Poverty trends in Turkey

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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 rapid economic growth during the 2000s can be hailed as one of the success stories of the global economy (World Bank 2013). However there is relatively little detailed information available about poverty trends in Turkey and their relationship with economic growth, especially about the situation in the late 2000s when macroeconomic growth rates fell. This paper provides new and detailed evidence about poverty trends in Turkey using data from annual household budget surveys covering the period 2003–11.

Our research makes several contributions. First, using good quality data, we provide a detailed anatomy of poverty for a country about which relatively little is known, carefully distinguishing between periods of relatively rapid poverty decline (2003–8) and little change (2008–11). 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 (Datt and Ravallion 1992), and also employ univariate (Foster et al. 1984) and multivariate decompositions (Yun 2004) to assess the role played by changes in the distribution of poverty risks across various subgroups within the population and changes in population composition.

Our robust conclusion is that absolute poverty declined rapidly between 2003 and 2008 but fell only slightly between 2008 and 2011. Changes in relative poverty were negligible throughout. Using poverty decomposition methods, we argue that the rate of decline in the absolute poverty rate is largely accounted for by changes in the rate of national economic growth rather than by changes in the income distribution or by changes in the distribution of poverty risks across various subgroups within the population or in population composition.

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Abstract

This paper provides new evidence about poverty trends in Turkey between 2003 and 2011 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 2011. Changes in relative poverty were negligible throughout. Using poverty decomposition methods, we argue that the rate of decline in the absolute poverty rate is largely accounted for by changes in the rate of national economic growth rather than by changes in the income distribution or by changes in the distribution of poverty risks across various subgroups within the population or in population composition.

Keywords: poverty, Turkey, poverty dominance
JEL codes: I32, D31, C12

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Poverty trends in Turkey

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 rapid economic growth during the 2000s can be hailed as one of the success stories of the global economy (World Bank 2013). This growth spurt coincided with notable changes in income distribution: Turkey is one of the few OECD countries in which income inequality declined in the 2000s and 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 economic growth, especially about the situation in the late 2000s when macroeconomic growth rates fell. The aim of this paper is to provide new and detailed evidence about poverty trends in Turkey using data from annual household budget surveys covering the period 2003–11.

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. An official poverty line was first announced in 2004, derived from analysis of the 2002 HBS. Before 2004, most studies of Turkish poverty had to derive their own poverty lines using a range of data sources, and most summarized poverty in one or two specific years. They do not examine trends in poverty over time or, if they do, only trends up until 2003 (more on this below).

The official Turkish poverty measurement methodology was developed in conjunction with the World Bank (World Bank and Turkstat 2005) and derived poverty lines using a basic-needs approach based on the costs of food and non-food items for households of different size and composition and information from the annual HBS (more on this below). Official poverty lines are currently available only for 2002–9. Since 2006 and related to Turkey's EU candidature, the Turkish Statistical Institute (Turkstat) has also published statistics about relative income poverty using EU definitions, derived from the Turkish component of EU Statistics on Income and Living Conditions (EU-SILC).

Most studies of poverty in Turkey that are based on the HBS use Turkstat's official poverty lines (e.g. Yukseler and Turkan 2008, Aran et al. 2010) though a few have used the EU's relative poverty line (e.g. OECD 2008, Guloglu et al. 2012). Changes in poverty over the last decade and the factors accounting for them are the subject of only a limited number of

studies (OECD 2008, Yukseler and Turkan 2008, Aran et al. 2010). 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 research is mostly published in the Turkish language.

Turkstat statistics show that the official poverty rate decreased sharply over the decade prior to 2009, but the reasons for this decrease have not been examined in detail. Using annual HBS data covering the period 2003–11, we analyze the trends in poverty and the factors that underlie them. Like most previous studies of poverty in Turkey, we use poverty lines derived using a basic needs approach. However, unlike those studies (and the 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 (2008–11). 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 (Datt and Ravallion 1992), and also employ univariate (Foster et al. 1984) and multivariate decompositions (Yun 2004) to assess the role played by changes in the distribution of poverty risks across various subgroups within the population 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 of poverty changes by population subgroup (variously defined) appear in Section 7. (Multivariate decomposition results are reported in the text with the detailed estimates provided in the Appendix.) Section 8 provides a summary and conclusions.

2. Previous research about poverty in Turkey

Official statistics on income distribution and poverty in Turkey were relatively sparse prior to 2002. Turkstat conducted nationally representative Household Income and Consumption Expenditure Surveys (HICES) in 1987 and 1994. However, official poverty lines and poverty rates derived using them were first announced in 2004, based on the analysis of the 2002 HBS. 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 Table 1 for a summary of previous 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 selected years, not looking at trends over a longer period, or examine trends up to only 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.

<Table 1 near here>

Drawing on the 2002 HBS, Turkstat began to announce consumption-based absolute poverty lines, namely US$1, US$2.15, US$4.3, a food poverty line, and a combined food and non-food poverty line. The methodology for deriving the last two lines was developed in conjunction with the World Bank (World Bank and Turkstat 2005) and uses a cost-of-basic-needs approach. Using 2003 HBS data, a food basket comprising 80 items required to meet a diet providing 2100 calories of food intake per day was specified. This price of each item is assessed each year, and the total cost of the basket valued at current prices defines the food poverty line. The cost of non-food contribution to 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 non-food consumption share varies from year to year (e.g. in 2003 it was 60%, in 2009, it was 65%) and, hence, so too does the food consumption share. Because of this, official Turkish poverty lines vary in real terms between one year and the next (more on this below), and they are not truly 'absolute' poverty lines in the way that a US$1 a day line is. In addition to poverty estimates derived using the basic needs approach, Turkstat has announced income-based relative poverty statistics since 2006, derived using data from the Turkish component of EU-SILC.

Most research using HBS data employ Turkstat's official poverty lines: see e.g. Yukseler and Turkan (2008), and Aran et al. (2010). Studies using relative poverty lines include OECD (2008) and Guloglu et al. (2012). However, few have analysed poverty trends in depth or the factors accounting for them.

The OECD's (2008) *Growing Unequal* report analyzes income inequality and poverty trends between the 1980s and the 2000s. The OECD notes that, although Turkey is one of the countries where income disparities are wide, they have been narrowing rapidly. By contrast with most OECD countries (where income inequality has been rising), Turkey is one of the few member states in which income inequality decreased during the 1990s. All discussion of poverty in the OECD report is with reference to relative income poverty. Yukseler and Turkan (2008) analyze the change in poverty between 2002 and 2006 by using official poverty estimates from HBS data sets. They conclude that increasing wage and transfer shares in total income led to the improvement in income distribution and poverty. Aran et al. (2010), also using Turkstat's basic needs poverty line, investigate the changes in poverty between 2003 and 2006. They find that the fall in aggregate poverty can largely be attributed to a decline in poverty among people living in urban areas. However, 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 children.

This review shows that there is no study that has examined Turkish poverty trends in detail over the 2000s, and none refers to changes after 2009. 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 per cent and 10 per cent 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 to summarize aggregate poverty (Foster et al. 1984). For a particular year, these are defined as follows:

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

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 (living standards below the poverty line), 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 headcount ratio (poverty rate) is the case when $\alpha = 0$. Although the headcount ratio is the most commonly used measure of poverty, it does not account for the depth of poverty. P_α is the normalized poverty gap index in the case $\alpha = 1$, and the squared normalized gap index if $\alpha = 2$. Each 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 specific 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 in turn 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 $Z = [z^-, z^+]$.[1]

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 100c%, 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 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 change 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.[2] Their methods are applicable to poverty measures (such as those used here) which can be characterized in terms of the poverty line, the mean income of the distribution, and the Lorenz curve representing the structure of relative income inequality. In this situation, the poverty measure at time t, P_t can be expressed as:

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

where z is the poverty line, μ_t is the mean income and L_t is a vector of parameters describing the Lorenz curve at t. According to equation (2), changes in poverty arise from a change in mean income relative to poverty line (μ_t/z) or a change in inequality (L_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

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

[2] There are other related but less commonly used decomposition methods: see e.g. Kakwani and Subbaro (1990) or Jain and Tendulkar (1990). For discussion of these methods, see Datt and Ravallion (1992).

associated with a change in the Lorenz curve while holding average living standards constant. Thus, the change in poverty between two years t and $t+\tau$ may be decomposed as:

$$P_{t+\tau} - P_t = \underbrace{G(t, t+\tau; r)}_{\substack{\text{growth} \\ \text{component}}} + \underbrace{D(t, t+\tau; r)}_{\substack{\text{redistribution} \\ \text{component}}} + \underbrace{R(t, t+\tau; r)}_{\text{residual}} \tag{3}$$

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

$$G(t, t+\tau; r) = P(z/\mu_{t+\tau}, L_r) - P(z/\mu_t, L_r) \tag{4}$$

$$D(t, t+\tau; r) \equiv P(z/\mu_r, L_{t+\tau}) - P(z/\mu_r, L_t) \tag{5}$$

and r refers to the reference year employed in the calculation (either t or $t+\tau$). The residual component, R, in equation (3) exists whenever the poverty measure is not additively separable between μ and L, i.e. the marginal effect on poverty of a change in the mean (inequality) also depends on the change in inequality (mean). Datt and Ravallion (1992) show that the residual may also 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 $t+\tau$.

Datt and Ravallion (1992) calculated FGT poverty measures for each of two parametric specifications of the Lorenz curve (Beta Lorenz and General Quadratic Lorenz), with the choice between them determined by which specification fitted the data best. We follow their strategy. Our calculations use the gidecomposition program of Ravallion and Lokshin (2004).

3.4. Decomposition of a poverty change into changes in subgroup poverty risks and changes in population composition

We complement our growth-distribution decompositions with decompositions of changes in the headcount ratio poverty index (P_0) by population subgroup in order to examine the separate roles played by changes in poverty incidence (the changes in poverty risks for particular subgroups) and by changes in population composition (which reflect changes in the relative size of the different subgroups). These decompositions allow us to answer questions such as: how much of the change in poverty is attributable to the change in poverty among people living in rural areas and how much to the change in poverty among people living in urban areas, and how much is accounted by the population shift between urban and rural areas? This sort of accounting exercise is repeated for several subgroup definitions. We refer to these as univariate decompositions of poverty change, by contrast with the regression-based multivariate decompositions that are discussed later.

FGT indices are additively decomposable poverty indices with population-share weights (Foster et al. 1984). Suppose all individuals can be partitioned into a set of mutually-exclusive non-overlapping subgroups. Let m be the set of all subgroups, P_t be aggregate poverty in year t, n_{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 change in poverty between two years, labelled '1' and '2', as:

$$P_1 = \sum_m n_{j1} P_{j1} \tag{6}$$

$$P_2 = \sum_m n_{j2} P_{j2} \tag{7}$$

$$\Delta P = P_2 - P_1 = \sum_m (n_{j2} P_{j2} - n_{j1} P_{j1}) \tag{8}$$

This expression can be rewritten as:

$$\Delta P = \sum_m [\theta n_{j2} + (1-\theta) n_{j1}] \Delta P_j + \Delta n_j [\theta P_{j1} - (1-\theta) P_{j2})] \tag{9}$$

where $0 \leq \theta \leq 1$, and ΔP_j and Δn_j are the changes between years 1 and 2 in subgroup j's poverty and population share, respectively. The presence of θ in (9) shows that there is an index number issue. Shorrocks (2013) argues persuasively that this issue is addressed by employing the Shapley rule, in which case θ = ½. Implementing this rule leads to the expression for the exact decomposition of poverty change that we use:[3]

$$\Delta P = \sum_m \frac{n_{j,t1} + n_{j,t2}}{2} \Delta P_j + \sum_m \frac{P_{j,t1} + P_{j,t2}}{2} \Delta n_j . \tag{10}$$

The first term on the right hand side of equation (10) represents the change in aggregate poverty accounted for by changes in poverty 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 aggregate poverty accounted for by changes in the distribution of population shares of each subgroup, holding subgroup poverty levels constant (at the average of the base- and final-year values).

[3] Ravallion and Huppi (1991) also derive a decomposition rule employing the additivity property of the FGT class of poverty indices. They decompose the change in poverty into intra-sectoral effect (changes in average income), population shifts, and an interaction effect. The way in which the interaction effect is treated is the main difference between the method we use and the method of Ravallion and Huppi (1991).

4. Data and definitions

Our empirical analysis uses unit record data from the Turkish HBS for each year over the period 2003–2011. The HBS has been conducted annually since 2002, and each survey provides detailed information about household consumption and socio-economic characteristics. Approximately 8,640 households have been interviewed in each annual round, except in 2003 when the sample was much larger.[4] 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 (ABPRS).

4.1. The measure of living standards

Both income and consumption are widely used to evaluate household living standards and thence poverty. Consumption data are particularly appropriate for developing countries because of the view that households may be more able or more willing to recall what they have spent rather than what they earned (World Bank 2005) and the greater measurement error for income data more generally (see e.g. Deaton 1997).

The standard of living measure used in our research is based on a comprehensive measure of household consumption, defined as monthly average household expenditure on items for the purpose of consumption. These include items purchased, consumption from own production and income in kind, goods and services purchased by the household to be given to

[4] In 2003, the survey size was about 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 and 2011). The number of households with valid responses is slightly fewer than these numbers.

private persons or bodies as gifts or allowances, expenditures on durable goods, and imputed rent.

We use the official Consumer Price Index (2003 = 100) to deflate all household consumption data to 2011 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.[5]

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 is:

$$E_i = \pi(A_i + 0.9C_i)^{0.6}. \quad (10)$$

The scale is normalized to equal one for the reference household type (two adults and two children), where π is the normalization factor.[6]

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

The poverty lines used in this article differ from the lines used by Turkstat and other studies about poverty in Turkey. See Table 2 which refers to Turkstat's (combined food and non-food) poverty lines, a relative poverty line, and the two absolute lines that we use.

<Table 2 near here>

As mentioned earlier, Turkstat's food and non-food poverty lines change over time, not only when prices change, but also when the composition of the reference basic needs basket changes. As the non-food expenditure share rises (when overall general living standards rise) and, correspondingly, the food expenditures share decreases, the cost of the food basket is divided by a relatively smaller food expenditure share, resulting in a higher figure being obtained for non-food expenditures. Because of this, the combined food and non-

[5] 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.) After 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 2003–2011 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.

[6] 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).

food poverty lines calculated by Turkstat are expected to be higher than a poverty line which is fixed in real terms at some base-year level. Turkstat has been conducting a study to revise its poverty line methodology and, as a result, official food and non-food poverty lines (and estimates of poverty rates based upon them) have not been published since 2010. Although Turkstat's poverty lines are higher than the relative poverty lines shown in Table 2 (defined as 60% of contemporary median consumption) in 2003 and 2004, they are close to each other between 2005 and 2009.

As shown in Table 1 above, the poverty lines used in the previous studies of poverty in Turkey have varied in nature. Before 2004, the year the first HBS-based estimates were announced, poverty analysts mainly used their own poverty lines. After 2004, analysts mostly employed Turkstat's poverty lines, though some preferred to use relative poverty lines (consumption- and income-based).

We use absolute poverty lines because we believe that 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. Using an absolute poverty line guarantees that the poverty comparisons made are consistent in the sense that two individuals with the same level of welfare are treated the same way (Ravallion 1998). To be sure, most countries (with the exception of the USA) tend to raise their poverty line as they become more affluent, the concept of absolute poverty remains relevant for Turkey. 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), and we note that relative poverty lines have been used by the OECD in cross-national comparisons involving Turkey (OECD 2008). So that we can compare results across poverty line definitions, we also employ relative poverty lines expressed as fractions of median equivalized household consumption (with 60 per cent of the median used for the headline estimates).

For our poverty index calculations based on absolute lines, we focus on two definitions: the '2003 poverty line' and the '2009 poverty line'. The 2003 line is derived by taking the (food plus non-food) poverty threshold announced by Turkstat for 2003 and expressing it in 2011 prices. Analogously, the 2009 line is the Turkstat line for 2009 reflated to 2011 prices, and is higher than the 2003 line (235 TL per month compared to 197 TL per month). The relative poverty line defined as 60 per cent of contemporary median income is well below the 2003 poverty line in the earlier years of the 2003–11 period, but well above

both 2003 and 2009 poverty lines by 2011. 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, 2003–11

Taking the 2003 poverty line as the cut-off, we estimate the absolute poverty rate to decline by 24.1 percentage points between 2003 and 2011, from 35.2 per cent to 11.1 per cent. With the 2009 poverty line, the reduction is even more dramatic, a drop of 30.0 percentage points in the absolute poverty rate from 46.2 per cent to 16.3 per cent. By contrast, relative poverty rates remained much the same over the same period (20.8 per cent compared to 19.6 per cent). If the average gap and average squared gap indices are used, there are the same patterns for the 2003–11 period as a whole, i.e. a large decline in absolute poverty with relative poverty broadly constant. See Table 3 for the full set of the poverty estimates broken down by year and FGT poverty index.

<Table 3 near here>

Table 3 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 2.9 percentage points between 2008 and 2011. With the 2009 line, the corresponding changes are 27.0 percentage points and 3.0 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 2011).

Observe that 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 3, 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 per cent to 100 percent 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 2011. 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 A1.

<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 A1.) The upper boundary of the domain is more than twice the poverty line levels shown in Table 2, 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 A1). Poverty was greater in 2003 than in 2008 over virtually all conceivable absolute poverty lines.

Figure 1(b), summarizing the comparison between 2008 and 2011, 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 2011 than 2008 at every poverty line over the full range (Table A1). 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 A2. 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 per cent 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 per cent and 49 per cent 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 2008–11, poverty fell slightly at median-fractions below the conventional 60 per cent cut-off:

application of the min-*t* criterion shows lower poverty in 2011 for all relative poverty lines between 11 per cent and 57 per cent of the contemporary median.

These results draw attention to a problem with using relative poverty lines in times of rapid economic change. In the Turkish case, median consumption rose by around 63 per cent 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 boom period: 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 using the Datt and Ravallion (1992) method is undertaken separately for the sub-periods 2003–8 and 2008–11 and for both the 2003 and 2009 poverty lines. The decomposition estimates are provided in Table 4.

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 19.2 percentage points of the 21.2 percentage points decrease in the poverty rate is attributed to consumption growth, only 5.7 percentage points is attributed to redistribution. If the 2009 poverty line is used, the corresponding estimates are 22.8 percentage points and 6.1 percentage points (with the total change 27.0 percentage points). Our results are consistent with those of Aran et al. (2010) who, applying the same method to poverty changes in Turkey between 2003 and 2006, also found that the growth component was the largest. In addition, our result echoes 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 4 near here>

Between 2008 and 2011, when the poverty rate decline was much smaller, the growth component again plays the dominant role. However, while both the growth in average living standards and the change in distribution tended to decrease poverty according to 2003 poverty line, the pattern is different if the higher 2009 line is used. In this case, the change in distribution tended to increase poverty, but the growth in average living standards counteracted the redistribution effect. This means that distributional changes tended to have adverse effects for individuals in households with living standard levels above the 2003 poverty line but below the 2009 poverty line. On a related theme, Yemstov (2001) comparing Turkey in 1987 and 1994, found that poverty reduction over and above that observed could have occurred if growth in average living standards had been accompanied by a decrease in inequality.

6.2. Macro-economic 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 subperiods investigated. The Turkish economy's growth performance parallels the trends in poverty we have documented. After volatile economic growth in 1990s and a serious contraction in GDP in 2001, the Turkish economy then experienced an upsurge in GDP growth rates, commonly attributed to structural reforms, macroeconomic policies, and favorable conditions in the international markets (SPO 2008). The Turkish economy grew by 6.9 per cent in real terms annually on average over the period 2003–7. Alongside the increase in GDP, GDP per capita (PPP) increased by more than 50 per cent, reaching US $13,455 in 2007 compared to US $8,618 in 2001. However, the economy started to slow down in the second quarter of the 2007, and stagnated from the second half of the 2008 when the effects of global crisis began to have effect (SPO 2010). Nevertheless, the Turkish GDP rebounded strongly beginning 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).

Although one might expect the employment rate to improve when the economic growth increases, the employment performance of the Turkish economy after the 2001 economic crisis was weak. Total employment increased by about 8 per cent between 2004 and 2008. Unemployment rates remained broadly stable. They were around 11 per cent over the same period, increased in 2009 when the growth rate was negative, and started to decline thereafter. See Figure 3 for a summary of the trends in the indicators. The most important reason for limited increase in employment was the decline of employment in the agricultural

sector related to the on-going structural transformation in the economy. Although employment in urban areas increased rather rapidly after the 2001 crisis as a result of job creation, this could not compensate for the rapid loss of employment in agriculture (Taymaz 2009). The reduction in size of the agricultural sector has been reversed since 2008, and this has contributed to the decline in unemployment rate and to the increase in employment rate.

<Figure 3 near here>

A strong economy facilitated the funding of improvements in social protection. With the improvement in the Turkish macro-economy, the budget devoted to social expenditures increased and significant progress was made on a number of social indicators (e.g. the poverty rate, inequality, infant mortality rate, and educational enrolment rates). People are better-off because of increases in their labour and transfer incomes (Yükseler and Türkan 2008). And, the increase in wages for low-waged workers and employers was higher than the increase for high-waged ones. Social protection for people out of labor market was also generous and there were also high rates of increase in the minimum wage. See Figure 4 for indicative statistics. Social assistance expenditure, which constitutes a relatively small part of social security expenditures in Turkey, has been rising steadily since 2002, with the increase mainly driven by increases in in-cash and in-kind assistance to families and children. In addition, there have been attempts to provide more effective and sufficient services to the needy within the social assistance system. These trends continued between 2008 and 2012 despite relatively lower rates of increase in the minimum wage and social assistance.

<Figure 4 near here>

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

The Datt-Ravallion decompositions suggest that economic growth played a dominant role in the poverty decline observed in an aggregate. Using subgroup decompositions, we now turn to consider whether everyone shared the benefits (in poverty rate terms) of economic growth. Although policy-reduction policy should be concerned with its impacts on aggregate poverty, it cannot ignore the diversity of impacts underlying the averages (Ravallion 2001).[7]

[7] Ravallion (2001) estimated growth elasticity of poverty for 120 spells of poverty (two successive household surveys) derived from 50 developing countries and concluded that the growth elasticity shows a great deal of variation across countries. He relates the variations in it to income inequality levels and trends. Ravallion's

Using the methods outlined in Section 3, we decompose changes in poverty between two pairs of years (2003–8, 2008–11) into the components representing changes in the distribution of subgroup poverty risks and changes in population composition (changes in the relative size of the different groups). Although poverty profiles for a given year have been derived in many studies of Turkish poverty, they have rarely been employed to study poverty trends, or are not as up to date as our analysis.

We use HBS variables to define a number of subgroup classifications that summarize the demographic composition and labor market attachment of households: place of residence (urban, rural), household size, the number of gainfully employed workers in the household expressed as a fraction of the total number of adults, and the education level of the household head. Because poverty status is assessed using a household-level consumption variable, most of the variables are also measured at the household level. In this section, we report the results of a selection of the decompositions that we have undertaken, and which are based on the 2003 poverty line. Additional univariate decompositions (by household type and age of household head), and corresponding estimates derived using the 2009 poverty line, are reported in the Appendix Table 4 for brevity. (They do not change the story we are about to tell.)

We know from the earlier sections that the aggregate poverty rate decreased between 2003 and 2008 and also between 2008 and 2011 (but by less). Table 5 shows that all the population subgroups that we consider experienced a decrease in poverty between 2003 and 2008. The magnitude of the decrease, and the contributions to it differs by population subgroup, however. For instance, the poverty decrease is greater in urban areas, small-sized households, households with gainfully-employed workers, and households with more educated heads, than for their complementary groups (rural households, large households etc.). However, the results need careful interpretation. For example, the decrease in urban poverty may have contributed to the decrease in rural poverty because of the linkages arising through migration and income transfers.

In some senses, the decline in poverty in between 2003 and 2008 was like a selection process in which those who were best equipped to exit poverty did so, leaving behind a pool of individuals with relatively adverse characteristics (see Appendix Table A.3). For instance whereas the share of individuals with an illiterate household head was 12.8 per cent of the poor population in 2003, it increased to 21.9 per cent in 2008 and 23.0 per cent in 2011.

(2001) approach has also been employed by some other studies. See, for example, Christiaensen et al. (2003) for an analysis of changes in poverty in selected African countries.

Between 2008 and 2011, the poverty decline was selective again. For example, there were increases in the poverty rates of individuals living in large households, and individuals living in households without any gainfully employed workers.

Changes in the relative sizes of the various groups also accounted for poverty trends, with the compositional shift between 2003 and 2008 having a poverty-reducing effect. For example, over that period, there were increases in the relative numbers of individuals living in small-sized households, in households with younger and more educated heads, a higher number of workers, and in households in urban areas.

However, these types of compositional shift reversed between 2008 and 2011. For example, the compositional effect for the urban-rural decomposition is positive reflecting the shift from urban to rural areas paralleling the increase in agricultural employment after 2008. There were also increases in the population shares of individuals living in large households (with 8+ persons), and in households with older and less educated heads.

These sorts of compositional shift between 2008 and 2011 are poverty-increasing factors (Table 5) because the poverty rate in these groups is above the average. Again the results need careful interpretation. The shifts may reflect poverty-alleviating strategies undertaken by households due to the worse economic conditions after 2008. For example, households may have chosen to (re)unify to capture economies of scale. Or, with the harder economic conditions, people may have returned to rural areas where agriculture was still offered employment opportunities.

The share of individuals living in households with at least one gainfully-employed worker continued to increase between 2008 and 2011. 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). The decrease in poverty rate for the individuals whose household head is aged more than 60 years was less and it stayed above the average in 2011. Although some households may have doubled up, e.g. with elderly parents, the establishment of smaller households after 2003 may change the poverty situation of elderly people who changed from living with their children to living alone (or only with their partner).

The univariate decompositions provide breakdowns for each subgroup classification one at a time, and yet the classifications may substantially overlap and it may be a combination of characteristics that matters. Some decompositions may indicate effects because the relevant characteristic is correlated with some other, more important, characteristic. In order to control for the effects of a number of characteristics simultaneously,

we have also undertaken decompositions based on multivariate regression analysis. The poverty rate in a given year is modeled as a (non-linear) 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. The multivariate decompositions provide estimates of the relevant importance of (i) changes in conditional poverty rates (associated with changes in regression coefficients) and (ii) 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, and we only summarize the results here as they echo the univariate results. 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 2011, we also find that changes in conditional poverty rates mainly account for the poverty rate fall. The finding from the univariate analysis that the poverty rate decrease was more selective between 2008 and 2011 was also supported by multivariate analysis. For instance, the 'returns' to living in a large household or having children were better in 2003 than in 2008. As the univariate decompositions showed, whereas the average education level or share of gainfully-employed workers continued to increase between 2008 and 2011, there was some shift towards characteristics associated with greater chances of being poor (living in a rural area, or in a large household). Nonetheless, overall, the characteristics effect is insignificantly different from zero in the multivariate analysis. Therefore, the changes in the distribution of characteristics such as the increasing population share of the rural population, and of large households, cannot be interpreted as making a significant contribution to the changes in poverty.

8. Summary and conclusions

Our headline result about poverty trends in Turkey between 2003 and 2011 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 2011, when the decline was small. These results are robust to the choice of the absolute poverty line and poverty index.

Our decomposition analysis shows that the declines in poverty in both periods are primarily attributable to growth rather than redistribution. The subgroup decompositions of

poverty change suggest that, between 2003 and 2008, all population groups experienced a fall in poverty regardless of their characteristics, and the decline in aggregate poverty over the period is accounted for almost entirely by changes in subgroup poverty risks rather than any changes in population composition. By contrast, although aggregate poverty also decreased between 2008 and 2011, it did not decrease among all subgroups. There is also some suggestion that the decline in poverty was more 'selective' in terms of characteristics in the second sub-period compared with the first.

What of poverty in Turkey after 2011? In the light of the results of our paper, GDP growth is the principal driver of poverty trends. After zero or negative real GDP growth in 2008 and 2009, growth rates were positive in 2010 and 2011, but fell towards zero again in 2012 (Figure 3). So, we expect absolute poverty rates to have hardly changed after 2011 or perhaps risen slightly. A decline in poverty is unlikely without a return to economic growth, or the development of anti-poverty programmes that are targeted on groups prone to poverty such as individuals living in rural areas, children, and elderly people.

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Table 1. Selected studies of poverty in Turkey: data and poverty lines

Study	Survey	Poverty line (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 2).
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 2).
Caglayan and Dayioglu (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).
Seker and Dayioglu (forthcoming)	2006–9 Panel, Statistics on Income and Living Conditions	Income-based relative poverty line (60% of contemporary median)

Table 2. Poverty lines (equivalized household consumption, Turkish Lira per month, 2011 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	197	131.3	150	197	235
2004	186	108.8	171	197	235
2005	194	98.5	197	197	235
2006	200	96.6	207	197	235
2007	214	97.3	220	197	235
2008	233	95.9	243	197	235
2009	235	98.7	238	197	235
2010	n.a.	n.a.	240	197	235
2011	n.a.	n.a.	253	197	235

Note: In 2011, 1 Turkish Lira (TL) = US$0.6. n.a.: Turkstat's basic-needs poverty lines are not available for 2010 and 2011.

Table 3. Poverty in Turkey, 2003–11, by FGT poverty index and poverty line (percentages)

Year	Poverty rate 100*FGT(0)			Average poverty gap 100*FGT(1)			Average squared poverty gap 100*FGT(2)		
	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		2003 line	2009 line	60% of median
2003	35.2	46.2	20.8	11.1	15.9	5.7	4.9	7.5	2.3
	(0.400)	(0.408)	(0.313)	(0.171)	(0.194)	(0.147)	(0.100)	(0.122)	(0.082)
2004	29.0	38.4	22.7	8.9	12.9	6.3	3.8	5.9	2.5
	(0.654)	(0.683)	(0.532)	(0.260)	(0.305)	(0.262)	(0.144)	(0.182)	(0.147)
2005	22.2	30.4	22.2	6.7	9.9	6.7	2.9	4.5	2.8
	(0.620)	(0.668)	(0.531)	(0.242)	(0.288)	(0.284)	(0.134)	(0.169)	(0.168)
2006	19.9	27.2	21.9	5.6	8.5	6.4	2.3	3.8	2.7
	(0.628)	(0.679)	(0.557)	(0.236)	(0.284)	(0.288)	(0.126)	(0.163)	(0.167)
2007	16.9	24.1	21.5	4.6	7.2	6.1	1.8	3.0	2.5
	(0.571)	(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)	(0.187)	(0.234)	(0.281)	(0.093)	(0.125)	(0.165)
2009	13.8	20.7	21.2	3.6	5.9	6.1	1.5	2.4	2.5
	(0.473)	(0.547)	(0.490)	(0.160)	(0.199)	(0.234)	(0.085)	(0.110)	(0.137)
2010	12.9	19.1	19.8	3.4	5.4	5.7	1.4	2.3	2.4
	(0.457)	(0.523)	(0.462)	(0.157)	(0.195)	(0.225)	(0.084)	(0.108)	(0.131)
2011	11.1	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)	(0.090)	(0.124)
	Change (percentage points)								
2003–2008	–21.2	–27.0	0.0	–7.2	–9.9	0.7	–3.3	–4.9	0.6
	(0.673)	(0.719)	(0.617)	(0.253)	(0.304)	(0.256)	(0.137)	(0.175)	(0.144)
2008–2011	–2.9	–3.0	–1.2	–1.2	–1.5	–1.0	–0.6	–0.8	–0.5
	(0.696)	(0.775)	(0.713)	(0.233)	(0.295)	(0.291)	(0.113)	(0.155)	(0.162)

Source: Authors' calculations from Household Budget Survey data covering 2003–11. See text for details.
Notes: Poverty lines are explained in the main text and as shown in Table 2. 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 FGT0 and calculated using the relative poverty line.

Table 4. Growth and redistribution components of absolute poverty change, Turkey, 2003–08 and 2008–11 (percentage points)

	Observed change in poverty rate	Growth	Redistribution	Residual
2003 Poverty Line				
2003–2008	–21.2	–19.2	–5.7	3.7
2008–2011	–2.9	–2.2	–0.5	–0.2
2009 Poverty Line				
2003–2008	–27.0	–22.8	–6.1	1.9
2008–2011	–3.0	–2.5	0.6	–1.1

Source: Authors' calculations from Household Budget Survey data covering the 2003–11 period using the Datt and Ravallion (1992) method. See text for details.

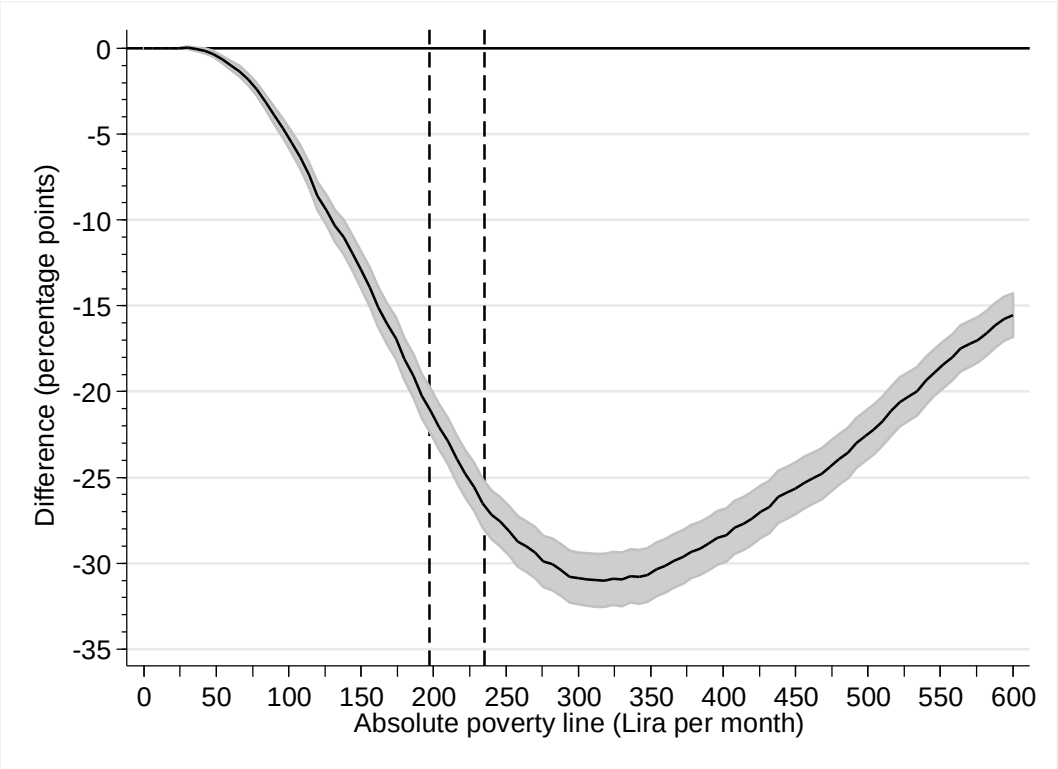
Table 5. Subgroup decompositions of the change in the poverty rate, 2003–8 and 2008–11 (2003 poverty line)

	Subgroup population share (%)			Subgroup poverty rate (%)			2003–8		2008–11	
							Changes in subgroup poverties	Changes in population composition	Changes in subgroup poverties	Changes in population composition
	2003	2008	2011	2003	2008	2011	Percentage points		Percentage points	
Place of residence										
Urban	60.8	69.3	68.5	25.0	7.6	5.2	–11.3	1.4	–1.7	–0.1
Rural	39.2	30.7	31.6	51.1	28.5	24.0	–7.9	–3.4	–1.4	0.2
All	100.0	100.0	100.0	35.2	14.0	11.1	–19.2	–2.0	–3.1	0.2
Household size										
<3	8.6	9.8	12.1	18.9	7.5	5.7	–1.1	0.2	–0.2	0.2
3	14.6	17.8	18.5	19.3	4.6	4.0	–2.4	0.4	–0.1	0.0
4	25.3	27.5	26.8	25.0	7.3	6.5	–4.7	0.4	–0.2	–0.1
5	19.3	17.2	17.3	37.2	14.7	9.1	–4.1	–0.6	–1.0	0.0
6	12.1	11.8	10.0	45.9	23.2	15.6	–2.7	–0.1	–0.8	–0.4
7 or 8	11.9	9.8	8.8	54.3	30.4	24.5	–2.6	–0.9	–0.6	–0.3
>8	8.3	6.2	6.6	63.4	35.9	40.7	–2.0	–1.1	0.3	0.2
All	100.0	100.0	100.0	35.2	14.0	11.1	–19.6	–1.6	–2.6	–0.3
Share of gainfully employed workers in the household										
0%	13.5	12.7	11.5	32.1	15.3	15.6	–2.2	–0.2	0.0	–0.2
> 0% and ≤ 50%	75.9	69.9	66.9	37.2	15.0	12.3	–16.2	–1.6	–1.8	–0.4
> 50%	10.6	17.4	21.6	24.5	9.0	5.0	–2.2	1.1	–0.8	0.3
All	100.0	100.0	100.0	35.2	14.0	11.1	–20.6	–0.6	–2.6	–0.3
Education level of household head										
Illiterate	7.0	6.5	7.3	64.8	47.1	36.3	–1.2	–0.3	–0.7	0.4
Literate without diploma	5.6	5.4	6.1	53.0	34.6	22.7	–1.0	–0.1	–0.7	0.2
Primary school	53.6	48.4	48.8	41.6	15.9	12.3	–13.1	–1.5	–1.8	0.1
Secondary school	11.0	11.2	10.6	26.2	7.3	5.6	–2.1	0.0	–0.2	–0.0
High school	15.0	18.0	15.8	14.7	3.1	2.8	–1.9	0.3	–0.1	–0.1
University and above	7.7	10.5	11.4	3.7	0.1*	0.5*	–0.3	0.1	0.0	0.0
All	100.0	100.0	100.0	35.2	14.0	11.1	–19.7	–1.5	–3.5	0.6

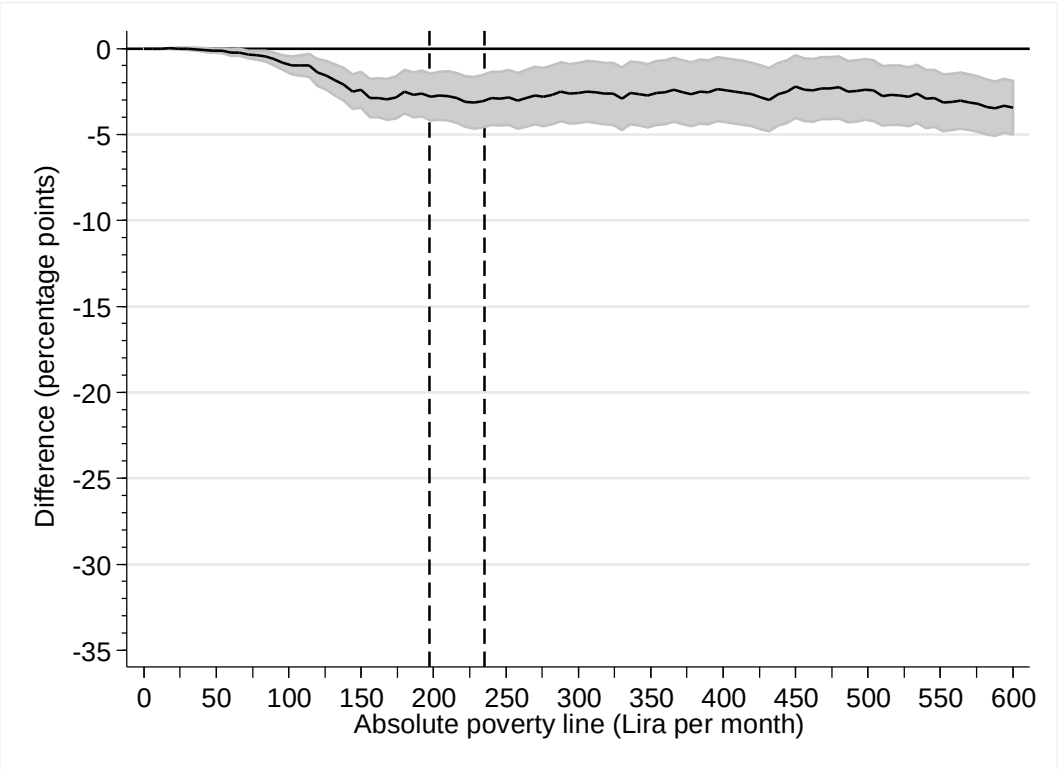
Source: Authors' calculations based on Household Budget Survey data covering 2003-11. See text for details.
*: calculation based on fewer than 20 observations.

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

(a) 2003 versus 2008



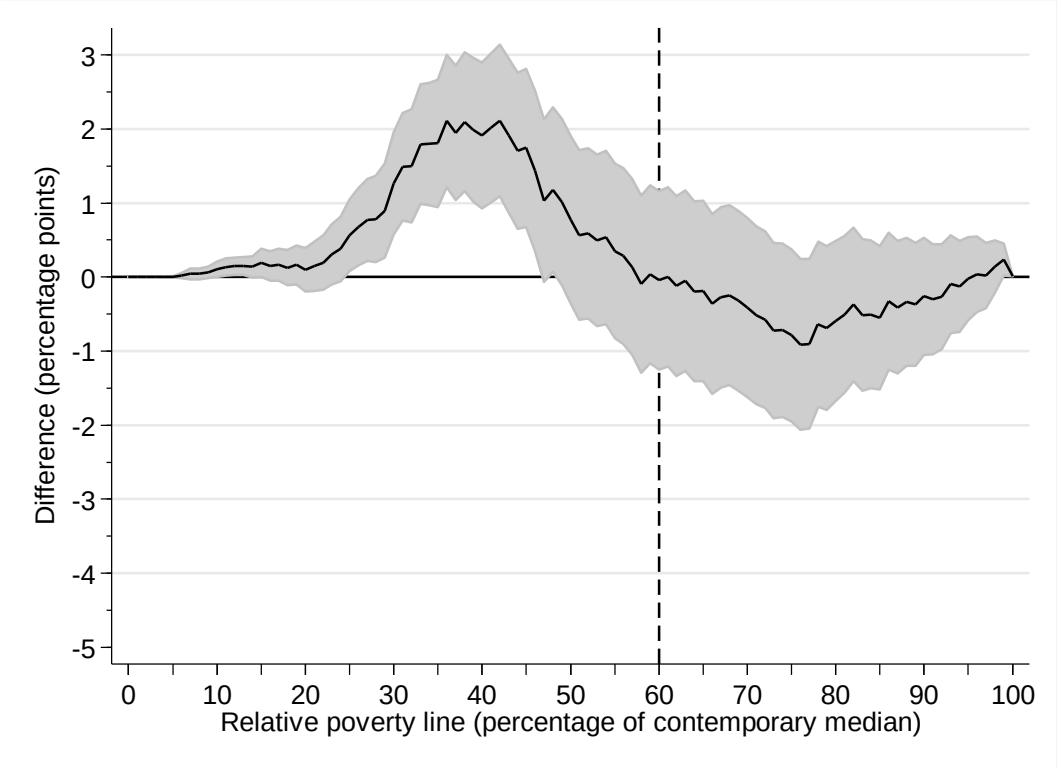
(b) 2008 versus 2011



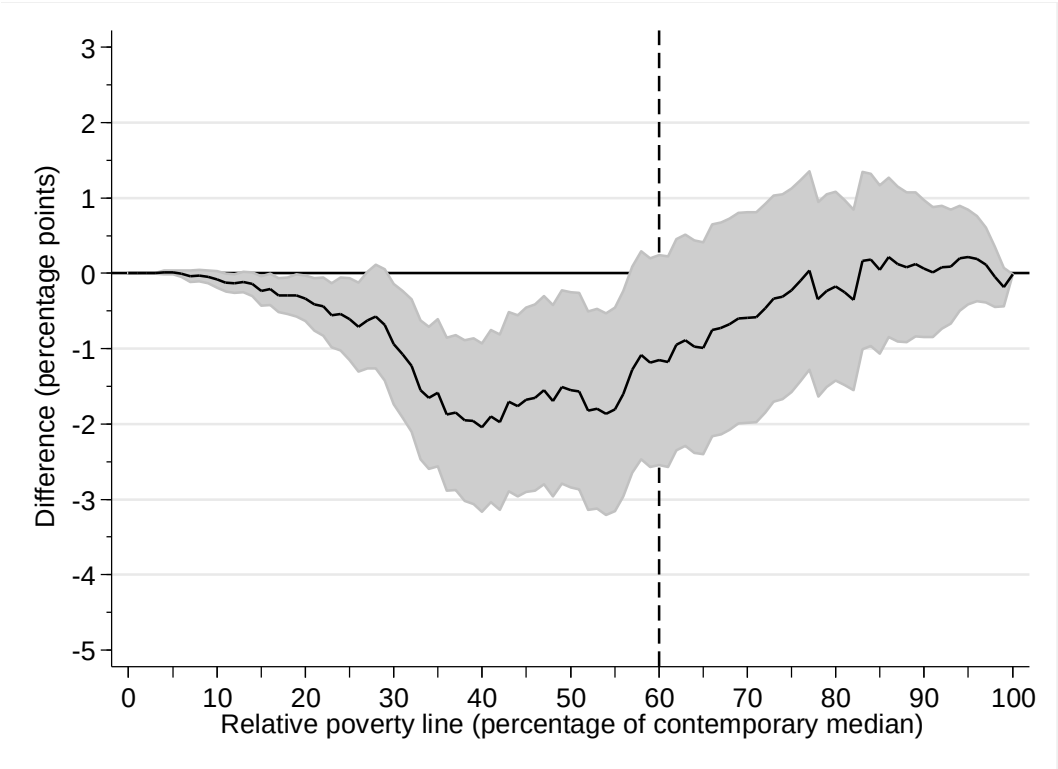
Source: Authors' calculations from Household Budget Survey data covering 2003–11. See text for details.
Note: The dashed lines show the 2003 and 2009 poverty lines (i.e. TL197 and TL235 per month, respectively).

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

(a) 2003 versus 2008

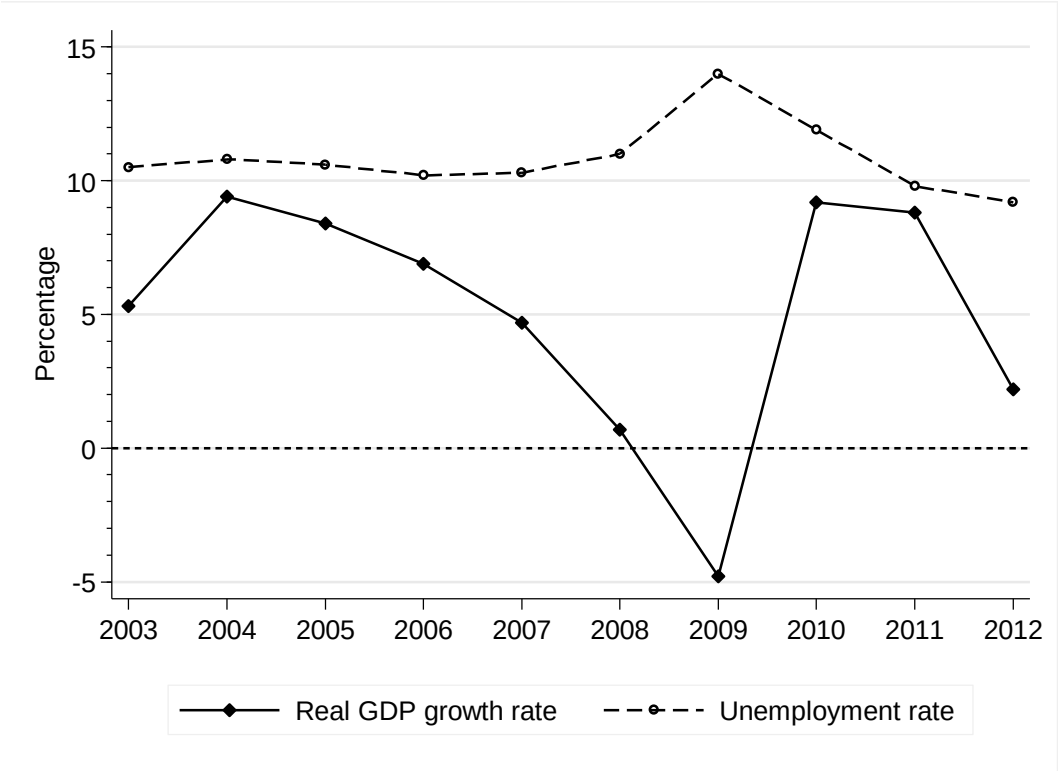


(b) 2008 versus 2011



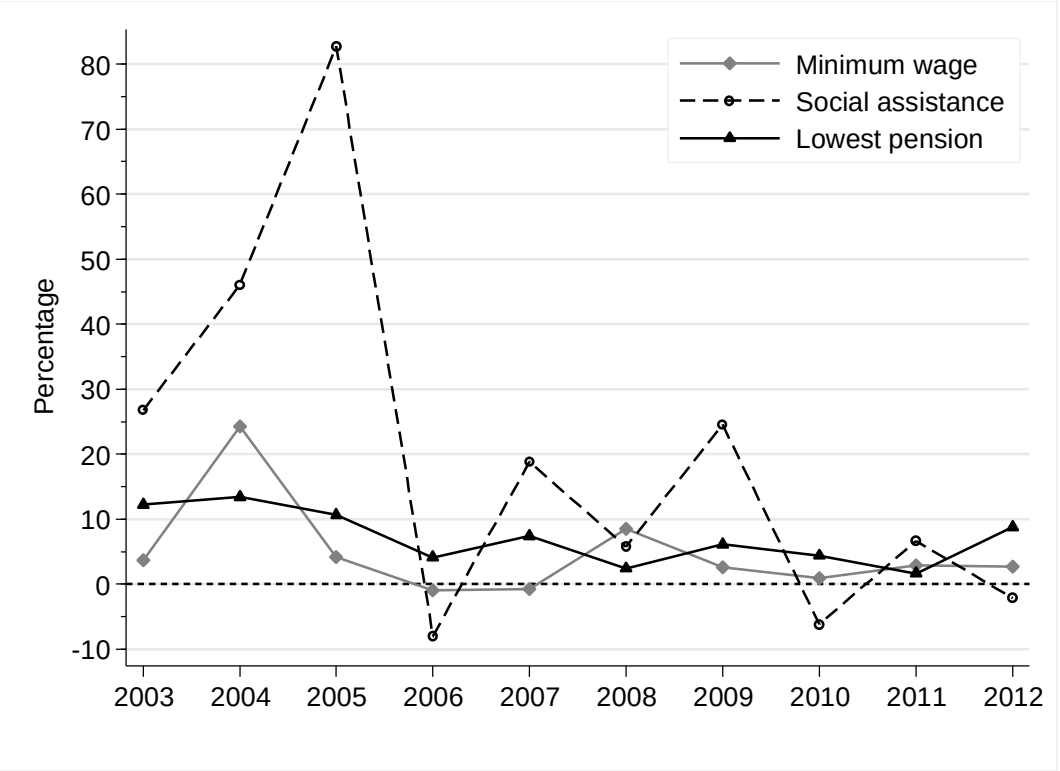
Source: Authors' calculations from Household Budget Survey data covering 2003–11. See text for details.

Figure 3. Annual rates of real GDP growth and unemployment (%): Turkey, 2003–12



Source: Turkstat.
Note: The population weights used to derive the unemployment rate are derived from the Address Based Population Registration System (ABPRS), except for 2003 when the weights are from the 2000 Population survey.

Figure 4. Annual growth rates in minimum wages, lowest pension, and social assistance (%): Turkey, 2003–12



Source: Turkish Ministry of Development.
Note: Lowest pension is the average of the three lowest pensions for insured individuals and pensioners working with a service contract, self-employed, self-employed in agriculture, and civil servants.

APPENDIX

Table A1. 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	–0.1	–1.49
50	0.7	0.2	–0.5	–5.10
60	1.3	0.4	–1.0	–6.90
70	2.2	0.5	–1.7	–10.06
80	3.6	0.7	–2.8	–13.53
90	5.2	1.2	–4.0	–15.23
100	7.4	2.0	–5.4	–16.99
110	9.7	2.7	–7.0	–18.98
120	12.5	4.0	–8.5	–19.51
130	15.3	5.1	–10.3	–21.45
140	18.1	6.5	–11.6	–22.13
150	20.9	7.6	–13.3	–23.95
160	24.1	9.0	–15.1	–25.40
170	27.0	10.4	–16.7	–26.89
180	30.1	11.5	–18.6	–29.17
190	33.2	12.8	–20.4	–31.05
200	36.1	14.3	–21.9	–32.34
210	39.0	15.8	–23.3	–33.76
220	42.0	17.2	–24.9	–35.31
240	47.4	20.2	–27.2	–37.38
260	52.8	23.9	–28.9	–38.51
280	57.5	27.3	–30.2	–39.47
300	61.4	30.7	–30.8	–39.30
320	65.1	34.5	–30.6	–38.66
340	68.7	38.3	–30.4	–38.05
360	71.8	42.1	–29.7	–37.19
380	74.6	45.8	–28.8	–36.24
400	76.9	49.2	–27.8	–35.13
420	79.1	52.3	–26.8	–34.23
440	81.0	55.5	–25.5	–33.03
460	82.6	58.0	–24.6	–32.31
480	83.9	60.7	–23.2	–30.89
500	85.3	63.7	–21.6	–29.40
520	86.5	66.5	–20.0	–27.78
540	87.6	69.1	–18.4	–26.40
560	88.5	71.5	–17.1	–25.13
580	89.5	73.7	–15.8	–24.00
600	90.3	75.4	–14.8	–23.12

(b) 2008 and 2011

Poverty line, *z* (Lira per month)	*F*(2008) (%)	*F*(2011) (%)	Difference (percentage points)	t-statistic
40	0.1	0.0	–0.1	–1.70
50	0.2	0.1	–0.1	–2.20
60	0.3	0.1	–0.2	–2.36
70	0.5	0.2	–0.3	–2.74
80	0.7	0.4	–0.4	–2.63
90	1.2	0.6	–0.6	–3.19
100	2.0	1.1	–0.9	–3.57
110	2.7	1.7	–1.0	–3.35
120	4.0	2.6	–1.4	–3.53
130	5.1	3.5	–1.6	–3.53
140	6.5	4.2	–2.3	–4.51
160	9.0	6.3	–2.7	–4.73
170	10.4	7.4	–3.0	–4.86
180	11.5	9.0	–2.5	–3.86
190	12.8	10.3	–2.5	–3.75
200	14.3	11.6	–2.6	–3.76
210	15.8	13.0	–2.8	–3.79
220	17.2	14.1	–3.1	–4.15
240	20.2	17.3	–2.9	–3.67
260	23.9	20.9	–3.0	–3.60
280	27.3	24.6	–2.7	–3.13
300	30.7	28.1	–2.6	–2.87
320	34.5	31.9	–2.6	–2.87
340	38.3	35.5	–2.8	–3.04
360	42.1	39.5	–2.5	–2.69
380	45.8	43.1	–2.7	–2.80
400	49.2	46.7	–2.5	–2.62
420	52.3	49.6	–2.7	–2.83
440	55.5	52.8	–2.7	–2.85
460	58.0	55.6	–2.3	–2.51
480	60.7	58.4	–2.3	–2.47
500	63.7	61.2	–2.4	–2.70
520	66.5	63.8	–2.7	–3.11
540	69.1	66.2	–2.9	–3.42
560	71.5	68.2	–3.2	–3.86
580	73.7	70.3	–3.4	–4.19
600	75.4	72.0	–3.5	–4.32

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

(a) 2003 and 2008

Poverty line, *z* (% of median)	*F*(2008) (%)	*F*(2011) (%)	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 2011

Poverty line, *z* (% of median)	*F*(2008) (%)	*F*(2011) (%)	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	0.74
5	0.0	0.0	0.0	0.74
6	0.0	0.0	–0.0	–0.13
7	0.1	0.0	–0.0	–0.91
8	0.1	0.0	–0.0	–0.87
9	0.1	0.0	–0.0	–1.14
10	0.1	0.0	–0.1	–1.51
11	0.2	0.0	–0.1	–2.05
12	0.2	0.0	–0.1	–2.17
13	0.2	0.1	–0.1	–1.69
14	0.2	0.1	–0.1	–1.77
15	0.3	0.1	–0.2	–2.32
16	0.4	0.2	–0.2	–1.99
17	0.5	0.2	–0.3	–2.56
18	0.5	0.2	–0.3	–2.40
19	0.7	0.4	–0.3	–2.08
20	0.8	0.4	–0.3	–2.16
21	1.0	0.5	–0.4	–2.33
22	1.2	0.7	–0.4	–2.22
23	1.4	0.9	–0.6	–2.57
24	1.7	1.2	–0.5	–2.17
25	2.1	1.4	–0.6	–2.21
26	2.4	1.7	–0.7	–2.36
27	2.7	2.0	–0.6	–1.90
28	2.9	2.4	–0.6	–1.64
29	3.4	2.7	–0.7	–1.82
30	4.0	3.1	–0.9	–2.29
31	4.6	3.5	–1.1	–2.50
32	5.0	3.8	–1.2	–2.74
33	5.7	4.2	–1.5	–3.30
34	6.1	4.4	–1.7	–3.44
35	6.6	5.0	–1.6	–3.18
36	7.3	5.4	–1.9	–3.62
37	7.6	5.8	–1.8	–3.52
38	8.3	6.3	–2.0	–3.59
39	8.8	6.9	–2.0	–3.49
40	9.3	7.2	–2.0	–3.60
41	9.8	7.9	–1.9	–3.25
42	10.4	8.4	–2.0	–3.32
43	10.9	9.2	–1.7	–2.81
44	11.3	9.6	–1.8	–2.87
45	11.9	10.3	–1.7	–2.69
46	12.4	10.8	–1.7	–2.62
47	12.8	11.3	–1.6	–2.44
48	13.6	11.9	–1.7	–2.61
49	14.1	12.6	–1.5	–2.30
50	14.7	13.1	–1.5	–2.34
51	15.2	13.7	–1.6	–2.35
52	15.9	14.0	–1.8	–2.71

53	16.4	14.6	–1.8	–2.65
54	17.1	15.2	–1.9	–2.73
55	17.6	15.8	–1.8	–2.61
56	18.3	16.7	–1.6	–2.30
57	18.8	17.5	–1.3	–1.83
58	19.3	18.2	–1.1	–1.54
59	20.1	19.0	–1.2	–1.67
60	20.8	19.6	–1.2	–1.62
61	21.6	20.4	–1.2	–1.65
62	22.3	21.3	–0.9	–1.32
63	23.1	22.2	–0.9	–1.24
64	23.9	22.9	–1.0	–1.36
65	24.6	23.6	–1.0	–1.39
66	25.1	24.4	–0.8	–1.05
67	25.9	25.2	–0.7	–1.02
68	26.7	26.0	–0.7	–0.95
69	27.3	26.7	–0.6	–0.84
70	28.0	27.4	–0.6	–0.82
71	28.6	28.1	–0.6	–0.82
72	29.4	28.9	–0.5	–0.66
73	30.0	29.6	–0.3	–0.48
74	30.7	30.4	–0.3	–0.44
75	31.5	31.2	–0.2	–0.33
76	32.1	32.0	–0.1	–0.14
77	32.9	32.9	0.0	0.06
78	33.9	33.5	–0.3	–0.52
79	34.5	34.3	–0.2	–0.36
80	35.3	35.2	–0.2	–0.27
81	36.1	35.9	–0.3	–0.41
82	37.0	36.6	–0.4	–0.57
83	37.6	37.7	0.2	0.28
84	38.3	38.5	0.2	0.31
85	39.2	39.2	0.0	0.09
86	40.1	40.3	0.2	0.40
87	40.8	40.9	0.1	0.23
88	41.6	41.7	0.1	0.16
89	42.3	42.4	0.1	0.24
90	43.1	43.1	0.1	0.14
91	43.9	43.9	0.0	0.03
92	44.5	44.6	0.1	0.18
93	45.3	45.4	0.1	0.22
94	46.0	46.2	0.2	0.57
95	46.7	46.9	0.2	0.66
96	47.3	47.5	0.2	0.67
97	48.0	48.1	0.1	0.44
98	48.8	48.7	–0.0	–0.22
99	49.5	49.3	–0.2	–1.41
100	50.0	50.0	0.0	

Table A3. Subgroup population shares (column %), by year

Variables	2003	2008	2011
Household type			
Household without child(ren)	16.5	14.7	13.7
Female headed household with child	5.2	8.5	8.0
Male headed household with youngest child aged 0–5	50.0	51.3	54.9
Male headed household with youngest child aged 6–14	28.3	25.5	23.5
All	100.0	100.0	100.0
Household Size			
<3	4.6	5.3	6.1
3	8.1	5.9	6.7
4	18.2	14.3	15.9
5	20.4	18.1	14.1
6	15.6	19.6	14.5
7 or 8	18.3	21.2	18.9
>8	14.8	15.6	23.8
All	100.0	100.0	100.0
No. gainfully employed adults (as share of no. of adults)			
0%	12.4	13.9	15.6
> 0% & <=50%	80.2	74.8	74.5
> 50%	7.4	11.3	9.8
All	100.0	100.0	100.0
Place of residence			
Urban	43.3	37.6	32.9
Rural	56.7	62.4	67.1
All	100.0	100.0	100.0
Age of household head (years)			
<30	7.4	6.9	6.6
30–39	31.2	32.3	27.0
40–49	28.9	25.1	27.8
50–59	15.8	16.5	15.0
>60	16.7	19.2	23.6
All	100.0	100.0	100.0
Education of household head			
Illiterate	12.8	21.9	23.0
Literate without diploma	8.4	13.3	12.5
Primary school	63.4	54.9	54.5
Secondary school	8.2	5.8	5.7
High school	6.3	4.0	3.8
University and above	0.8	0.1	0.5
All	100.0	100.0	100.0

Source: Authors' calculations based on data from Household Budget Surveys covering the 2003-2011 period, see text for details.

Table A4. Subgroup decompositions of the change in poverty (2009 poverty line)

	Subgroup population shares (%)			Subgroup poverty rates (%)			2003–8		2008–11	
							Change in subgroup poverties	Change in population composition	Change in subgroup poverties	Change in population composition
	2003	2008	2011	2003	2008	2011	Percentage points		Percentage points	
Location										
Urban	60.8	69.3	68.5	35.7	11.5	9.0	–15.8	2.0	–1.7	–0.1
Rural	39.2	30.7	31.6	62.5	36.8	32.1	–9.0	–4.3	–1.5	0.3
All	100.0	100.0	100.0	46.2	19.2	16.3	–24.8	–2.2	–3.1	0.2
Household size										
<3	8.6	9.8	12.1	27.6	11.4	9.1	–1.5	0.2	–0.3	0.2
3	14.6	17.8	18.5	28.8	8.1	6.3	–3.3	0.6	–0.3	0.1
4	25.3	27.5	26.8	36.0	11.9	11.2	–6.4	0.5	–0.2	–0.1
5	19.3	17.2	17.3	49.4	20.6	15.2	–5.3	–0.7	–0.9	0.0
6	12.1	11.8	10.0	57.4	29.9	23.7	–3.3	–0.1	–0.7	–0.5
7 or 8	11.9	9.8	8.8	66.6	38.7	31.9	–3.0	–1.1	–0.6	–0.4
>8	8.3	6.2	6.6	74.5	41.4	49.1	–2.4	–1.2	0.5	0.2
All	100.0	100.0	100.0	46.2	19.2	16.3	–25.2	–1.8	–2.4	–0.5
Household type										
Household without child	28.7	30.6	34.0	29.5	10.2	7.7	–5.7	0.4	–0.8	0.3
Female headed household with child	3.6	3.8	4.1	62.7	38.0	31.3	–0.9	0.1	–0.3	0.1
Male headed household with youngest child aged 0-5	39.0	37.8	36.7	57.5	26.0	23.0	–12.1	–0.5	–1.1	–0.3
Male headed household with youngest child aged 6-14	28.8	27.8	25.1	45.6	17.4	15.7	–8.0	–0.3	–0.5	–0.4
All	100.0	100.0	100.0	46.2	19.2	16.3	–26.7	–0.3	–2.7	–0.3
No. of Gainfully Employed Workers (as share of total adults)										
0%	13.5	12.7	11.5	43.1	20.8	20.6	–2.9	–0.3	–0.0	–0.3
>0% & <=50%	75.9	69.9	66.9	48.7	20.7	18.1	–20.4	–2.1	–1.7	–0.6
>50%	10.6	17.4	21.6	32.6	12.3	8.3	–2.8	1.5	–0.8	0.4
All	100.0	100.0	100.0	46.2	19.2	16.3	–26.1	–0.9	–2.5	–0.5

Table A4. (cont.)

Eduation of household head									
Illiterate	7.0	6.5	7.3	76.2	54.1	44.8	–1.5	–0.4	–0.7	0.4
Literate without diploma	5.6	5.4	6.1	63.3	43.7	29.6	–1.1	–0.1	–0.8	0.3
Primary school	53.6	48.4	48.8	53.9	22.7	19.1	–15.9	–2.0	–1.8	0.1
Secondary school	11.0	11.2	10.6	38.2	11.4	9.0	–3.0	0.1	–0.3	–0.1
High school	15.0	18.0	15.8	24.2	5.7	5.1	–3.0	0.5	–0.1	–0.1
University and above	7.7	10.5	11.4	7.4	0.5	1.1	–0.6	0.1	0.1	0.0
All	100.0	100.0	100.0	46.2	19.2	16.3	–25.1	–1.9	–3.5	0.6
Age of household head									
<30	7.0	8.1	7.1	49.9	20.2	13.7	–2.2	0.4	–0.5	–0.2
30–39	27.5	27.5	26.2	51.0	22.2	17.3	–7.9	0.0	–1.3	–0.3
40–49	30.3	28.5	28.5	44.7	17.5	16.3	–8.0	–0.6	–0.4	–0.0
50–59	18.9	19.5	20.6	39.8	16.0	12.7	–4.6	0.2	–0.7	0.2
>60	16.3	16.5	17.7	47.0	20.4	20.0	–4.4	0.1	–0.1	0.3
All	100.0	100.0	100.0	46.2	19.2	16.3	–27.1	0.1	–3.0	0.0

Source: Authors' calculations from Household Budget Survey data covering the 2003–11 period. See text for details.

Table A5. Subgroup decompositions of the change in poverty (2003 poverty line)

	Subgroup population shares (%)			Subgroup poverty rates (%)			2003–8		2008–11	
							Change in subgroup poverties	Change in population composition	Change in subgroup poverties	Change in population composition
	2003	2008	2011	2003	2008	2011	Percentage points		Percentage points	
Household type										
Household without child(ren)	28.7	30.6	34.0	20.1	6.7	4.6	–4.0	0.3	–0.7	0.2
Female headed household with child	3.6	3.8	4.1	51.5	30.2	22.4	–0.8	0.1	–0.3	0.1
Male-headed household with youngest child aged 0–5	39.0	37.8	36.7	45.3	19.1	16.5	–10.1	–0.4	–1.0	–0.2
Male headed household with youngest child aged 6–14	28.8	27.8	25.1	34.6	13.0	10.3	–6.1	–0.2	–0.7	–0.3
All	100.0	100.0	100.0	35.2	14.0	11.1	–21.0	–0.2	–2.7	–0.2
Age of household head										
<30	7.0	8.1	7.1	37.4	12.1	10.3	–1.9	0.3	–0.1	–0.1
30–39	27.5	27.5	26.2	40.1	16.4	11.4	–6.5	0.0	–1.4	–0.2
40–49	30.3	28.5	28.5	33.3	12.3	10.8	–6.2	–0.4	–0.4	–0.0
50–59	18.9	19.5	20.6	29.3	11.9	8.1	–3.3	0.1	–0.8	0.1
>60	16.3	16.5	17.7	36.2	16.4	15.2	–3.3	0.0	–0.2	0.2
All	100.0	100.0	100.0	35.2	14.0	11.1	–21.2	–0.0	–2.9	0.0

Source: Authors' calculations based on data from Household Budget Surveys covering the 2003–11 period. See text for details.

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 that we used were 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***	18.29	–4.74***	17.56
	(0.193)		(0.191)	
Coefficients effect (C)	–17.32***	81.71	–22.26***	82.44
	(0.670)		(0.702)	
Change in poverty (E+C)	–21.20***	100.0	–27.00***	100.0
	(0.558)		(0.594)	
2008-2011				
Characteristics effect (E)	0.03	–0.90	–0.10	2.27
	(0.080)		(0.083)	
Coefficients effect (C)	–2.90***	100.90	–2.89***	97.73
	(0.583)		(0.656)	
Change in poverty (E+C)	–2.88***	100.0	–2.95***	100.0
	(0.575)		(0.644)	

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