim De Weerdt, and Yasuyuki, Todo, 2013. Urbanization and Poverty Reduction – The Role of Rural Diversification and Secondary Towns. *Agricultural Economics.* Forthcoming.

Dorosh, Paul, and James, Thurlow, 2012. Can Cities or Towns Drive African Development? Economy-wide Analysis for Ethiopia and Uganda, UNU-WIDER Working Paper 2012/50: Helsinki.

Durlauf, Steven N., Paul A. Johnson, and Jonathan R.W. Temple, 2005, Growth Econometrics, in Philippe Aghion and Steven N. Durlauf (Eds.), *Handbook of Economic Growth*. Elsevier B.V., Amsterdam.

Ferré, Céline, Francisco, Ferreira, and Peter, Lanjouw, 2012. Is There a Metropolitan Bias? The Relationship between Poverty and City Size in a Selection of Developing Countries, *World Bank Economic Review*, 26-3: 351-382.

Fields, Gary, 2005. A Welfare Economic Analysis of Labor-Market Policies in the Harris-Todaro Model. *Journal of Development Economics*, 76(1): 127-46.

Fujita, Masahisa, and Jacques-François, Thisse, 2002. *Economics of Agglomeration; Cities, Industrial Location and Regional Growth*, Cambridge University Press, Cambridge.

Glasser Matthew, et al. 2008. The Urban Transition in Tanzania. World Bank: Washington DC.

Gollin, Douglas, Remi Jedwab and Dietrich Vollrath. 2013. *Urbanization Without Structural Transformation: Evidence from Sub-Saharan Africa*. Mimeographed.

Headey Derek, Dirk, Bezemer and Peter, Hazell, 2010. Agricultural Employment Trends in Asia and Africa: Too Fast or Too Slow? *World Bank Research Observer* 25(1): 57-89.

Haggblade, Steven., Peter, Hazell, and Tom, Reardon, 2007, eds., *Transforming the Rural Nonfarm Economy – Opportunities and Threats in the Developing World*, John Hopkins University Press: Baltimore.

Henderson, J. Vernon. 2003. The Urbanization process and Economic Growth: The So-What Question, *Journal of Economic Growth*, 8: 47-71.

Henderson, J. Vernon, 2010. Cities and Development. *Journal of Regional Science*, 50(1): 515-540.

Klasen, Stephan, and Mark, Misselhorn, 2006, *Determinants of Growth Semi-Elasticity of Poverty Reduction*, mimeographed, University of Gottingen, Gottingen.

Kraay, Aart, 2006, When is Growth Pro-Poor? Evidence from a Panel of Countries, *Journal of Development Economics*, 80-1: 198-227.

Lall, Somik, Harris, Selod, and Zmarak, Shalizi, 2006. *Rural-Urban Migration in Developing Countries: A Survey of Theoretical Predictions and Empirical Findings*, World Bank Policy Research Working Paper 3915: Washington D.C.

Lanjouw, Peter and Rinku, Murgai, 2009. Poverty Decline, Agricultural Wages and Nonfarm Employment in Rural India: 1983-2004. *Agricultural Economics*, 40: 243-263.

Loayza, Norman and Claudio Raddatz, 2010. The Composition of Growth Matters for Poverty Alleviation. *Journal of Development Economics* 93 (1): 137–151.

Montalvo, J., and Martin, Ravallion. 2010. The Pattern of Growth and Poverty Reduction in China. *Journal of Comparative Economics*: 38: 2-16.

Owusu, Victor, Awudu, Abdulai, and Seini Abdul-Rahman, 2011. Non-farm work and food security among farm households in Northern Ghana, *Food Policy*, 36(2): 108-118.

Otsuka, Keijiro, 2007, The Rural Industrial Transition in East Asia: Influences and Implications, in Haggblade, S., P., Hazell, and T., Reardon, eds., *Transforming the Rural Nonfarm Economy – Opportunities and Threats in the Developing World*, John Hopkins University Press: Baltimore.

Potts, D. 2012. *Whatever happened to Africa's rapid urbanization?* Working Paper, Africa Research Institute.

Ravallion, Martin, 2002, On the Urbanization of Poverty, *Journal of Development Economics*, 68(2), 435-442.

Ravallion, Martin and Gaurav Datt, 1996. How Important to India's Poor Is the Sectoral Composition of Economic Growth? *World Bank Economic Review*, 10(1): 1-25.

Ravallion, Martin and Shaohua, Chen 2007. China's (uneven) progress against poverty, *Journal of Development Economics*, 82(1): 1-42.

Ravallion, Martin, 2012. Why Don't We See Poverty Convergence? *American Economic Review*, 102(1): 504-23.

Ravallion, Martin, Shaohua Chen and Prem Sangraula, 2007. New Evidence on the Urbanization of Global Poverty, *Population and Development Review*, 33(4): 667-701.

Suryahadi, Asep, Daniel Suryadarma, and Sudarno Sumarto, 2009. The Effects of Location and Sectoral Components of Economic Growth on Poverty: Evidence from Indonesia, *Journal of Development Economics*, 89-1: 109-117.

Szirmai, Adam, 2012. Industrialization as an engine of Growth in Developing Countries, 1950-2005, *Structural Change and Economic Dynamics*, 23(4): 406-420.

Timmer, P., 2009. *A World Without Agriculture—The Structural Transformation in Historical Perspective*. Henry Wendt Lecture Series. American Enterprise Institute, Washington D.C.

United Nations, 2007, *World Urbanization Prospects: The 2007 Revision Population Database*.

World Bank, 2008, *World Development Report 2008: Agriculture for Development*, World Bank: Washington D.C.

World Bank, 2009, *World Development Report 2009: Reshaping Economic Geography*, World Bank: Washington D.C.

Table 1: 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 2: 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
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 of more. Alternative definition of metropolis is based on the share of the population in urban agglomerations with 750,000 or more in 2007.

Table 3: Migration out of agriculture into the missing middle is more poverty reducing.

	(1)	(2)	(3)	(4)
Change rate of the poverty headcount ratio (Poverty line)	$1	$2	$1	$2
Change rate of the share of the missing middle	-	-	-9.705***	-3.355***
			(3.400)	(1.148)
Change rate of the share of metropoles	-	-	-5.415	-2.970
			(6.066)	(2.148)
Growth rate of GDP per capita	-2.702**	-1.533***	-2.347**	-1.438***
	(1.051)	(0.434)	(1.064)	(0.461)
Flood Number of floods	5.397	1.470	6.426**	1.843*
	(3.441)	(1.093)	(3.163)	(1.016)
Observations	206	206	206	206
R-squared	0.423	0.415	0.478	0.457
Adjusted R-squared	0.117	0.105	0.189	0.156
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 4: Superior poverty reducing effects from migration out of agriculture into the missing middle is robust against alternative poverty, metropolis and non-agricultural population measures as well as non-linear specifications.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Change rate of the population headcount (%)	Poverty gap ratios, not headcount ratios		Poverty headcounts (%point changes)		Alternative definition of urban areas		Excl. obs with large discrepancies in nonagricultural population by source		Quadratic specification	
(Poverty line)	$1	$2	$1	$2	$1	$2	$1	$2	$1	$2
Change rate of the share of the missing middle	-13.67***	-5.827***	-0.997	-1.536**	-9.370***	-3.188***	-9.139**	-2.746**	-13.08***	-4.816***
	(5.207)	(1.979)	(0.663)	(0.767)	(3.272)	(1.138)	(3.689)	(1.154)	(2.849)	(1.127)
Quadratic term	-	-	-	-	-	-	-	-	1.896***	0.867***
									(0.662)	(0.309)
Change rate of the share of metropoles	-9.008	-4.484	2.000	3.732	-6.124***	-2.070**	-3.511	-2.273	-2.134	-2.874
	(8.816)	(3.282)	(2.037)	(4.075)	(2.033)	(0.798)	(6.513)	(2.406)	(9.259)	(3.833)
Quadratic term	-	-	-	-	-	-	-	-	-2.101	-0.396
									(2.817)	(1.185)
Growth rate of GDP per capita	-2.346	-1.616**	-0.0590	-0.229***	-2.238**	-1.411***	-1.295	-1.187**	-2.516**	-1.560***
	(1.467)	(0.664)	(0.0453)	(0.0756)	(1.013)	(0.425)	(1.284)	(0.566)	(1.028)	(0.433)
Number of floods	10.16**	3.342*	-0.178	-0.112	6.854**	1.973*	6.970**	1.702*	6.770**	2.010**
	(4.492)	(1.705)	(0.329)	(0.353)	(3.156)	(1.022)	(3.252)	(1.024)	(3.111)	(0.989)
Observations	205	205	233	233	199	199	173	173	199	199
R-squared	0.417	0.463	0.313	0.385	0.523	0.490	0.458	0.422	0.541	0.514
Adjusted R-squared	0.093	0.163	-0.028	0.080	0.250	0.198	0.120	0.062	0.267	0.223
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	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. In columns 3 and 4, %point changes in poverty headcounts are regressed on %point changes in population shares. In columns 5 and 6, the urban population is defined as the population in cities of a population of 750,000 or more in 2005. In columns 7 and 8, China, Pakistan, Bangladesh, Georgia, Kazakhstan, Turkey, Ukraine, and Russia are excluded.

Table 5: Superior poverty reducing effects from migration out of agriculture into the missing middle as opposed to metropoles is not affected by agriculture's contribution to growth or poverty induced migration patterns.

	(1)	(2)	(3)	(4)	(5)	(6)
Change rate of poverty headcount ratio	Controlling for sources of growth				Dynamic specification	
(Poverty line)	$1	$2	$1	$2	$1	$2
Change rate of the share of the missing middle	-	-	-11.13***	-4.112***	-8.906***	-3.155***
			(3.372)	(1.154)	(3.279)	(1.132)
Change rate of the share of metropoles	-	-	-2.809	-2.003	-5.327	-2.948
			(6.682)	(2.385)	(5.917)	(2.124)
Growth rate of GDP per capita	-	-	-	-	-2.099**	-1.376***
					(1.055)	(0.466)
Growth rate of agricultural GDP per capita (share-weighted)	-3.520*	-1.703**	-2.699	-1.418**	-	-
	(2.021)	(0.757)	(1.752)	(0.692)		
Growth rate of non-agricultural GDP per capita (share-weighted)	-2.307*	-1.440***	-2.405**	-1.496***	-	-
	(1.259)	(0.528)	(1.134)	(0.511)		
Poverty headcount ratio in the initial year of the spell	-	-	-	-	-0.923**	-0.230*
					(0.383)	(0.121)
Number of floods	5.778	1.588	6.910**	2.005*	6.273**	1.805*
	(3.633)	(1.168)	(3.286)	(1.050)	(2.970)	(0.981)
Observations	201	201	201	201	206	206
R-squared	0.425	0.412	0.492	0.468	0.504	0.467
Adjusted R-squared	0.102	0.082	0.194	0.156	0.224	0.165
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	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.

Table 6: When accounting for differential effects on growth, migration out of agriculture into the missing middle is more poverty reducing.

	(1)	(2)
Change rate of the poverty headcount ratio (Poverty line)	$1	$2
Change rate of the share of the missing middle	-10.75***	-3.993***
	(3.186)	(1.071)
Change rate of the share of metropoles	-2.525	-1.199
	(6.046)	(2.039)
Number of floods	7.501***	2.502***
	(2.849)	(0.934)
Observations	206	206
R-squared	0.446	0.385
Adjusted R-squared	0.146	0.052
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.

Table 7: Metropolitization is associated with larger inequality

	(1)	(2)	(3)
Dependent variable: Gini coefficient	First Difference	OLS	OLS
Share of people in the missing middle	0.210	-0.246	-0.080
	(0.239)	(0.045)**	(0.035)*
Metropolitan share of the population	0.536	0.513	0.245
	(0.720)	(0.058)**	(0.065)**
GDP per capita	1.289	3.151	2.175
	(1.615)	(0.758)**	(0.680)**
GDP per capita squared	-0.068	-0.218	-0.151
	(0.068)	(0.046)**	(0.040)**
Observations	230	232	232
R-squared	0.152	0.596	0.790
Year dummies	Yes	Yes	Yes
Regional dummies	No	No	Yes
Country dummies	No	No	No

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 8: Metropolitization is associated with faster GDP Growth

	(1)	(2)
Dependent variable	Growth rate of GDP per capita	
Change rate of the share of people in the missing middle	0.418	0.630
	(0.388)	(0.336)+
Change rate of the metropolitan share of the population	1.159	1.072
	(0.485)*	(0.402)**
Initial GDP per capita		-0.373
		(0.124)**
Year dummies	Yes	Yes
Country dummies	Yes	Yes
Estimation method	2SLS	2SLS
Observations	209	209

Notes: Robust standard errors are in parentheses. **, *, and + denote statistical significance at the 1-, 5-, and 10-percent level, respectively.

Appendix: Sample country observations, their population shares and poverty headcounts

		Share in total population (%)			Poverty head count ratio (%)	
		Agriculture	Missing middle	Mega cities	$1	$2
Algeria	1988	28.0	64.4	7.6	1.8	13.9
	1995	25.4	66.5	8.1	1.1	14.4
Armenia	2002	45.3	18.4	36.3	3.4	36.1
	2003	46.0	17.6	36.4	1.7	30.3
Azerbaijan	1995	28.8	48.2	23.0	11.5	45.8
	2001	26.3	51.4	22.3	3.6	33.3
Bangladesh	1988	66.7	24.8	8.5	35.4	86.2
	1991	64.3	26.4	9.3	33.7	85.3
	1995	60.5	29.3	10.2	32.9	81.9
	2000	55.7	32.9	11.4	41.3	84.2
Bolivia	1990	46.9	27.9	25.2	5.7	28.7
	1997	45.0	26.4	28.6	20.4	39.1
	1999	44.5	26.4	29.1	26.2	44.2
	2002	43.6	26.4	30.0	24.0	42.9
Brazil	1981	35.3	32.6	32.1	11.8	31.1
	1984	31.3	36.3	32.4	15.2	37.0
	1985	30.0	37.5	32.5	15.8	36.3
	1987	27.3	39.7	33.0	11.9	29.4
	1989	24.6	42.0	33.4	9.0	25.5
	1990	23.3	43.0	33.7	14.0	32.3
	1992	21.8	44.1	34.1	10.1	24.3
	1993	21.1	44.6	34.3	8.3	23.4
	1995	19.8	45.5	34.7	10.5	23.3
	1996	19.1	46.0	34.9	6.9	21.7
	1997	18.5	46.4	35.1	9.0	23.5
	1998	17.9	46.8	35.3	1.4	15.7
	1999	17.3	47.2	35.5	8.0	23.0
	2001	16.1	47.9	36.0	8.2	22.4
	2002	15.6	48.2	36.2	6.7	21.2
	2003	15.0	48.5	36.5	7.4	21.7
Bulgaria	1997	8.6	77.1	14.3	0.8	20.0
	2001	6.6	79.0	14.4	3.0	13.0
	2003	5.8	80.0	14.2	0.0	6.4
Cameroon	1996	63.8	20.0	16.2	35.8	71.8
	2001	58.3	23.6	18.1	20.1	54.8
Chile	1987	19.4	45.8	34.8	6.2	24.1
	1990	18.8	46.2	35.0	2.0	14.1
	1992	18.1	47.0	34.9	1.1	12.1
	1994	17.5	47.8	34.7	0.9	10.8
	1996	16.9	48.5	34.6	0.0	8.2
	1998	16.3	49.1	34.6	0.0	7.8
	2000	15.8	49.6	34.6	0.4	6.3
	2003	14.9	50.4	34.7	0.5	5.6
China	1985	72.9	15.0	12.1	24.2	72.1
	1987	72.5	15.1	12.4	28.8	69.0
	1992	70.9	15.7	13.4	29.1	64.7
	1993	70.4	15.9	13.7	27.7	66.8

		Share in total population (%)			Poverty head count ratio (%)	
		Agriculture	Missing middle	Mega cities	$1	$2
China (cont.)	1994	69.9	16.1	14.0	24.3	59.9
	1995	69.3	16.4	14.3	21.3	55.0
	1996	68.8	16.5	14.7	16.9	52.2
	1997	68.3	16.6	15.1	16.2	48.4
	1998	67.7	16.7	15.6	16.3	48.6
	1999	67.2	16.8	16.0	17.7	50.0
	2002	65.5	17.6	16.9	14.1	41.8
Colombia	1980	40.5	31.2	28.3	7.8	20.2
	1988	29.4	40.7	29.9	4.5	14.7
	1989	28.0	42.0	30.0	2.5	12.0
	1991	25.9	43.7	30.4	2.8	11.6
	1995	23.4	45.1	31.5	3.1	16.3
	1996	22.8	45.1	32.1	5.6	18.9
	1998	21.6	45.0	33.4	8.1	20.5
	1999	21.0	45.0	34.0	7.9	22.0
	2000	20.4	45.0	34.6	8.4	21.3
	2003	18.8	46.0	35.2	7.6	19.4
Costa Rica	1981	27.6	49.8	22.6	14.8	32.0
	1986	26.9	49.7	23.4	7.3	18.1
	1990	25.9	50.1	24.0	5.2	16.1
	1992	24.1	51.5	24.4	4.4	15.5
	1993	22.6	52.8	24.6	4.1	14.6
	1996	21.6	53.2	25.2	3.6	13.3
	1997	20.6	53.9	25.5	1.9	10.1
	1998	20.1	54.2	25.7	1.4	9.1
	2000	20.4	53.3	26.3	2.0	9.4
	2001	15.6	57.8	26.6	1.4	8.2
	2003	15.1	57.5	27.4	1.8	9.6
Cote d'Ivoire	1987	61.3	22.3	16.4	3.3	28.5
	1988	60.7	22.8	16.5	7.5	36.4
	1993	56.7	26.4	16.9	9.9	44.9
	1995	54.6	28.2	17.2	12.3	49.4
	1998	51.4	30.8	17.8	15.5	50.4
	2002	47.0	34.2	18.8	15.7	48.4
Dominican Republic	1986	27.8	50.6	21.6	8.6	24.8
	1989	25.6	52.9	21.5	3.8	21.4
	1992	23.0	55.4	21.6	1.6	10.1
	1996	19.6	58.6	21.8	1.8	11.7
	1997	18.9	59.2	21.9	3.1	11.7
	2000	16.7	61.1	22.2	1.1	9.1
	2003	14.8	62.7	22.5	1.9	12.1
Ecuador	1987	35.2	39.4	25.4	13.5	31.0
	1994	30.2	43.4	26.4	16.8	37.4
	1998	27.2	45.4	27.4	14.7	35.2
Egypt, Arab Rep.	1990	40.5	37.7	21.8	4.0	42.6
	1995	37.0	41.8	21.2	3.8	47.0
	1999	34.3	44.9	20.8	3.2	44.2
El Salvador	1989	37.1	44.3	18.6	21.4	43.0

		Share in total population (%)			Poverty head count ratio (%)	
		Agriculture	Missing middle	Mega cities	$1	$2
El Salvador (cont.)	1995	32.6	47.3	20.1	20.8	47.1
	1996	31.9	47.7	20.4	25.3	51.9
	1997	31.2	48.1	20.7	21.5	47.5
	1998	30.5	48.5	21.0	21.4	45.0
	2000	29.1	49.4	21.5	18.9	39.2
	2002	27.8	50.5	21.7	20.4	40.5
Ethiopia	1995	84.4	11.8	3.8	31.3	76.4
	2000	82.4	13.7	3.9	21.6	76.6
Georgia	1999	52.2	24.5	23.3	2.6	14.6
	2000	52.1	24.6	23.3	2.8	16.1
	2001	52.8	23.9	23.3	2.7	15.8
	2002	53.8	22.9	23.3	5.3	23.3
	2003	54.9	21.7	23.4	6.4	25.8
Ghana	1987	60.0	28.2	11.8	46.5	85.6
	1988	59.8	28.3	11.9	45.5	84.5
	1991	59.1	28.5	12.4	47.2	84.0
	1998	57.3	28.8	13.9	36.2	71.1
India	1983	67.9	23.2	8.9	48.0	87.9
	1986	66.2	24.6	9.2	48.3	87.6
	1987	65.6	25.1	9.3	46.2	87.0
	1988	65.1	25.5	9.4	49.5	88.2
	1992	63.2	26.9	9.9	51.1	88.0
	1993	62.7	27.3	10.0	41.8	85.3
	1994	62.3	27.6	10.1	45.1	86.9
	1995	61.9	27.9	10.2	50.6	88.2
	1997	61.0	28.5	10.5	44.3	86.3
	1999	60.1	29.2	10.7	35.6	80.8
Indonesia	1984	54.7	36.9	8.4	36.7	80.0
	1987	55.0	36.4	8.6	28.1	75.8
	1990	55.9	35.4	8.7	20.6	71.1
	1993	50.6	40.3	9.1	17.4	64.2
	1996	44.0	46.4	9.6	14.1	59.7
	1998	45.0	45.0	10.0	26.3	75.9
	1999	43.2	46.6	10.2	7.6	55.2
	2000	45.1	44.5	10.4	7.2	55.4
	2002	44.3	44.8	10.9	7.8	52.9
Iran, Islamic Rep.	1986	35.0	42.1	22.9	1.5	12.4
	1990	32.3	44.8	22.9	1.6	11.7
	1994	29.8	47.1	23.1	0.4	7.0
	1998	27.6	49.3	23.1	0.3	7.2
Kazakhstan	1993	20.7	72.5	6.8	0.4	17.5
	1996	19.3	73.6	7.1	1.9	18.7
	2001	17.2	75.2	7.6	0.1	8.4
	2002	16.8	75.6	7.6	1.8	21.4
	2003	16.4	76.0	7.6	0.9	17.1
Kenya	1992	78.8	15.1	6.1	33.5	63.9
	1994	78.0	15.7	6.3	26.5	62.3
	1997	76.8	16.4	6.8	12.4	45.1

		Share in total population (%)			Poverty head count ratio (%)	
		Agriculture	Missing middle	Mega cities	$1	$2
Madagascar	1980	81.5	12.1	6.4	49.2	80.3
	1993	77.0	14.8	8.2	46.3	80.0
	1997	75.5	16.1	8.4	49.8	84.7
	1999	74.7	16.9	8.4	66.0	90.2
	2001	73.8	17.8	8.4	61.0	85.1
Malaysia	1984	35.5	58.0	6.5	2.0	15.0
	1987	31.4	62.2	6.4	1.2	14.7
	1989	28.7	65.0	6.3	0.9	13.9
	1992	25.4	68.5	6.1	0.4	13.8
	1995	22.7	71.3	6.0	0.9	13.5
	1997	21.0	73.2	5.8	0.1	8.8
Mali	1989	86.1	5.6	8.3	16.5	55.4
	1994	84.0	7.2	8.8	72.3	90.6
	2001	80.4	10.0	9.6	36.3	72.7
Morocco	1984	51.5	32.9	15.6	2.0	16.5
	1990	44.7	39.2	16.1	0.1	7.5
	1998	37.7	45.9	16.4	0.6	14.3
Mozambique	1996	82.2	11.9	5.9	45.6	80.9
	2002	80.8	12.9	6.3	36.2	74.1
Nicaragua	1993	39.0	41.9	19.1	47.9	77.9
	1998	42.3	37.5	20.2	44.7	79.0
	2001	43.4	35.5	21.1	47.7	81.6
Nigeria	1985	48.4	40.8	10.8	65.7	90.9
	1992	41.0	47.3	11.7	59.2	85.3
	1996	37.1	50.6	12.3	78.2	94.6
	2003	30.6	55.6	13.8	71.2	92.3
Pakistan	1987	55.4	28.9	15.7	49.6	88.9
	1990	51.9	32.1	16.0	47.8	87.9
	1992	51.0	32.8	16.2	8.5	63.0
	1996	49.1	34.2	16.7	15.4	73.9
	1998	48.1	34.9	17.0	13.5	65.8
	2001	46.6	36.0	17.4	17.5	73.3
Panama	1991	26.6	38.1	35.3	11.8	24.1
	1995	20.8	43.5	35.7	7.4	17.4
	1996	20.1	44.1	35.8	7.9	18.5
	1997	18.6	45.4	36.0	3.2	12.9
	2000	17.0	46.6	36.4	7.2	17.6
	2001	18.1	45.3	36.6	9.4	20.2
	2002	17.4	45.7	36.9	6.1	17.5
	2003	17.5	45.4	37.1	6.0	16.8
Paraguay	1990	38.9	39.1	22.0	4.9	26.3
	1995	36.6	39.7	23.7	19.4	38.5
	1997	35.6	39.3	25.1	14.7	28.2
	1999	34.8	38.7	26.5	13.6	28.2
	2002	33.4	37.7	28.9	16.4	33.2
	2003	32.9	37.4	29.7	13.6	29.8
Peru	1985	38.0	35.9	26.1	1.1	9.9
	1990	35.7	37.5	26.8	1.4	10.4

		Share in total population (%)			Poverty head count ratio (%)	
		Agriculture	Missing middle	Mega cities	$1	$2
	1994	33.5	39.5	27.0	9.4	31.6
	1996	32.4	40.7	26.9	8.9	28.4
	2000	30.4	43.4	26.2	18.1	37.7
	2001	29.9	44.0	26.1	15.5	36.3
	2002	29.4	44.6	26.0	12.9	32.2
	2003	28.9	45.2	25.9	10.5	30.6
Philippines	1985	49.1	36.9	14.0	23.4	62.0
	1988	47.1	38.6	14.3	19.5	57.0
	1991	45.1	40.3	14.6	20.2	55.5
	1994	43.3	41.6	15.1	18.1	52.7
	1997	41.4	43.6	15.0	13.6	43.9
	2000	39.5	45.8	14.7	13.5	44.9
	2003	37.7	47.8	14.5	13.5	43.9
Poland	1998	22.8	72.9	4.3	0.1	1.9
	1999	22.2	73.5	4.3	0.1	1.2
	2000	21.7	74.0	4.3	0.1	1.3
	2001	21.2	74.5	4.3	0.1	1.4
	2002	20.7	74.9	4.4	0.1	1.5
Romania	1994	20.1	71.2	8.7	2.8	27.4
	1998	16.7	74.3	9.0	1.0	12.8
	2000	15.1	75.9	9.0	2.1	20.4
	2001	14.4	76.6	9.0	1.5	16.8
	2002	13.7	77.4	8.9	1.7	15.6
	2003	13.1	78.0	8.9	1.1	12.6
Russian Federation	1993	12.7	69.6	17.7	6.1	22.7
	1996	11.7	70.3	18.0	7.0	22.6
	1998	11.1	70.7	18.2	2.8	18.6
	2000	10.5	71.0	18.5	6.2	23.8
	2001	10.2	71.2	18.6	1.8	16.8
	2002	10.0	71.2	18.8	0.7	13.5
Senegal	1991	76.5	6.1	17.4	45.4	73.0
	1994	75.6	6.8	17.6	24.0	65.7
	2001	73.5	8.4	18.1	16.8	55.9
South Africa	1993	12.2	61.7	26.1	10.0	34.2
	1995	11.4	62.1	26.5	6.3	32.2
	2000	9.6	62.8	27.6	12.4	36.0
Thailand	1981	70.2	19.6	10.2	21.6	55.0
	1988	65.4	24.0	10.6	17.9	54.1
	1992	62.6	26.7	10.7	6.0	37.5
	1996	59.6	30.0	10.4	2.2	28.3
	1998	58.0	31.6	10.4	0.0	28.2
	1999	57.2	32.5	10.3	2.0	31.6
	2000	56.5	33.2	10.3	2.0	32.5
	2002	54.9	34.8	10.3	0.9	25.8
Turkey	1987	55.6	23.0	21.4	1.5	15.9
	1994	50.6	26.2	23.2	2.3	18.0
	2000	46.3	29.3	24.4	0.8	9.7
	2002	44.8	30.3	24.9	2.8	19.9

		Share in total population (%)			Poverty head count ratio (%)	
		Agriculture	Missing middle	Mega cities	$1	$2
	2003	44.1	30.8	25.1	3.2	19.4
Uganda	1989	84.8	11.0	4.2	87.7	97.1
	1992	83.7	12.0	4.3	90.3	98.1
	1996	82.0	13.6	4.4	87.9	97.5
	1999	80.6	14.9	4.5	84.9	96.6
	2002	79.1	16.4	4.5	82.3	95.7
Ukraine	1995	17.0	70.8	12.2	2.1	14.8
	1996	16.4	71.3	12.3	2.0	16.4
	1999	14.9	72.6	12.5	2.2	26.9
	2002	13.5	73.7	12.8	0.5	9.3
	2003	13.1	74.0	12.9	0.2	5.0
Venezuela, RB	1981	14.3	50.4	35.3	6.3	22.6
	1987	12.8	52.8	34.4	6.6	24.7
	1989	12.3	53.4	34.3	3.0	14.5
	1993	10.7	55.0	34.3	2.7	17.9
	1995	9.9	55.7	34.4	9.4	28.8
	1996	9.5	55.9	34.6	14.8	36.6
	1997	9.1	56.1	34.8	9.6	28.6
	1998	8.8	56.2	35.0	14.3	30.6
	2003	7.2	56.5	36.3	18.7	40.2
Vietnam	1998	64.8	22.4	12.8	3.8	39.7
	2002	62.0	25.0	13.0	1.8	33.2
Yemen, Rep.	1992	58.2	35.9	5.9	3.4	19.9
	1998	52.4	40.3	7.3	9.4	43.5
Zambia	1991	74.0	16.9	9.1	60.4	82.1
	1993	73.0	17.7	9.3	73.6	90.7
	1996	71.5	19.0	9.5	72.2	91.5
	1998	70.4	19.8	9.8	65.7	87.8
Zimbabwe	1990	68.2	21.9	9.9	54.4	78.0
	1995	65.5	23.9	10.6	56.1	83.0

Note: Some observations above are not used, since they are outliers in terms of growth of any of the five variables.