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Poverty trends in Turkey

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Abstract

This paper provides new evidence about poverty trends in Turkey between 2003 and 2012 and the factors accounting for them. We give particular attention to issues of statistical inference, and the choice of the poverty line and the poverty measure. Our robust conclusion is that absolute poverty declined rapidly between 2003 and 2008 but fell only slightly between 2008 and 2012. Changes in relative poverty were negligible throughout. Using decomposition methods, we argue that the declines in the absolute poverty rate are largely accounted for by changes in the rate of economic growth rather than by distributional changes or changes in population composition.

Keywords: poverty, Turkey, poverty dominance, consumption, basic needs, poverty line, poverty decomposition
JEL codes: I32, D31, C12

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1. Introduction

Turkey is a large, strategically important, middle-income country, one of the founder members of the OECD, a G20 member, and a candidate EU member state. Its economic success has been hailed as a 'source of inspiration for a number of developing countries' (World Bank 2014, p. 3). The growth spurt in the 2000s coincided with notable changes in income distribution: Turkey is one of the few OECD countries in which income inequality declined in the 2000s and relative poverty rates fell considerably (OECD 2012). However, this is a broad-brush description of the Turkish experience. The reality is that there is relatively little detailed information available about poverty trends in Turkey, and their relationship with macroeconomic growth, especially about the situation in the late 2000s when growth rates fell. The aim of this paper is to provide new and detailed evidence about poverty trends in Turkey for the period 2003–12.

Official statistics in Turkey do not provide this information, even though there have been substantial developments in income distribution and poverty data since the annual Household Budget Survey (HBS) began in the early 2000s. Most HBS-based studies of poverty in Turkey use Turkstat's poverty lines (explained later), though a few have used the EU's relative poverty line. Changes in poverty over the last decade and the factors accounting for them are the subject of only a limited number of studies. Moreover, in this research, the most recently-used HBS data refer to 2006; there is no checking of the robustness of conclusions to the choice of poverty line or use of methods of statistical inference; and the findings are not easily accessible to an international audience (most are published in the Turkish language). Turkstat statistics show that the poverty rate decreased sharply over the decade prior to 2009 according to the poverty lines they use, but the reasons for this decrease have not been examined in detail.

Using annual HBS data for the ten-year period 2003–12, we analyze changes in poverty and the factors associated with them. Like most previous studies of poverty in Turkey, we use poverty lines derived using a basic needs approach. However, unlike those studies and official statistics, we mostly employ poverty lines that are fixed in real terms over time ('absolute' poverty lines). This choice guarantees that the poverty comparisons we make are consistent in the sense that two individuals with the same living standards at two different time points are treated in the same way (Ravallion 1998). However, for reference, we also include some analysis that employs relative poverty lines, and show that these lines lead to some non-intuitive results over the period when the Turkish economy grew rapidly.

Our research makes several contributions. First, using good quality data, we provide a detailed anatomy of poverty for an important middle-income country about which relatively little is known, carefully distinguishing between periods of relatively rapid poverty decline (2003–8) and little change (2008–12). Second, we examine the robustness of our conclusions about poverty trends to choice of poverty line using dominance methods and, more generally, take issues of statistical inference seriously. Third, we use decomposition methods to examine the factors accounting for changes in absolute poverty rates over the two sub-periods. We distinguish between growth and redistribution components of poverty change, and also employ univariate and multivariate decompositions to provide poverty profiles and to assess the roles played by changes in subgroup poverty rates and changes in population composition.

The rest of the paper is organized as follows. Section 2 reviews previous research about poverty in Turkey. Our methods are outlined in Section 3. Section 4 describes the HBS data and explains how we use them to measure household living standards, derive poverty lines, and measure poverty. Our findings are presented in Sections 5–7. Poverty estimates are presented in Section 5, and we undertake comparisons over time using stochastic dominance checks and specific indices, and absolute and relative poverty lines, assessing whether changes are statistically significant using appropriate methods of statistical inference. Decompositions of changes in absolute poverty rates into growth and redistribution components are presented in Section 6 together with contextual discussion about changes in the Turkish economy. Univariate decompositions by population subgroup appear in Section 7. Section 8 provides a summary and conclusions. Additional results are presented in the online Appendix.

2. Previous research about poverty in Turkey

Official statistics on income distribution and poverty in Turkey were sparse prior to 2004. Turkstat conducted nationally representative Household Income and Consumption Expenditure Surveys (HICES) in 1987 and 1994. Due to the lack of official poverty lines or consensus about the definition of poverty, most pre-2004 studies focused on the derivation of poverty lines, measurement of poverty rates, and description of who was poor: see e.g. Dumanlı (1996), Dansuk (1997), and Alıcı (2002). See Appendix Table A1 for further details of these and later studies.

Poverty lines were derived using basic needs methods (with the food basket composition and costs varying across studies), and using calorie requirements when

determining the food basket. However, these studies mostly focus on one or two years, not looking at trends over a longer period, or examine trends up to around 1994. World Bank (2000) and Yemstov (2001) analyse the change in poverty between 1987 and 1994 using 1987 and 1994 HICES data and absolute and relative poverty lines that they constructed. Gursel et al. (2000) use the same data to analyze the change in relative poverty between 1987 and 1994.

Turkstat first announced poverty lines in 2004, drawing on 2002 HBS data about household consumption. There were six thresholds, namely US$1, US$2.15, US$4.3 (per capita), each converted to Turkish Lira using the then-current OECD purchasing power parity rates, a food poverty line, a combined food and non-food poverty line, and a line equal to half median equivalent consumption expenditure.

The Turkstat food and combined food and non-food thresholds were derived using a cost-of-basic-needs approach, initially developed in conjunction with the World Bank (World Bank and Turkstat 2005), and modified when 2003 HBS data became available. A food basket was specified that comprised 80 items required to meet a diet providing 2100 calories of food intake per day. The food basket's composition has remained the same, but the price of each item has been re-assessed annually. The total cost of the basket valued at current prices defines the food poverty line for a particular year. The cost of non-food contribution to total basic needs is calculated by dividing the cost of the food basket by the food consumption share of people a little above the poverty line.

The real value of all six Turkstat poverty lines varies from year to the next: they are not fully absolute poverty lines. Because the non-food consumption share varies from year to year – e.g. in 2003 it was 60% and in 2009 it was 65% – the food consumption share varies as well, and this implies changes in the value of the total food and combined food and non-food poverty lines (more on this below). The Turkish Lira value of the US dollar-denominated poverty lines has also declined over time because Turkstat does the conversion using current PPPs. For example, we estimate that the 'US $4.3' line declined from TL198 per month in 2003 to TL131 per month in 2012 (both amounts expressed in 2012 prices).[1] More recently, Turkstat has also begun reporting income-based fraction-of-median poverty statistics, derived using data from the Turkish component of EU-SILC.

Turkstat's estimates of poverty rates using these poverty lines are available at http://www.turkstat.gov.tr/PreTablo.do?alt_id=1013, covering 2002–2009 for basic needs poverty lines and 2006–2013 for relative income poverty lines (as at January 2015). Official

[1] We estimate the '$US 2.15' line to have declined over the same period from around TL99 to TL66 per month (2012 prices). The OECD PPP series is shown at http://www.turkstat.gov.tr/PreTablo.do?alt_id=1065.

food and non-food poverty lines, and estimates of poverty rates based upon them, have not yet been published for the post-2009 period because Turkstat has been conducting a study of how to revise its poverty line methodology.

Most other research using HBS data has employed Turkstat's basic needs poverty lines.[2] Yükseler and Türkan (2008) find that poverty rates fell between 2002 and 2006 using basic needs poverty lines and argue that this is related to increases in the shares of wages and transfers in total household income. Aran et al. (2010), also using Turkstat's basic needs poverty lines, report that aggregate poverty fell between 2003 and 2006, and they relate this to a reduction in poverty among people living in urban areas. They also found that poverty rates did not decline for everyone: for example, poverty rates were higher in 2006 than 2003 for individuals in large agricultural households, with a low level of education, and households with children.

This review shows that there is no study that has examined Turkish poverty trends in detail over the 2000s, and none examines changes after 2009 using a consumption-based measure of living standards. There has not been checking of the robustness of conclusions about trends in poverty, with the exception of Aran et al. (2010) who check their poverty change results using poverty lines 5% and 10% below and above the Turkstat lines. Methods of statistical inference have not been employed, and nor has there been systematic examination of the factors accounting for the poverty trends that are revealed. We provide these dimensions in this paper.

3. Methods: poverty measures and their decomposition

3.1 Aggregate poverty measures

We use FGT indices (P_α) to summarize aggregate poverty (Foster, Greer, and Thorbecke 1984). For any given year, these are defined as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{z - y_i}{z}\right)^\alpha I(y_i < z), \qquad \alpha \geq 0, \tag{1}$$

where z is the poverty line, y_i is the measure of living standards of person i, N is the population size, and $I(y_i < z)$ is a binary indicator function equal to one if individual i is poor,

[2] Studies using relative poverty lines include Caglayan and Dayioğlu (2011) using consumption data, and Guloglu et al. (2012), OECD (2008), and Şeker and Dayioğlu (2014) using income data. For example, the proportion of persons in Turkey with income less than half contemporary median household income fell slightly between the mid-1980s and the mid-1990s, but rose between the mid-1990s and the mid-2000s (OECD 2008, Figure 5.3).

and equal to zero otherwise. Parameter α summarizes poverty aversion: larger values give greater weight in the aggregate poverty index to poorer individuals (those with larger poverty gaps). The poverty rate (headcount ratio) is P_0. Although the poverty rate is the most commonly used measure of poverty, it does not account for the depth of poverty, unlike P_1, the normalized poverty gap index. P_2, the squared normalized gap index, is also sensitive to inequality among the poor. Every FGT index is additively decomposable by population subgroup, a property that we exploit below. Since FGT indices are generalized means, estimation and inference for poverty levels and differences are relatively straightforward. Our calculations used DASP software (Araar and Duclos 2007), which also takes proper account of the fact that our relative poverty lines (fractions of medians) are estimated.

3.2. Poverty dominance

Poverty comparisons based on indices such as the members of the FGT class provide complete orderings, but presuppose agreement about the choice of poverty line *z* and the index (value of α). It is of particular interest to be able to say whether there are poverty orderings that are robust to the choice of poverty line and poverty index.

In order to check the robustness of our poverty comparisons across years, we apply the methods of estimation and inference of Chen and Duclos (2011) which are based on Davidson and Duclos (2000). The poverty dominance results refer to unanimous orderings according to all generalized poverty gap indices including all FGT indices. According to this approach, the distribution for year *B*, F_B, is said to poverty dominate the distribution for year *A*, F_A, at the first order if and only if $F_A(z) > F_B(z)$ for all poverty lines *z* over restricted domain $Z = [z^-, z^+]$.[3]

To test for poverty dominance, the statistical significance of the difference between the poverty incidence curves for years *A* and *B* is investigated at poverty lines $y \in Z$. A finding of statistically significant negative differences, $F_B(z) - F_A(z) < 0$, for all poverty lines in the restricted domain $y \in Z$ reveals poverty dominance of $F_B(z)$ over $F_A(z)$ in $[z^-, z^+]$. More formally, we test the null hypothesis of non-dominance using the 'min-*t*' approach described by Chen and Duclos (2011). We calculate the *t*-ratio of the difference in poverty dominance curves at each value of $y \in Z$. For a test of size 100*c*%, we reject the null if the smallest such *t*-ratio ('min-*t*') is larger than the (1–*c*)th quantile of the normal distribution. Thus, for a test at the 5% level, we require min-*t* > 1.65. Rejection of the null implies poverty

[3] See Chen and Duclos (2011, 188–191) for details. On poverty dominance, see also Foster and Shorrocks (1988).

dominance for all poverty lines in $[z^-, z^+]$. Chen and Duclos' (2011) methods are applicable to both the absolute and relative poverty line cases, and we implemented them using DASP software (Araar and Duclos 2007).

3.3. Decomposition of poverty changes into growth and redistribution components

It has been common to view poverty reduction as reflecting the effects of economic growth and changes in the distribution of living standards: see e.g. World Bank (2006). Datt and Ravallion (1992) provide a decomposition method that reveals these two components. The poverty measure for year t, P_t can be expressed as:

$$P_t = P(\mu_t, L_t; z) \tag{2}$$

where z is the poverty line (assumed fixed), μ_t is the mean income and L_t describes the Lorenz curve for year t. The growth component is the change in poverty associated with a change in mean living standards while holding the Lorenz curve constant; the redistribution component is the change in poverty associated with a change in the Lorenz curve while holding average living standards constant. Datt and Ravallion (1992) show that the change in poverty between two years t and $t+\tau$, ΔP, can be decomposed as:

$$\Delta P = \underbrace{G(t, t+\tau; r)}_{Growth} + \underbrace{D(t, t+\tau; r)}_{Redistribution} + \underbrace{R(t, t+\tau; r)}_{Residual} \tag{3}$$

where the growth (G) and the redistribution (D) components are:

$$G(r) = P(\mu_{t+\tau}, L_r) - P(\mu_t, L_r) \quad \text{and} \quad D(r) = P(\mu_t, L_{t+\tau}) - P(\mu_r, L_t) \tag{4}$$

and r refers to the reference year employed in the calculation, which is either t or $t+\tau$. $R(.)$ is a residual component.[4]

The decomposition is potentially sensitive to the choice of reference year but Shorrocks (2013) argues persuasively that this index number issue is addressed by employing the Shapley rule which, in this context, means averaging the decompositions calculated separately for each value of r. This also has the advantage that the residual component vanishes (Kolenikov and Shorrocks 2003). Thus, we calculate the growth and redistribution components as:

$$G = \tfrac{1}{2}[G(t+\tau) + G(t)] \quad \text{and} \quad D = \tfrac{1}{2}[D(t+\tau) + D(t)]. \tag{5}$$

In addition, we follow Inchauste et al. (2014, Chapter 2) and use a non-parametric approach rather than fit parametric specifications of the Lorenz curve as Datt and Ravallion (1992) did.

[4] Datt and Ravallion (1992) show that the residual may be interpreted as the difference between the growth (redistribution) components evaluated at the final-year and base-year Lorenz curves (mean living standards) respectively, and it vanishes if either the mean or the Lorenz curve remains unchanged between t and $t+\tau$.

Our calculations use the `drdecomp` program of Sanfelice, Castanada, and Azevedo (2012). Calculations based on the Datt and Ravallion (1992) method led to the same substantive conclusions (Appendix Table A4).

3.4. Poverty profiles and decomposition of aggregate poverty changes into changes in subgroup poverties and population composition

We complement our growth-redistribution decompositions with decompositions of changes in the headcount ratio index (P_0) by population subgroup in order to examine the contributions of the different groups to total poverty in each year (poverty profiles), and also to analyze the roles played by the changes in poverty risks for particular subgroups and by changes in population composition when looking at poverty changes. These decompositions allow us to answer questions such as: how much of aggregate poverty in a given year is accounted for by the rural sector and how much by the urban sector, and also how much of the change in aggregate poverty between two years is attributable to changes in poverty within the sectors and how much by the population shift between urban and rural areas? Our accounting exercise is repeated for several subgroup definitions. We refer to these as univariate decompositions of poverty change to contrast them with the regression-based multivariate decompositions that are discussed later.

FGT indices are additively decomposable poverty indices with population-share weights (Foster, Greer, and Thorbecke 1984). Suppose all individuals can be partitioned into a set of mutually-exclusive non-overlapping subgroups. Let J be the set of all subgroups, P_t be aggregate poverty in year t, w_{jt} the population share of subgroup j in year t, and P_{jt} be the poverty measure for group j in year t. The subgroup decomposability property of the FGT class of poverty indices allows us to write the share of total poverty in a given year t that is accounted for by a particular subgroup j, s_{jt}, as:

$$s_{jt} = w_{jt}P_{jt}/P_t. \tag{6}$$

The change in poverty between two years t and $t+\tau$, ΔP, is written:

$$\Delta P = \sum_{j\in J}\left(\frac{w_{j,t+\tau}+w_{j,t}}{2}\right)\Delta P_j + \sum_{j\in J}\left(\frac{P_{j,t+\tau}+P_{j,t}}{2}\right)\Delta w_j. \tag{7}$$

The first term on the right hand side of equation (7) represents the change in aggregate poverty accounted for by changes in subgroup poverty rates holding the relative sizes of the subgroups constant (at the average of the base- and final-year values). The second term on the right hand side summarizes the impact of population composition. It is the change in the

aggregate poverty rate accounted for by changes in the distribution of population shares of each subgroup, holding subgroup poverty rates constant (at the average of the base- and final-year values).[5]

4. Data and definitions

Our analysis uses unit record data from the Turkish HBS for each year over the period 2003–2012. The HBS has been conducted annually since 2002, and each survey provides detailed information about household consumption and socio-economic characteristics. Approximately 8,600 households have been interviewed in each annual round, except in 2003 when the sample was much larger.[6] The survey runs over the full 12 months of each year, with approximately 720 households selected each month using a two-stage clustered sampling method with stratification. Cluster and strata identifiers are not available in the public-use HBS data, however.

Our analysis is restricted to 2003 and later years even though the HBS has been conducted since 2002. The reason is that 2003 has become the benchmark year. The food basket used in the calculation of the official poverty line was changed in that year and the items used to derive the consumer price index were also changed (see below).

All HBS estimates reported in this paper are based on the same population weights as used by Turkstat when deriving poverty estimates from the HBS and also underlying its population projections. Until 2007, their weights were calculated using the general population census conducted in 2000. Since 2007, Turkstat has employed weights derived from an Address Based Population Registration System.

4.1. The measure of living standards

The standard of living indicator used in our research is a comprehensive measure of household consumption. This is monthly average household expenditure, and includes spending on non-durable items, consumption from own production and income in kind, goods

[5] As with the growth-redistribution decomposition, there is an index number issue that needs to be addressed and, again, it is resolved by applying the Shapley rule of Shorrocks (2013).

[6] In 2003, the survey size was 25,920 households to provide estimation at NUTS2 regional level which contains 26 regions. One of the aims of the 2003 HBS was to provide the base year for consumer price index. The sample size was reduced to 8,600 households in 2004 and remained at about at the same level until 2009. In 2009, the sample size was increased to 12,600 households (the sample sizes were 13,248 households in 2010, 2011 and 2012). The number of households with valid responses is slightly fewer than these numbers.

and services purchased by the household to be given to private persons or bodies as gifts or allowances, expenditure on durable goods, and imputed rent.[7]

We use the official Consumer Price Index (2003 = 100) to deflate all household consumption data to 2012 prices. This leads to the main difference between our measure of real household consumption and the official one. Turkstat's measure adjusts for within-year changes in the cost of living and changes between regions, but month-of-interview and detailed region identifiers are not available to us in the public-use HBS files. Hence, our adjustments for inflation are based on the national-level CPI using annual-average values for each year.[8]

We use the same two-parameter adult equivalence scale as Turkstat. For household i containing A_i adults (individuals aged over 14 years) and C_i children, the scale rate, E_i, is:

$$E_i = \pi(A_i + 0.9C_i)^{0.6}. \quad (9)$$

The scale is normalized to equal one for the reference household type (two adults and two children), where π is the normalization factor.[9]

We count an individual as poor if the real value of his or her household's equivalized consumption is less than the poverty line for the year in question.

4.2. Poverty Lines

We use absolute poverty lines because they provide essential benchmarks for informing anti-poverty policies in low- and middle-income countries. Our goal is not only to identify the poor, but also changes in poverty over time, using a living standards threshold that is fixed in real terms. We acknowledge that there is also interest in poverty lines that increase as aggregate living standards rise (on this, see e.g. Chen and Ravallion 2013). In order to compare results across poverty line definitions, we also employ relative poverty lines expressed as fractions of median equivalized household consumption (with 60% of the median used for the headline estimates).

[7] We also undertook the dominance comparisons using consumption measures that excluded either or both of imputed rents or durable expenditures. The findings were broadly the same: see Appendix Figures A1 and A2.
[8] The official CPI before 2003 used a different basket of items and was indexed to 1994 = 100. (See http://www.turkstat.gov.tr/PreTablo.do?alt_id=1014 for both series.) Since January 2006, the old CPI has been updated using the monthly rate of change in the 2003=100 CPI, and so it is only with the new CPI that there is consistent coverage of the 2003–2012 period spanned by our HBS data.The change to the new CPI reduced estimates of the inflation rate. For instance, between January 2003 and December 2005, prices rose by 29.4% according to the 2003 = 100 CPI but by 39.4% according to the 1994 = 100 CPI.
[9] The choice of normalization factor has no impact on the results. A two-parameter scale of the same general form has been used in many empirical studies around the world, albeit with different parameter values. See e.g. Citro and Michael (1995) and Jenkins and Cowell (1994).

Table 1 shows the values in 2012 prices of Turkstat's combined food and non-food poverty line, a relative poverty line, and the two absolute lines that we use. The Turkstat basic needs threshold varies over time for the reasons discussed earlier, and leads to poverty lines in each year that are higher than the corresponding relative poverty line (defined as 60% of contemporary median consumption) in 2003 and 2004. However, the two lines are close to each other between 2005 and 2009.

<Table 1 near here>

We focus on two absolute poverty line definitions. The '2003 poverty line' is derived by taking the combined food plus non-food poverty threshold announced by Turkstat for 2003 and expressing it in 2012 prices. The '2009 poverty line' is the Turkstat line for 2009 reflated to 2012 prices, and is higher than the 2003 line (256 TL per month compared to 214 TL per month). The relative poverty line is well below the 2003 poverty line in the earlier years of the 2003–12 period but well above both 2003 and 2009 poverty lines by 2012. In fact, the 60-per-cent-of-median line is the same as the 2003 poverty line in 2005 and about the same as the 2009 poverty line in 2009.

5. Trends in aggregate poverty, 2003–12

Taking the 2003 poverty line as the cut-off, we estimate the absolute poverty rate to decline by 24.3 percentage points between 2003 and 2012, from 35.1% to 10.7%. With the 2009 poverty line, the reduction is even more dramatic, a drop of 30.2 percentage points in the absolute poverty rate from 46.2% to 16.0%. By contrast, relative poverty rates remained much the same over the same period (20.8% compared to 20.2%). If the average gap and average squared gap indices are used, there are the same patterns for the 2003–12 period as a whole, i.e. a large decline in absolute poverty with relative poverty broadly constant. See Table 2 for the full set of the poverty estimates broken down by year and FGT poverty index.

<Table 2 near here>

Table 2 also reveals that the decline in poverty occurred at a relatively fast rate before 2008 and the rate of decline slowed thereafter. According to our 2003 poverty line, the absolute poverty rate declined by 21.2 percentage points between 2003 and 2008, and by 3.2 percentage points between 2008 and 2012. With the 2009 line, the corresponding changes are 27.0 percentage points and 3.2 percentage points. Given the turning point in 2008, we divide

the period as a whole into two sub-periods: one of rapid decline in absolute poverty (2003 to 2008) and one with a much smaller decline (2008 to 2012).

Every change in poverty calculated for each of the two sub-periods differs from zero at the 1% level of statistical significance, with the exception of the two poverty rate change calculations based on the relative poverty line (see Table 2, last two lines).

Are the poverty orderings revealed by these specific indices and poverty lines robust? To assess this, we employ the poverty dominance methods of Chen and Duclos (2011) discussed earlier. We follow their advice and undertake calculations at a large number of points over the range of poverty lines. For absolute poverty comparisons, we use a range of lines from 40 TL per month to 600 TL per month in increments of 10 or 20 TL (37 intervals in total). For relative poverty comparisons, we examine poverty lines equal to fractions of contemporary median income over the range from 1% to 100% of the median (with increments of 1 percentage point).

Estimated differences in poverty incidence curves are shown with their associated point-wise 95% confidence intervals in Figure 1. Panel (a) shows the differences between 2003 and 2008, and panel (b) shows the differences between 2008 and 2012. For reference, we also indicate the values of the 2003 and 2009 poverty lines in each chart. The estimates of $F(y)$ and their difference at each poverty line, together with the associated t-statistics, are reported in Appendix Table A2.

<Figure 1 near here>

Figure 1(a) shows that estimated differences between 2003 and 2008 poverty rates and the associated confidence interval lie completely below zero, i.e. there are negative poverty differences at all poverty lines between 0 TL per month and 600 TL per month. (See also Table A2.) The upper boundary of the domain is more than twice the poverty line levels shown in Table 1, and so well above any plausible poverty threshold. Applying the dominance check of Chen and Duclos (2011) (based on the smallest t-statistic for the difference calculations) with a 5% significance level shows rejection of the null hypothesis of non-dominance at all poverty lines above 40 TL per month (Table A2). Poverty was greater in 2003 than in 2008 over virtually all conceivable absolute poverty lines.

Figure 1(b), summarizing the comparison between 2008 and 2012, tells a different story. The estimated differences in poverty dominance curves are negative throughout the whole range of poverty lines considered, but the differences are now quite small. It remains the case, however, that the differences differ statistically from zero. According to the min-t criterion, there is less poverty in 2012 than 2008 at every poverty line over the full range

(Table A2). The conclusion that poverty fell slightly over the second period is therefore robust to the choice of absolute poverty line.

What if a relative poverty line that is defined as a (varying) fraction of contemporary median consumption is used instead? The dominance comparisons are summarized in Figure 2, panels (a) and (b), with the numerical estimates and associated *t*-statistics in Appendix Table A3. For the period 2003–8, Figure 2 suggests that poverty is greater in 2008 than in 2003 if the relative poverty line is a smaller fraction of the median than the conventional fraction 60% but, at higher fractions, poverty differences evaporate. Application of the min-*t* criterion with a 5% significance level shows lower poverty in 2003 for all relative poverty lines between 24% and 49% of the contemporary median (a ranking that is the reverse of the finding for this period using an absolute poverty line). For median-fractions in ranges outside this, the null of non-dominance cannot be rejected. For the period 2008–12, poverty fell slightly at median-fractions below the conventional 60% cut-off: application of the min-*t* criterion shows lower poverty in 2012 for all relative poverty lines between 29% and 46% of the contemporary median.

These results draw attention to a problem with using relative poverty lines in times of rapid macroeconomic change. In the Turkish case, median consumption rose by around 63% between 2003 and 2008 and it is somewhat perverse to have a poverty measure that records negligible change or a rise in poverty (depending on the median-fraction used) when average living standards are growing so rapidly. The situation has some parallels with the case of relative poverty rates rising in Ireland during the Celtic Tiger economic boom: see e.g. the discussion by Jenkins et al. (2013: Chapter 1). These findings reinforce the case for using absolute poverty lines for assessing social progress in Turkey during the 2000s. We use them in the remainder of this paper.

6. Decomposition of poverty trends: growth and redistribution

6.1. Decomposition results

Our decomposition of poverty changes into growth and distribution components is undertaken separately for the sub-periods 2003–8 and 2008–12 and for both the 2003 and 2009 poverty lines, and three FGT poverty indices. See Table 3. We discuss the estimates based on the headcount ratio (P_0) and then consider how the results differ if P_1 and P_2 are used instead.

For the change between 2003 and 2008, the calculations show that the increase in average living standards contributed substantially more to the decrease in poverty than improvement in the distribution of living standards, and for both poverty lines. For example, with the 2003 poverty line, whereas 17.3 percentage points of the 21.1 percentage point decrease in the poverty rate is attributed to consumption growth, only 3.8 percentage points is attributed to redistribution. If the 2009 poverty line is used, the corresponding estimates are 21.9 percentage points and 5.1 percentage points (with the total change 27.0 percentage points). Our results are consistent with those of Aran et al. (2010) who, applying the Datt and Ravallion (1992) method to poverty changes in Turkey between 2003 and 2006, also found that the growth component was the largest. In addition, our results echo the findings of Azevedo et al. (2013) that growth explains most of the observed reduction in poverty for 14 of the 16 countries that they considered (Latin American countries, Bangladesh, Moldova, Romania, Peru, and Thailand).

<Table 3 near here>

Between 2008 and 2012, when the poverty rate decline was much smaller, the growth component again plays the dominant role. However, by contrast with the earlier period, the redistribution component is now positive rather than negative. The change in distribution had a poverty-increasing effect and this was larger for the higher absolute poverty threshold. This suggests that the effect is largely driven by individuals in households with living standard levels above the 2003 poverty line but below the 2009 poverty line. Over this period, this refers to individuals in the second lowest decile group, broadly speaking (see Table 2 and Appendix Table A8).

If poverty indices P_1 and P_2 are used for the decompositions, the results are similar to those for P_0, with one exception. That is, as before, the redistribution component accounts for a much smaller share of total poverty change than does the growth component, and for both periods. What is different with P_1 and P_2 is that the redistribution component for 2008–2012 is negative – contributing a small poverty-reducing impetus – rather than positive. Thus, distributional changes over this period are such that they equalized the distribution of poverty gaps even though they were also increasing the proportion of persons poor (by a small amount). This result is broadly consistent with the fact that the aggregate inequality of consumption declined between 2003 and 2007 (or 2008 depending on the measure) and increased between 2010 and 2012: see Appendix Figures A3 and A4.

6.2. Macroeconomic and related changes

Our finding that the growth component is substantially more important than the distributional component points to the role of economic growth in poverty reduction over the two periods investigated. The Turkish economy's growth performance over time parallels the trends in poverty. After a serious contraction in GDP in 2001, the real GDP growth rate increased substantially, a turnaround commonly attributed to structural reforms, macroeconomic policies, and favorable conditions in the international markets (State Planning Organisation 2008). Between 2002 and 2007, the real GDP growth rate was between 4.7% and 9.4% per year, averaging nearly 7%. See Figure 3, which also shows that growth rates for real GDP per capita moved in parallel, though at a slightly lower level. However, economic growth started to slow in the second quarter of the 2007 and came to a stop in the second half of 2008 as a result of the global financial crisis (State Planning Organisation 2010), but rebounded strongly in the second quarter of 2009, with the upturn enhanced by robust export and consumption growth. This recovery was the strongest in the OECD area (OECD 2010). The annual growth rate of real GDP was near zero for 2008 and –4.8% in 2009, but around 9% in both 2010 and 2011. Although the rate fell to 2.1% in 2012 (0.8% on a per capita basis), it was 4.1% in 2013 (2.9% on a per capita basis).

<Figure 3 near here>

For the redistribution component of the poverty changes between 2003–8 and 2008–12 to have been larger, there would have needed to have been increases in consumption opportunities that were greater for relatively poor households compared to relatively rich households. Figures 3 and 4 help explain why this was not the case.

Increases in labour income for poor households may arise through increases in household work attachment or increases in pay for those already working, with the former particularly important.[10] Figure 3 shows that when economic growth rates were particularly high during the 2000s, this did not translate into a marked increase in employment. Between 2003 and 2008, the unemployment rate fell only slightly before rising slightly, to around 10% (the range was just 1.5 percentage points). The rate was at this level over the subsequent five years as well (apart from an increase in 2009). However, one difference between the first period and the second was that the gap between the overall and non-agricultural unemployment rates decreased slightly. In addition, observe that the non-employment and the non-participation rates both increased slightly even during the period when economic growth

[10] Most Turkish households rely on employment as their primary source of income and so household work attachment is an important correlate of poverty. See e.g. Dansuk (1997) and World Bank (2000).

was strong (with small declines after 2009), a pattern that also reflects high rates of population growth (Taymaz 2010).

Thus, overall, strong economic performance did not translate into changes in labour market performance with strong poverty-reducing features. The principal reason for the limited increase in employment was the on-going structural transformation in the economy. Although employment in urban areas increased markedly after the 2001 crisis, this did not compensate for the substantial loss of employment in agriculture (Taymaz 2010).[11] At the same time, although the non-employment rate for women in urban areas increased slightly, it remained very high – a feature that Taymaz refers to as 'one of the most striking and problematic aspects of employment issues in Turkey' (2010, p. 2).[12] The reduction in agricultural employment has been reversed since 2008 (Turkstat 2015), and contributed to the (small) decline in unemployment rate and non-employment rates.[13]

Other reasons for the small redistributive component compared to the growth component of poverty changes relate to the nature of the changes in social protection expenditures and wages for those in work. When the economy was relatively strong, total expenditure on social protection grew, from 10.4% of GDP in 2003 to 11.7% in 2008, peaking at 13.8% in 2009 reflecting a rise in unemployment-related payments, and remaining around that level over the next 5 years (Turkstat 2015). Annual growth rates of real total expenditures on social protection were, however, higher in the 2003–08 period on average than for 2009–12: see Figure 4. The same is true for the annual changes in the 'minimum pension' (a composite measure we derived as the average, in real terms, of the lowest pensions paid by the four types of pension scheme), and also for annual changes in the minimum wage paid to industrial and service sector workers.

<Figure 4 near here>

The differences in growth rates for the periods before and after 2008 help explain why the redistribution component was less important for 2008–12 than for 2003–8. But social protection expenditures (and wages) did not have a particularly pro-poor orientation in either

[11] The proportion of adults that worked in agriculture fell from 29.1% in 2004 to around 24% by 2006 (Turkstat 2015).

[12] In 2007, the employment rate for women was 16.9% in urban areas and 31.4% in rural areas (the corresponding labour force participation rates were 20.2% and 32.7%). For men, the corresponding rates are 63.0% and 66.7% (70.6% and 72.6%). See Social Planning Organisation (2010, Table IV.58).

[13] Another factor has been changes in the incidence of informal employment, a sector that is characterised by lower pay than formal employment. Taymaz reports that there was a 'very sharp decline in the extent of formality from 2004, especially in the case of female workers (2010, p. 7). He also refers to a minor increase in the share of formal employment in 2006 but the data available 'are not sufficient to suggest if this is the beginning of a new upward trend in formality' (2010, p. 7).

period. That is not to say that they did not help the poor at all. As the decomposition analysis showed, poverty gaps were reduced by redistribution, and social protection is likely to have played a role in this.

7. Decomposition of poverty trends: changes in poverty risks and population composition by population subgroup

Poverty-reduction policy should be concerned not only with its impact on aggregate poverty, but also examine the diversity of impacts that accompany the aggregate changes (Ravallion 2001). We do this in this section, using the subgroup decomposition methods outlined in Section 3. We provide poverty profiles for 2003, 2008, and 2012, and decompose changes in the poverty rate (FGT index P_0) between 2003–2008 and 2008–2012 into the components representing changes in the distribution of subgroup poverty risks and changes in population composition. Our subgroup definitions classify individuals in terms of their location, household size, the number of gainfully employed workers in their household expressed as a fraction of the total number of adults, and the education level of the household head. We report decompositions based on the 2003 poverty line. Estimates derived using the 2009 poverty line do not change the story we are about to tell (see Appendix Table A5).

The first nine columns of Table 4 show the subgroup population shares (w_{jt}), poverty rates (P_{jt}), and subgroup shares of total poverty (s_{jt}) for each of the three years (see equation 6), and the last four columns show the components of total poverty change over each period (as defined in equation 7).

<Table 4 near here>

Looking first at the urban/rural breakdown, we see that most poverty in Turkey is accounted for by rural households and the rural sector's poverty share increased over time. Although there was a substantial migration from rural to urban areas between 2003 and 2008 – the rural share of the population fell from around 40% to nearly 30% – the sector's poverty rate did not fall as much as the urban area's rate over the same period. (The rate fell by about 70% in urban areas but by less than one half in rural areas.) Between 2008 and 2012, the rural share of the population stayed much the same but, as in the earlier period, the sector's poverty rate fell by less than in urban areas.

The household size breakdowns show that Turkey is a country in which large household sizes are common: around one-quarter of the population live in households with 6

or more members. The prevalence of relatively small households (those with three or fewer members) increased throughout the period, however, with around 23% of individuals in this group in 2003 compared with 27% in 2008 and 34% in 2012. Poverty rates fell for all household size groups between 2003 and 2008 (and for all groups between 2008 and 2012 as well, except the '< 3' one), though it remained the case that poverty rates were higher, the larger the household size. Mainly reflecting the increasing population share, the poverty share of those in relatively small households increased over the period as a whole, but most of aggregate poverty was still accounted for by the large-sized household groups in 2012.

The principal changes in work attachment over the period were a shift in numbers of individuals between households with less than half of the adults working and households with more than half the adults working. Whereas the proportion of individuals in households with no working adults stayed constant between 2003 and 2012 at around 12%, the proportion in those with more than half the adults working rose by around 12 percentage points over the period, from 11% to 23%. This factor accounts for the small rise in the group's share of aggregate poverty over time. Poverty rates fell substantially between 2003 and 2008 for all three groups, and to a lesser extent between 2008 and 2012 (the largest fall in for the group with the greatest work attachment). Unsurprisingly, the group with the greatest work attachment has the lowest poverty rate in each of the three years.

The breakdowns by the education level of the household head reveal that the main compositional shift over the period (and mostly between 2003 and 2008) was a rise in the proportion of individuals with household heads with high school or better education accompanied by a corresponding fall in the proportion of individuals in households with heads educated to primary school level. There is a clear gradient in poverty rates by education level with, for example, the poverty rate for individuals in the primary education group around three times greater than the rate for those in the high school group. This persists throughout the period, despite the large falls in the poverty rate for each group especially between 2003 and 2008.

The final four columns show the decomposition of the changes in poverty rate into the components associated with changes in population composition and changes associated with changes in subgroup poverty rates. It is clear that the latter component plays by far the largest role, regardless of the subgroup classification used, and in both periods; changes in population composition have accounted for a negligible proportion of the decline in absolute poverty rates in Turkey between 2003 and 2012. Although there have been some large compositional changes, including the shift from rural to urban areas, a growing prevalence of smaller

households, and more individuals in households in which more than half the adults are gainfully employed – all changes that are poverty-reducing, other things being equal – the decline in subgroup poverty rates had a larger effect on the change in the aggregate poverty rate.

The univariate decompositions provide breakdowns for each subgroup, one at a time, and yet the classifications may substantially overlap. A characteristic may appear important simply because it is correlated with some other characteristic. In order to control for the effects of a number of characteristics simultaneously, we have also undertaken decompositions based on multivariate regression analysis in which the poverty rate in a given year is modeled as a probit function of a linear combination of regression coefficients and measures of characteristics. The change in poverty between two years can then be composed analogously to the univariate method (Yun 2004). The multivariate decompositions provide estimates of the relevant importance of changes in conditional poverty rates (associated with changes in regression coefficients) and changes in the distribution of poverty-relevant characteristics (associated with changes in characteristic means).

For brevity, the methods and results are presented in the Appendix as the results echo the univariate ones. That is, we find that the fall in poverty rates between 2003 and 2008 was mostly accounted for by the changes in conditional poverty rates, with changes in the distributions of characteristics playing a small role. For the small poverty rate decline between 2008 and 2012, we also find that changes in conditional poverty rates account for the poverty rate fall. The decomposition component summarizing changes in characteristics is insignificantly different from zero in the multivariate analysis.

8. Summary and conclusions

Our headline result about poverty trends in Turkey between 2003 and 2012 is that absolute poverty rates declined substantially over the period taken as a whole. (Relative poverty changed little.) However, there were two distinct sub-periods: between 2003 and 2008 when absolute poverty declined rapidly, and between 2008 and 2012, when the decline was small. These results are robust to the choice of the absolute poverty line and poverty index.

Our analysis shows that the declines in poverty in both periods are primarily attributable to growth rather than to changes in inequality (in the Lorenz sense). The subgroup decompositions of poverty change show that, between 2003 and 2008, all population subgroups experienced a fall in poverty, and the decline in aggregate poverty over the period

is accounted for almost entirely by these changes rather than any changes in population composition. There was compositional change that was poverty-reducing but its contribution to aggregate poverty change was relatively small. Much the same story also applies to the 2008–2012 period when the aggregate poverty rate fell by less.

What of poverty in Turkey after 2012? According to our analysis, economic growth has been the principal driver of poverty trends. We know that the real GDP growth rate in 2013 was slightly higher than in 2012, and the unemployment rate, non-employment rate, and non-participation rate changed little (Figure 3). Changes in minimum pension levels and total social protection expenditure changed little too (Figure 4). So, we expect absolute poverty rates to have hardly changed between 2012 and 2013. Consistent with this, we note that the proportion of persons with equivalized consumption less than the 'US$4.3 (PPP)' poverty line changed little – it fell from 2.3% to 2.1%, reflecting a larger fall in rural areas than urban areas (Turkstat 2015) – though this may also reflect a decline in the real value of the poverty threshold. In addition, Turkstat (2015) report that the change between 2012 and 2013 in the proportion of individuals in households with an equivalised income less than 60% of the contemporary median income was a decline of only 0.3 percentage points (from 22.6% to 22.3%). Changes are also small if the fraction of the median is 40%, 50%, or 70% instead.

A marked decline in poverty is unlikely without a more substantial rise in the economic growth rate combined with measures that also raise employment rates, or the development of anti-poverty programmes targeted on groups prone to poverty such as individuals living in, for example, rural areas, or with low levels of education, or in large households.

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Table 1. Poverty lines (equivalized household consumption, Turkish Lira (TL) per month, 2012 prices)

Year	Turkstat's 'basic needs' poverty lines		Relative poverty line	Absolute poverty lines used in this paper	
	Poverty line	As a percentage of 60% of contemporary median	60% of contemporary median	2003 poverty line	2009 poverty line
2003	214	131.5	163	214	256
2004	202	108.6	186	214	256
2005	212	98.8	214	214	256
2006	218	96.7	225	214	256
2007	233	97.3	239	214	256
2008	254	95.9	265	214	256
2009	256	98.7	259	214	256
2010	n.a.	n.a.	261	214	256
2011	n.a.	n.a.	276	214	256
2012	n.a.	n.a.	284	214	256

Notes. In 2012, 1 Turkish Lira (TL) ≈ US $0.6. n.a.: Turkstat's basic needs poverty lines are not available for 2010–2012. Equivalized household consumption and the different types of poverty line are explained in the main text.

Table 2. FGT poverty index estimates, by poverty line and year

Year	Poverty rate ($P_0 \times 100$)			Average poverty gap ($P_1 \times 100$)			Average squared poverty gap ($P_2 \times 100$)		
	Absolute poverty lines		Relative poverty line	Absolute poverty lines		Relative poverty line	Absolute poverty lines		Relative poverty line
	2003 line	2009 line	60% of median	2003 line	2009 line	60% of median	2003 line	2009 line	60% of median
2003	35.1	46.2	20.8	11.0	15.9	5.7	4.9	7.5	2.3
	(0.400)	(0.408)	(0.313)	(0.170)	(0.194)	(0.147)	(0.100)	(0.122)	(0.082)
2004	28.8	38.4	22.7	8.9	12.9	6.3	3.8	5.9	2.5
	(0.653)	(0.683)	(0.531)	(0.259)	(0.305)	(0.262)	(0.144)	(0.182)	(0.147)
2005	22.1	30.4	22.2	6.7	9.9	6.7	2.8	4.5	2.8
	(0.620)	(0.668)	(0.531)	(0.241)	(0.288)	(0.284)	(0.133)	(0.169)	(0.168)
2006	19.8	27.2	21.9	5.6	8.5	6.4	2.3	3.8	2.7
	(0.627)	(0.679)	(0.557)	(0.236)	(0.284)	(0.288)	(0.126)	(0.163)	(0.167)
2007	16.8	24.1	21.5	4.5	7.2	6.1	1.8	3.0	2.5
	(0.570)	(0.632)	(0.524)	(0.200)	(0.248)	(0.266)	(0.099)	(0.134)	(0.149)
2008	14.0	19.2	20.8	3.9	6.0	6.5	1.6	2.6	2.8
	(0.541)	(0.593)	(0.532)	(0.186)	(0.234)	(0.281)	(0.093)	(0.125)	(0.165)
2009	13.7	20.7	21.2	3.6	5.9	6.1	1.5	2.4	2.5
	(0.472)	(0.547)	(0.490)	(0.160)	(0.199)	(0.234)	(0.084)	(0.110)	(0.137)
2010	12.7	19.1	19.8	3.4	5.4	5.7	1.3	2.3	2.4
	(0.454)	(0.523)	(0.462)	(0.156)	(0.195)	(0.225)	(0.083)	(0.108)	(0.131)
2011	11.0	16.3	19.6	2.8	4.5	5.5	1.0	1.8	2.3
	(0.438)	(0.499)	(0.475)	(0.139)	(0.179)	(0.223)	(0.065)	(0.091)	(0.124)
2012	10.7	16.0	20.2	2.6	4.3	5.7	0.9	1.7	2.3
	(0.442)	(0.508)	(0.476)	(0.130)	(0.171)	(0.224)	(0.062)	(0.086)	(0.124)
				Change (percentage points)					
2003–2008	–21.1	–27.0	0.0	–7.1	–9.9	0.7	–3.3	–4.9	0.6
	(0.673)	(0.719)	(0.617)	(0.252)	(0.304)	(0.256)	(0.136)	(0.175)	(0.144)
2008–2012	–3.2	–3.2	–0.6	–1.4	–1.7	–0.8	–0.7	–0.9	–0.5
	(0.698)	(0.780)	(0.714)	(0.227)	(0.290)	(0.291)	(0.112)	(0.152)	(0.163)

Source: Authors' calculations from annual Household Budget Surveys, 2003–12. See text for details.
Notes: Poverty lines are explained in the main text and their values are shown in Table 1. The poverty indices (P_α) are defined in equation (1). Standard errors in parentheses. All poverty change estimates differ from zero at the 1% level of statistical significance, except for the two estimates based on P_0 and calculated using the relative poverty line.

Table 3. Growth and redistribution components of poverty change, Turkey, 2003–8 and 2008–12 (percentage points), by FGT poverty index and absolute poverty line

	P_0			P_1			P_2		
	ΔP	G	D	ΔP	G	D	ΔP	G	D
2003 Poverty Line									
2003–2008	–21.1	–17.3	–3.8	–7.1	–6.3	–0.8	–3.3	–3.1	–0.5
2008–2012	–3.1	–3.3	0.1	–1.4	–1.1	–0.2	–0.6	–0.5	–0.1
2009 Poverty Line									
2003–2008	–27.0	–21.9	–5.1	–9.9	–8.5	–1.4	–4.9	–4.4	–0.5
2008–2012	–3.2	–4.4	1.2	–1.7	–1.6	–0.1	–0.9	–0.8	–0.1

Source: Authors' calculations from annual Household Budget Survey data for 2003–12.
Notes: G and D are the Growth and Redistribution components of the change in poverty, ΔP, as defined in equations (3)–(5). The components may not sum exactly to the total change because of rounding. The FGT poverty indices P_α are defined in equation (1).

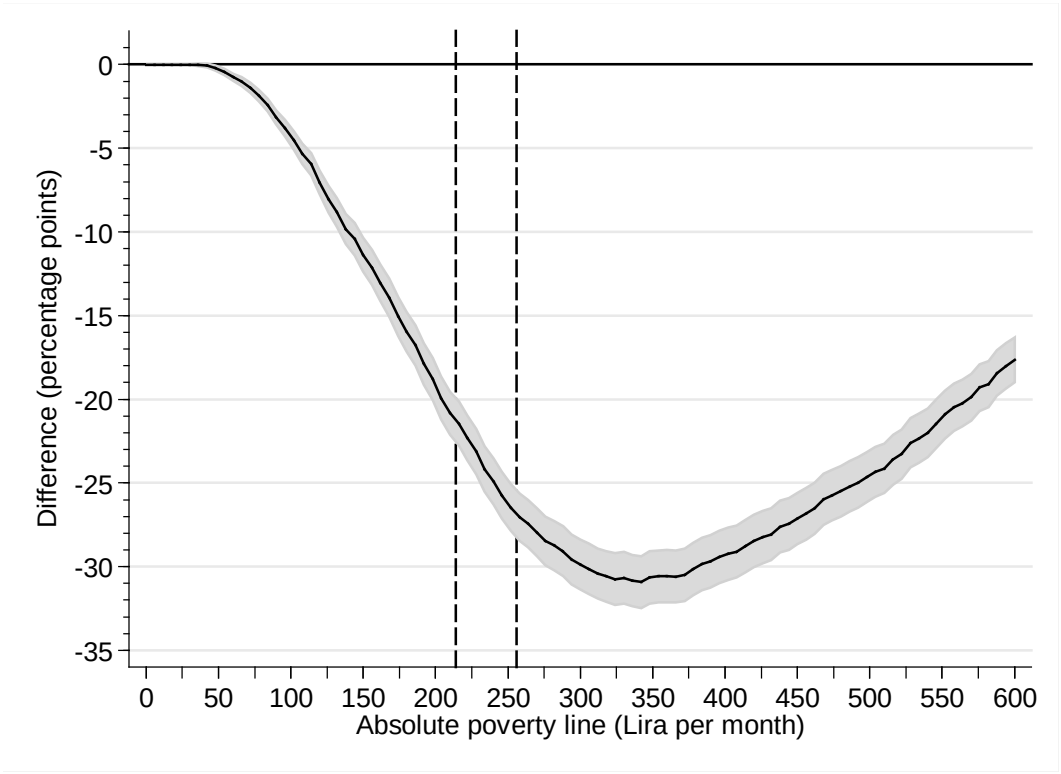
Table 4. Subgroup decompositions of the poverty rate (P_0) and its changes, 2003–8 and 2008–12 (2003 poverty line)

	Subgroup population share (w_{jt}) (%)			Subgroup poverty rate (P_{jt}) (%)			Subgroup share of total poverty (s_{jt}) (%)			2003–8		2008–12	
	2003	2008	2012	2003	2008	2012	2003	2008	2012	Changes in subgroup poverties	Changes in population composition	Changes in subgroup poverties	Changes in population composition
										Percentage points		Percentage points	
Location													
Urban	60.8	69.3	68.5	24.8	7.6	5.3	43.0	37.6	33.9	–11.2	1.4	–1.6	–0.1
Rural	39.2	30.7	31.5	50.9	28.4	22.5	56.8	62.3	66.2	–7.8	–3.4	–1.8	0.2
All	100.0	100.0	100.0	35.1	14.0	10.7	100.0	100.0	100.0	*–19.0*	*–2.0*	*–3.4*	*0.1*
Household size													
<3	8.6	9.8	12.6	18.9	7.5	7.7	4.6	5.3	9.1	–1.1	0.2	0.0	0.2
3	14.6	17.8	19.4	19.3	4.6	4.4	8.0	5.8	8.0	–2.4	0.4	–0.0	0.1
4	25.3	27.5	27.7	24.8	7.2	5.3	17.9	14.1	13.7	–4.7	0.4	–0.5	0.0
5	19.3	17.2	16.7	37.0	14.6	11.1	20.3	17.9	17.3	–4.1	–0.6	–0.6	–0.1
6	12.1	11.8	10.0	45.7	23.2	18.3	15.8	19.6	17.1	–2.7	–0.1	–0.5	–0.4
7 or 8	11.9	9.8	8.1	54.0	30.4	23.0	18.3	21.3	17.4	–2.6	–0.9	–0.7	–0.4
>8	8.3	6.2	5.6	63.4	35.9	33.7	15.0	15.9	17.6	–2.0	–1.1	–0.1	–0.2
All	100.0	100.0	100.0	35.1	14.0	10.7	100.0	100.0	100.0	*–19.6*	*–1.6*	*–2.5*	*–0.8*
Number of gainfully employed workers in the household (as share of number of adults)													
0%	13.5	12.7	11.5	31.9	15.3	14.2	12.3	13.9	15.3	–2.2	–0.2	–0.1	–0.2
> 0% and ≤ 50%	75.9	69.9	65.4	37.1	14.9	11.8	80.2	74.4	72.1	–16.1	–1.6	–2.1	–0.6
> 50%	10.6	17.4	23.2	24.5	9.0	5.9	7.4	11.2	12.8	–2.2	1.1	–0.6	0.4
All	100.0	100.0	100.0	35.1	14.0	10.7	100.0	100.0	100.0	*–20.5*	*–0.6*	*–2.8*	*–0.4*
Education level of household head													
Illiterate	7.0	6.5	6.8	64.3	47.1	29.4	12.8	21.9	18.7	–1.2	–0.3	–1.2	0.1
Literate without diploma	5.6	5.4	5.6	52.8	34.6	26.5	8.4	13.3	13.9	–1.0	–0.1	–0.5	0.1
Primary school	53.6	48.4	45.6	41.5	15.8	12.7	63.4	54.6	54.1	–13.1	–1.5	–1.5	–0.4
Secondary school	11.0	11.2	12.0	25.9	7.3	6.5	8.1	5.8	7.3	–2.1	0.0	–0.1	0.1
High school	15.0	18.0	17.3	14.7	3.0	3.7	6.3	3.9	6.0	–1.9	0.3	0.1	–0.0
University and above	7.7	10.5	12.7	3.7	0.1*	0.5*	0.8	0.1	0.6	–0.3	0.1	0.0	0.0
All	100.0	100.0	100.0	35.1	14.0	10.7	100.0	100.0	100.0	*–19.6*	*–1.5*	*–3.2*	*–0.2*

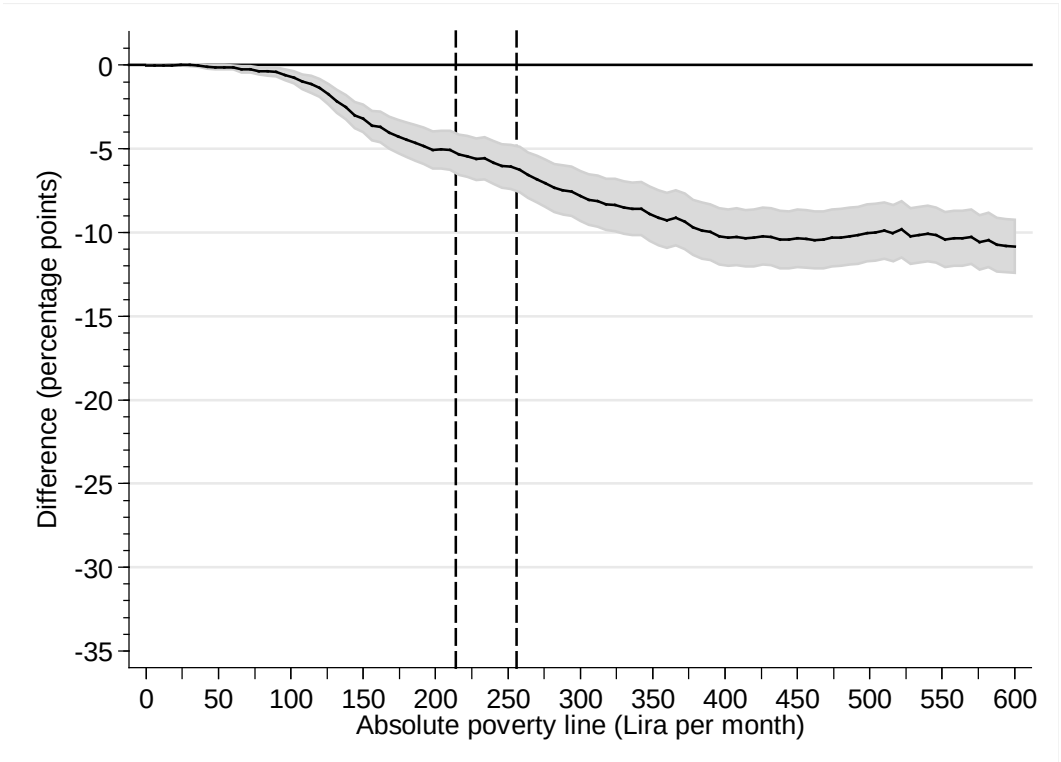
Source: Authors' calculations based on annual Household Budget Survey data for 2003–12. See text for details. Notes: The subgroup shares of total poverty are derived using equation (6). The decomposition components shown in the last four columns are derived using equation (7). The estimates derived using the 2009 poverty line are provided in Appendix Tables A5. *: calculation based on fewer than 20 observations.

Figure 1. Absolute poverty comparisons: differences between poverty incidence curves (percentage points) with pointwise 95% confidence intervals, by period

(a) 2003 versus 2008



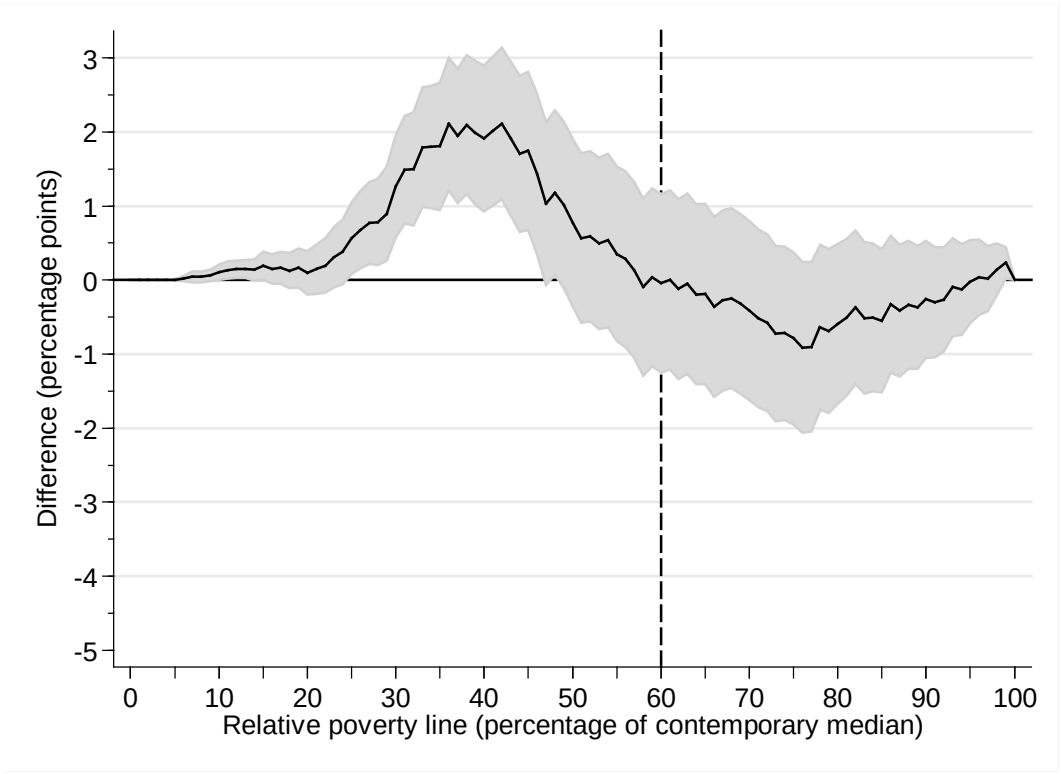
(b) 2008 versus 2012



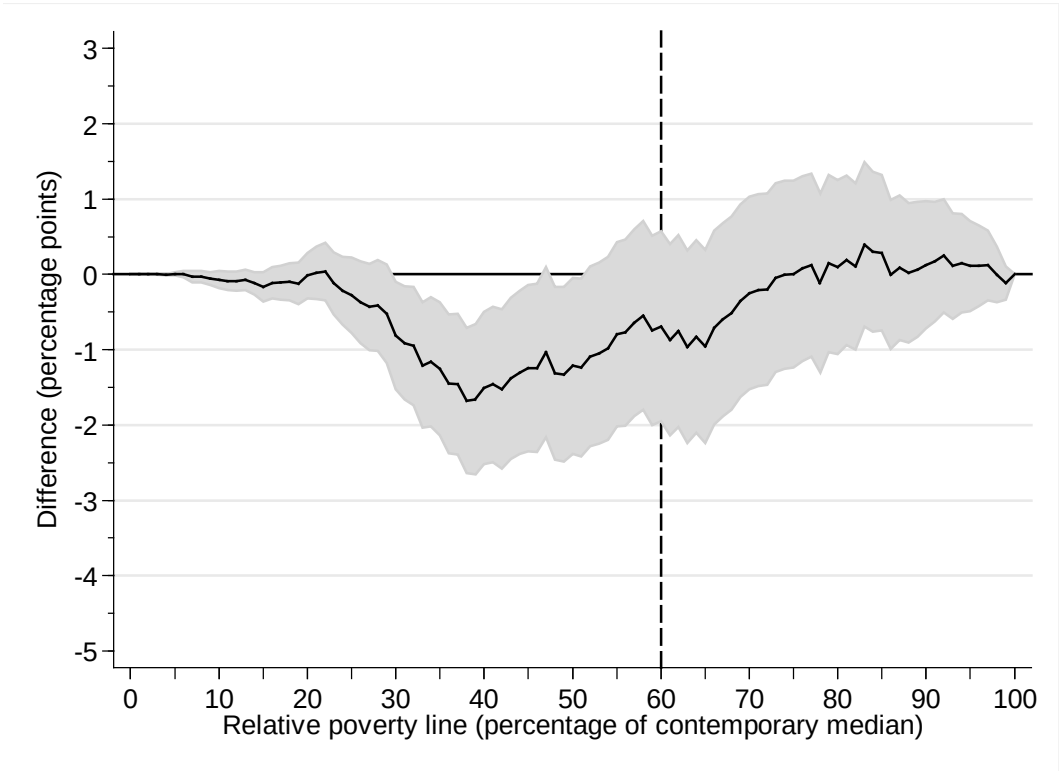
Source: Authors' calculations from annual Household Budget Survey data for 2003–12. See text for details.
Notes: The dashed lines show the 2003 and 2009 poverty lines, i.e. TL214 and TL256 per month (2012 prices)
.

Figure 2. Relative poverty comparisons: differences between poverty incidence curves (percentage points) with pointwise 95% confidence intervals, by period

(a) 2003 versus 2008

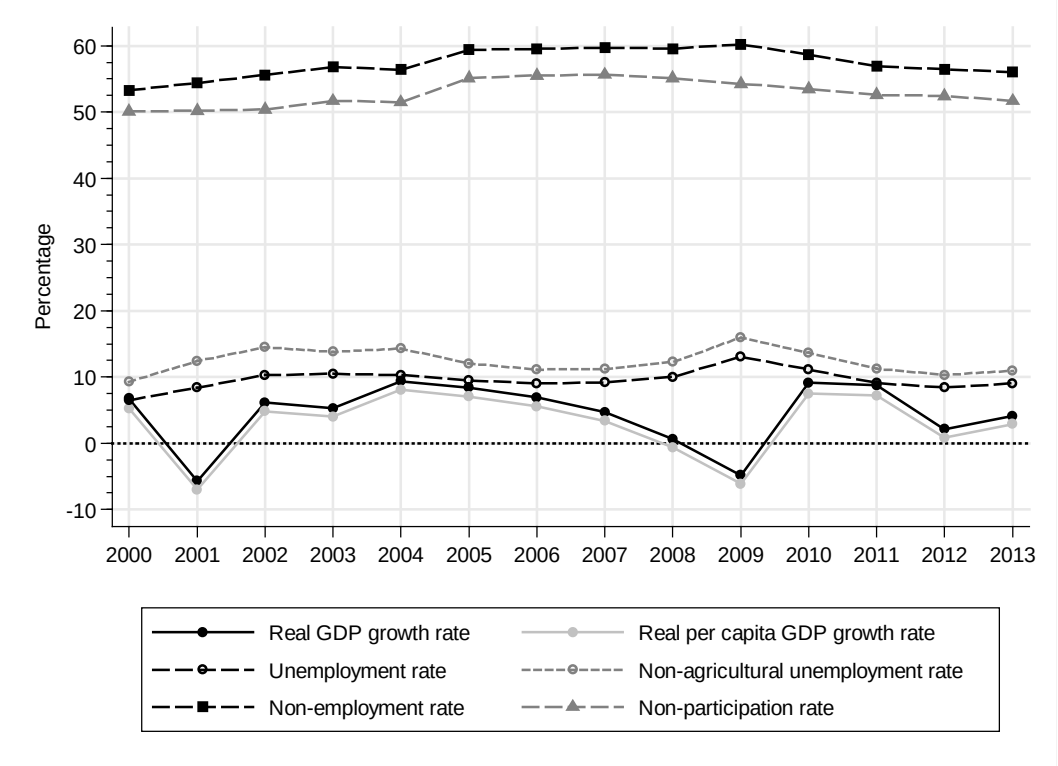


(b) 2008 versus 2012



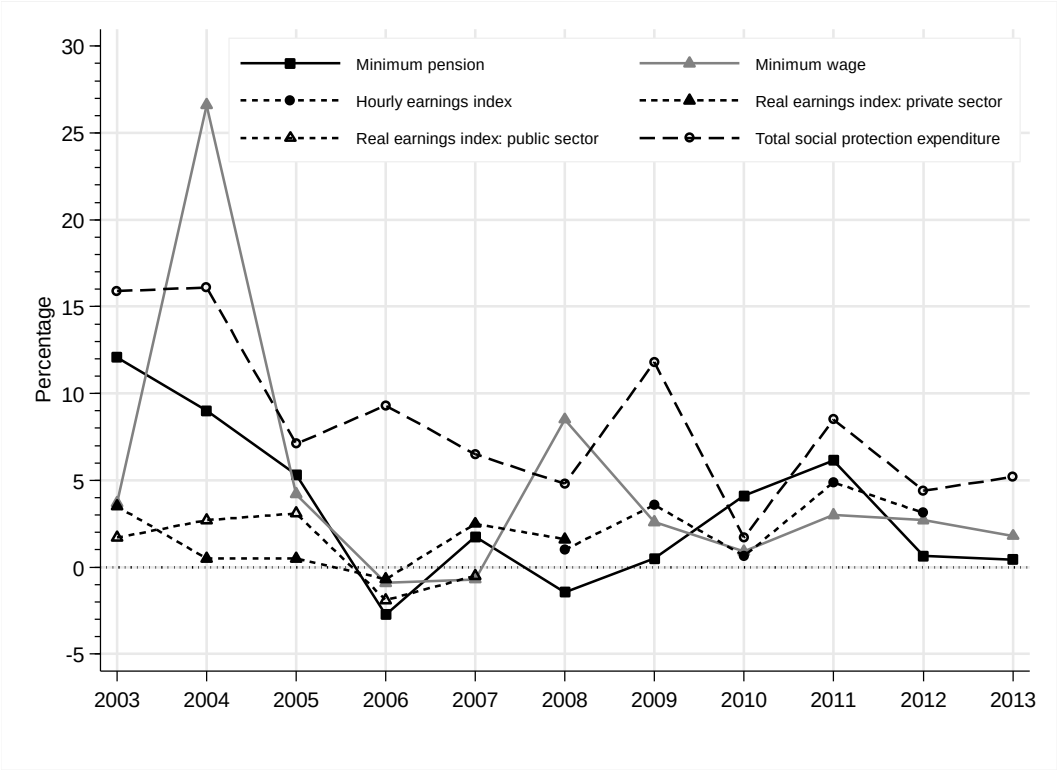
Source: Authors' calculations from annual Household Budget Survey data for 2003–12. See text for details.

Figure 3. Unemployment, non-employment, and non-participation rates (%), and real GDP growth rate (%), by year



Source: Turkstat (2015). Notes: The population estimates used to derive the series are derived from the Address Based Population Registration System for years after 2003, and from the 2000 Population survey for earlier years.

Figure 4. Annual growth rates (%) in real values of minimum wage, minimum pension, earnings indices, and total social protection expenditure, by year



Source: Republic of Turkey Ministry of Development and Turkstat (2014), except for the real earnings index series which derive from State Planning Organisation (2010, Table IV.45).
Notes: Minimum pension refers to the average of the lowest pension payable to each of four groups of workers – those with a service contract, self-employed, self-employed in agriculture, and civil servants. Nominal amounts converted to real amounts using the CPI.

APPENDIX

Poverty trends in Turkey

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20 January 2015

Table A1. Selected studies of poverty in Turkey: data and poverty lines

Study	Survey	Poverty line type and level (expressed in 2011 prices)
	Pre-2004 studies	
Dumanlı (1996)	1987 Household Income and Consumption Survey	Consumption-based (food only) absolute line: 71 TL/month per person for 1987. Change in poverty line 1987–1994 is derived by adjusting for price inflation.
Dansuk (1997)	1987 Household Income and Consumption Survey	Consumption-based absolute and relative poverty lines. The absolute poverty line is equal to the lowest consumption expenditure among seven regions of Turkey (219 TL/month per person). Food poverty line established in Dumanlı (1996) is adjusted by taking into account calorie requirements and price differences in five regions of Turkey resulting in 10 different poverty lines for urban and rural areas within five regions (average figures: 177 TL/month for urban and 158 TL/month for rural) .
Gürsel et. al. (2000)	1987 and 1994 Household Income and Consumption Surveys	Income-based relative poverty line (50% of contemporary median). Monthly per adult equivalent poverty lines: 340 TL for 1987 and 332 TL for 1994.
World Bank (2000) and Yemstov (2001)	1987 and 1994 Household Income and Consumption Surveys	Absolute lines (one-dollar a day, food poverty line, food and non-food poverty line) and relative poverty lines. Monthly per adult equivalent absolute poverty rates: 183 TL (food only) and 349 TL (food and non-food) on average for all survey period. For food and non-food poverty line, the food poverty line is doubled for urban areas and is multiplied by 1.75 for rural areas.
	Post-2004 studies	
World Bank and Turkstat (2005)	1994 Household Income and Consumption Survey and 2002 Household Budget Survey	The methodology used by Turkstat in 2002–9 is based on this study. The 2002 food poverty line is 78 TL/month for each adult equivalent and, for food and non-food, the poverty line is 182 TL/month.
Yükseler and Türkan (2008)	2002–6 Household Budget Surveys	Same poverty lines as Turkstat (Table 1 in main text).
OECD (2008)	1987 and 1994 Household Income and Consumption Surveys and 2004 Household Budget Survey	Relative income-based poverty line and absolute poverty line (setting the contemporary median income in 1990 as the threshold and keeping it constant in real terms). The absolute poverty rate is calculated for only 15 OECD countries, excluding Turkey.
Aran et al. (2010)	2003–6 Household Budget Surveys	Same poverty lines as Turkstat (Table 1 in main text).
Caglayan and Dayioğlu (2011)	2008 Household Budget Survey	Consumption-based relative poverty line (50% of contemporary median).
Guloglu et al. (2012)	1994 Household Income and Consumption Survey and 2003–6 Household Budget Surveys	Income-based relative poverty line (50% of contemporary median).
Şeker and Dayioğlu (2014)	2006–9 Panel, Statistics on Income and Living Conditions	Income-based relative poverty line (60% of contemporary median)

Note: the full bibliographic references for the studies are given in the main text.

Table A2. Absolute poverty comparisons: differences in poverty incidence curves

(a) 2003 and 2008

Poverty line, *z* (Lira per month)	*F*(2003) (%)	*F*(2008) (%)	Difference (percentage points)	t-statistic
40	0.2	0.1	–0.0	–0.61
50	0.5	0.2	–0.3	–3.50
60	1.0	0.2	–0.8	–6.66
70	1.7	0.4	–1.3	–8.39
80	2.6	0.6	–2.0	–10.92
90	4.0	0.8	–3.2	–14.42
100	5.6	1.4	–4.2	–15.44
110	7.6	2.1	–5.5	–17.08
120	9.7	2.7	–7.0	–19.10
130	12.4	3.7	–8.7	–20.47
140	15.0	4.9	–10.1	–21.58
150	17.4	6.1	–11.3	–22.16
160	20.1	7.4	–12.7	–23.04
170	22.8	8.7	–14.1	–24.17
180	25.7	9.7	–16.0	–26.24
190	28.3	10.9	–17.5	–27.78
200	31.2	12.1	–19.1	–29.61
210	34.0	13.2	–20.8	–31.60
220	36.6	14.5	–22.1	–32.62
240	42.1	17.2	–24.9	–35.35
260	47.1	20.0	–27.1	–37.27
280	52.0	23.4	–28.6	–38.23
300	56.4	26.6	–29.8	–39.15
320	60.2	29.6	–30.6	–39.57
340	63.7	32.9	–30.8	–39.14
360	67.2	36.7	–30.6	–38.37
380	70.1	40.1	–30.0	–37.53
400	72.8	43.4	–29.4	–36.93
420	75.2	46.8	–28.4	–35.84
440	77.4	49.8	–27.6	–34.95
460	79.3	52.6	–26.7	–34.18
480	81.0	55.5	–25.5	–33.03
500	82.5	57.9	–24.6	–32.31
520	83.7	60.3	–23.4	–31.11
540	85.0	63.0	–22.0	–29.73
560	86.1	65.8	–20.3	–28.05
580	87.2	68.1	–19.1	–27.05
600	88.1	70.5	–17.7	–25.70

(b) 2008 and 2012

Poverty line, *z* (Lira per month)	*F*(2008) (%)	*F*(2012) (%)	Difference (percentage points)	t-statistic
40	0.1	0.0	–0.1	–1.75
50	0.2	0.0	–0.1	–2.23
60	0.2	0.1	–0.1	–2.18
70	0.4	0.1	–0.3	–2.74
80	0.6	0.3	–0.3	–1.89
90	0.8	0.5	–0.3	–2.15
100	1.3	0.7	–0.7	–2.94
110	2.1	1.4	–0.7	–2.55
120	2.7	1.7	–1.0	–3.27
130	3.7	2.2	–1.5	–4.02
140	4.9	2.7	–2.2	–5.40
160	7.4	4.4	–3.0	–5.85
170	8.7	5.5	–3.2	–5.67
180	9.7	6.3	–3.4	–5.70
190	10.8	7.4	–3.4	–5.53
200	12.1	8.6	–3.5	–5.33
210	13.1	10.0	–3.1	–4.56
220	14.5	11.5	–3.1	–4.33
240	17.2	14.0	–3.2	–4.29
260	20.0	16.5	–3.5	–4.54
280	23.4	19.4	–4.0	–4.88
300	26.6	22.4	–4.2	–4.89
320	29.6	25.3	–4.3	–4.82
340	32.9	28.5	–4.4	–4.80
360	36.7	32.2	–4.5	–4.77
380	40.1	35.5	–4.6	–4.90
400	43.3	38.4	–4.9	–5.17
420	46.7	41.7	–5.0	–5.26
440	49.8	44.7	–5.1	–5.40
460	52.6	47.6	–5.0	–5.27
480	55.5	50.7	–4.8	–5.09
500	57.9	53.3	–4.6	–4.89
520	60.3	55.9	–4.4	–4.77
540	63.0	58.6	–4.4	–4.86
560	65.8	61.0	–4.8	–5.44
580	68.1	63.2	–4.9	–5.57
600	70.5	65.1	–5.4	–6.25

Table A3. Relative poverty comparisons: differences in poverty incidence curves

(a) 2003 and 2008

Poverty line, *z* (% of median)	*F*(2003) (%)	*F*(2008) (%)	Difference (percentage points)	t-statistic
1	0.0	0.0	0.0	0.00
2	0.0	0.0	0.0	0.00
3	0.0	0.0	0.0	0.00
4	0.0	0.0	0.0	0.92
5	0.0	0.0	0.0	0.85
6	0.0	0.0	0.0	1.15
7	0.0	0.1	0.0	1.16
8	0.0	0.1	0.0	1.14
9	0.0	0.1	0.1	1.61
10	0.0	0.1	0.1	1.93
11	0.0	0.2	0.1	2.37
12	0.0	0.2	0.1	2.50
13	0.0	0.2	0.2	2.48
14	0.1	0.2	0.1	1.90
15	0.2	0.3	0.2	2.02
16	0.2	0.4	0.2	1.50
17	0.3	0.5	0.2	1.51
18	0.4	0.5	0.1	1.05
19	0.5	0.7	0.2	1.22
20	0.7	0.8	0.1	0.67
21	0.8	1.0	0.1	0.86
22	1.0	1.2	0.2	1.05
23	1.1	1.4	0.3	1.49
24	1.3	1.7	0.4	1.71
25	1.5	2.1	0.6	2.27
26	1.7	2.4	0.7	2.54
27	1.9	2.7	0.8	2.72
28	2.2	2.9	0.8	2.62
29	2.5	3.4	0.9	2.77
30	2.8	4.0	1.3	3.59
31	3.1	4.6	1.5	4.03
32	3.5	5.0	1.5	3.86
33	3.9	5.7	1.8	4.36
34	4.3	6.1	1.8	4.24
35	4.8	6.6	1.8	4.12
36	5.2	7.3	2.1	4.63
37	5.7	7.6	1.9	4.20
38	6.2	8.3	2.1	4.37
39	6.9	8.8	2.0	4.01
40	7.4	9.3	1.9	3.80
41	7.8	9.8	2.0	3.93
42	8.3	10.4	2.1	4.05
43	9.0	10.9	1.9	3.60
44	9.6	11.3	1.7	3.17
45	10.2	11.9	1.7	3.20
46	11.0	12.4	1.4	2.59
47	11.8	12.8	1.0	1.85
48	12.4	13.6	1.2	2.08
49	13.1	14.1	1.0	1.76
50	13.9	14.7	0.8	1.34

51	14.7	15.2	0.6	0.98
52	15.3	15.9	0.6	1.01
53	15.9	16.4	0.5	0.83
54	16.5	17.1	0.5	0.90
55	17.3	17.6	0.4	0.59
56	18.0	18.3	0.3	0.47
57	18.6	18.8	0.1	0.22
58	19.4	19.3	–0.1	–0.15
59	20.1	20.1	0.0	0.06
60	20.8	20.8	–0.0	–0.07
61	21.6	21.6	0.0	0.00
62	22.4	22.3	–0.1	–0.19
63	23.1	23.1	–0.0	–0.08
64	24.0	23.9	–0.2	–0.31
65	24.8	24.6	–0.2	–0.30
66	25.5	25.1	–0.4	–0.58
67	26.2	25.9	–0.3	–0.44
68	26.9	26.7	–0.2	–0.40
69	27.6	27.3	–0.3	–0.52
70	28.4	28.0	–0.4	–0.67
71	29.2	28.6	–0.5	–0.84
72	29.9	29.4	–0.6	–0.95
73	30.7	30.0	–0.7	–1.20
74	31.4	30.7	–0.7	–1.20
75	32.3	31.5	–0.8	–1.32
76	33.1	32.1	–0.9	–1.55
77	33.8	32.9	–0.9	–1.54
78	34.5	33.9	–0.6	–1.12
79	35.2	34.5	–0.7	–1.22
80	35.9	35.3	–0.6	–1.07
81	36.7	36.1	–0.5	–0.94
82	37.3	37.0	–0.4	–0.70
83	38.1	37.6	–0.5	–0.99
84	38.8	38.3	–0.5	–0.99
85	39.7	39.2	–0.5	–1.11
86	40.4	40.1	–0.3	–0.69
87	41.2	40.8	–0.4	–0.90
88	41.9	41.6	–0.3	–0.77
89	42.6	42.3	–0.4	–0.87
90	43.3	43.1	–0.3	–0.64
91	44.2	43.9	–0.3	–0.79
92	44.8	44.5	–0.3	–0.73
93	45.4	45.3	–0.1	–0.28
94	46.1	46.0	–0.1	–0.41
95	46.7	46.7	–0.0	–0.09
96	47.3	47.3	0.0	0.15
97	47.9	48.0	0.0	0.10
98	48.6	48.8	0.1	0.80
99	49.3	49.5	0.2	2.13
100	50.0	50.0	0.0	

(b) 2008 and 2012

Poverty line, *z* (% of median)	*F*(2008) (%)	*F*(2012) (%)	Difference (percentage points)	t-statistic
1	0.0	0.0	0.0	0.00
2	0.0	0.0	0.0	0.00
3	0.0	0.0	0.0	0.00
4	0.0	0.0	0.0	–0.91
5	0.0	0.0	0.0	0.74
6	0.0	0.0	–0.0	–0.17
7	0.1	0.0	–0.0	–0.94
8	0.1	0.0	–0.0	–0.93
9	0.1	0.0	–0.0	–1.42
10	0.1	0.0	–0.1	–1.68
11	0.2	0.0	–0.1	–1.93
12	0.2	0.1	–0.1	–1.93
13	0.2	0.1	–0.1	–1.89
14	0.2	0.1	–0.1	–1.90
15	0.3	0.1	–0.2	–2.50
16	0.4	0.2	–0.2	–1.74
17	0.5	0.3	–0.2	–0.98
18	0.5	0.4	–0.1	–1.12
19	0.7	0.5	–0.2	–1.19
20	0.8	0.6	–0.2	–1.45
21	0.9	0.7	–0.2	–1.28
22	1.2	1.0	–0.2	–0.75
23	1.4	1.3	–0.1	–0.56
24	1.7	1.6	–0.1	–0.61
25	2.1	1.6	–0.5	–1.52
26	2.4	1.8	–0.6	–1.89
27	2.7	2.0	–0.6	–1.93
28	2.9	2.4	–0.5	–1.55
29	3.4	2.6	–0.8	–2.15
30	4.0	2.9	–1.1	–2.85
31	4.6	3.3	–1.3	–3.25
32	5.0	3.6	–1.4	–3.30
33	5.7	4.0	–1.3	–3.82
34	6.1	4.5	–1.6	–3.32
35	6.6	5.0	–1.6	–3.15
36	7.3	5.6	–1.7	–3.35
37	7.6	6.4	–1.2	–2.38
38	8.3	6.4	–1.9	–3.51
39	8.8	6.8	–2.0	–3.60
40	9.3	7.4	–1.9	–3.23
41	9.8	7.9	–1.9	–3.23
42	10.4	8.5	–2.0	–3.28
43	10.9	9.1	–1.7	–2.84
44	11.3	9.8	–1.6	–2.51
45	11.9	10.6	–1.3	–2.10
46	12.4	11.2	–1.2	–1.94
47	12.8	11.8	–1.0	–1.51
48	13.6	12.5	–1.1	–1.73
49	14.1	13.2	–0.9	–1.44
50	14.7	13.6	–1.1	–1.52
51	15.2	14.2	–1.0	–1.55
52	15.9	14.8	–1.1	–1.56

53	16.4	15.5	–0.9	–1.34
54	17.1	16.0	–1.1	–1.55
55	17.6	16.5	–1.1	–1.58
56	18.3	17.3	–1.0	–1.43
57	18.8	18.1	–0.7	–0.98
58	19.3	18.6	–0.7	–0.98
59	20.1	19.3	–0.8	–1.14
60	20.8	20.2	–0.6	–0.88
61	21.6	21.0	–0.6	–0.84
62	22.3	21.5	–0.8	–1.09
63	23.1	22.1	–1.0	–1.46
64	23.9	22.9	–1.0	–1.33
65	24.6	23.6	–1.0	–1.43
66	25.1	24.2	–0.9	–1.25
67	25.9	24.8	–1.1	–1.57
68	26.7	25.7	–1.0	–1.39
69	27.3	26.4	–0.9	–1.17
70	28.0	27.3	–0.7	–0.96
71	28.6	28.0	–0.6	–0.84
72	29.4	28.8	–0.6	–0.83
73	30.0	29.7	–0.3	–0.39
74	30.7	30.7	–0.0	–0.05
75	31.5	31.3	–0.2	–0.19
76	32.1	32.3	0.1	0.18
77	32.9	33.1	0.0	0.35
78	33.9	33.7	–0.2	–0.23
79	34.5	34.5	–0.0	–0.08
80	35.3	35.4	0.1	0.23
81	36.1	36.1	–0.0	–0.09
82	37.0	36.9	–0.1	–0.17
83	37.6	37.5	–0.1	–0.12
84	38.3	38.2	–0.1	–0.23
85	39.2	38.9	–0.3	–0.48
86	40.1	39.8	–0.3	–0.54
87	40.8	40.5	–0.3	–0.59
88	41.6	41.4	–0.2	–0.43
89	42.3	42.0	–0.3	–0.57
90	43.1	42.8	–0.3	–0.49
91	43.8	43.4	–0.4	–0.93
92	44.5	44.0	–0.5	–1.25
93	45.3	44.7	–0.6	–1.53
94	46.0	45.3	–0.7	–1.65
95	46.7	46.2	–0.5	–1.28
96	47.3	46.9	–0.6	–1.37
97	48.0	47.6	–0.4	–1.35
98	48.8	48.5	–0.3	–1.29
99	49.5	49.2	–0.3	–2.06
100	50.0	50.0	0.0	

Table A4. Growth and redistribution components of absolute poverty change, Turkey, 2003–08 and 2008–12 (percentage points) [Datt-Ravallion (1992) method]

	Observed change in poverty rate	Component of decomposition		
		Growth	Redistribution	Residual
2003 Poverty Line				
2003–2008	–21.1	–19.2	–5.6	3.7
2008–2012	–3.2	–3.1	0.3	–0.4
2009 Poverty Line				
2003–2008	–27.0	–22.8	–6.0	1.8
2008–2012	–3.2	–3.8	1.8	–1.2

Notes: Authors' calculations from annual Household Budget Survey data for the 2003–12 period using the Datt and Ravallion (1992) method. See main text for details. Calculations employ the gidecomposition program of Ravallion and Lokshin (2004).

Ravallion, M. and Lokshin, M. (2004). 'gidecomposition.ado', Stata module included in the Poverty Analysis Toolkit. Washington, DC: World Bank. http://go.worldbank.org/GK05KRV0Q0

Table A5. Subgroup decompositions of the poverty rate (P_0) and its changes, 2003–8 and 2008–12 (2009 poverty line)

	Subgroup population share (w_{jt}) (%)			Subgroup poverty rate (P_{jt}) (%)			Subgroup share of total poverty (s_{jt}) (%)			2003–8		2008–12	
	2003	2008	2012	2003	2008	2012	2003	2008	2012	Changes in subgroup poverties	Changes in population composition	Changes in subgroup poverties	Changes in population composition
										Percentage points		Percentage points	
Location													
Urban	60.8	69.3	68.5	35.7	11.5	9.4	47.0	41.5	40.2	–15.8	2.0	–1.4	–0.1
Rural	39.2	30.7	31.5	62.5	36.8	30.3	53.0	58.8	59.7	–9.0	–4.3	–2.0	0.3
All	100.0	100.0	100.0	46.2	19.2	16.0	100.0	100.0	100.0	*–24.8*	*–2.2*	*–3.4*	*0.2*
Household size													
<3	8.6	9.8	12.6	27.6	11.4	11.7	5.1	5.8	9.2	–1.5	0.2	0.0	0.3
3	14.6	17.8	19.4	28.8	8.1	7.6	9.1	7.5	9.2	–3.3	0.6	–0.1	0.1
4	25.3	27.5	27.7	36.0	11.9	9.6	19.7	17.0	16.6	–6.4	0.5	–0.6	0.0
5	19.3	17.2	16.7	49.4	20.6	17.2	20.6	18.5	18.0	–5.3	–0.7	–0.6	–0.1
6	12.1	11.8	10.0	57.5	29.9	26.3	15.1	18.4	16.4	–3.3	–0.1	–0.4	–0.5
7 or 8	11.9	9.8	8.1	66.6	38.7	30.1	17.2	19.8	15.2	–3.0	–1.1	–0.7	–0.5
>8	8.3	6.2	5.5	74.5	41.4	44.0	13.4	13.4	15.1	–2.4	–1.2	0.2	–0.3
All	100.0	100.0	100.0	46.2	19.2	16.0	100.0	100.0	100.0	*–25.2*	*–1.8*	*–2.2*	*–1.0*
Number of gainfully employed workers in the household (as share of number of adults)													
0%	13.5	12.7	11.5	43.1	20.8	21.2	12.6	13.8	15.2	–2.9	–0.3	0.0	–0.3
> 0% and ≤ 50%	75.9	69.9	65.4	48.7	20.7	17.7	80.0	75.4	72.3	–20.4	–2.1	–2.0	–0.8
> 50%	10.6	17.4	23.2	32.6	12.3	8.6	7.5	11.1	12.5	–2.8	1.5	–0.7	0.6
All	100.0	100.0	100.0	46.2	19.2	16.0	100.0	100.0	100.0	*–26.1*	*–0.9*	*–2.7*	*–0.5*
Education level of household head													
Illiterate	7.0	6.5	6.8	76.2	54.1	39.2	11.5	18.3	16.7	–1.5	–0.4	–1.0	0.1
Literate without diploma	5.6	5.4	5.6	63.3	43.7	37.9	7.7	12.3	13.3	–1.1	–0.1	–0.3	0.1
Primary school	53.6	48.4	45.6	53.9	22.7	19.0	62.5	57.2	54.2	–15.9	–2.0	–1.7	–0.6
Secondary school	11.0	11.2	12.0	38.2	11.4	12.2	9.1	6.7	9.2	–3.0	0.1	0.1	0.1
High school	15.0	18.0	17.3	24.2	5.7	5.7	7.9	5.3	6.2	–3.0	0.5	0.0	–0.0
University and above	7.7	10.5	12.7	7.4	0.5	0.8	1.2	0.3	0.6	–0.6	0.1	0.0	0.0
All	100.0	100.0	100.0	46.2	19.2	16.0	100.0	100.0	100.0	*–25.1*	*–1.9*	*–2.9*	*–0.3*

Source: Authors' calculations from annual Household Budget Survey data for 2003–12. See text for details. Notes: The subgroup shares of total poverty are derived using equation (6). The decomposition components shown in the last four columns are derived using equation (7).

Multivariate decomposition

Using multiple regression methods, the change in the aggregate poverty rate between two years can be decomposed into two components, one reflecting changes in characteristics ('endowments') and one representing changes in coefficients (the 'return' of the characteristics in terms of poverty). If there is linear relationship between a metric outcome of interest and a set of explanatory variables, the contributions to the difference in mean outcomes of differences in characteristics and differences in coefficients can be found using the Oaxaca (1973) and Blinder (1973) decomposition method. In this paper, we use the multivariate decomposition methodology of Yun (2004) that extended the Oaxaca-Blinder method to the case of a binary outcome (poverty status here). The regressor variables are all categorical and defined very similarly to those used in the univariate decompositions, viz household type, household size, the share of adults in gainful employment, and the age and education of the household head. The detailed regression estimates are available from the authors on request.

Table A6. Decomposition of poverty differences in 2003–2008 and 2008–2011, Turkey

	2003 poverty line		2009 poverty line	
	Coefficient	% of total change	Coefficient	% of total change
2003–2008				
Characteristics effect (E)	–3.88***	18.38	–4.74***	17.57
	(0.193)		(0.191)	
Coefficients effect (C)	–17.22***	81.62	–22.26***	82.43
	(0.669)		(0.702)	
Change in poverty (E+C)	–21.10***	100.0	–27.00***	100.0
	(0.557)		(0.594)	
2008–2012				
Characteristics effect (E)	–0.75***	23.15	–1.11***	34.15
	(0.086)		(0.101)	
Coefficients effect (C)	–2.49***	76.85	–2.14***	65.85
	(0.610)		(0.684)	
Change in poverty (E+C)	–3.24***	100.0	–3.25***	100.0
	(0.575)		(0.653)	

Source: Authors' calculations using annual Household Budget Survey data for 2003–11. See text for details.
Notes: Estimates derived using the mvdcmp Stata routine (Powers et al. 2011). ***: statistically significant at the 1% level.

Blinder, A. S. (1973). 'Wage Discrimination: Reduced Form and Structural Estimates', *Journal of Human Resources*, 8 (4), 436–455.

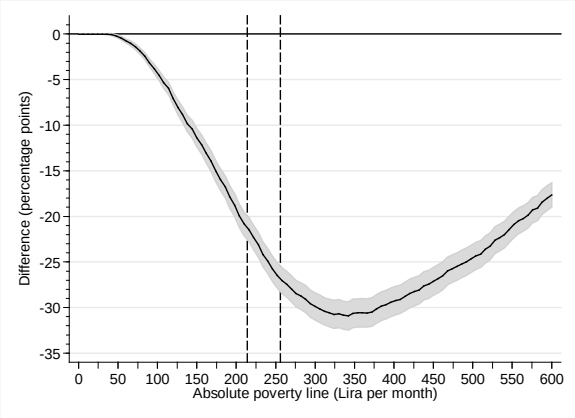
Oaxaca, R. L. (1973). 'Male-Female Wage Differentials in Urban Labor Markets', *International Economic Review*, 14 (3), 693–709.

Powers, D. A., Yoshioka, H., and Yun, M.–S. (2011). 'mvdcmp: Multivariate Decomposition for Non-Linear Response Models', *The Stata Journal*, 11 (4), 556–576.

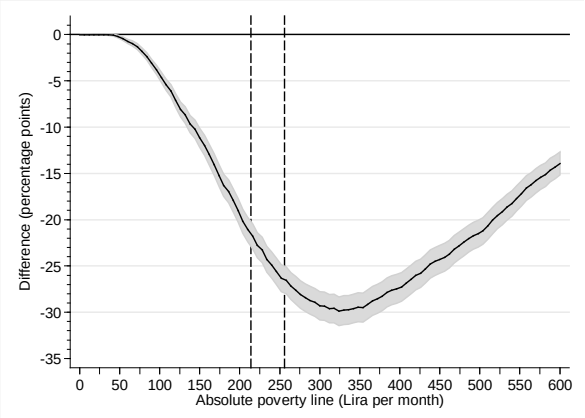
Yun, M.-S. (2004). 'Decomposing Differences in the First Moment', *Economic Letters*, 82 (2), 275–280.

Figure A1. Absolute poverty comparisons: differences between poverty incidence curves (percentage points) with pointwise 95% confidence intervals, by subperiod and well-being measure

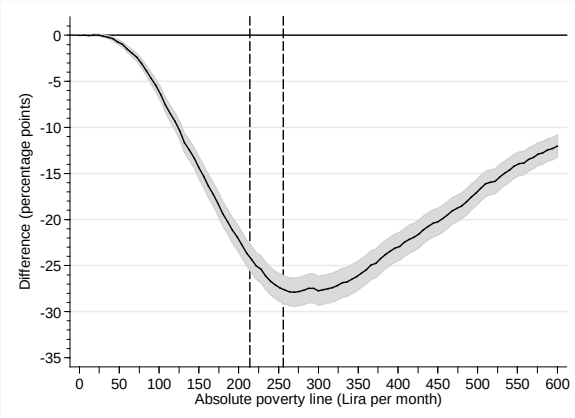
(a) 2003 versus 2008



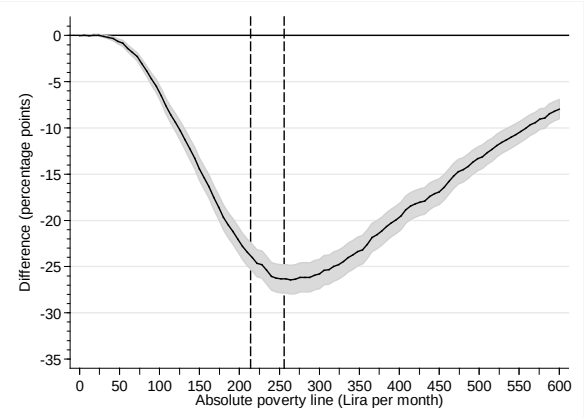
Consumption (as in Figure 1, panel a)



Consumption, excluding durable expenditure



Consumption, excluding imputed rent

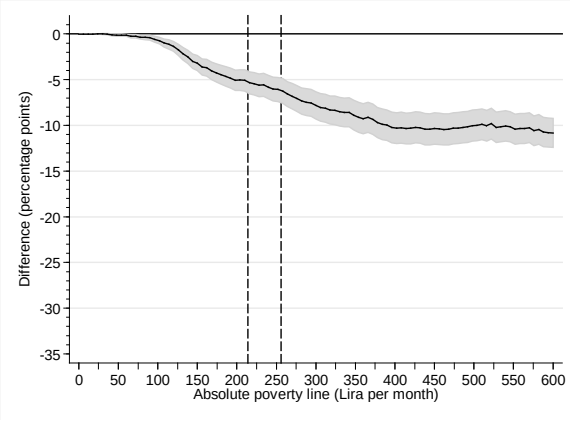


Consumption, excluding durable expenditures and imputed rent

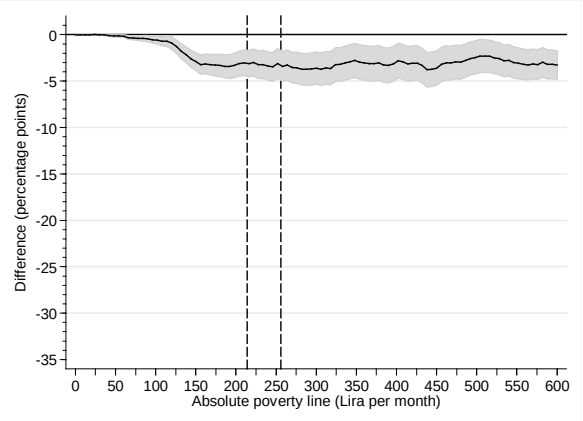
Notes: as for Figure 2 in the main text.

Figure A1 (continued). Absolute poverty comparisons: differences between poverty incidence curves (percentage points) with pointwise 95% confidence intervals, by subperiod and well-being measure

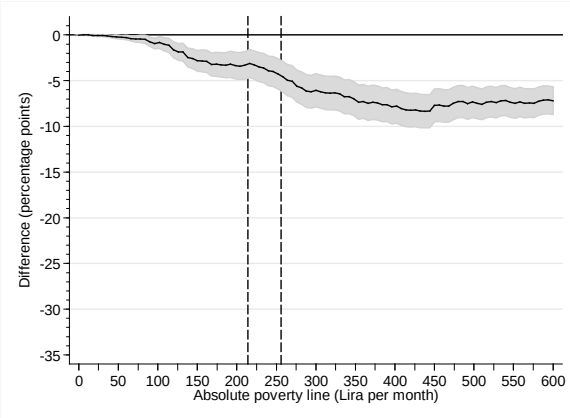
(b) 2008 versus 2012



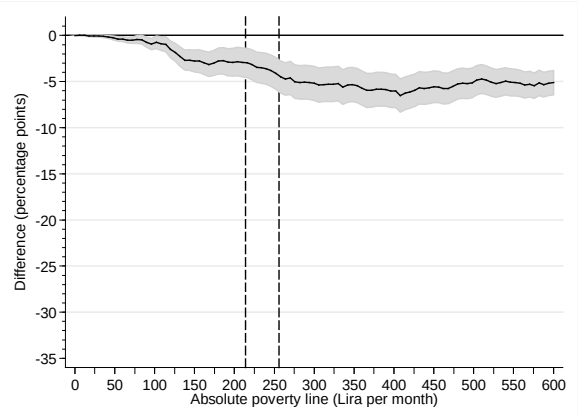
Consumption (as in Figure 1, panel a)



Consumption, excluding durable expenditure



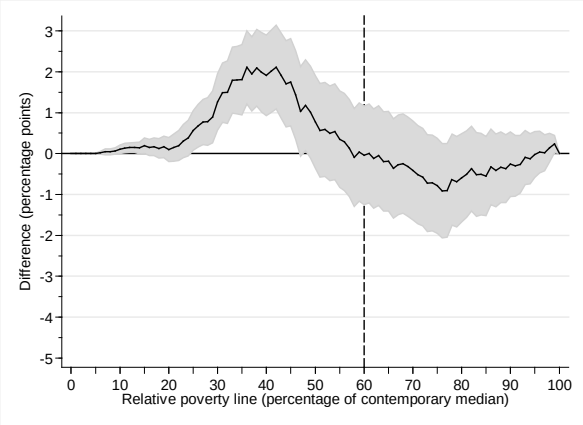
Consumption, excluding imputed rent



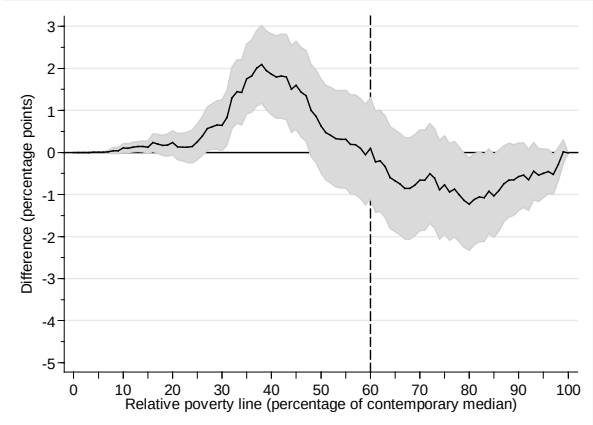
Consumption, excluding durable expenditures and imputed rent

Figure A2. Relative poverty comparisons: differences between poverty incidence curves (percentage points) with pointwise 95% confidence intervals, by subperiod and well-being measure

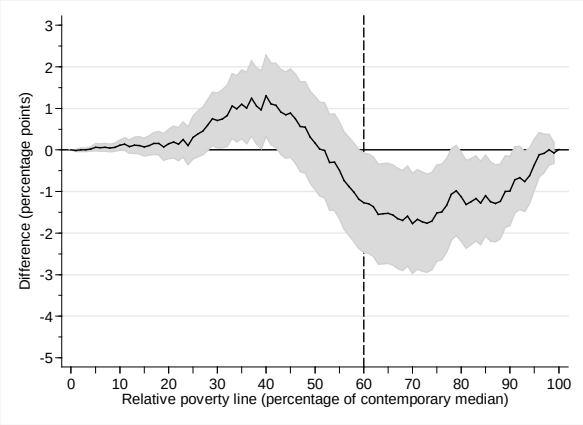
(a) 2003 versus 2008



Consumption (as as in Figure 1, panel a)



Consumption, excluding durable expenditure

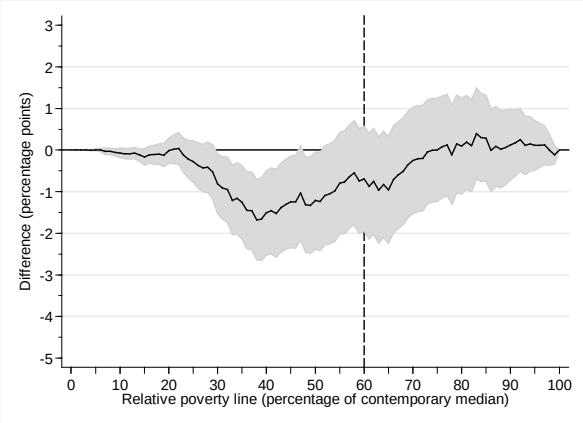


Consumption, excluding imputed rent

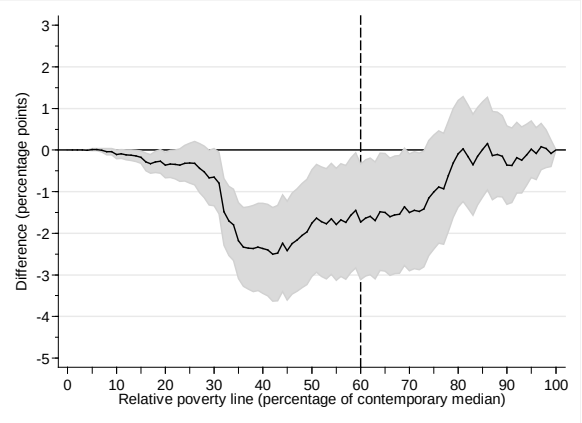
Consumption, excluding durable expenditures and imputed rent

Figure A2 (continued). Relative poverty comparisons: differences between poverty incidence curves (percentage points) with pointwise 95% confidence intervals, by subperiod and well-being measure

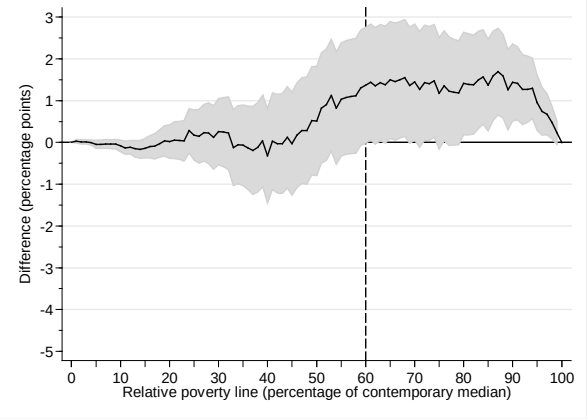
(b) 2008 versus 2012



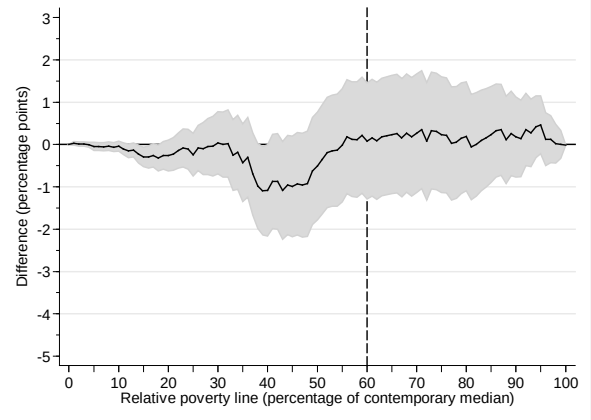
Consumption (as in Figure 1, panel a)



Consumption, excluding durable expenditure

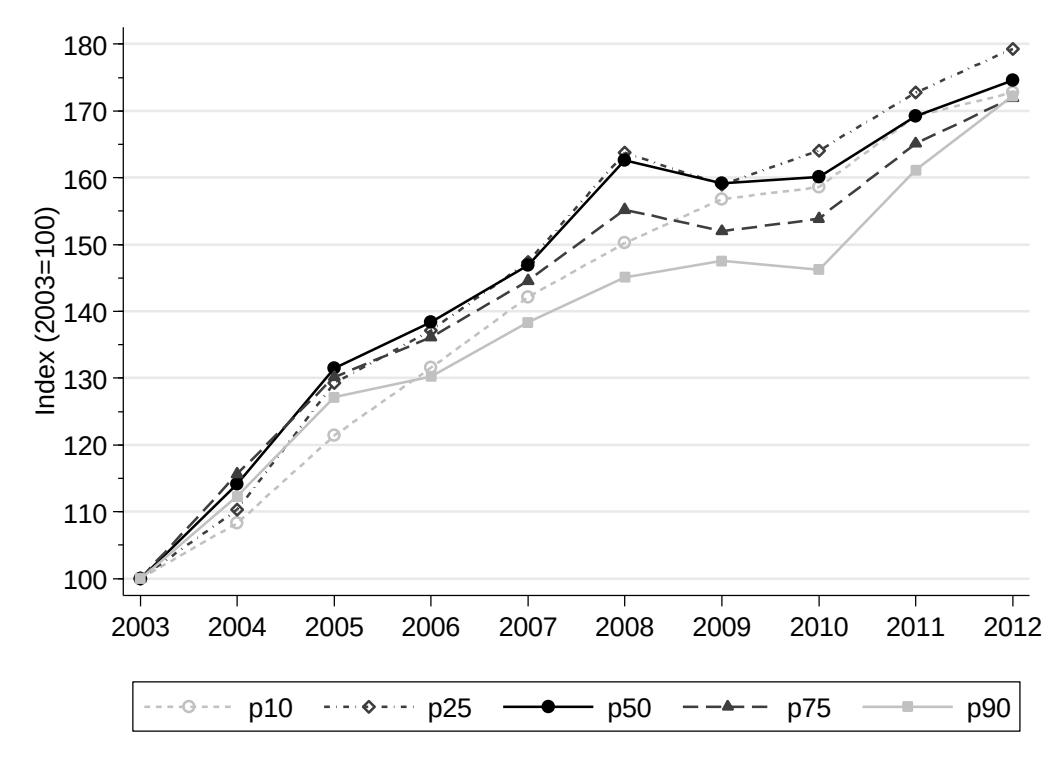


Consumption, excluding imputed rent



Consumption, excluding durable expenditures and imputed rent

Figure A3. Trends in real consumption per equivalent adult (indexed 2003 = 100), by percentile



Source: Authors' calculations using annual Household Budget Survey data for 2003–11. See text for details. Notes: Estimates derived using the ineqdeco Stata routine (Jenkins 1998, revised 2008), and refer to the 10th, 25th, 50th, 75th, and 90th percentiles, respectively.

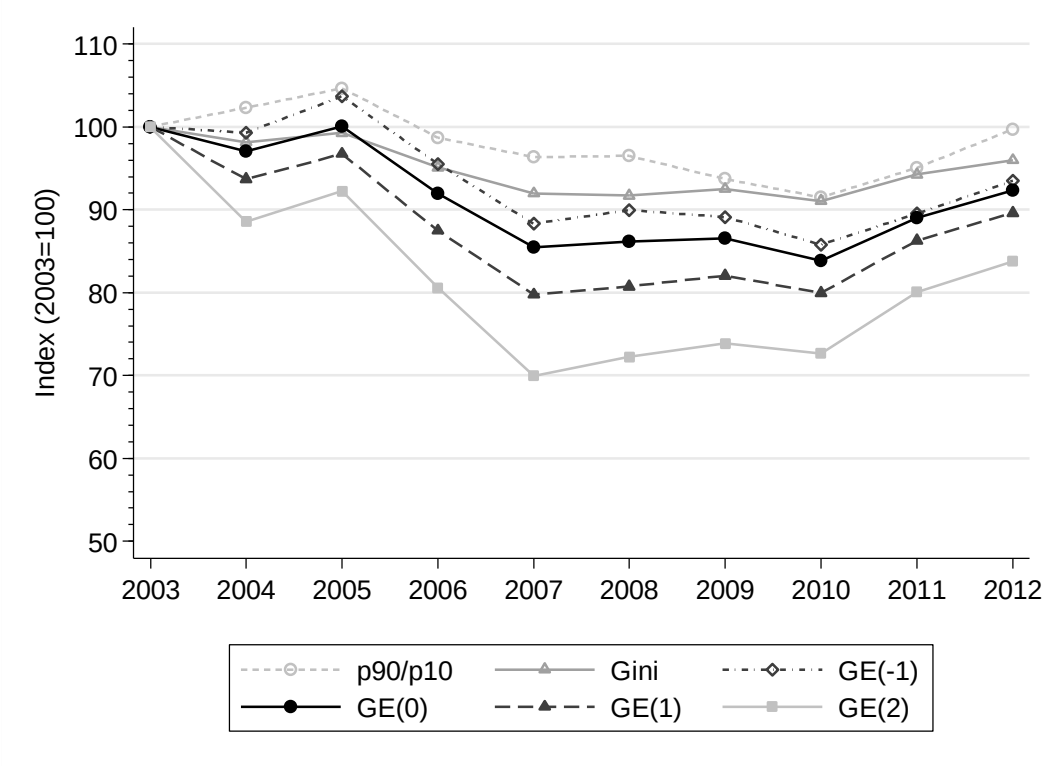
The raw (unindexed) values of the percentiles underlying the figure, and the mean, are shown below:

Table A8. Selected percentiles and mean of consumption per equivalent adult (TL per month, 2012 prices)

Year	p5	p10	p25	p50	p75	p90	p95	Mean
2003	97	121	178	272	418	644	877	361
2004	105	131	196	310	483	723	945	401
2005	116	147	229	357	544	819	1141	457
2006	125	160	243	376	569	839	1111	470
2007	135	173	262	399	604	891	1138	491
2008	141	182	291	442	649	935	1256	536
2009	147	190	282	432	635	950	1257	529
2010	155	192	291	435	643	942	1233	535
2011	161	205	307	460	690	1038	1417	582
2012	166	210	318	474	718	1110	1468	607

Jenkins, S. P. (2008). 'ineqdeco: Stata module to module to calculate inequality indices with decomposition by subgroup'. https://ideas.repec.org/c/boc/bocode/s366002.html

Figure A4. Trends in inequality of real consumption per equivalent adult (indexed 2003 = 100), by inequality index



Source: Authors' calculations using annual Household Budget Survey data for 2003–11. See text for details.

Notes: Estimates derived using the ineqdeco Stata routine (Jenkins 1998, revised 2008), and refer to the following indices: the ratio of the 90th percentile to the 10th percentile, the Gini coefficient, and Generalised Entropy (GE) inequality indices with sensitivity-to-income-share-differences parameter a = –1, 0 (mean log deviation), 1 (Theil index), and 2 (half the coefficient of variation squared). GE(–1) is relatively bottom-sensitive, and GE(2) is relatively top-sensitive. The data for each year were trimmed by 0.5% at the top and 0.5% at the bottom. (Untrimmed data yield similar trends, except that the decline for GE(2) is more pronounced in the early- to mid-2000s.)

Jenkins, S. P. (2008). 'ineqdeco: Stata module to module to calculate inequality indices with decomposition by subgroup'. https://ideas.repec.org/c/boc/bocode/s366002.html