

Why Did Poverty Decline in India?

A Nonparametric Decomposition Exercise

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Abstract

This paper uses panel data to analyze factors that contributed to the rapid decline in poverty in India between 2005 and 2012. The analysis employs a nonparametric decomposition method that measures the relative contributions of different components of household livelihoods to observed changes in poverty. The results show that poverty decline is associated with a significant increase in labor earnings, explained in turn by a steep rise in wages for unskilled labor, and diversification from farm to nonfarm sources of income in rural areas. Transfers, in the form

of remittances and social programs, have contributed but are not the primary drivers of poverty decline over this period. The pattern of changes is consistent with processes associated with structural transformation, which add up to a highly pro-poor pattern of income growth over the initial distribution of income and consumption. However, certain social groups (Adivasis and Dalits) are found to be more likely to stay in or fall into poverty and less likely to move out of poverty. And even as poverty has reduced dramatically, the share of vulnerable population has not.

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Why Did Poverty Decline in India?

A Nonparametric Decomposition Exercise

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1. Introduction

Recent estimates indicate a rapid decline in poverty in India. The Government of India's Planning Commission (2013) estimates the annual average decline in poverty to be 2.2 percent between 2004/05 and 2011/12—from a poverty headcount ratio of 37.2 percent to 21.9 percent. While there were hints of acceleration in poverty reduction between 1993/94 and 2004/05, the next seven years significantly stepped up in pace. The poverty headcount rate fell at an average annual rate of 1.5 percentage points between 2004/05 and 2009/10 and at nearly 4 percentage points per year between 2009/10 and 2011/12.²

There are many possible drivers of falling poverty over this period. There is evidence of a stronger feedback effect from urban economic growth to rural poverty reduction (Datt, Ravallion, and Murgai, 2015), consistent with growing linkages—through trade, migration, and transfers—between rural and urban areas (see also United Nations, 2011). Deininger and Liu (2013) find evidence that implementation of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) since 2006 has significantly increased consumption and accumulation of financial assets. Sen and Himanshu (2013) point to the role of the Public Distribution System (PDS) as a major contributor to poverty decline. And Dang and Lanjouw (2015) find that more education, salaried work and social capital contribute to upward mobility during this period.

In this paper, we examine the relative contributions of different sources—at the household level—to poverty reduction in India during the latter part of the decade of the 2000s. We use panel data from the nationally representative India Human Development Survey (IHDS) for 2005 and 2012. Poverty rates estimated from this survey using a similar welfare standard (consumption levels below official poverty lines) as in the NSS (National Sample Survey, on which official poverty estimates are based) show a large decline in poverty between the two years, which is roughly comparable to the trend estimated from NSS. This allows us to take advantage of the rich information on income sources of households available from the IHDS and its panel nature to decompose the sources of poverty change among households between 2005 and 2012. More specifically, we look at the extent to which shifts in household composition and income sources have contributed to changes in household income; and with that, to changes in the real value of household consumption. In our analysis, these household level factors can be grouped into broad categories of interest such as the demographic composition of households, extent of engagement in the labor market and labor earnings, and non-labor earnings such as remittances and social benefits.

To conduct this analysis, we employ a nonparametric decomposition method based on the counterfactual simulations done previously by Inchauste et al. (2012) and Azevedo et al. (2013), following Barros et al. (2006)—see also Inchauste et al. (2014). Our results should not be interpreted in causal terms, since the method we use adopts a simple “accounting” approach toward decomposing incomes, with counterfactual simulations that do not take into account behavioral responses of individuals and households to changes in different components of household income. In spite of these limitations, our results are useful for assessing the relative importance of different forces that

² Dang and Lanjouw (2015) find that the remarkable decline in poverty between 2009/2010 and 2012 is not driven by statistical noise or changes in survey design.

contribute directly to household income, inducing the rapid observed changes in consumption-based welfare measures seen during this period.

The rest of the paper is organized as follows. Section 2 describes the methodological framework. Section 3 describes the data and provides descriptive statistics on the sample and distributional measures. Section 4 presents the results. Section 5 concludes.

2. Methodology

Let us define a household consumption identity where household consumption per-capita is a function of income per-capita:

$$c_{h,t} = \theta_{h,t} \frac{Y_{h,t}}{n_{h,t}}$$

$Y_{h,t}$ denotes the income of household h in period t ; $c_{h,t}$ corresponds to the level of consumption per-capita of household h in period t ; $\theta_{h,t}$ denotes the consumption-income ratio at the household level in period t , and $n_{h,t}$ denotes household size in period t . The consumption-income ratio adjusts any differences between income and consumption. Thus it captures the marginal propensity to consume as well as measurement errors in reported income and consumption.

Let $F(\cdot)$ be the cumulative density function of the consumption distribution. Since poverty rates depend on $F(\cdot)$, we can write any distributional statistic (ϑ) as a function of each of the components of $F(\cdot)$:

$$\vartheta_t = \varphi \left(F(c(\boldsymbol{\theta}_t, \mathbf{n}_t, \mathbf{y}_t)) \right).$$

Given that we know the distributions of per-capita consumption for $t = \{1,2\}$, we can construct counterfactual distributions for the second period by substituting the observed value of the components in the first period, one at a time.

Table 1 illustrates this method for one of the six possible paths in our specification. The order in which the cumulative effects are calculated matters for the contribution of each component, which is also known as path-dependence.³ In our example with three variables in Table 1, there would be six (3 factorial) decomposition paths. To address path-dependence, we calculate the cumulative decomposition in every possible order, and then average the results for each component following the method proposed by Azevedo, Sanfelice and Nguyen (2012), whereby the average contribution of each variable is the Shapley-Shorrocks estimate of each component (Shorrocks, 2013).

³ Path-dependency is a common problem in the micro-decomposition literature. See, for example, Essama-Nssah (2012) and Fortin et al (2011).

Table 1. Computing the counterfactual distributions for one possible path

Step	Estimate	Component measured
1	$\vartheta_1 = \varphi \left(F(c(\boldsymbol{\theta}_1, \mathbf{n}_1, \mathbf{y}_1)) \right)$	Initial value of ϑ : ϑ_1
2	$\widehat{\vartheta}_2^1 = \varphi \left(F(c(\boldsymbol{\theta}_1, \mathbf{n}_2, \mathbf{y}_1)) \right)$	Contribution of household size: $(\widehat{\vartheta}_2^1 - \vartheta_1)$
3	$\widehat{\vartheta}_2^2 = \varphi \left(F(c(\boldsymbol{\theta}_1, \mathbf{n}_2, \mathbf{y}_2)) \right)$	Contribution of income per-capita: $(\widehat{\vartheta}_2^2 - \widehat{\vartheta}_2^1)$
4	$\vartheta_2 = \varphi \left(F(c(\boldsymbol{\theta}_2, \mathbf{n}_2, \mathbf{y}_2)) \right)$	Final value of ϑ : ϑ_2 . Contribution of consumption-income ratio: $(\vartheta_2 - \widehat{\vartheta}_2^2)$

Source: Authors' compilation.

Given the additive properties of income per-capita we can further decompose our identity to explore different mechanisms behind changes in ϑ .⁴ For example, consider rewriting our consumption identity above as

$$c_{h,t} = \theta_{h,t} \left(\frac{n_{h,t}^A}{n_{h,t}} \left(\frac{n_{h,t}^W}{n_{h,t}^A} \left(\frac{1}{n_{h,t}^W} \sum_{i \in A_t} y_{i,h,t}^L \right) + \frac{1}{n_{h,t}^A} \sum_{i \in A_t} y_{i,h,t}^O \right) + \frac{1}{n_{h,t}} \sum_{i \in N_t} y_{i,h,t}^{NL} \right),$$

where $n_{h,t}^A$ denotes the number of adults (of working age); $n_{h,t}^W$ denotes the number of adult workers; $y_{i,h,t}^L$ denotes labor income (e.g., wage/salary) perceived by the individual i , belonging to the set A of adults, and N of persons; $y_{i,h,t}^O$ denotes “other income” (interests, dividends, pensions, etc.)—which we assume depends only on adults; and the $y_{i,h,t}^{NL}$ denotes non-labor income (e.g., benefits and remittances)—which we assume, are perceived by any member of the household. Thus,

$$\vartheta_t = \varphi \left(F \left(c \left(\boldsymbol{\theta}_t, \frac{n_t^A}{n_t}, \frac{n_t^W}{n_t^A}, \frac{y_t^L}{n_t^W}, \frac{y_t^O}{n_t^A}, \frac{y_t^{NL}}{n_t} \right) \right) \right).$$

We can then use this expression and the methodology described above to determine the contribution of changes in each defined component to changes in ϑ . Note, however, that $\boldsymbol{\theta}_t$ acts as a residual component since it captures measurement errors. Hence, $\boldsymbol{\theta}_t$ does not have an economic meaning.

An important caveat to this approach is that these decompositions are based on counterfactual income distributions that are equilibrium-inconsistent. In other words, since the components are modified one at a time, the counterfactuals do not reflect an economic equilibrium that incorporates behavioral responses to these changes, but rather an artificial state of the world where we assume that these components can be modified one at a time, keeping everything else constant.

The availability of panel data for our analysis confers some important advantages over a number of other studies employing a similar decomposition method that use cross-section data. In using cross-section data, since second period households cannot be observed in the first period, a rank-preserving

⁴ By using this statistical argument, we express distribution of $c_{h,t}$ as a function of the marginal distributions of its determinants in the identity and the associated dependency between the components (Barros et al., 2006).

transformation has to be used to assign first period characteristics to the second-period observations (Inchauste et al., 2012; Azevedo et al., 2013a; Azevedo et al., 2013b).

Rank preservation implies anonymity, where the identity of the individual experiencing a particular outcome (such as income) is irrelevant—a permutation of outcomes between any two individuals in any of the two distributions being compared has no effect on the comparison. With this assumption, one can compare across the same quantiles of two distributions (including distributions at two periods of time) *as if* they are the same observations. But such a comparison may not account for the true nature of mobility trajectories (Bourguignon, 2010).⁵ By using panel data, where the assumption of rank preservation is not needed since households can be observed over both periods, we account for the true trajectories of mobility, which results in more precise estimates of the contribution of each component to poverty reduction. As we will see later, the ability to account for mobility is particularly important in this case, given the vast differences in the distribution of income growth across households that are observed, depending on whether one uses an anonymous or nonanonymous measure of growth incidence.

3. Data and Descriptive Statistics

We use the India Human Development Survey (IHDS) for 2005 and 2012, a nationally representative survey that was conducted in all states and union territories of India (with the exception of Andaman and Nicobar and Lakshadweep). Both rounds of the IHDS provide household level aggregates for job status, job sector, earnings from labor activities and other sources of income (i.e., remittances, government transfers, etc.), and consumption.

The data presents some limitations, which require making the reasonable assumption that only individuals 15 years of age or older can be considered as workers, which also implies that households with positive labor income must be deemed to have at least one working adult.⁶ More specifically, we assume that there is at least one adult-worker per household in any activity that reports positive earnings for the household.⁷ Likewise, in order to assess accurately the relative contributions of different income sources to welfare improvements, we consider only those activities that generate earnings as “work.” Finally, we consider individuals as workers if they were engaged for at least 240 hours in a given activity during the last year; activities can include taking care of animals, working on the household farm or business, or for a wage or salary.

We restrict ourselves to households in the IHDS balanced panel—that is, about 83% of the households from IHDS-I were re-interviewed in IHDS-II—which comprises of 34,643 out of a total of 41,554 households surveyed for both periods. In order to get a one-to-one matching of households, we

⁵ This is most easily seen by a thought experiment of two households with vastly different incomes, where the incomes switch perfectly from one period to another (household A’s income in period 1 becomes household B’s income in period 2, and vice-versa), while every other household’s income remains constant. With anonymity, no change can be detected; whereas in a panel data, there will be change.

⁶ In some cases there is information on labor income even when no household member appears to be working, or only children (14 years of age or less) are reported as working. These problems can occur due to measurement error and/or child labor. The former is quite likely, as in some cases we find individuals as young as 3 years of age working.

⁷ In our sample only 0.05 percent of households report having kids working and no adults working. We also find that less than 2 percent of the households report labor income but no adult-workers.

combine split households—single households in 2005 that have divided into multiple households in 2012—into a single household. For these households, consumption and income are computed as the weighted average (by household size) of the income and consumption of the component households. This adjustment affects 12 percent of the households in the balanced panel.

Table 2. Sample Size

Year	Individuals		Households	
	Observations	Expanded observations	Observations	Expanded observations
2005	163668	966495179	30327	182818331
2012	171648	1012300000	30327	182818331

Source: IHDS, 2005 and 2012

The sample is restricted further as follows. First, we restrict ourselves to households with positive total income (which are 98.5 percent of the sub-sample), thereby excluding households with substantial agricultural or business losses.⁸ Second, outliers (0.57 percent) are identified using the *blocked adaptive computationally efficient outlier nominators* algorithm (Billor et al., 2000) on all sources of income and the consumption aggregate, and then eliminated from the sample. Third, households with consumption-income ratios above the 95th percentile are dropped to reduce measurement error (4.9 percent),⁹ as are households with missing values in our variables of interest (0.04 percent). All these adjustments reduce the sample by an additional 6.3 percent, which leaves us with a balanced panel of 30,343 households. Table 2 shows the size of the sample by year, and the number of expanded observations using panel-adjusted weights.¹⁰

3.1. The distribution of income and consumption growth

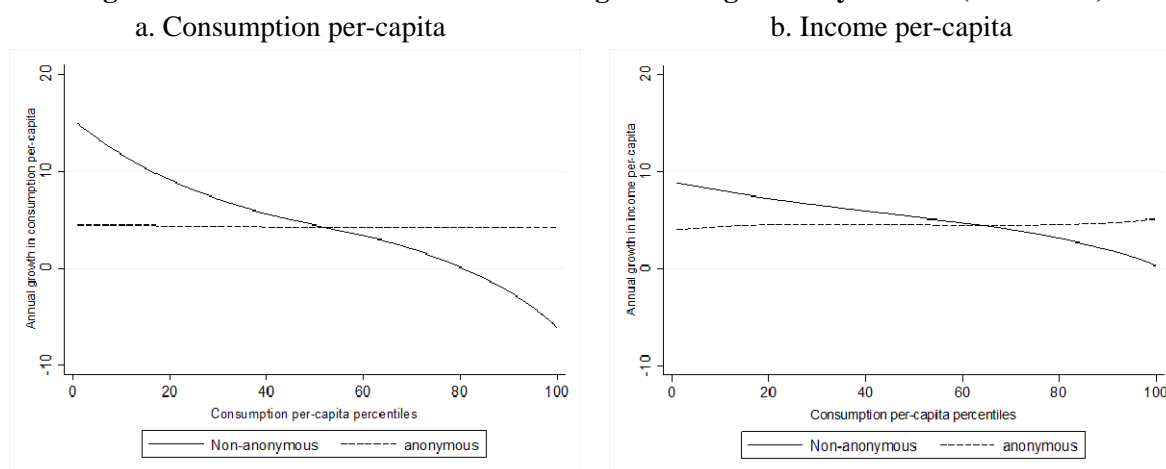
The period of 2005-2012, according to IHDS data, shows an interesting pattern of distributional change. In looking at how income and consumption growth have been distributed across the population, the distinction between anonymous and non-anonymous measures is important. Anonymous growth incidence curves (GIC), which show the annual percentage change in income or consumption for every centile of the distribution (dotted lines in Figure 1), are flat for both consumption and income, at a level well above zero. This implies that growth has been significant with almost no impact on the overall distribution of consumption and income, which is also consistent with negligible change in the Gini coefficients for these indicators (Table 3).

⁸ For capital gains we convert all negative income sources to zero because these might reflect losses in a particular year but not in the long-run. All incomes and consumptions are converted to 2005 prices and adjusted for spatial price differences (at the State level).

⁹ Households with high consumption income ratios are likely to be those under-reporting income, or experiencing losses in business incomes. Most are in the top decile of the consumption distribution, and their exclusion has little impact on decompositions focused on the lower tail of the distribution.

¹⁰ Even though the restrictions imposed by data reduce the full sample by around 13 percent, in Table A3 in the Appendix we show that that the poverty estimates we obtain using the full sample are consistent with those obtained from using our balanced-panel sample. Therefore, the results we present here are indicative of what would have been obtained with the full, nationally representative, sample.

Figure 1. Growth incidence curves: average annual growth by centiles (2005-2012)



Note: Consumption and incomes are expressed in All-India Rural 2004-05 Rupees, after correcting for spatial and inter-temporal cost of living differences using the Tendulkar poverty lines.

Source: Calculations based on IHDS, 2005 and 2012.

Anonymous GICs can be misleading about the extent of mobility in the population because they do not account for the fact that households in a particular centile are unlikely to be the same in the two years. Non-anonymous GICs for consumption and income which show the annual growth in per capita income/consumption for households sorted (in increasing order) by their per capita consumption in period 1 (solid lines in Figure 1) are more meaningful for assessing mobility. In sharp contrast to the anonymous cases, the non-anonymous GICs show consistently downward slopes, suggesting that consumption and income growth was faster among the poor than among the better-off. For the top 20 percent of population in 2005, consumption growth was in fact negative even though their incomes grew over this period. The fact that the non-anonymous GIC for consumption slopes downwards more steeply than the GIC for income could indicate changes in savings and/or borrowing behavior of the poor relative to that of the rich.

The wide divergence between anonymous and non-anonymous incidences of growth is somewhat unusual, as it suggests greater upward mobility among those at the bottom of the distribution in 2005 that still had almost no impact on the overall distribution of income and consumption. To put it differently, India has remained as unequal (or equal) in terms of per capita income or consumption in 2012 as it was in 2005, but with a lot of “churning” underneath in terms of households moving up and down relative to other households.

Table 3. Poverty and inequality measures

	Year	
	2005	2012
Inequality		
Gini	34.5	34.3
Rural	33.3	32.9
Urban	35.6	35.4

90-10 ratio	4.3	4.3
Rural	4.1	4.0
Urban	4.5	4.4
Poverty - National poverty line		
Headcount ratio, FGT(0)	39.0	19.2
Rural	42.8	21.9
Urban	29.7	12.6

Note: The National poverty line is 446 rupees, expressed in 2004/05 All India rural rupees, spatially deflated.

Source: Calculations based on IHDS, 2005 and 2012.

While the Gini index and the ratio of the 90th and 10th percentiles of the distribution remained almost unchanged between 2005 and 2012, the poverty headcount rate fell from 39 percent in 2005 to 19.2 percent in 2012, which made for an annual rate of decline of 2.8 percent, a trend that is broadly consistent with official NSS-based estimates. Rural areas saw a higher reduction in poverty, with the 2012 poverty rate almost half of what it was in 2005. High reduction in poverty with almost no change in inequality suggests that poverty in both rural and urban areas has declined mainly as a result of growth as opposed to redistribution, which is confirmed by standard growth-inequality decompositions (not shown here).¹¹

3.2. Transitions in and out of poverty

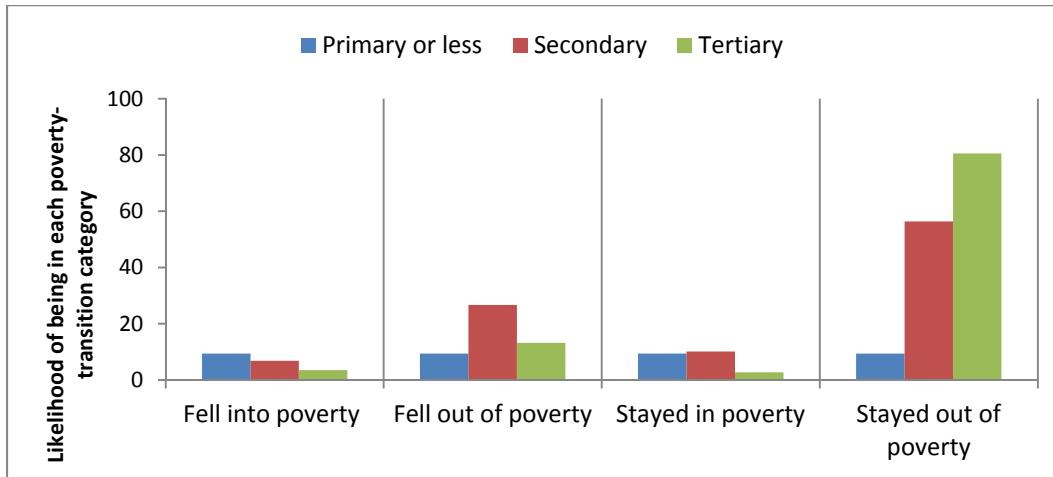
Panel data allow us to look into some of the dynamics of poverty transitions, as we are able to identify those households that stayed in poverty in both periods (12 percent), that fell out of poverty between 2005 and 2012 (27 percent), that fell into poverty between 2005 and 2012 (7 percent) and that stayed out of poverty in both periods (54 percent). The fact that 81 percent of the population stayed out of poverty in both years or climbed out of poverty suggests strong upward mobility over this period. It is important to note that these observations are not dependent upon disproportionate contribution of any single state where measurement errors in data collection may result in higher or lower poverty estimates.

In spite of general all-round improvement, some population groups remain more vulnerable than others. For instance, households where the most educated member had less than secondary education (in 2005) are more likely to be poor in both periods or fall into poverty in 2012 compared to households with less education (Figure 2, panel a). Households that derived most of their income (70 percent or higher share of total income) in 2005 from non-agricultural labor and self-employment are more likely to be non-poor in both periods; while those who depended on agriculture income or non-labor income are more likely to be chronically poor. Disaggregating by religion/caste (Figure 2, panel b), forward castes and other minority religions (Christian, Sikh and Jain) are much more likely to be non-poor in both periods than other groups (other backward castes or OBC, Muslims, Dalits and Adivasis); while Adivasis are much more likely to be chronically poor than other groups.

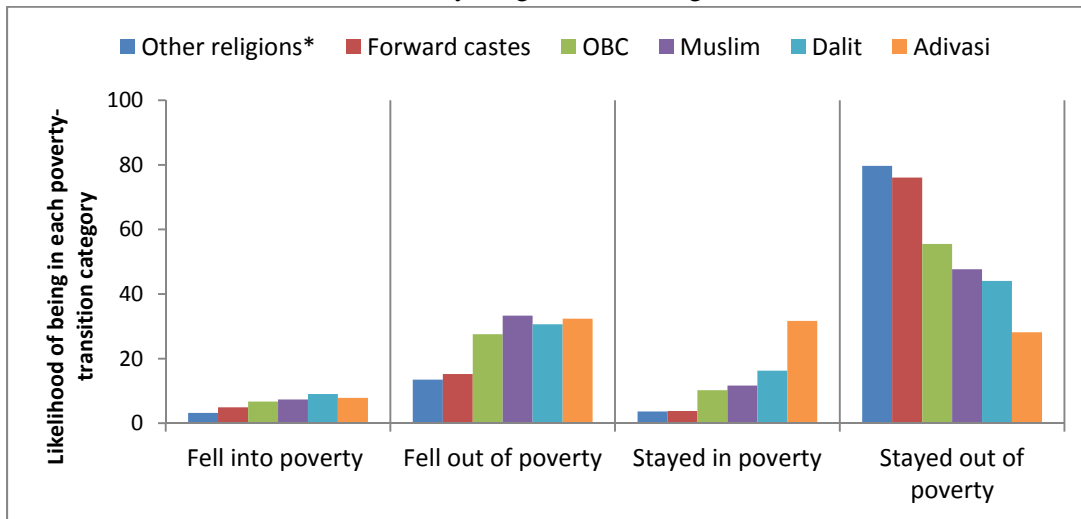
¹¹ We confirm this by means of Datt and Ravallion (1992) decomposition of changes in a welfare indicator into growth and distribution, following the Shapley and nonparametric methodology suggested by Shorrocks (2013) and Shorrocks and Kolenikov (2003). Results for these decompositions are available upon request.

Figure 2. Likelihood of being in each poverty-transition category

a. By educational attainment categories

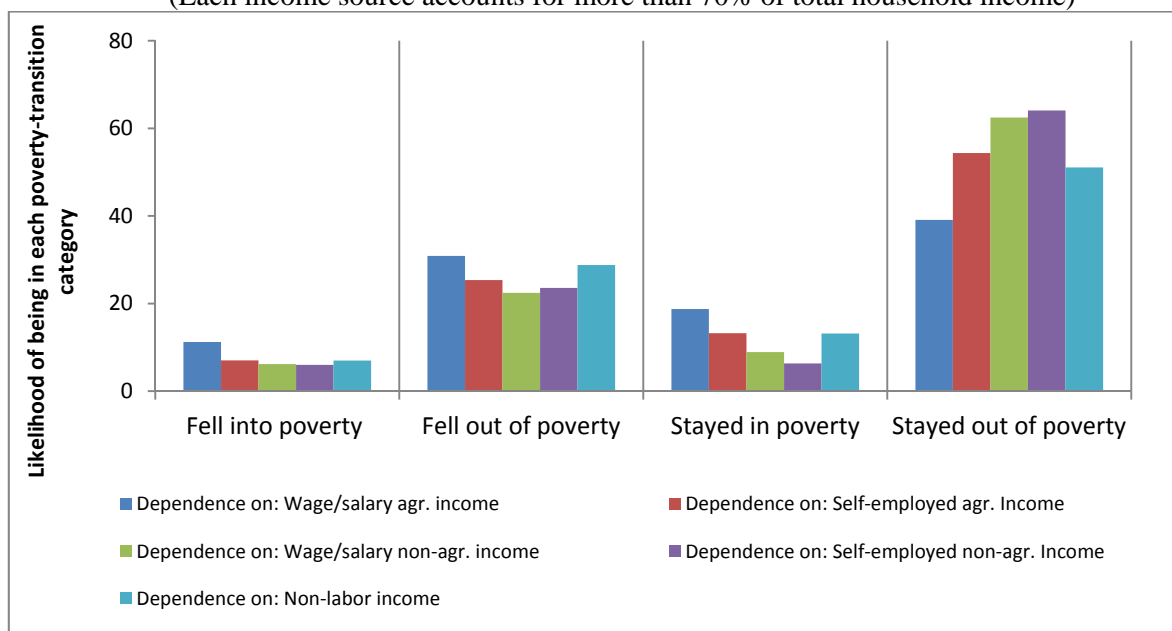


b. By religion/caste categories



(Continues in the next page)

c. By categories of main income source
(Each income source accounts for more than 70% of total household income)



Note: Other religions include Christian, Sikh and Jain. Of those who were poor in 2005, the distribution is: Forward castes: 9.3%; OBC: 33.7%; Dalit: 27.6%; Adivasi: 13.5%; Muslim: 15.1%; Christian, Sikh and Jain: 0.9%, for total of 100%. Non-labor income includes the following income categories: remittances, benefits and other income.

Source: Calculations based on IHDS, 2005 and 2012.

Compared to other caste/religion groups, upward mobility is low for Dalits and even lower for Adivasis; and conversely, downward mobility is the highest for Adivasis and the second-highest for Dalits.¹² Figure 3 shows that conditional on being poor in 2005, an Adivasi is 25 percent and a Dalit is 8 percent less likely to be non-poor in 2012 than an OBC (the group with the next lowest probability). And conditional on being nonpoor in 2005, an Adivasi and a Dalit are 12 and 5 percent more likely to be poor in 2012, respectively, than a Muslim (the group with the next highest probability). These results are qualitatively unchanged even after controlling for the effects of education, household composition (size and share of adults) and area of residence (urban/rural) in the year 2005.¹³

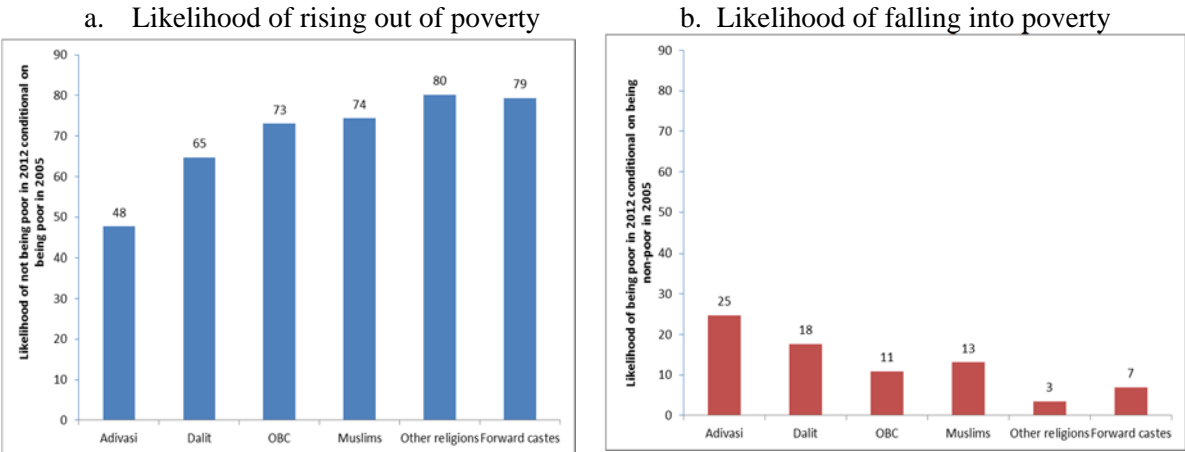
Thus Adivasis are at a disadvantage relative to the rest of the population both in terms of chronic poverty and transitions in and out of poverty; while Dalits have a smaller disadvantage relative to

¹² See also Thorat et al. (2014).

¹³ This refers to probit regressions of the likelihood of being non-poor in 2012 among those who were poor in 2005 and the likelihood of being poor in 2012 among those who were non-poor in 2005 (results available upon request). The independent variables include the maximum education of household members, household size and share of adults, area of residence (urban/rural) (all in 2005), and caste/religion. Being an Adivasi, Dalit or OBC has a significantly negative (positive) effect—in declining order of magnitude—on the likelihood of rising out of (falling into) poverty relative to forward castes; and being a Muslim has a positive and significant effect on falling into poverty only. Secondary and tertiary education, and household size have significant impacts on both likelihoods in the expected direction; share of adults has a positive association with the likelihood of rising out of poverty; and being urban reduces the likelihood of falling into poverty.

other groups in poverty transitions. Moreover, initial differences in education, household composition and urban/rural status—attributes that are typically important for poverty transitions—do not fully explain the disadvantages faced by Adivasis and to a lesser extent, Dalits, compared to other caste/religion groups. Li and Rama (2015) using NSS data find that location, when defined in more disaggregated terms, reduces the caste/religion association with household welfare. Their results suggest that the disadvantage of being an Adivasi or a Dalit is attributable to the relatively disadvantaged locations in which they live, a feature that is not captured by the highly aggregated urban/rural distinction used here.

Figure 3. Likelihood of falling into poverty or rising out of poverty in 2012, by caste/religion



Source: Calculations based on IHDS, 2005 and 2012.

3.3. Changes in household composition and income sources

To set the context for our analysis and identify broad trends in social and economic structure, we look at changes in demographic composition of households and income sources: agricultural and non-agricultural salaried or wage work, and agricultural and non-agricultural self-employed work.¹⁴ These are also the components of labor income that we consider when decomposing poverty change using the methodology described in Section 2.

Table 4 shows descriptive statistics for the entire sample and then disaggregated by urban/rural split and gender. Substantial changes have occurred between 2005 and 2012, which provide hints of what our decompositions later are likely to reveal. This period has seen increases in the average share of working-age adults in the household (i.e., a lower dependency ratio) and that of working adults as a share of all working-age adults—which translates to a rise in the share of working adults in the

¹⁴ See Table A1 in the Appendix for information on each of these components.

household.¹⁵ There is also evidence of significant changes in the labor market: the share of non-agricultural wage/salaried workers (out of all working adults) increased substantially for both men and women. This occurred with some decline in the share of agricultural wage workers and a much sharper decline in the share of farmers (agricultural self-employed). Similarly, the rising share of non-agricultural wage workers along with declining share for agricultural employment is consistent with the pattern of structural transformation that other studies have found for India.¹⁶

A few differences between rural and urban areas are worth highlighting. Dependency rates are much higher in rural areas, but the share of adults who are working is much higher in rural areas. Unsurprisingly, the share of workers in non-agricultural activities is higher in urban areas in comparison to rural ones. However, rural areas have experienced significant changes in occupational structure that are in the same direction (and larger in magnitude) than what is seen for the country as a whole—in contrast to much smaller changes in urban areas. The transformation that is changing the nature of employment in India away from agriculture thus seems to have occurred much more visibly in rural than in urban areas, which is not surprising given the high dependence of households on agriculture in rural India to start with.

Differences between men and women are worth highlighting as well. While the share of workers among total number of males is much higher than that among women, women are more likely to be working in agriculture than men. The share of non-agricultural wage workers is rising at a lower rate among female workers than male workers, while that of agricultural self-employed is declining at a faster rate among female workers than among male workers.

¹⁵ Trends in the IHDS panel are similar to the NSS with one prominent exception. In the IHDS panel, female workforce participation rates increase from 66% to 69% between 2005 and 2012. This is in marked contrast to the NSS which suggests a 12-13 percentage point decline in labor force participation (LFP) rates over the same period. We can only speculate that the difference arises because of the ways in which work, particularly subsidiary/part-time work that is particularly common amongst women is captured in the two surveys. Chatterjee et al. (2015) also note differences between the NSS and the Census which shows no decline in female LFP between 2001 and 2011.

¹⁶ Interestingly, there is almost no decline in the share of farming and animal care in total workers, for men and women alike, when the definition of workers is unrestricted; i.e., also includes those who worked for less than 240 hours during the past year (not shown, but available upon request to the authors). This suggests that self-employed agricultural activities tend to occupy a large number of workers for short durations, possibly to supplement other incomes or generate self-consumption, rather than be a main source of income. Also, the importance of agriculture as an important source of income has fallen between 2005 and 2012.

Table 4. Descriptive Statistics

	Year		Difference between years
	2005	2012	
Socio-demographic characteristics for the full sample (%)			
Adults (15 years of age or older)	65.8	67.7	1.9 ***
People living in urban areas	27.4	27.2	-0.2
Women as percentage of adults	50.3	50.9	0.7 *
Working adults (as percentage of adults)	60.7	62.7	2.0 ***
Women (as percentage of working adults)	35.0	38.3	3.3 ***
Wage/salaried workers in the agricultural sector (as percentage of working adults)	21.9	18.3	-3.6 ***
Wage/salaried workers in the non-agricultural sector (as percentage of working adults)	33.2	39.4	6.2 ***
Self-employed workers in the agricultural sector (as percentage of working adults)	57.5	44.8	-12.7 ***
Self-employed workers in the non-agricultural sector (as percentage of working adults)	12.9	12.4	-0.5 *
Socio-demographic characteristics for urban areas (%)			
Adults (15 years of age or older)	69.7	71.9	2.3 ***
Working adults (as percentage of adults)	44.8	46.9	2.1 ***
Women (as percentage of working adults)	21.0	23.9	2.9 ***
Wage/salaried workers in the agricultural sector (as percentage of working adults)	5.7	4.0	-1.7 ***
Wage/salaried workers in the non-agricultural sector (as percentage of working adults)	60.2	62.8	2.6 ***
Self-employed workers in the agricultural sector (as percentage of working adults)	14.0	10.0	-4.0 ***
Self-employed workers in the non-agricultural sector (as percentage of working adults)	26.8	25.8	-1.0
Socio-demographic characteristics for rural areas (%)			
Adults (15 years of age or older)	64.3	66.1	1.8 ***
Working adults (as percentage of adults)	67.2	69.1	1.9 ***
Women (as percentage of working adults)	38.8	42.3	3.5 ***
Wage/salaried workers in the agricultural sector (as percentage of working adults)	26.3	22.2	-4.1 ***
Wage/salaried workers in the non-agricultural sector (as percentage of working adults)	25.8	33.0	7.1 ***
Self-employed workers in the agricultural sector (as percentage of working adults)	69.4	54.4	-14.9 ***

Self-employed workers in the non-agricultural sector (as percentage of working adults)	9.2	8.8	-0.4 *
Socio-demographic characteristics for men (%)			
Adults (15 years of age or older)	65.5	66.4	1.0 **
Working adults (as percentage of adults)	77.1	78.9	1.8 ***
Wage/salaried workers in the agricultural sector (as percentage of working adults)	20.8	16.7	-4.1 ***
Wage/salaried workers in the non-agricultural sector (as percentage of working adults)	43.0	51.5	8.5 ***
Self-employed workers in the agricultural sector (as percentage of working adults)	48.4	37.4	-11.0 ***
Self-employed workers in the non-agricultural sector (as percentage of working adults)	16.9	15.9	-1.1 ***
Socio-demographic characteristics for women (%)			
Adults (15 years of age or older)	66.2	68.9	2.8 ***
Working adults (as percentage of adults)	43.5	47.1	3.6 ***
Wage/salaried workers in the agricultural sector (as percentage of working adults)	23.9	20.8	-3.1 ***
Wage/salaried workers in the non-agricultural sector (as percentage of working adults)	15.0	20.1	5.1 ***
Self-employed workers in the agricultural sector (as percentage of working adults)	74.5	56.7	-17.8 ***
Self-employed workers in the non-agricultural sector (as percentage of working adults)	5.5	6.9	1.4 ***

* Significant at ten percent; ** significant at five percent; *** significant at one percent.

Note: The split agricultural/non-agricultural sector does not add up to 100% given that there might be workers who work in both the agricultural and the non-agricultural sector, the same happens on the work/farm/business split.

Source: IHDS, 2005 and 2012.

The average earnings per worker has increased substantially across sectors and job types (Table 5).¹⁷ This is consistent with a trend of rising labor productivity, with the caveat that average earning per worker is a crude proxy for productivity as it does not take into account the actual number of hours worked. For wage workers, daily earnings have risen substantially with greater increases in wages for agricultural laborers than for rural non-agricultural laborers. Despite this, agricultural earnings per worker have increased slowly because of a steep decline in the total number of days worked as agricultural labor, and simultaneously a rise in days of non-agricultural wage work (see also Table A5, in the Appendix). The general trend of rising incomes is seen for other types of income as well. Remittances and benefits (from public programs) in per capita terms have increased considerably among both rural and urban households (largely due to more households receiving remittances or program transfers), as have incomes from other sources, such as interests, dividends and pensions.

The composition of household income has changed in line with the other changes (Table 6). Earnings from non-agricultural wages/salaries have the highest share in total household income in 2012 (45 percent) compared to 41 percent in 2005, with almost all of the increase occurring in rural areas. The share of income from agricultural wages/salaries—the second largest component of household income—has fallen from 2005 to 2012, as has the share of income from farming and animal care. The declining importance of agricultural income relative to non-agricultural income in rural India is seen from a telling statistic: in 2005, 49 percent of rural household income came from agriculture whereas 43 percent came from non-agricultural work; in 2012, these shares were 40 percent and 47 percent, respectively, showing a reversal in relative importance. Lastly, the shares of remittances and benefits in total household income have increased—with remittances, which was initially a higher share of income than benefits, having increased faster.

To summarize, poverty fell rapidly during the period, from 39 to 19 percent, underpinned by stable inequality and sharp upward mobility, especially amongst the poorest households. 27 percent of the population climbed out of poverty between 2005 and 2012 while only 7 percent fell into poverty. Low levels of education (below secondary level) and being an Adivasi or (to a lesser extent) Dalit significantly raised the likelihood of both chronic poverty and risk of falling into poverty.

Changes between 2005 and 2012 seem to have been consistent with structural transformation, with falling dependency rates and rising share of workers within households, and a shift from agricultural self-employment toward non-agricultural wage/salaried work. Other observed trends are also consistent with structural transformation: rising wages and days of work (proxied by increasing earnings per worker), the declining importance of agriculture as an income source in rural areas, and rising incomes from other sources, particularly remittances. The decompositions of poverty changes in Section 4 will quantify the relative contributions of these processes on aggregate poverty reduction, nationally as well as for rural and urban areas separately.

¹⁷ See Table A2 in the Appendix for information on the components of the splits.

Table 5. Average income, by source

Income source	Year		Percentage change (%) 2005-2012	
	2005	2012		
Average wage/salary agricultural income (per wage/salaried agricultural worker)	170.5	209.4	22.8	***
Urban	49.5	57.3	15.8	
Rural	220.5	272.1	23.4	***
Average wage/salary non- agricultural income (per wage/salaried non-agricultural worker)	1243.0	1694.4	36.3	***
Urban	2115.0	2799.5	32.4	***
Rural	883.3	1238.5	40.2	***
Average self-employed agricultural income (per self-employed agricultural worker)	351.2	521.6	48.5	***
Urban	92.3	140.6	52.3	***
Rural	458.0	678.8	48.2	***
Average self-employed non- agricultural income (per self-employed non-agricultural worker)	511.2	643.7	25.9	***
Urban	913.0	1122.9	23.0	***
Rural	345.4	446.0	29.1	***
Average income, other sources (per adult)	45.5	73.4	61.3	***
Urban	80.9	125.8	55.6	***
Rural	31.0	51.8	67.4	***
Average remittances (per capita)	24.4	53.8	120.0	***
Urban	13.5	36.8	171.6	***
Rural	28.9	60.8	110.0	***
Average benefits (per capita)	2.5	10.0	293.9	***
Urban	1.9	6.8	255.3	***
Rural	2.8	11.3	304.8	***

* Significant at ten percent; ** significant at five percent; *** significant at one percent.

Note: Income sources are in rupees, constant prices of 2005, spatially deflated.

Source: IHDS, 2005 and 2012.

Table 6. Share of each income source in total income, household level

Income source (% of total household income)	Year		Change 2005-2012	
	2005	2012		
Agricultural wage/salary income	15.9	12.2	-3.7	***
Urban	3.8	2.3	-1.6	***
Rural	20.9	16.3	-4.5	***
Non-agricultural wage/salary income	41.3	44.8	3.5	***
Urban	61.9	62.1	0.2	

Rural	32.7	37.6	4.9	***
Self-employed agricultural income	20.8	17.3	-3.5	***
Urban	2.9	2.0	-0.9	***
Rural	28.1	23.6	-4.5	***
Self-employed non-agricultural income	14.6	13.8	-0.8	**
Urban	24.2	23.6	-0.6	
Rural	10.6	9.8	-0.8	*
Other sources of income	3.3	3.9	0.6	***
Urban	5.3	6.3	1.0	***
Rural	2.5	2.9	0.4	**
Remittances	3.5	6.0	2.5	***
Urban	1.5	2.7	1.3	***
Rural	4.4	7.4	3.0	***
Benefits	0.7	2.0	1.3	***
Urban	0.4	1.0	0.7	***
Rural	0.8	2.4	1.6	***

* Significant at ten percent; ** significant at five percent; *** significant at one percent.

†Table A1 in the Appendix describes the components of each income source

Source: IHDS, 2005 and 2012.

4. Decomposing Changes in Poverty

Following Section 2, $y_{i,h,t}^L$ and $y_{i,h,t}^{NL}$ are split further into different sources of income. We split $y_{i,h,t}^L$ into wage/salaried work (agricultural and non-agricultural) and self-employed work (agricultural and non-agricultural), and $y_{i,h,t}^{NL}$ into benefits and remittances. Thus we have:

$$y_{h,t} = \frac{n_{h,t}^A}{n_{h,t}} \left(\frac{n_{h,t}^W}{n_{h,t}^A} \left[\frac{n_{h,t}^{AW}}{n_{h,t}^W} \left(\frac{1}{n_{h,t}^{AW}} \sum_{i \in AW_t}^{n_{h,t}^A} y_{i,h,t}^{AW} \right) + \frac{n_{h,t}^{NW}}{n_{h,t}^W} \left(\frac{1}{n_{h,t}^{NW}} \sum_{i \in NW_t}^{n_{h,t}^A} y_{i,h,t}^{NW} \right) + \frac{n_{h,t}^F}{n_{h,t}^W} \left(\frac{1}{n_{h,t}^F} \sum_{i \in F_t}^{n_{h,t}^A} y_{i,h,t}^F \right) \frac{n_{h,t}^{Bu}}{n_{h,t}^W} \left(\frac{1}{n_{h,t}^{Bu}} \sum_{i \in Bu_t}^{n_{h,t}^A} y_{i,h,t}^{Bu} \right) \right] \right. \\ \left. + \frac{1}{n_{h,t}^A} \sum_{i \in A_t}^{n_{h,t}} y_{i,h,t}^O \right) + \frac{1}{n_{h,t}} \sum_{i \in N_t}^{n_{h,t}} y_{i,h,t}^R + \frac{1}{n_{h,t}} \sum_{i \in N_t}^{n_{h,t}} y_{i,h,t}^B,$$

where $n_{h,t}^{AW}$ is the number of agricultural wage/salaried workers; $n_{h,t}^{NW}$ is the number of non-agricultural wage/salaried workers; $n_{h,t}^F$ is the number of self-employed workers in agricultural activities; $n_{h,t}^{Be}$ is the number of self-employed workers in non-agricultural activities; $y_{i,h,t}^{AW}$ corresponds to wage/salary earnings from agricultural activities; $y_{i,h,t}^{NW}$ corresponds to wage/salary earnings from non-agricultural activities; $y_{i,h,t}^F$ corresponds to wage/salary earnings from self-employed agricultural activities; $y_{i,h,t}^{Be}$ corresponds to wage/salary earnings from self-employed non-agricultural activities; $y_{i,h,t}^O$ denotes other income; and $y_{i,h,t}^R$ and $y_{i,h,t}^B$ denote remittances and benefits respectively.

As in Section 2, we can write any distributional measure ϑ as a function of the defined components:

$$\vartheta = \varphi \left(F \left(c \left(\theta, \frac{n^A}{n}, \frac{n^W}{n^A}, \frac{n^{AW}}{n^W}, \frac{n^{NW}}{n^W}, \frac{n^F}{n^W}, \frac{n^{Be}}{n^W}, \frac{y^{AW}}{n^{AW}}, \frac{y^{NW}}{n^{NW}}, \frac{y^F}{n^F}, \frac{y^{Be}}{n^{Be}}, \frac{y^O}{n^A}, \frac{y^R}{n}, \frac{y^B}{n} \right) \right) \right).$$

We then use the methodology outlined in Section 2 to compute the contributions of each component to the observed changes in the poverty headcount ratio.

4.1. Results

Figure 4 shows the results of our decomposition exercise (see Table A4 in the Appendix for the numerical results). The largest share of the decline in poverty headcount rate can be attributed to income from wage/salaried non-agricultural activities, while income from agricultural self-employment and wage/salaried work contributed to a smaller extent.¹⁸ This is consistent with rising wages for both agricultural and non-agricultural casual labor (see Section 3), higher non-agricultural wages, and a greater employment intensity (days of work) in wage work outside agriculture (see Table 5). Although most sources of non-labor income led to some decline in poverty, remittances contributed most substantially, which is consistent with the large increases seen in remittances in Section 3.

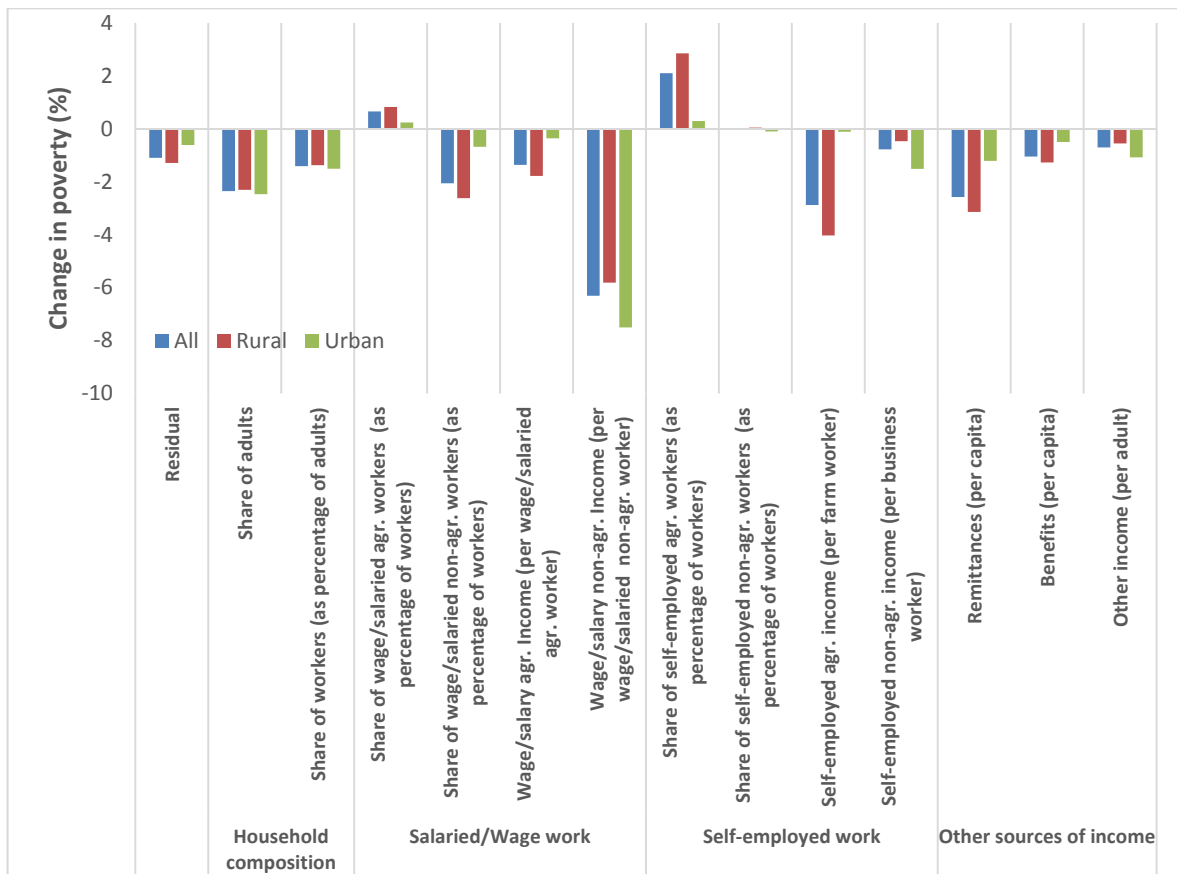
Changes in the household composition—namely dependency ratio and work participation of households (i.e., share of adults among household members and share of workers among adults)—also contributed to poverty decline, due to an increase of around 2 percent in both these ratios seen in Section 3. Changes in the share of workers in non-agricultural wage employment has contributed to poverty reduction; while changes in shares of wage employment and self-employment in agriculture have been poverty-increasing. These contributions are a result of significant movements out of farming and into non-agricultural wage employment that yields higher earnings, as seen in Section 3, which are consistent with the process of structural transformation.¹⁹

Changes in dependency ratio and work participation have similar contributions to urban and rural poverty reduction, consistent with an increase (roughly 2 percent) in these ratios in both urban and rural areas (see Table 4). Increase in income from wage/salary non-agricultural employment contributed more to poverty reduction in urban than in rural areas; the same is true for income from non-agricultural self-employment, which had almost no contribution to poverty reduction in rural areas and nationally; while increase in remittances had a much greater contribution in rural areas. Changes in the shares of workers in different types of employment have much larger contributions (positive or negative) to poverty changes in rural areas than in urban areas, which reflect a more rapid pace of transformation in rural areas that had a much higher share of agricultural employment to start with than in urban areas, as noted in section 3.

¹⁸ As mentioned earlier, wages of agricultural laborers grew more than those of non-agricultural laborers; but since nonagricultural wages are higher and more people work in nonagricultural activities now, the contribution of nonagricultural income to total labor income is higher (see Table A5 in the Appendix).

¹⁹ The poverty-increasing contribution of the share of wage employment and self-employment in agriculture simply reflects the fact that these shares fell between 2005 and 2012, which, if nothing else had changed, would have led to poverty increase.

Figure 4. Nonparametric decomposition of changes in poverty headcount ratio

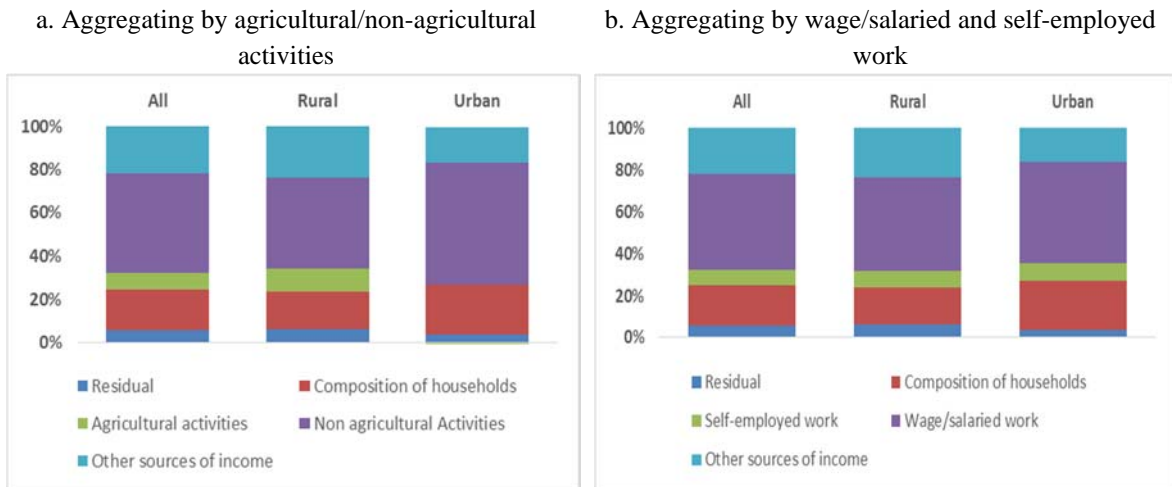


Source: IHDS, 2005 and 2012

Aggregating the contributions of components by sector, changes in the non-agricultural sector are found to account for the largest share of both urban and rural poverty reduction, followed by other income sources, household composition, and then the agricultural sector (Figure 5, panel a). The non-agricultural sector contributes as much as 46 percent of national poverty reduction, which includes 42 and 57 percent of rural and urban poverty reduction, respectively. Agriculture has no contribution to urban poverty decline, while the contributions of other income sources and household composition to poverty decline are similar for urban and rural areas.

Aggregating the contributions of components by type of work, changes in wage/salaried work and self-employment have together contributed 54 percent of the national poverty decline, which includes almost similar contributions to reductions in rural and urban poverty (Figure 5, panel b). Thus rising labor income, rather than changes in household composition and other income sources, has been the main driver of poverty reduction (see Figure A1, Appendix), consistent with what has been reported by and large for other countries as well. Most of the contribution of labor income comes from changes in wage/salaried work, which accounts for 46 percent of national poverty reduction compared to only 8 percent of the decline being attributable to changes in self-employed work.

Figure 5. Contributions to changes in poverty by aggregated categories



Note: Contribution of agricultural activities is the sum of contributions of: (a) income from agricultural wage employment; (b) income from agricultural self-employment; (c) share of workers in agricultural wage employment; and (d) share of workers in agricultural self-employment; and analogously for the contribution of non-agricultural activities. Contribution of wage/salaried work is the sum of contributions of: (a) income from agricultural wage employment; (b) income from non-agricultural wage employment; (c) share of workers in agricultural wage employment; and (d) share of workers in non-agricultural wage employment; and analogously for the contribution of self-employment. Non-labor income includes remittances, benefits and other income.

Source: IHDS, 2005 and 2012

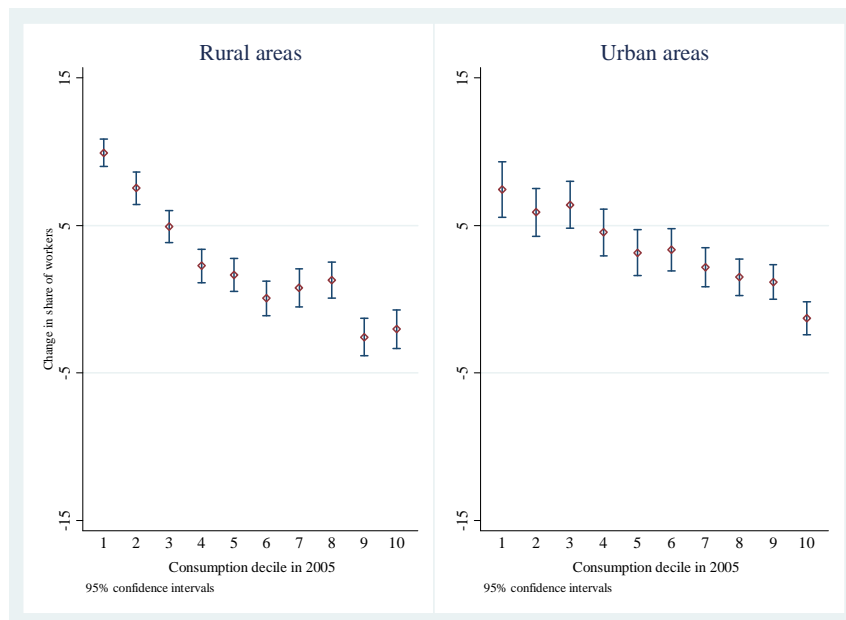
4.2. A distributional analysis of changes

Descriptive statistics, disaggregated by the initial distribution of consumption, are useful to study underlying patterns in the factors that have contributed to poverty reduction. This will help us better understand how the different components have contributed to poverty changes and more generally, to the pattern of strongly pro-poor (nonanonymous) income growth seen in Section 3 earlier.

Changes in the share of working adults among household members have been poverty reducing and contributed to pro-poor growth (defined by the 2005 consumption distribution). The share of workers in the household has risen, particularly for those at or below the 4th decile of consumption per capita in 2005, in both rural and urban areas (Figure 6).²⁰ This is the net result of a decline in dependency ratios or an increase in the share of working age adults in the household (Figure A2, Appendix) and an increase in the share of adults who are employed (Figure A3, Appendix). In both urban and rural areas, the increase in the share of workers in households has been largest for the poorest decile of 2005 and progressively smaller for less poor groups. These trends explain in part the strongly pro-poor non-anonymous growth in per capita consumption when households are sorted by the income and consumption distribution of 2005 (see Figure 1).

²⁰ Note that the poverty line was at the 37th percentile of the consumption distribution in 2005.

Figure 6. Changes in share of workers among all individuals in a households between 2005 and 2012, by consumption per-capita deciles of 2005

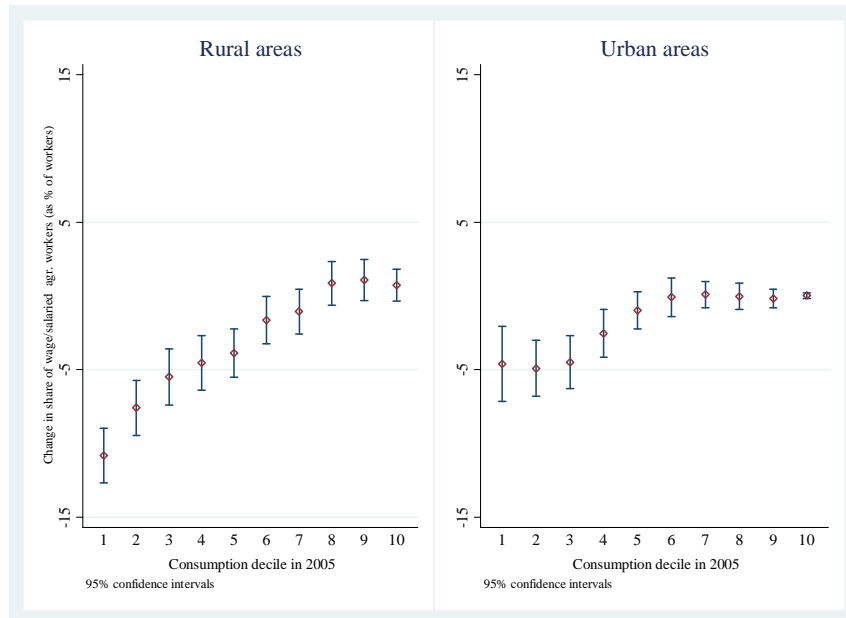


Source: IHDS, 2005 and 2012

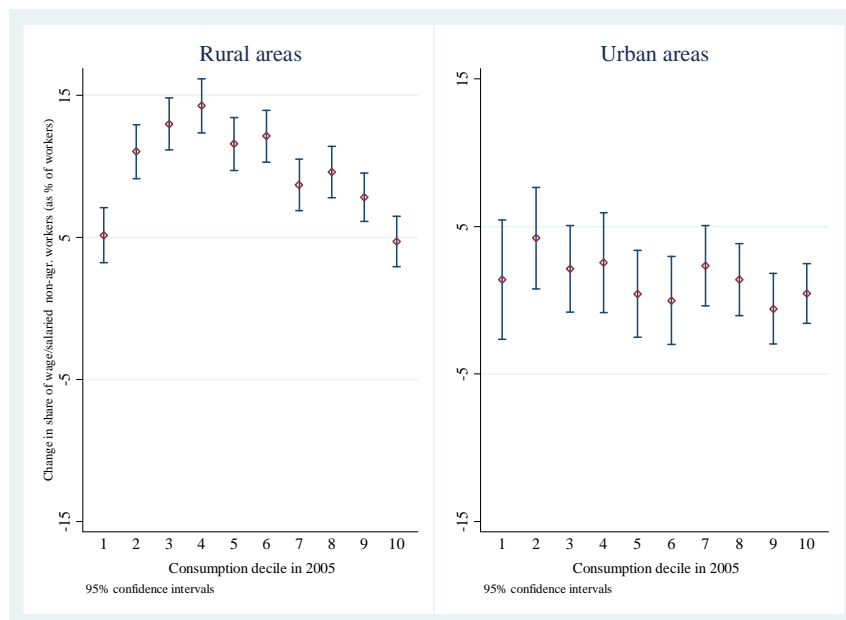
Shifts out of agricultural employment into non-agricultural wage/salaried employment have been poverty-reducing and contributed to pro-poor growth. Households have been switching out of agricultural wage/salaried activities to non-agricultural wage/salaried activities; and both reduction in share of agricultural wage employment and increase in share of non-agricultural wage employment are more pronounced for the lower deciles (Figure 7). Since returns to work in the non-agricultural sector are much higher than in the agricultural sector (Figure A4, Appendix), it is easy to see how these labor market shifts have resulted in poverty reduction. Taken together, these results play a big role in the strongly pro-poor income growth pattern seen in the non-anonymous growth incidence curves in Figure 1 earlier.

Figure 7. Changes in share of agricultural and non-agricultural wage/salaried workers between 2005 and 2012, by consumption per-capita deciles of 2005

a. Agricultural activities



b. Non-agricultural activities

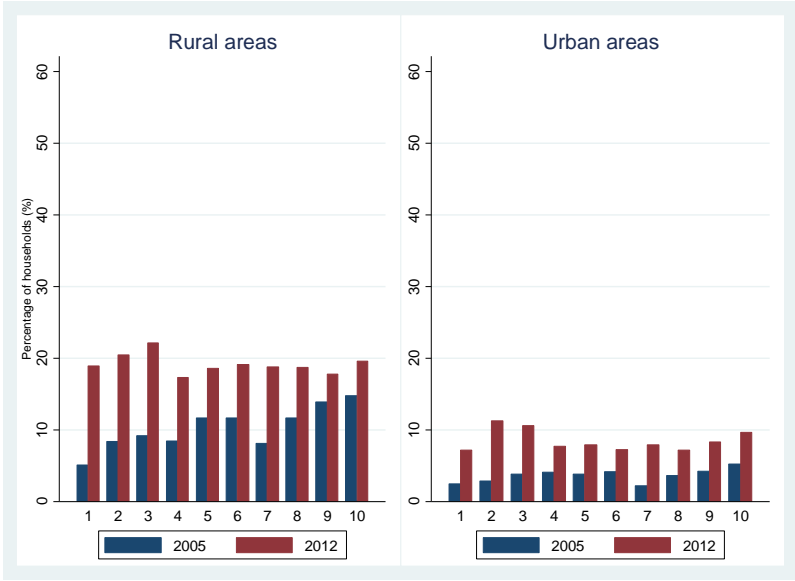


Source: IHDS, 2005 and 2012

Increases in remittances and benefits have been poverty reducing, with significant increases in both that have favored the poor. We do not find significant changes in the average amounts of remittances

and benefits reported by households.²¹ Instead, the large poverty-reducing contributions of remittances and benefits are mainly due to a higher share of households receiving benefits and remittances.²² While the rural poor of 2005 were less likely to receive remittances compared to the non-poor in 2005 (Figure 8a), the share of remittance recipients has increased much more among this group (Figure 8b), which explains the large contribution of remittances to reduction in rural poverty. The likelihood of receiving benefits was pro-poor in 2005 for both rural and urban (Figure 9a) and has increased at a rapid rate that has also favored those who were poor in 2005 (Figure 9b). Increases in the share of households who receive remittances and benefits have thus not only been substantial, but also occurred at a higher rate among those who were less well-off in 2005. This is particularly true for remittances in rural areas and benefits in both rural and urban areas. The pattern of increases in both these components suggest that they contributed to the strongly pro-poor non-anonymous growth of income and consumption.

Figure 8. Share of households receiving remittances and changes over time
a. Likelihood of receiving remittances by consumption deciles in 2005

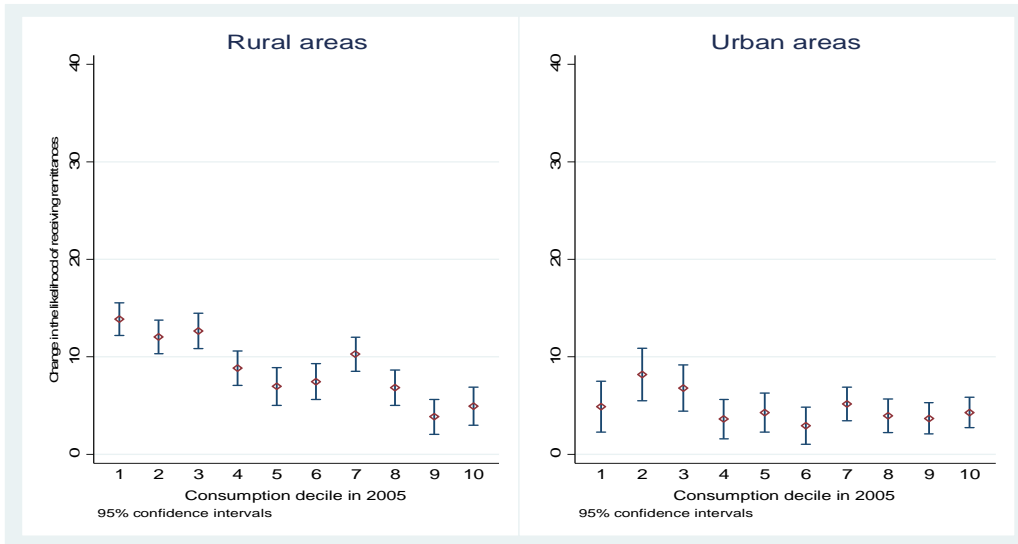


(Continues in the next page)

²¹ Not shown, but available upon request to the authors.

²² Figure A5 in the Appendix breaks down benefits by source.

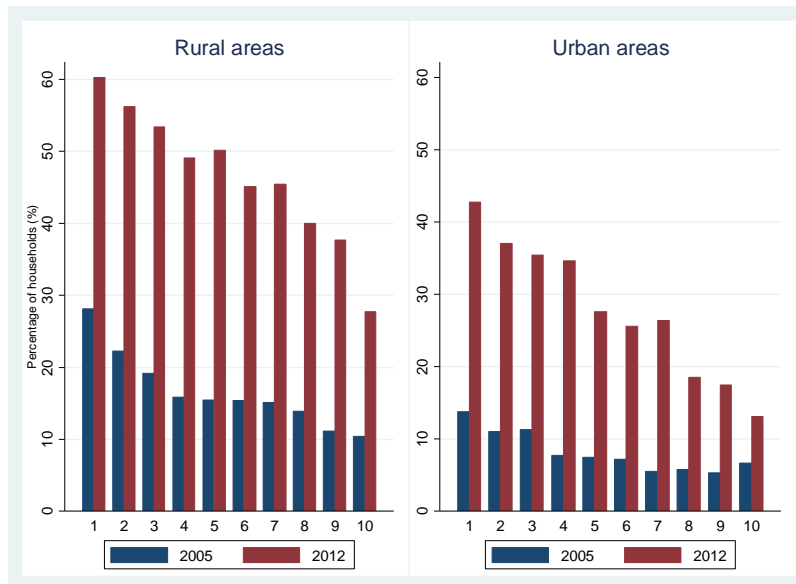
b. Change in the likelihood of receiving remittances by consumption deciles of 2005



Source: IHDS, 2005 and 2012

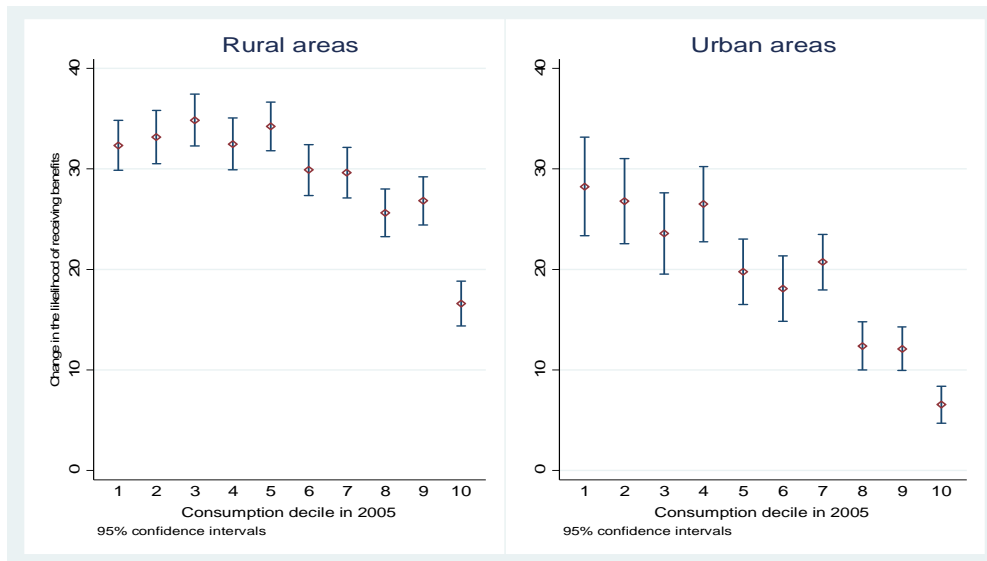
Figure 9. Share of households receiving benefits and changes over time

a. Likelihood of receiving benefits by consumption deciles in 2005



(Continues in the next page)

a. Change in the likelihood of receiving benefits by consumption deciles of 2005



Source: IHDS, 2005 and 2012

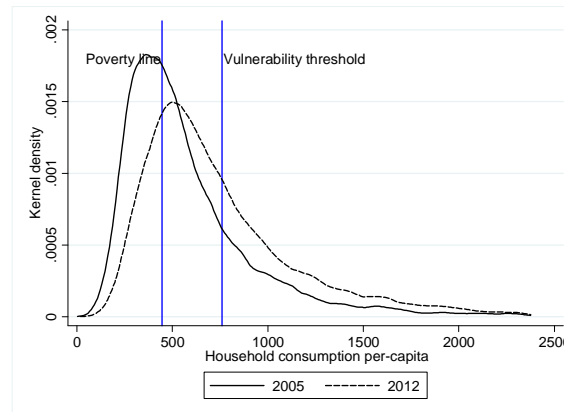
4.3. Vulnerability

Although poverty has fallen, the mean income (658 rupees) and median income (516 rupees) for 2005 are very close to the poverty line (446 rupees). This raises the question: how vulnerable are those escaping poverty to the risk of falling into poverty? To identify the vulnerable population we use a threshold that comes from Dang and Lanjouw (2015), who define a vulnerability threshold of 760 rupees (expressed in 2004-05 All India Rural Rupees) for India. By constructing synthetic panels using NSS data, they derive this threshold as one that yields a probability of 20 percent of falling into poverty conditional on household and demographic characteristics over the seven year period.²³ In our data, this threshold lies around the 76th percentile of consumption per-capita.

We plot the poverty line and the threshold on the kernel estimates of the distributions of consumption per-capita for 2005 and 2012 (Figure 10). As the poverty rate has fallen, the percentage of vulnerable individuals (those between the poverty line and vulnerability threshold) has increased slightly, from 36 percent to 38 percent. Of those who climbed out of poverty between 2005 and 2012, 64 percent remained below the vulnerability threshold; and among those who remained non-poor in 2012, 38 percent fell below the vulnerability threshold. In other words, many of those who have moved or stayed out of poverty are still vulnerable to falling into poverty.

²³ See Dang and Lanjouw (2015) for further methodological details.

Figure 10. Kernel distribution estimates of consumption per-capita



Bandwidth: 2

Source: IHDS, 2005 and 2012

Our decomposition exercise can help construct counterfactual scenarios that are useful to demonstrate vulnerability to specific events, like economic and policy shocks. The coefficients in Table A4 in the Appendix show the potential “loss” in poverty reduction if each factor had remained at its 2005 level, for each household. For example, a (hypothetical) economic shock that drove remittances down to its 2005 levels would have led to around 3 percent higher rural poverty and 1 percent higher urban poverty compared to what is observed now. Similarly, if benefits from government programs had been unchanged from the 2005 levels, rural and urban poverty in 2012 would have been higher by 1 and 0.5 percentage points, respectively.

5. Conclusion

There has been much speculation and debate around the causes and drivers of the rapid poverty reduction in India seen from official data over the last decade. Our paper is an attempt to contribute to this debate, using evidence from two rounds of IHDS panel data that cover the period 2005 to 2012, which show trends roughly comparable with those from the official data sources for similar years. This paper attempts to understand the broad directions of changes from a household perspective that have led to the observed poverty decline.

Four main findings are important to highlight. First, increase in labor earnings—which was most rapid among those in non-agricultural wage/salaried employment but also occurred in agriculture—was a major factor in reducing poverty. This was complemented by workers shifting out of agriculture and into wage and salaried non-agricultural work that yield higher earnings per worker—a transition that was particularly rapid among households who were poor in 2005. Second, in broad sectoral terms, changes in the non-agricultural sector contributed much more to poverty reduction than did the agricultural sector; and changes in wage/salaried employment contributed much more than did self-employment. Third, a combination of demographic changes (decline in dependency ratio) and increasing employment among adults of working age have contributed significantly as well. Fourth, remittances and benefits account for a substantial part of poverty decline, due to expansion in the

share of population receiving these types of income, which also occurred at a higher rate among poorer and rural households.

These results seem to suggest a poverty reduction process shaped mainly by structural transformation, whose key elements appear to be: falling dependency rates; a shift from agriculture toward non-agricultural wage employment and a reduced reliance on agricultural income in rural areas; rising labor productivity; and rising incomes from remittances that may indicate greater migration and spatial mobility of workers. Given the high initial dependence on agriculture in rural areas, it is not surprising to find the transformation process to have occurred much more visibly in rural than in urban areas. Many of these processes require further research to understand underlying patterns and relationships, as the decompositions here at best provide rough estimates of what the changes have meant for poverty reduction. The dominant role in poverty reduction played by the expansion of employment and earnings in the non-agricultural sector, and particularly that of wage/salaried employment in this sector, provides important clues about policy imperatives for poverty reduction.

Despite rapid poverty reduction, that vulnerability persists almost unchanged between 2005 and 2012 should be a source of concern. Since average and median consumption per capita are close to the national poverty line, even small shifts in welfare can lead to big changes in poverty rates, but leave many of those who move out of poverty highly vulnerable to falling into poverty. The share of the vulnerable out of total population, by our rough estimates, may even have increased by 2 percentage points between 2005 and 2012. This sobering estimate, as well as the decomposition results that show that expansion in social benefits have contributed tangibly to poverty reduction, highlight the importance of social programs in addressing poverty and vulnerability in India, complementing the larger transformations in the economy.

Another sobering finding relates to inequality between social groups in poverty status as well as transitions over time. Being an Adivasi or (to a lesser extent) Dalit significantly raises the likelihood of being trapped in poverty and falling into poverty between the first and the second period, and reduces the likelihood of rising up from poverty, a pattern of disadvantage that is net of any observable differences in education and urban/rural location of Adivasis and Dalits with those of other social groups. Decompositions of poverty changes separately for social groups seem to suggest that the same forces that combined to reduce poverty for the country as a whole are by and large important for the disadvantaged groups as well.²⁴ Thus our analysis by itself says little about the nature of the disadvantages that these groups suffer and how to address them. Other sources of evidence and further research are therefore necessary to understand the sources of the disadvantage for Adivasis and Dalits, including the extent to which their status is related to economic geography factors such as their concentration in economically deprived areas.

²⁴ Decomposition results for caste/religion groups not shown here (available upon request).

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Appendix

Table A1. Types of workers

Wage/salaried agricultural work	Wage/salaried non-agricultural work	Self-employed agricultural work	Self-employed non-agricultural work
Wage work in agricultural activities	Salaries (monthly/annual-pay) of non-agricultural activities	Animal care, family farm work	Family business

Note: for further information visit: <http://ihds.umd.edu/employment.html>

Source: Calculations based on IHDS, 2005 and 2012.

Table A2. Sources of income

Labor income				Non-labor income		
Wage/salary agricultural income	Wage/salary non-agricultural income	Self-employed agricultural income	Self-employed non-agricultural income	Other income	Benefits	Remittances
Salaries (monthly/annual-pay) of agricultural activities Meals Housing Bonuses	Salaries (monthly/annual-pay) of non-agricultural activities Meals Housing Bonuses	Net agricultural property income Animal gross income minus expenses for animals Crops gross income minus total crop expenses	Gross receipts minus expenses: labour and other expenses	Renting property Interest, dividends Pensions: government Pensions: private sector Other income	Scholarships and gifts National Old Age pensions Widows' Pension Scheme National Maternity Scheme National Disability Pension Annapurna (national assistance) Other government transfers NGO or other assistance	Remittances

Note: for further information visit: <http://ihds.umd.edu/income.html#wage>

Source: Calculations based on IHDS, 2005 and 2012.

Table A3. Poverty and inequality measures for different samples

	2005		2012		Change (2012 minus 2005)	
	Full balanced panel	Full sample (Cross section)	Full balanced panel	Full sample (Cross section)	Full balanced panel	Full sample (Cross section)
Inequality						
Gini	35.8 (1.3)	36.1 (1.6)	36.0 (1.7)	36.9 (2.6)	0.2 (0.4)	0.8 (1)
Rural	34.8 (1.5)	34.6 (1.3)	35.0 (2.1)	35.8 (2.9)	0.2 (0.6)	1.2 (1.6)
Urban	36.6 (1)	37.3 (1.7)	36.8 (1.4)	37.4 (2)	0.2 (0.4)	0.1 (0.3)
90-10 ratio	4.4 (0.1)	4.5 (0.2)	4.4 (0.1)	4.6 (0.3)	0.0 (0)	0.1 (0.1)
Rural	4.2 (0.1)	4.2 (0.1)	4.2 (0.2)	4.4 (0.4)	0.0 (0)	0.2 (0.2)
Urban	4.7 (0.2)	4.9 (0.4)	4.6 (0.2)	4.8 (0.4)	-0.1 (0)	-0.1 (0)
Poverty - National poverty line						
Headcount ratio, FGT(0)	37.5 (-1.5)	37.6 (-1.4)	18.8 (-0.4)	20.2 (1)	-18.7 (1.1)	-17.4 (2.4)
Rural	40.7 (-2.1)	41.5 (-1.3)	21.3 (-0.6)	23.1 (1.2)	-19.4 (1.5)	-18.4 (2.5)
Urban	28.9 (-0.8)	27.0 (-2.7)	12.3 (-0.3)	13.1 (0.5)	-16.6 (0.5)	-13.9 (3.2)

The differences between the results in Table 5 (those using the smaller balanced panel) and the results presented for each analyzed sample are in parentheses.

Note: The National poverty line is 446 rupees, constant prices of 2005, spatially deflated. The full balanced panel consists of the balanced panel not dropping outliers and households with high consumption-income ratios. The full sample (cross-section) corresponds to the unrestricted sample.

Source: Calculations based on IHDS, 2005 and 2012.

Table A4. Decomposition of changes in poverty

Component	Contribution of each component to total change		
	All	Rural	Urban
Residual	-1.093***	-1.29***	-0.614***
Share of adults	-2.354***	-2.306***	-2.47***
Share of workers (as percentage of adults)	-1.412***	-1.374***	-1.506***
Share of wage/salaried agr. workers (as percentage of workers)	0.656***	0.828***	0.24***
Share of wage/salaried non-agr. workers (as percentage of workers)	-2.054***	-2.621***	-0.679***
Share of self-employed agr. workers (as percentage of workers)	2.107***	2.855***	0.296***
Share of self-employed non-agr. workers (as percentage of workers)	0.006***	0.049***	-0.099***
Wage/salary agr. income (per wage/salaried agr. worker)	-1.364***	-1.779***	-0.358***
Wage/salary non-agr. income (per wage/salaried non-agr. worker)	-6.307***	-5.813***	-7.504***
Self-employed agr. income (per self-employed agr. worker)	-2.882***	-4.027***	-0.108***
Self-employed non-agr. income (per self-employed non-agr. worker)	-0.774***	-0.468***	-1.514***
Other income (per adult)	-0.703***	-0.549***	-1.078***
Benefits (per capita)	-1.046***	-1.273***	-0.495***
Remittances (per capita)	-2.576***	-3.139***	-1.21***
Total Change	-19.795	-20.907	-17.099

* Significant at ten percent; ** significant at five percent; *** significant at one percent.

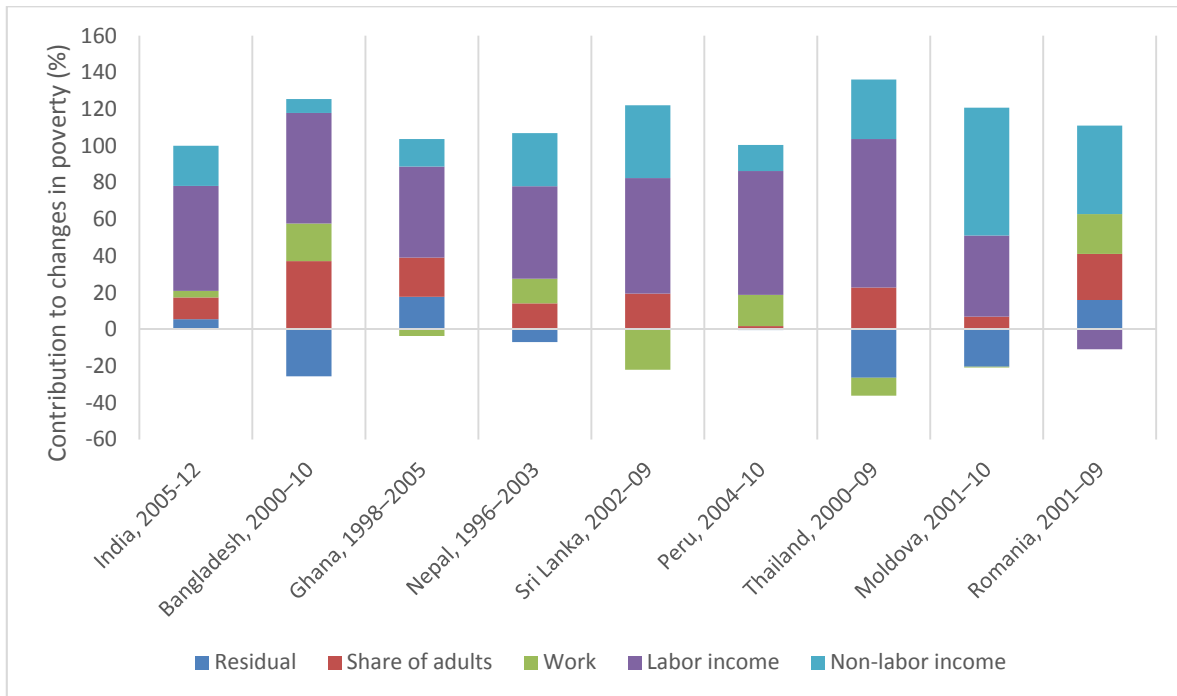
Source: Calculations based on IHDS, 2005 and 2012.

Table A5. Changes in Labor Force Behavior for Indians Ages 15-59

	% Participating				Average number of days worked			
	Urban		Rural		Urban		Rural	
	2005	2012	2005	2012	2005	2012	2005	2012
Men								
Not working	27.5	24.7	17.0	14.8	n.a.	n.a.	n.a.	n.a.
Work on own farm	3.4	4.2	44.7	47.6	2.7	2.7	43.5	37.2
Work on family business	19.7	18.7	11.7	10.2	55.1	52.6	26.2	24.1
Agricultural labor	3.2	2.3	25.6	22.7	6.9	4.3	39.0	30.5
Nonagricultural daily labor	17.5	20.7	21.9	27.2	45.0	52.3	39.8	50.2
Work on monthly salary	31.9	33.6	11.9	12.5	96.2	107.0	31.3	35.7
Work in NREGA	0.0	0.5	0.0	13.1	0.0	0.1	0.0	4.0
Worked only in agri (farmer or laborer)	4.4	3.3	39.0	30.1	9.6	7.1	82.2	67.5
Work only for family (on farm or business)	20.1	19.1	29.3	25.5	57.7	55.2	69.0	60.6
All work excluding MGNREGA	72.5	75.2	83.0	84.6	204.7	217.3	177.3	174.5
All work including MGNREGA	72.5	75.3	83.0	85.2	204.7	217.4	177.3	178.2
Women								
Not working	81.3	77.0	50.6	45.1	n.a.	n.a.	n.a.	n.a.
Work on own farm	2.1	2.5	32.4	36.2	1.2	1.1	23.7	21.2
Work on family business	4.0	5.2	3.2	4.1	9.6	12.1	5.5	8.5
Agricultural labor	2.1	2.2	18.6	17.8	3.2	2.9	23.0	19.3
Nonagricultural daily labor	3.4	4.1	5.4	4.4	6.5	8.0	6.9	6.5
Work on monthly salary	7.9	9.7	2.9	3.4	19.7	25.3	5.4	7.9
Work in MGNREGA	0.0	0.7	0.0	9.7	0.0	0.3	0.0	3.3
Worked only in agri (farmer or laborer)	3.6	3.6	38.5	34.7	4.5	4.1	46.7	40.4
Work only for family (on farm or business)	5.4	6.6	24.5	26.1	10.9	13.2	29.1	29.6
All work excluding MGNREGA	18.7	22.5	49.4	53.0	40.1	49.2	64.2	62.9
All work including MGNREGA	18.7	23.0	49.4	54.9	40.1	49.5	64.2	66.1

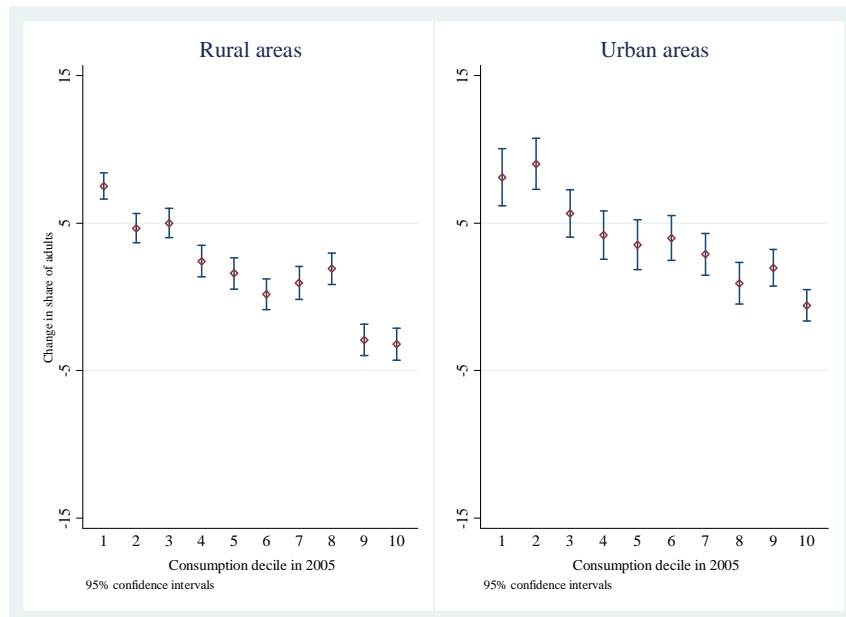
Note: Multiple activities may sum to more than 100 percent. In order to include estimates for the Mahatma Gandhi National Rural Employment Guarantee Act, we also take into account those individuals who work less than 240 hours a week. Source: Calculations based on IHDS, 2005 and 2012.

Figure A1. Contribution to changes in poverty



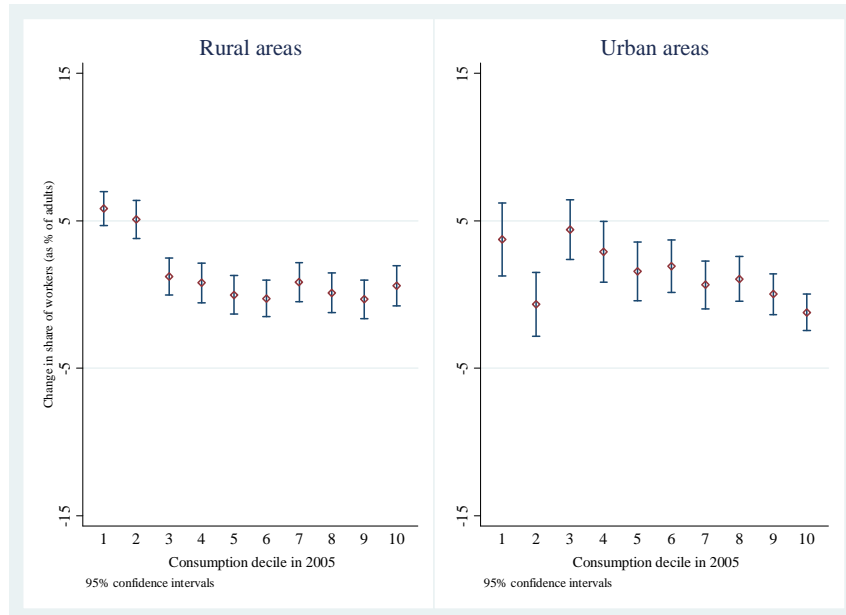
Source: IHDS, 2005 and 2012, and Inchauste et al. (2015).

Figure A2. Changes in the share of adults by consumption per-capita decile



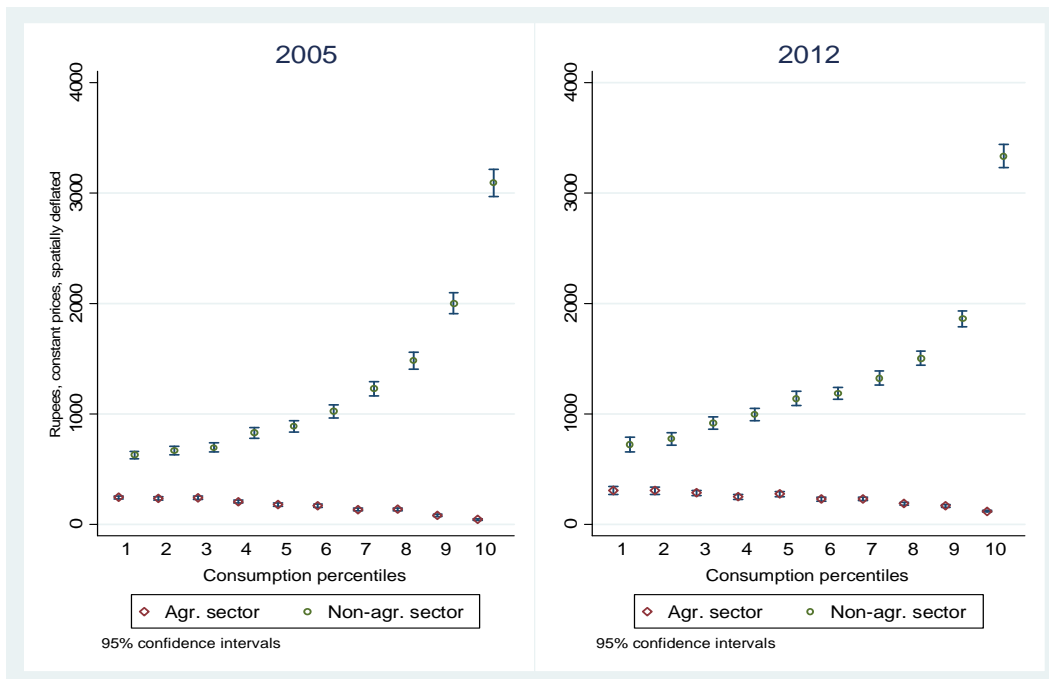
Source: IHDS, 2005 and 2012

Figure A3. Changes in the share of workers by consumption per-capita decile



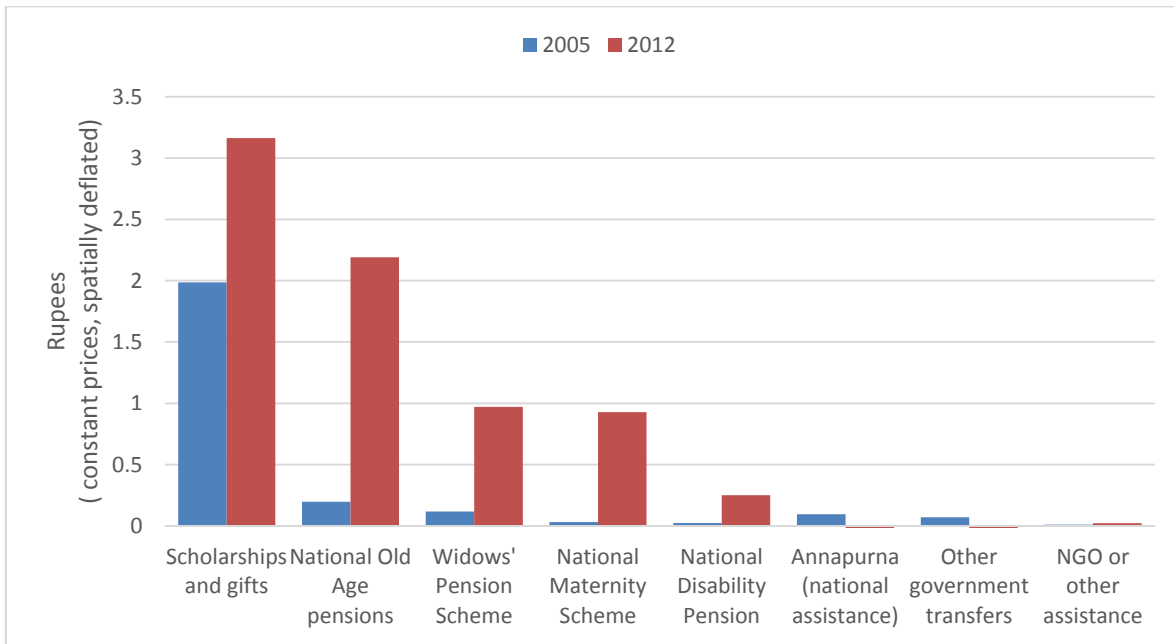
Source: IHDS, 2005 and 2012

Figure A4. Average/salary monthly wage per wage/salaried worker by consumption per-capita decile



Source: IHDS, 2005 and 2012

Figure A5. Average value of benefits per-capita by source



Source: Calculations based on IHDS, 2005 and 2012.