

Pathways to the Middle Class in Turkey

How Have Reducing Poverty and Boosting Shared Prosperity Helped?

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Abstract

Turkey's poverty reduction performance in the 2000s has been remarkably consistent. Extreme and moderate poverty have fallen considerably since 2003. Between 2002 and 2011, extreme poverty fell from 13 percent to 5 percent, while moderate poverty halved from 44 percent to 22 percent (respectively, defined using the World Bank's Europe and Central Asia regional poverty lines of 2.5 and 5 USD/PPP). Most of this poverty reduction (89 percent) has been driven by growth, a performance consistent with most countries in Europe and Central Asia. This is substantially different from the recent performance of other regions, such as Latin America, where redistribution contributed to poverty

reduction almost four times more than in Turkey. Turkey has also achieved sustained consumption growth of the bottom 40 percent of the population, even during the years of the world recession. Turkey's performance in poverty reduction and increased shared prosperity has been complemented by the systematic expansion of the middle class by 20 percentage points. This paper analyzes the main drivers of poverty reduction, shared prosperity, and changes in inequality in Turkey from 2002 to 2011. The analysis shows that labor markets, demographics, pensions, and social assistance have played a critical role in this process. It further explores some of the mechanisms that have facilitated these changes.

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*Pathways to the Middle Class in Turkey: How Have
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The numbers presented in this brief are based on a regional data harmonization effort known as ECAPOV that increases cross-country comparability of selected findings from official household surveys. For that reason, the numbers discussed here may be different from official statistics reported by governments and national offices of statistics. Such differences should not be interpreted in any way as a claim of methodological superiority, as both sets of numbers serve the complementary objectives, namely, regional comparability and the best possible representation of the facts of individual countries. The usual disclaimer applies.

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Introduction

1. **Turkey is classified as an upper middle income country, and has a Gross National Income per capita of \$18,190 USD PPP (2012).** With a Gross Domestic Product of 789 billion USD (2012), it is the 17th largest economy in the world. Turkey is a member of the Organization for Economic Development and Cooperation (OECD) and an EU accession candidate country. After a volatile period in the 1990s and the economic crisis in 2001, Turkey's economy demonstrated steady growth and modest inflation. Since the global economic crisis, Turkey has recorded among the strongest recoveries in the ECA region, even though growth has recently slowed significantly as concerns over external imbalances have intensified.

2. **High economic growth translated into remarkably consistent poverty reduction.** Between 2002 and 2011, extreme poverty fell from 13% to 5% while moderate poverty fell from 44% to 22% (respectively defined using the World Bank's Europe and Central Asia regional poverty lines of 2.5 and 5 USD/PPP).¹ This systematic increase in welfare led to a significant increase of the middle class in Turkey during 2002-2011.

3. **Turkey's economic performance and social gains have attracted a lot of attention from other countries, in particular countries in the Middle East and North Africa.** This raises demand for analytical work explaining the factors behind this success story. There are several important works published on the labor market and jobs, public finance, saving and economic growth in Turkey (Grun et al, 2013; World Bank, 2010, World Bank, 2011; World Bank, 2013a; World Bank, forthcoming), but analytical studies about poverty reduction, shared prosperity and intra-generational mobility are rather limited. There was a comprehensive poverty assessment conducted by the World Bank (2005) and a study on how the economic crisis affected the welfare of families in Turkey by the World Bank (2013a). There is a study by Şeker and Dayıoğlu (2014) which looks at mobility in and out of poverty during 2005-2008. Şeker and Jenkins (2013) analyzed poverty trends in Turkey during 2003-2011 and decomposed the changes into growth and redistribution components. Nevertheless, to the best of our knowledge, there are no comprehensive studies of the main drivers of poverty reduction, shared prosperity and inequality in Turkey during the last decade.

4. **This paper contributes to filling this knowledge gap and presents stylized facts on poverty reduction, shared prosperity and intra-generational mobility in Turkey from 2002 to 2011.** Using different econometric and statistical techniques, the drivers behind these changes are quantified in order to identify which factors were responsible for poverty reduction and intra-generational mobility during this period. Some of the mechanisms behind the main drivers of poverty reduction are also explored in this paper.

5. **The paper is structured as follows:** (i) explanation of the interrelationships between growth, poverty and shared prosperity; (ii) stylized facts about intra-generational class mobility; (iii) exploration

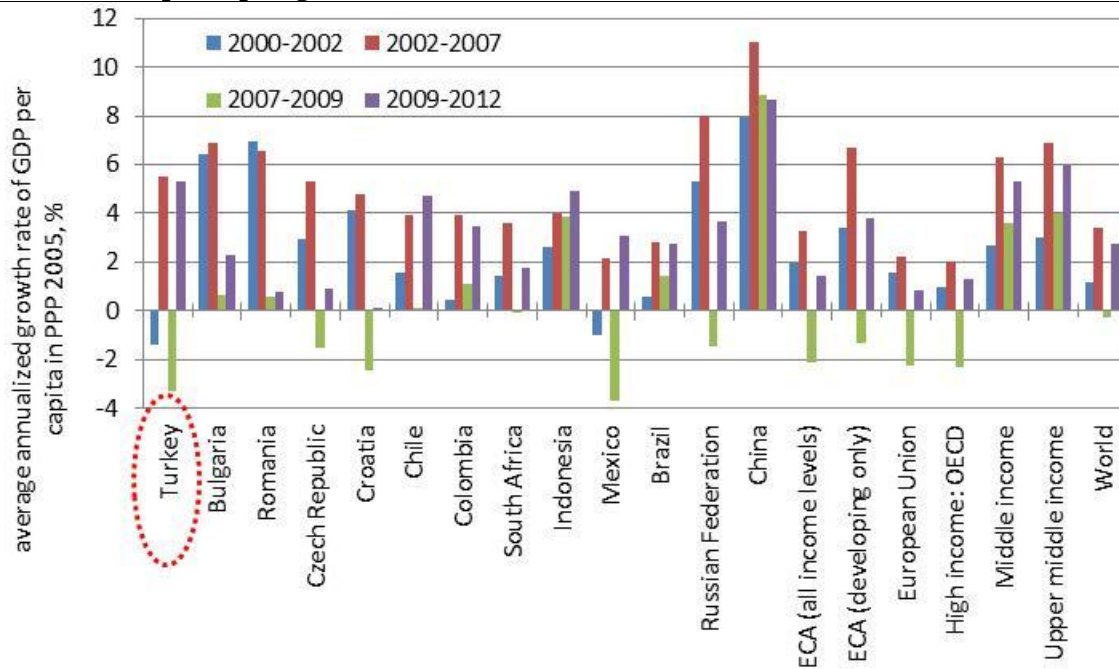
¹ This trend is also consistent with national official poverty reduction statistics produced by the Turkish Statistical Institute (TUIK) and published on their website although TUIK uses a different welfare aggregate and hence the level of underlying trends is not the same.

of the determinants of poverty reduction and intra-generational mobility; and (iv) brief discussion of the future challenges Turkey may face related to poverty reduction and shared prosperity.

I. Growth, poverty and shared prosperity

6. **Sound macroeconomic policies and structural reforms over the past decade have yielded robust economic growth in Turkey.** While the country experienced an average growth rate of 3 percent during 2000-2012, this average masks substantial volatility across different time periods (figure 1.1). Due to internal crisis in 2001, the average growth rate was negative during 2000-2002. This was followed by a period of rapid growth at an average rate of about 5.5 percent during 2002-2007. Another episode of negative growth was then observed during 2007-2009 due to the world economic crisis. Following this second crisis, a period of strong economic growth resumed again in Turkey, this time with an average growth rate of 5.3 percent during 2009-2012.

Figure 1.1: GDP per capita growth in selected countries



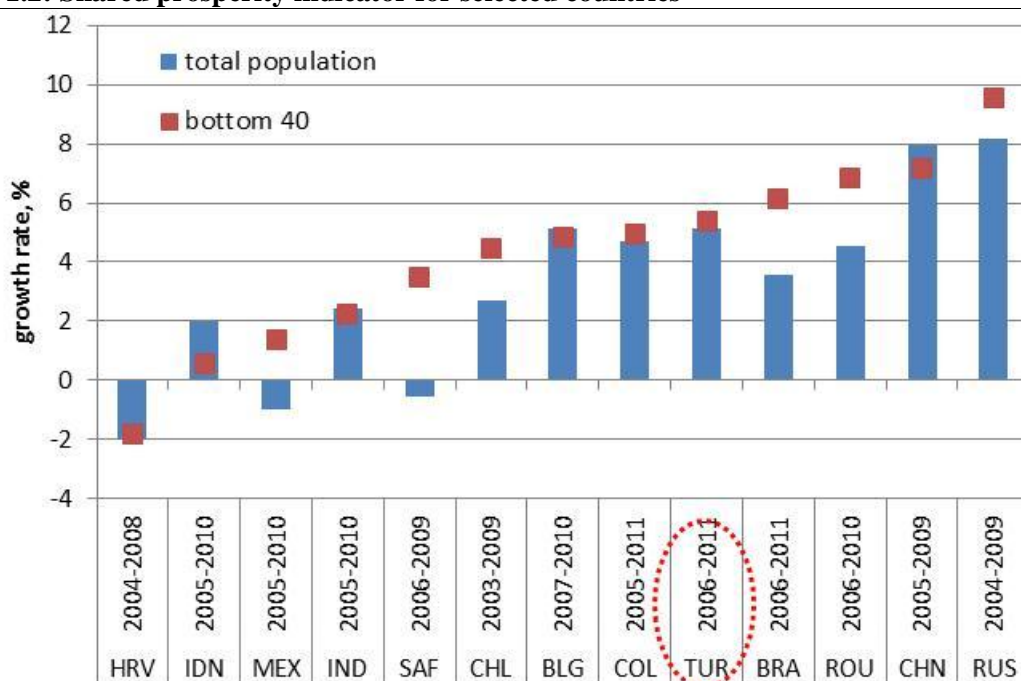
Source: WDI, authors' calculations.

Notes: GDP per capita in PPP, constant 2005 prices. Yearly average is calculated as geometric mean using the following formula $m = (\text{GDP}_{t2} / \text{GDP}_{t1})^{1/(t2-t1)} - 1$, where m is growth rate, t2 is second period, t1 is the first period. WDI data was accessed on the 16th of October 2013.

7. **Compared with other countries in the world, Turkey's performance during the growth periods was similar to what was observed in middle and upper-middle income countries and much better than what was observed in OECD and EU countries.** However, Turkey was hit much harder than upper middle income countries on average. The level of recession in Turkey during 2007-2009 was comparable and even higher than in EU and OECD countries with much higher levels of GDP per capita. The only country which experienced greater recession during 2007-2009 was Mexico.

8. **The benefits of economic growth were widely shared in Turkey.** The bottom 40 percent of the population benefited from the economic growth by as much as the average population (figure 1.2). Consumption of the bottom 40 percent (the indicator of “shared prosperity” used by the World Bank) of the population was positive during all sub-periods and across different welfare aggregates (see figure A.1 in the annex). Compared to other countries in the world, Turkey’s performance in shared prosperity was average and close to what was observed in Colombia and Bulgaria (figure 1.2).

Figure 1.2: Shared prosperity indicator for selected countries



Source: Provisional World Bank data on shared prosperity, as of October 25, 2013. Welfare aggregate is consumption per capita including durables, health and rent.

Notes: Shared prosperity is measured as annualized consumption per capita growth of the bottom 40 percent of the population. Annualized average is calculated as geometric mean.

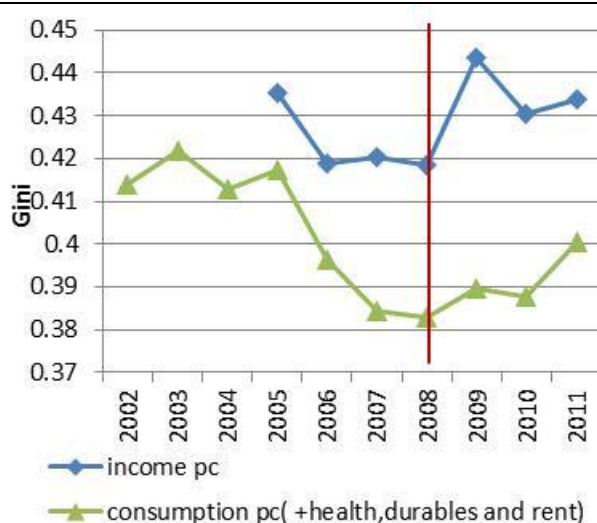
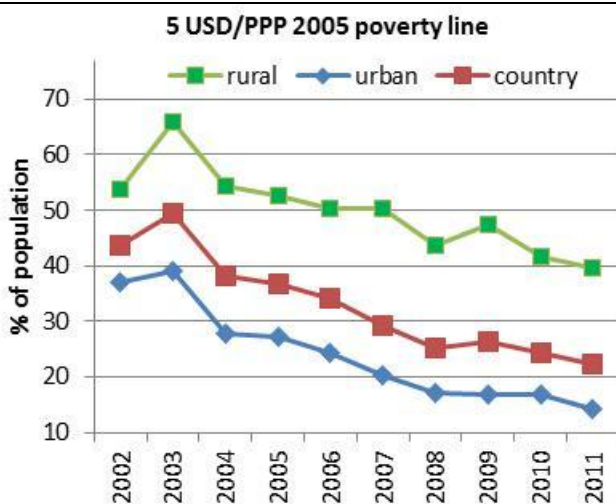
9. **The country has demonstrated a strong performance in poverty reduction during 2002-2011.** Poverty (defined using the regional 5 USD/PPP 2005 per day poverty line) declined by 22 percentage points during 2002-2011, falling from 44 percent to 22 percent. Most of this poverty reduction (89%) has been driven by growth, a performance consistent with most ECA countries. This is substantially different from the recent performance of other regions, such as Latin America, where redistribution contributed to poverty reduction almost four times more than in Turkey (Azevedo et al., 2013). Benchmarking Turkey’s performance in poverty reduction between 2008-2011 shows that its conditional performance controlling for initial poverty level, contemporaneous global growth and country’s growth during this period has been systematically higher than its unconditional performance. This means that Turkey’s performance has been better than its expected value given a set of observable characteristics.²

² Detailed explanation of the method and results is the fourth section of the report.

Figure 1.3: Poverty and inequality in Turkey, 2002-2011

a) Poverty rates, rural and urban

b) Gini coefficient, consumption and income per capita



Source: Authors' calculation based on ECAPOV data.

Notes: Poverty line is 5 USD/PPP per day. Welfare aggregate is consumption per capita including health, durables and rent.³

Source: Authors' calculation based on ECAPOV data.

Notes: Welfare aggregate is consumption per capita including health, durables and rent.

10. **The recession of 2007-2009 did not change drastically the observed patterns in poverty reduction.** In spite of a sharp economic downturn in 2008 and 2009, poverty increased only marginally in 2009 and average consumption growth of the bottom 40 percent of the population was still positive during 2007-2009. More worrisome is that the period after the crisis (2008-onwards) is marked by a gradual increase in inequality (figure 1.3b).

11. **Currently, the level of poverty in Turkey is similar to what is observed in several other upper-middle income countries in the ECA region.** For example, the poverty rate (defined using 5 USD/PPP 2005 per day poverty line) in Turkey in 2011 (22%) was higher than in Bulgaria in 2007 (17%) and lower than in Romania in 2011 (35%). Poverty continues to be higher in rural areas in Turkey and rural poverty reduction was lagging behind urban areas. With regards to inequality, Turkey performs as countries with the lowest inequality in Latin America and Caribbean region (LAC) and as countries with the highest inequality in the European Union (see figure A.2 in the annex).

Intra-generational (class) mobility in Turkey

12. **In parallel with a shrinking number of the poor, widely shared and systematic increases in welfare led to a significant expansion of the middle class in Turkey during 2002-2011.** The size of the

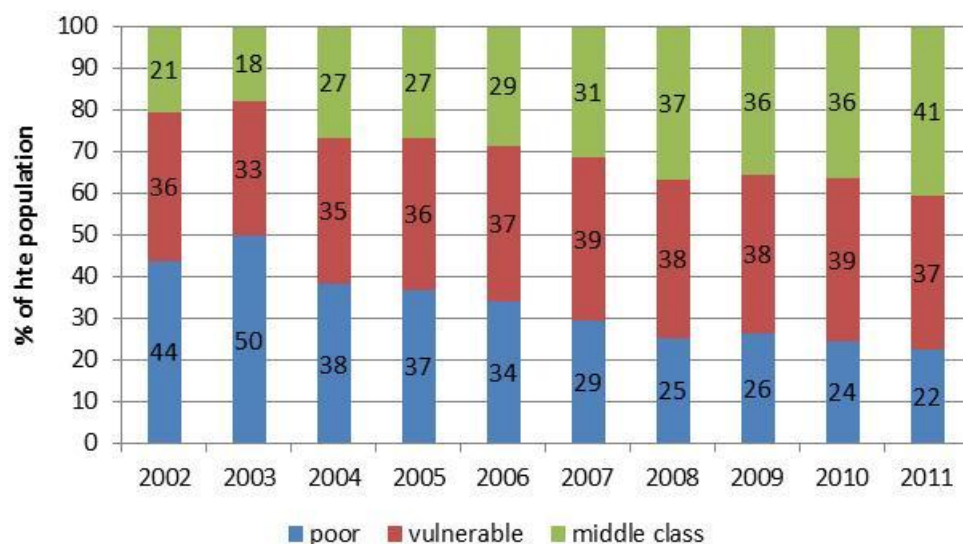
³ Consumption per capita instead of consumption per adult equivalent is used to allow cross-country comparability. In addition, there is a lot of discussion among research community and poverty economists which parameters to use for equivalence scale since this may have a substantial impact on poverty estimates. We checked the stochastic dominance of consumption per adult equivalent (modified OECD scale) over consumption per capita (see table A1). For all years, consumption per adult equivalent has first and second order dominance over consumption per capita. In other words, poverty based on consumption per capita will be always higher than poverty based on consumption per adult equivalent for any poverty line.

middle class (defined using the international 10 USD/PPP 2005 line following the Lopez-Calva and Ortiz-Juarez, 2011 also used in Ferreira et al, 2013) in Turkey doubled during 2002-2011 from 21 to 41 percent. The size of the vulnerable group (defined as population with consumption per capita between 5 and 10 USD/PPP 2005) increased from 36 to 37 percent of the population. Large changes occurred with the group of poor people which declined from 44 to 22 percent of the population respectively (figure 2.1).⁴

13. **Rural residents are more likely to be poor, while urban residents are more likely to be in the middle class.** As shown in tables A.3ab in the annex, the chances of being in the middle class are twice as high for urban as for rural residents, while rural poverty is higher than urban poverty. Nevertheless, due to the urbanization process observed in Turkey, in absolute terms most of the poor, vulnerable and the middle class are concentrated in urban areas.

14. **Upwards class transitions prevailed during 2002-2011.** Table 2.1 presents the upper bound for the mobility matrix showing how much of the population shifted across different classes during this time period. The least conservative estimates (upper bound) show that from 2002-2011, 40 percent of the poor moved to the vulnerable group, and 20 percent of the poor and 40 percent of the vulnerable group moved to the middle class. During this time, only 6 percent of the middle class fell into the poverty, thus making the middle class the most stable of all three categories. The magnitude of movement changes if more conservative lower bound estimates are used, but qualitatively the story remains the same: the absolute majority of those that moved out of poverty did not fall back (see table A2 in the annex). The same applies for those that moved out of the vulnerable group.

Figure 2.1: Poor, vulnerable and middle class in Turkey during 2002-2011, %⁵



Source: Authors' calculation based on ECAPOV data.

⁴ We could potentially try to distinguish top earners (households with consumption per capita higher than 50 USD/PPP 2005 per day) from the middle class, but since household budget surveys are not particularly good at capturing top earners (less than 1 percent of population in Turkey in 2011 had consumption per capita higher than this threshold) we have not done this.

⁵ The size of different classes based on income per capita is presented in figure A.3 in annex.

Notes: Welfare aggregate is consumption per capita including health, durables and rent. Thresholds used are 5 and 10 USD/PPP 2005 per day.

Table 2.1: Mobility matrix, 2002-2011, upper bound

	Origin	Percentage moving to 2011			Total
	(In 2002)	Poor	Vulnerable	Middle Class	
Poor	43	40	40	20	100
Vulnerable	37	17	42	40	100
Middle class	20	6	26	68	100
Total	100	22	38	40	100

Source: Authors' calculations based on ECAPOV data.

Notes: transition matrix is based on a synthetic panel for 2002-2011. Welfare aggregate is consumption per capita including health, durables and rent. Sample: heads of household 25-55 years of age. Detailed results of the regression predicting consumption per capita are presented in table A.2 in the annex. Methodological details are presented in Annex A2.

15. **Strong upward mobility is observed in urban areas, while chances of falling into poverty are much higher for rural residents.** Tables A.3ab in the annex show upper bound mobility matrixes for urban and rural areas. The poor in urban areas have non-negligible chances to move to the middle class and low chances to fall back to poverty: 25 percent of the poor in 2002 moved to middle class and only 5 percent moved back to poverty in 2011 in urban areas. In contrast, the rural poor have lower chances to move up to the middle class and higher chances to fall back to poverty. Namely, 14 percent of poor rural residents in 2002 moved to the middle class in 2011 and 16 percent of the middle class shifted back to poverty in 2011. This is not counterintuitive taking into account the nature of income generating activities in rural areas with agricultural playing an important role.

16. **Age, education and labor force status seem to be important predictors for economic classes.** Table A.5 contains the shares of poor, vulnerable and the middle class in population with different individual characteristics. As have been already said, urban residents have much higher chances to be in the middle class than rural residents. Individuals with tertiary education have the highest chances to be in the middle class. Children of age 5-15 have highest chances to be in poverty, while the retired population, especially those between 50-65 years has the highest chances to join the middle class. As will be further shown pensions (both increase in size and coverage) played a very important role for welfare improvement of all groups in the population.

17. **Consistent welfare improvement is also observed for the bottom 40 percent of the population.** As shown in table 2.2, there was a churning in the bottom 40 percent of the population in Turkey during 2002-2011.⁶ Between 14 and 42 percent (depending on upper or lower bound of estimate) of the population in the bottom 40 percent in 2002 moved to the top 60 percent in 2011, while 9 to 28 percent of the population in top 60 percent moved to the bottom 40 percent. However, in spite of all churning, overall mobility was positive. Figure 2.2 helps to unpack the shared prosperity growth into two components: (i) the average consumption of those households staying in the bottom 40 percent during two

⁶ Box 1 explains potential scenarios for churning of the bottom 40 percent of the population.

periods (persistent group) and (ii) the average consumption of those who moved out of (graduates) or into (entrants) the bottom 40 percent. As illustrated in figure 2.3, there is an average welfare improvement in the persistent group of the population staying in the bottom 40 percent during two periods. Moreover, entrants have a higher average consumption per capita than graduates (see Box 1 for definitions). Overall, this led to welfare gains across the whole distribution and positive consumption growth among the bottom 40 percent of the population.

Table 2.2: Mobility matrix for the bottom 40 and top 60 percent of the population

a) Upper bound				b) Lower bound			
2011				2011			
2002	Top 60	Bottom 40	Total	2002	Top 60	Bottom 40	Total
Top 60	43	17	60	Top 60	54	6	60
Bottom 40	17	23	40	Bottom 40	6	34	40
Total	60	40	100	Total	60	40	100

Source: Authors' calculations based on ECAPOV data.

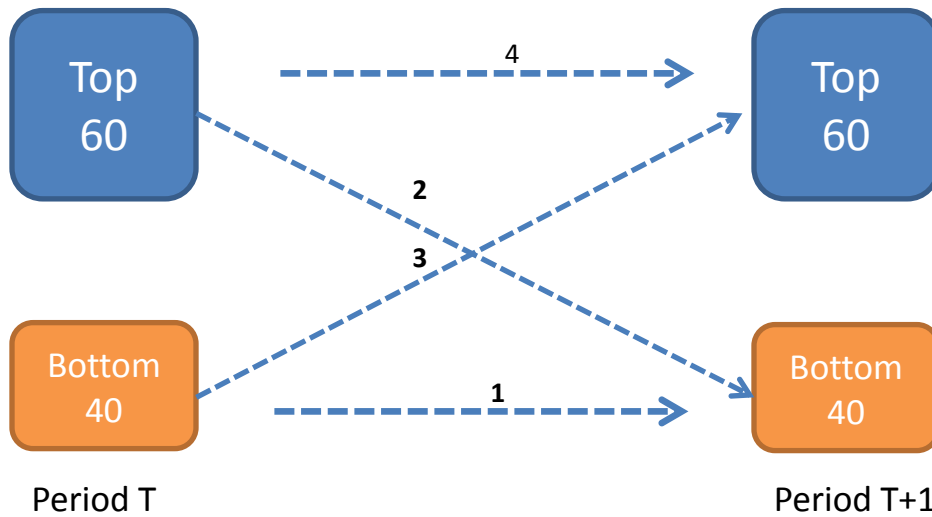
Notes: Transition matrix is based on a synthetic panel for 2002-2011. Welfare aggregate is consumption per capita including health, durables and rent. Sample: heads of household 25-55 years of age. Detailed results of the regression predicting consumption per capita are presented in table A.2 in the annex. Methodological details are presented in Annex A2.

Box 1. Churning in the bottom 40 percent of the population

The shared prosperity indicator, which measures consumption per capita growth of the bottom 40 percent of the population is an anonymous indicator. In other words, there is no guarantee to observe the same individuals in the bottom 40 percent of the population across years. In particular, several potential scenarios may occur. First, individuals can be the same in the bottom 40 percent in two periods [(1) in Figure 2.2]. Second, individuals from the bottom 40 percent in the first period can move to the top 60 percent in the second period (graduates) [(2) in Figure 2.2]. Third, individuals from the top 60 percent of the population in period one can move to the bottom 40 percent in the period two (entrants) [(3) in Figure 2.2]. The fourth scenario, in which the population in the top 60 percent is the same across periods, is not relevant to this analysis of the bottom 40 percent [(4) in Figure 2.2]. The overall impact of churning will depend on the magnitude of these movements.

There are several options to see the described scenarios. The first option is to track the mobility of people using panel data. This will allow tracking the same people over a particular period. The second option is to use a synthetic panel approach based on repeated cross-sectional data (see annex A2 for more details of this methodology). This provides an opportunity to predict the consumption of households in the first period using information about their consumption in the second period and permanent household characteristics. In this paper, the second approach is used.

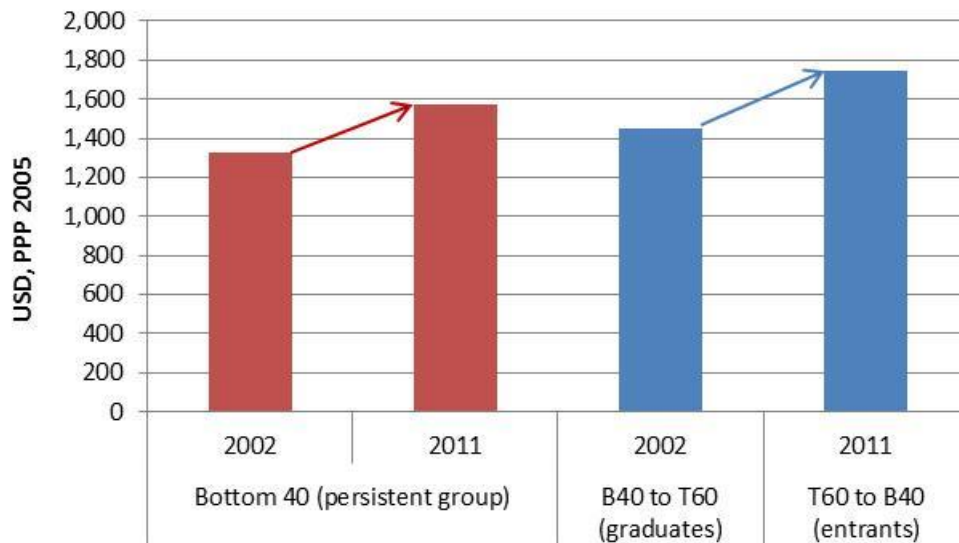
Figure 2.2: Churning in the bottom 40 percent of the population



Source: Authors' drawing.

18. **The population from the bottom 40 percent improved their individual and household characteristics during the last decade.** People from the bottom 40 are more likely to live in rural areas and to be less educated. They live in households with higher dependency ratios and tend to be self-employed. At the same time, during the last decade, people in the bottom 40 became more educated, more urbanized and shifted from self-employment to wage employment (see tables A.5 and A.6 in the annex). These positive changes helped them to benefit from economic growth.

Figure 2.3: Average consumption per capita in different groups in the bottom 40 percent of the population, upper bound

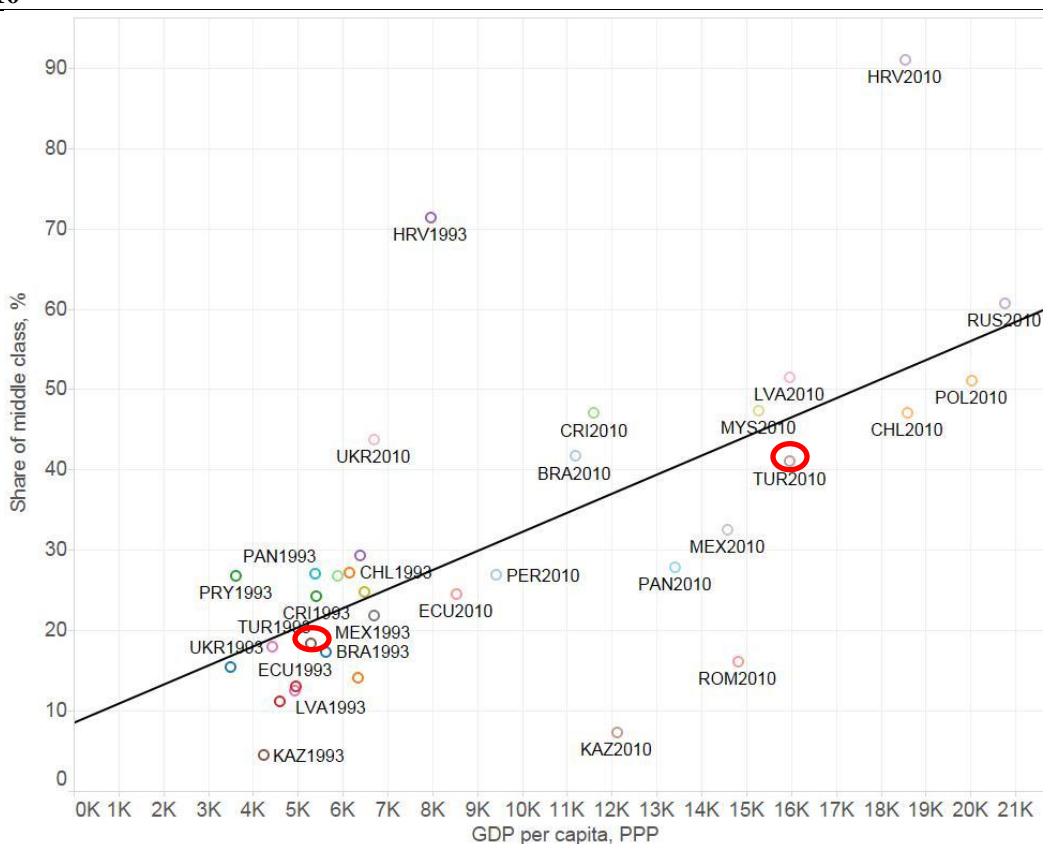


Source: Authors' calculation based on ECAPOV data.

Notes: Welfare aggregate is consumption per capita including health, durables and rent.

19. **In spite of all progress in intra-generational mobility, compared to the size of the middle class in other countries, Turkey is still lagging behind given its level of economic development.** Figure 2.4 compares the size of the middle class across selected countries in the world given their GDP per capita in PPP terms in two periods of time (circa 1993 and 2010). Despite a rapidly growing middle class, Turkey is still behind several countries with similar levels of economic development. For example, in 2010 the middle class in Turkey comprised 42 percent of the total population, compared to 47 percent in Malaysia and Chile and 52 percent in Latvia.

Figure 2.4: Share of the middle class and GDP per capita in PPP in selected countries, circa 1993 and 2010



Source: Authors' calculations based on POVCALNET: the on-line tool for poverty measurement developed by the Development Research Group of the World Bank. <http://iresearch.worldbank.org/PovcalNet/index.htm>

Notes: thresholds for middle class with consumption per capita above 10 USD/PPP. Each country has its own time period for the middle class depending on data availability. Middle class for Turkey in 2010 is based on 2011 data from ECAPOV with welfare aggregate including health, durables and rent.

II. Determinants of poverty reduction and intra-generational mobility

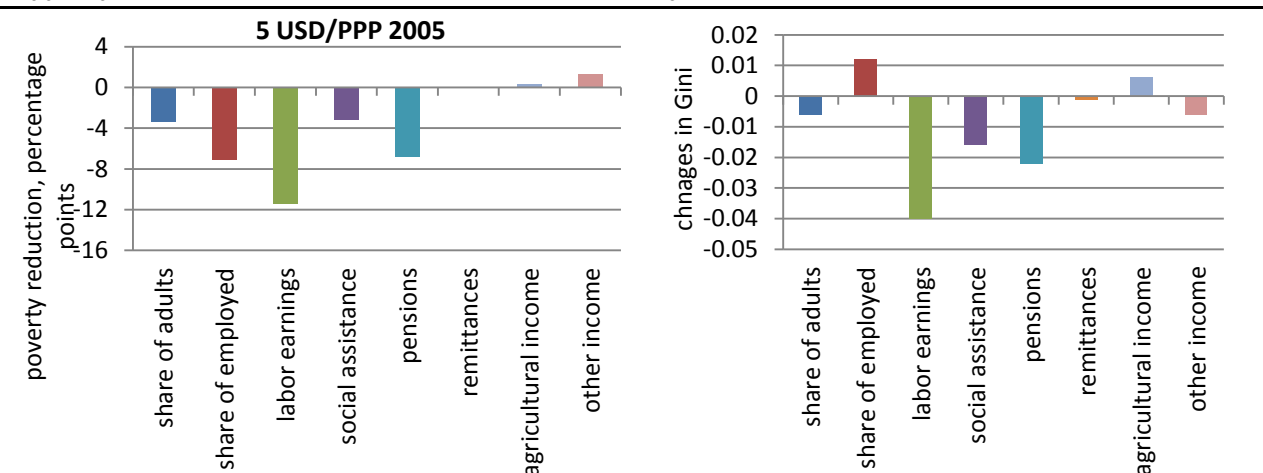
20. **This section shifts from stylized facts about poverty, inequality and shared prosperity to the analysis of determinants of observed changes in wellbeing and intra-generational mobility.** Income poverty decompositions are used to quantify the contribution of different factors to changes in welfare and inequality across classes, areas and gender. Having identified the labor market's contribution as the most important driver of poverty reduction in Turkey, we explore the mechanisms behind this impact.

2.1 Drivers of changes in poverty, inequality and intra-generational mobility

21. **The labor market was the most important factor driving poverty reduction in Turkey in the 2000s.** As income and consumption poverty trends are very similar in Turkey, an income poverty decomposition was used to quantify the contribution of different factors to poverty reduction (see figure A.4 in annex). As shown in figure 3.1, overall income poverty declined by 30 percentage points between 2002-2011 years. Labor market (earnings and added worker effect⁷) was responsible for 18 percentage points of this reduction, making it the largest single contributing factor. The role of pensions was important as well, accounting for 7 percentage points, with demographics (share of adults) and social assistance each accounting for 3 percentage points of poverty reduction.

22. **The relative contribution of different factors to poverty reduction is not the same across urban and rural areas.** Social assistance, pensions and added worker effect played a more important role in rural areas in relative terms. For example, pensions were responsible for more than one third of poverty reduction in rural areas compared to 20 percent in urban areas. In contrast, labor earnings played a more important role in urban areas. Thus, labor earnings were responsible for 42 percent of poverty reduction in urban areas compared to 28 percent in rural areas (figure 3.3).

Figure 3.1: Income poverty decomposition, 2002-2011 **Figure 3.2: Income Gini decomposition, 2002-2011**



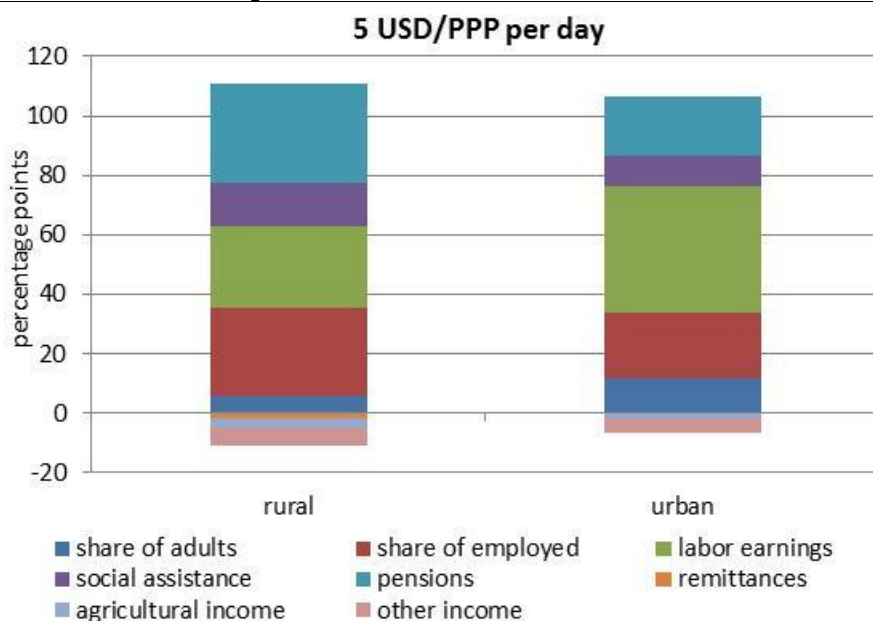
Source: Authors' calculation based on ECAPOV data.
Notes: Poverty line is 5 USD/PPP per day. Welfare aggregate is income per capita. Methodological details are presented in

Source: Authors' calculation based on ECAPOV data.
Notes: Welfare aggregate is income per capita. Higher Gini means higher inequality. Methodological details are presented

⁷ The added worker effect (share of employed) measures the impact of having household members with non-zero labor income.

23. **Drivers of poverty reduction differ across economic classes with labor earnings, social assistance and pensions playing a more important role for the vulnerable, poor and the bottom 40 percent of the population.** Contributions of different factors to economic wellbeing across poor, vulnerable and middle class groups are presented in figure 3.4ab. The labor market continues to be the most important factor for all classes, but with a different magnitude. In particular, labor earnings were more important for the poor and vulnerable, while the added worker effect was more important for the middle class. Consistent with these findings, decomposition of income growth by sources shows that social assistance, pensions and labor earnings are more important for the bottom 40 percent of the population.

Figure 3.3: Sources of welfare improvement across urban and rural areas in 2002-2011, %



Source: Authors' calculation based on ECAPOV data.

Notes: Welfare aggregate is income per capita. Negative share means negative contribution to welfare. Methodological details are presented in Annex A3.

24. **During 2007-2009 labor earnings were the main transmission mechanism for the negative effect of the economic crisis, but were counterweighed by employment and social assistance effects.** Income poverty decomposition by different sub-periods shows that during the crisis period of 2007-2009, wages contributed to an increase in poverty (see figure A.5 in annex). At the same time, this impact was counterweighed by a positive added workers effect (families probably had stronger incentives to have other members entering the labor markets) and by the existing social assistance packages.

25. **The contribution of the labor market to inequality reduction is rather mixed.** In contrast to poverty reduction, from the labor market only earnings lead to decreases in inequality (figure 3.2). The added worker effect increased the Gini during 2002-2011 which is consistent with higher contribution of employment to welfare improvement of the middle class. One possible explanation for this fact is that the

poor could not benefit as much from the increase in formal jobs (structural changes are discussed further in section 3.2) because of entry barriers such as good education, networks and so forth.⁸ Besides wages, pensions were the second most important equalizing factor during the considered period. The share of adults in the household and social assistance also contributed to the reduction of the Gini coefficient.

Figure 3.4a: Sources of welfare improvement across classes in 2002-2011, %

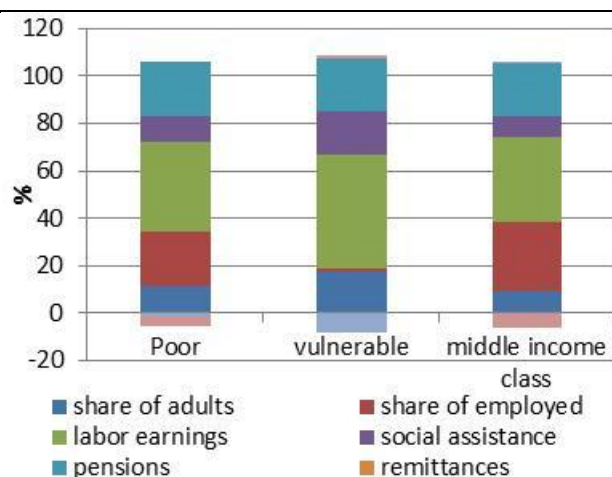
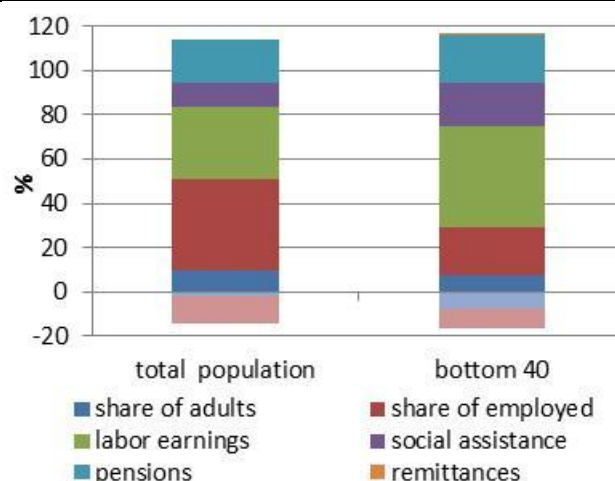


Figure 3.4b: Sources of welfare improvement for the bottom 40 percent of the population in 2002-2011, %



Source: Authors' calculation based on ECAPOV data.

Notes: Welfare aggregate is income per capita. Negative share means negative contribution to welfare. Thresholds for poor, vulnerable and middle class are 5 and 10 USD/PPP 2005 per day. Methodological details are presented in Azevedo and Nguyen (2014).

26. **The contribution of women to poverty and inequality reduction was very limited.** Income poverty decomposition across gender demonstrates that female contribution to poverty reduction through the labor market, share of adults and pensions was much lower than that of males (figure 3.5). Moreover, both female earnings and added worker effects were inequality increasing (figure 3.6). This may be related to the fact that women with better education benefit from entering the labor market and earning higher wages. One possible explanation of lower contribution of the share of female adults to poverty reduction is that women tend to get married earlier than men and leave the household. In addition, there was a tendency for men to enter marriage at a later age (see figure A.7 in annex).

⁸ This hypothesis is supported by the findings from Grun et al. (2013) showing that in the post-crisis period most of the jobs were formal jobs requiring university education.

Figure 3.5: Income poverty decomposition by gender, 2002-2011

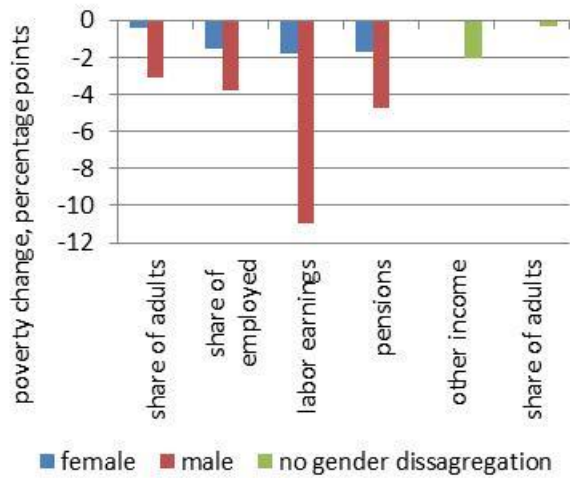


Figure 3.6: Income Gini decomposition by gender, 2002-2011

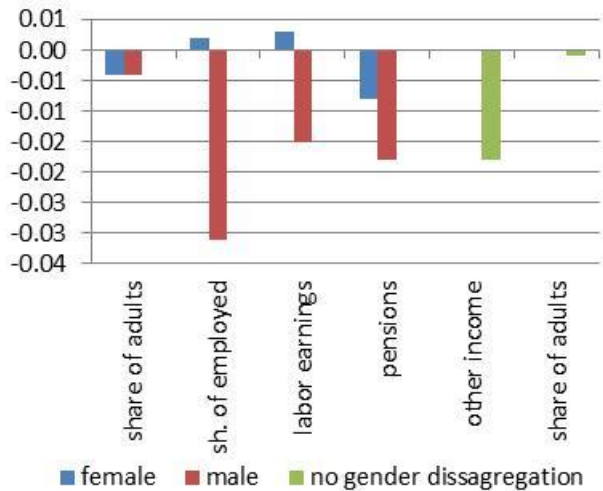


Figure 3.7: Income poverty decomposition by gender and public/private wages, 2002-2011

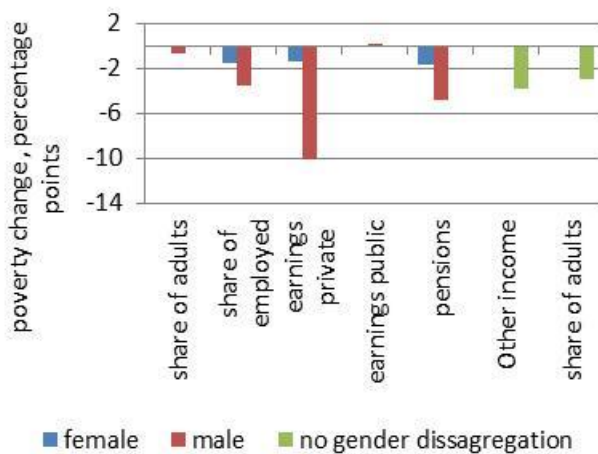
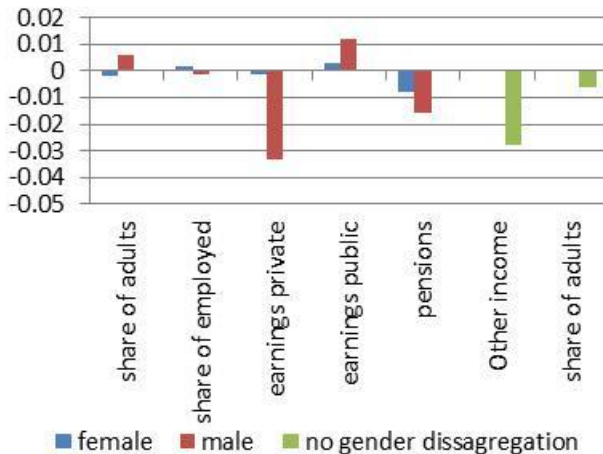


Figure 3.8: Income Gini decomposition by gender and public/private wages, 2002-2011



Source: Authors' calculation based on ECAPOV data.
Notes: Poverty line is 5 USD/PPP per day. Welfare aggregate is income per capita. Methodological details are presented in Annex A3.

Source: Authors' calculation based on ECAPOV data.
Notes: Welfare aggregate is income per capita. Methodological details are presented in Annex A3.

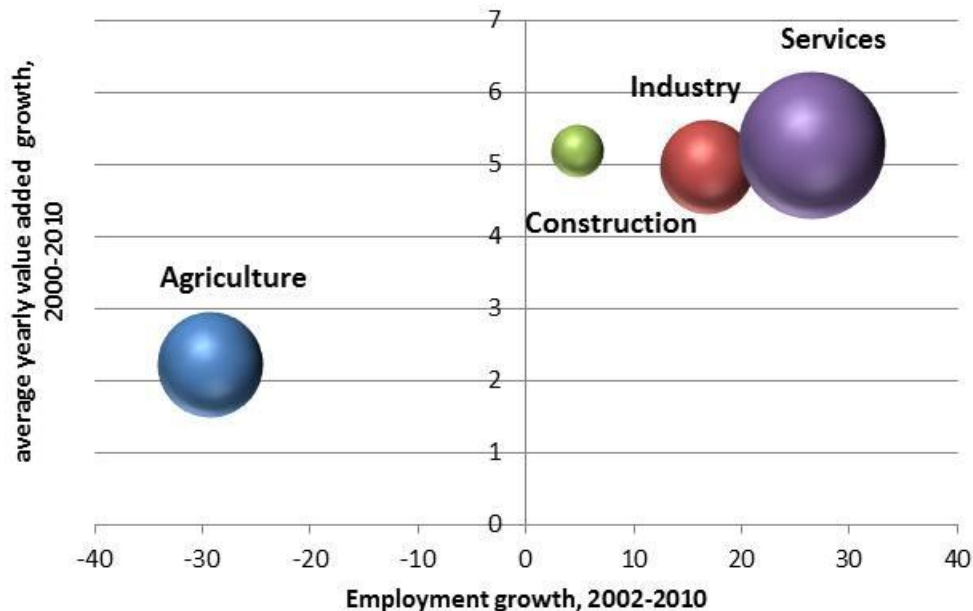
27. **The absolute majority of poverty reduction from earnings came from the private sector.** Income poverty decomposition by gender and public/private division of earnings presented in figure 3.7 shows that poverty reduction is associated only with private earnings and not with public earnings. In addition, public wages had an un-equalizing impact both for women and men (figure 3.8).

28. **Both coverage and size were important factors behind poverty reduction effect from pensions.** As shown in figure A.8 in the annex, increase in the share of pensioners and higher size of pensions played almost equal role for poverty reduction during 2002-2011: 3 and 4 percentage points respectively. This is in line with findings from World Bank (forthcoming) showing the pension contributions were growing since 2000 with increasing coverage. The share of social spending in GDP in Turkey was shown to be high given demographic structure with large and young working population. As a result, the size of pension benefits as percentage to economy wide average earnings were on the second place after New Zealand in the OECD.

2.2 Mechanisms of poverty reduction in the labor market

29. **There were substantial structural changes in the Turkish economy during 2002-2010.** As shown in figure 3.9, there was a drastic shift from agricultural employment to industry and services. Moreover, average economic growth in the agricultural sector was lagging behind economic growth in construction, industry and services. These structural changes enhance economic growth because labor productivity in agriculture in Turkey was the lowest of all sectors (Grun et al., 2013).

Figure 3.9: Employment creation and economic growth by sectors, %



Source: Authors' calculations based on LFS data and Turkish Statistical Institute.

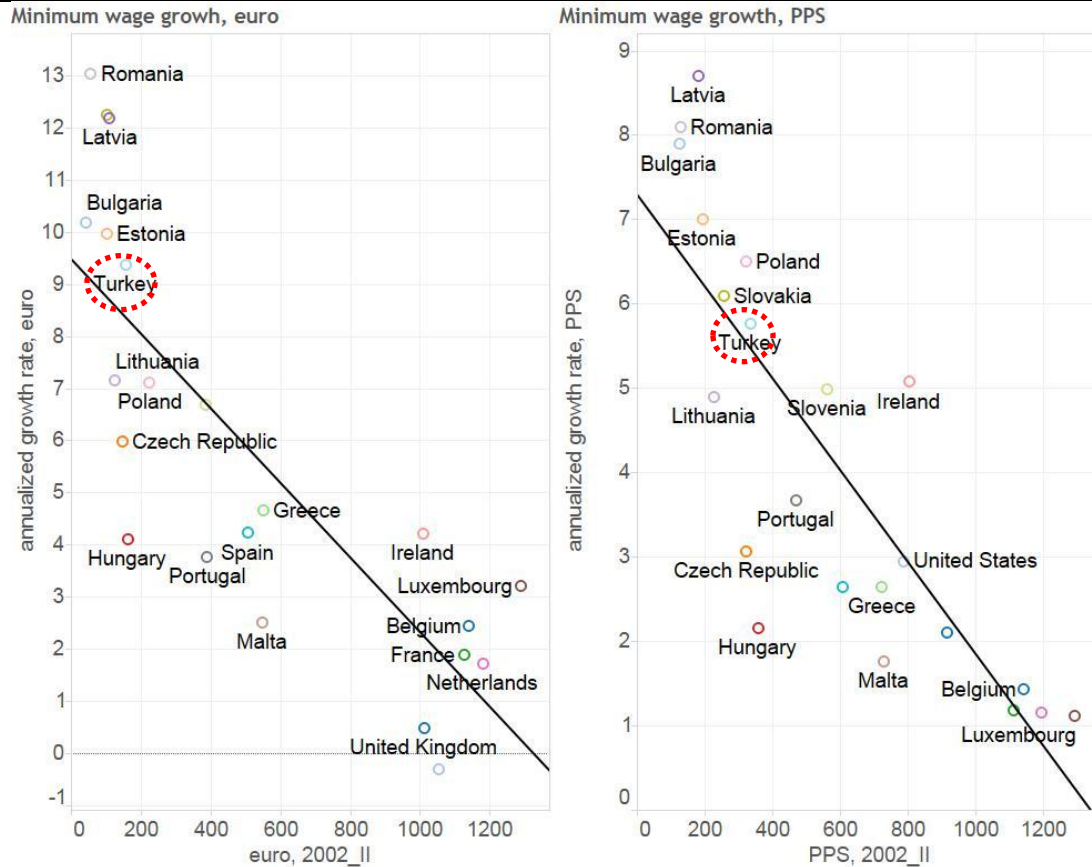
Notes: Size of the bubble shows the number of employed.

30. **Structural changes were supplemented by significant growth in the minimum wage.** One of the explanations for the importance of labor earnings in poverty reduction may stem from the increase in the minimum wage in Turkey. As shown in figure 3.10, the growth in the minimum wage in Turkey during 2002-2011 was substantial in comparison with other European countries whether measured in Euros or in purchasing power parities. There is evidence that the minimum wage in Turkey may be binding at least in the formal sector (see World Bank, 2013b) and it is high relative to average wages if

compared with other OECD countries (see Figure A.10). Hence, increases in the minimum wage can affect average earnings, both directly (increased earnings for minimum wage earners) and indirectly (by anchoring all wages at a higher new level). At the same time, the high minimum wage may also lead to greater informality, so the ultimate effect on household incomes is ambiguous.

31. **Structural changes in the economy led to more formal employment, but women did not benefit as much from this as men.** The expansion of the service and industrial sectors shifted employment from self-employment to more formal wage employment. This is consistent with the falling share of workers reporting zero earnings (especially pronounced for women). In spite of these positive changes, female labor force participation remains low, so only a small portion of women can benefit from these improvements. As shown in figure 3.13, female labor force participation in Turkey was about 28 percent in 2011 which is much lower than in countries with similar GDP per capita (it has since increased to 31 percent, but is still low in comparison).

Figure 3.10: Growth rates in minimum wages across Europe, 2002-2011



Source: Authors' calculation using monthly minimum wages - bi-annual data from Eurostat as of 19.11.13.
 Notes: Growth rates are calculated using geometric mean for the second halves of the year.

32. **The supply of skills in the labor market has improved, but this was accompanied by declining returns to education and experience.** Workers became more educated in Turkey during 2002-2011. During this time, the share of workers with tertiary education increased for men from 10 to 16 percent and for women from 19 to 24 percent. Regarding returns to education and skills, they were declining for both men and women (figures 3.14-3.17). Further analysis is needed to identify the reason behind a decline, but this may negatively affect the sustainability of the positive changes in the labor market.

33. **The wage gap in favor of men slightly declined in Turkey, but still remains quite high.** In 2002, the unconditional gender wage gap was 97 percent and the conditional gender wage gap was 86 percent.⁹ After 9 years the conditional and unconditional gaps in earnings narrowed to 81 percent and the difference between them disappeared. This means that in 2011 the existing gender wage gap cannot be explained by the difference in observable characteristics between men and women and is associated with other factors.

Figure 3.11: Structure of employment +15, %

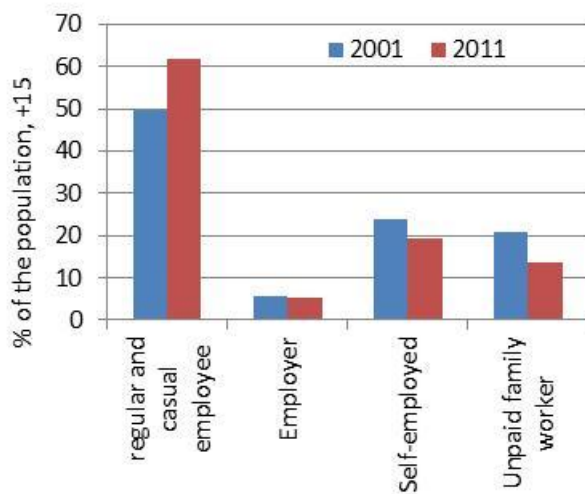
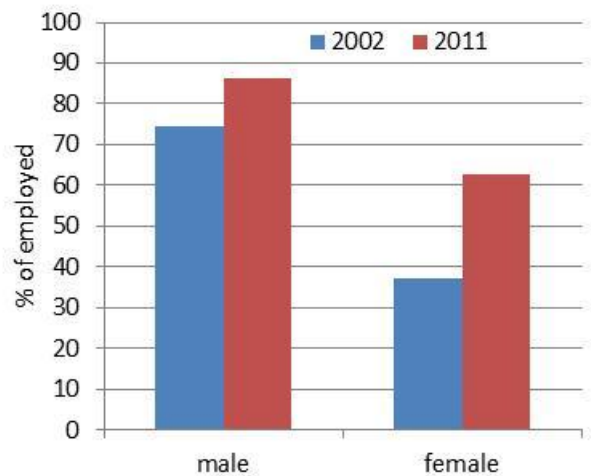


Figure 3.12: Share of workers with non-zero labor earnings, %

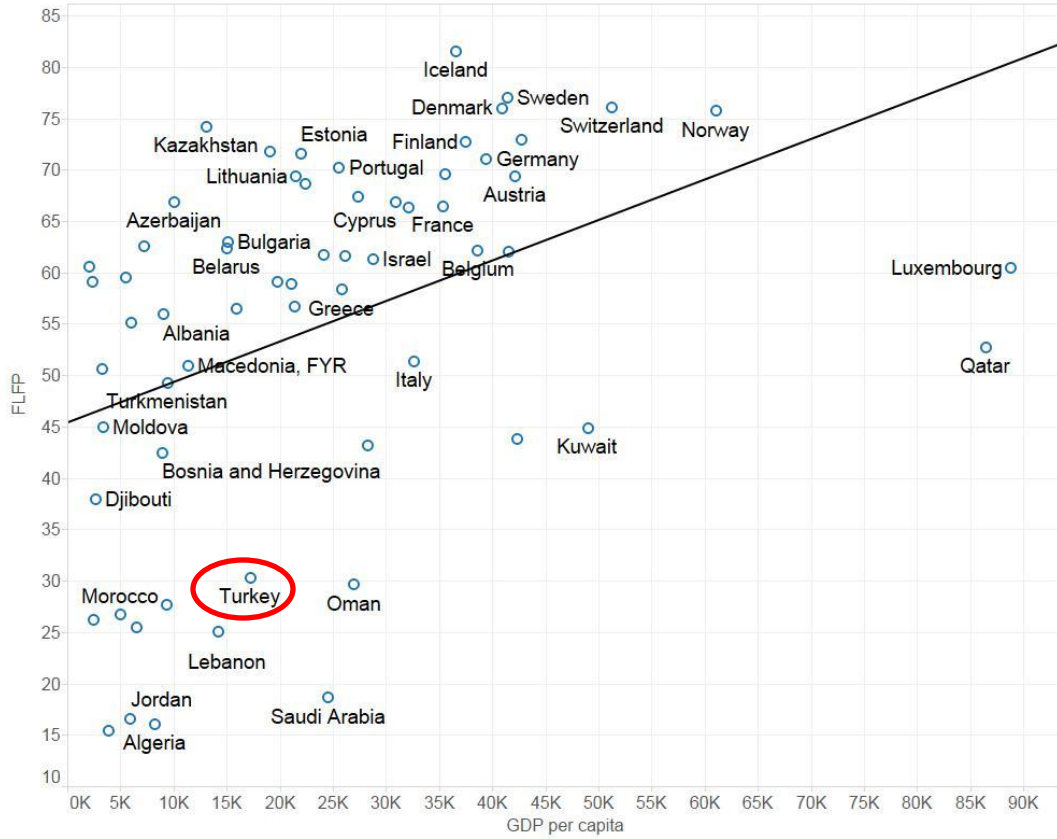


Source: Turkish Statistical Institute.

Source: Authors' calculation based on ECAPOV data.

⁹ Controls include education and experience.

Figure 3.13: Female labor force participation and GDP per capita across countries in 2011, %



Source: Authors' calculation, WDI.

Figure 3.14: Returns to experience for females, 2002-2011

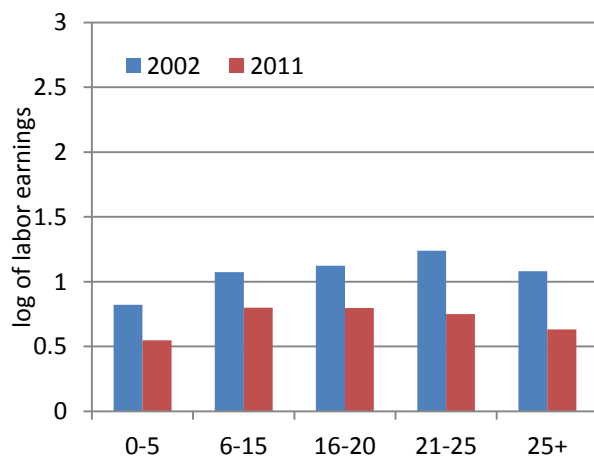
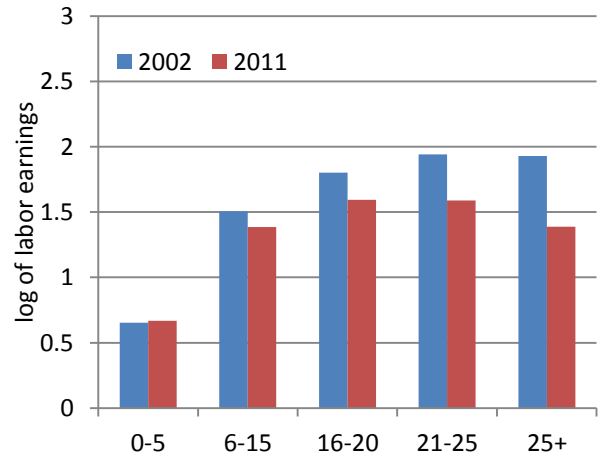


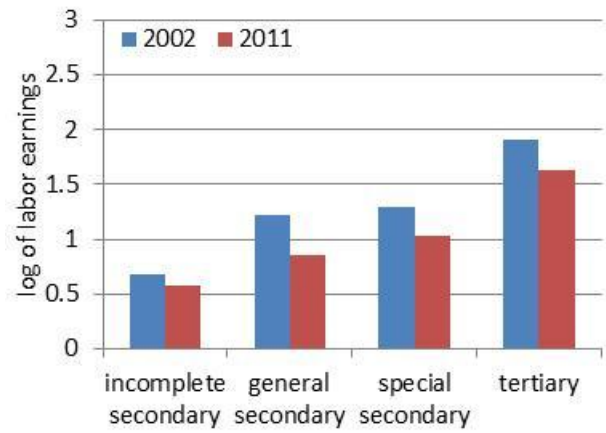
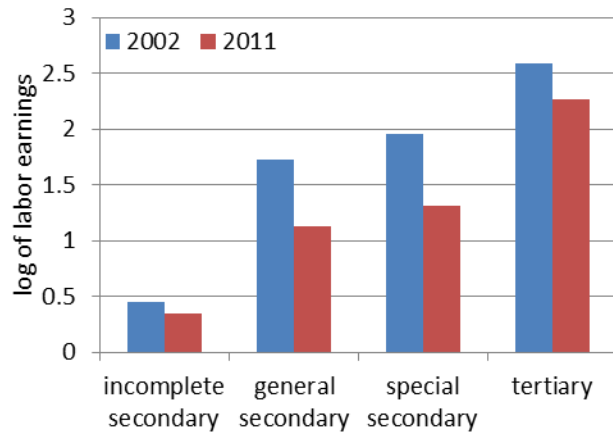
Figure 3.15: Returns to experience for males, 2002-2011



Source: Authors' calculation based on ECAPOV.

Notes: No experience is the base category.

Figure 3.16: Returns to education for females, 2002-2011 **Figure 3.17: Returns to education for males, 2002-2011**

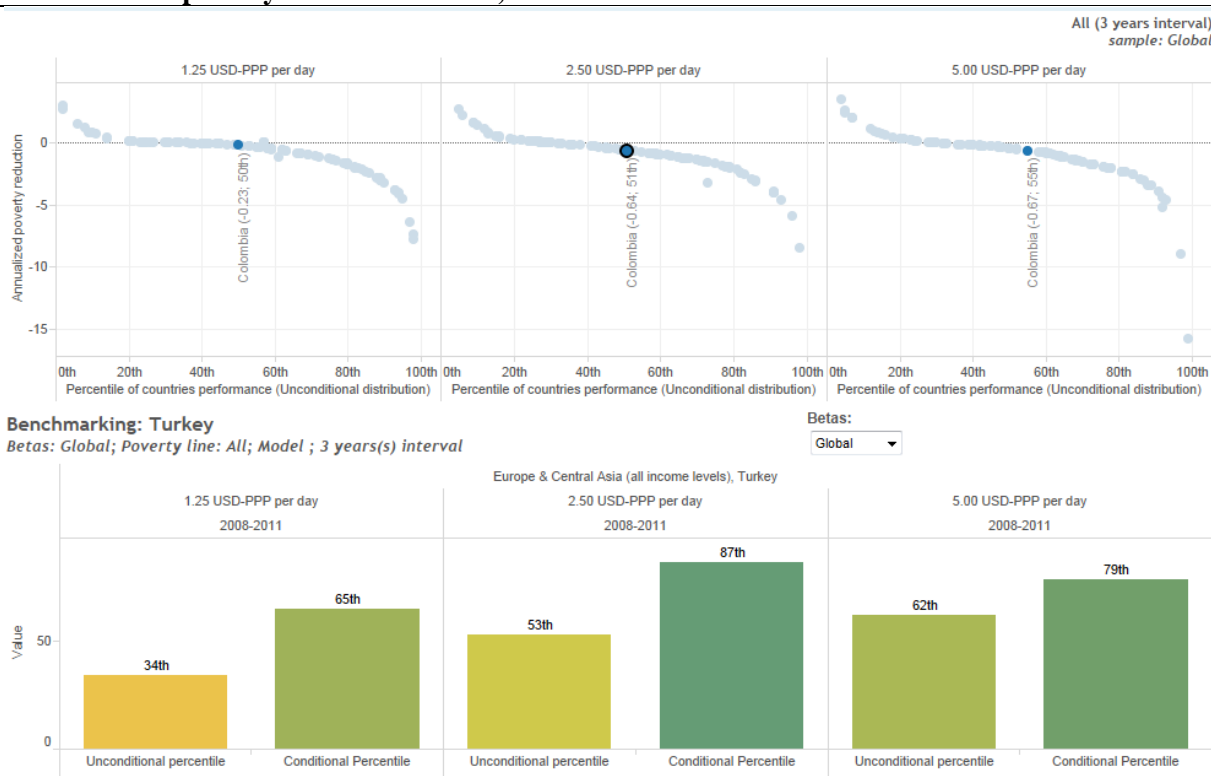


Source: Authors' calculation based on ECAPOV.
Notes: None/primary education is the base category.

III. Going forward

34. **Benchmarking Turkey’s performance in poverty reduction between 2008 and 2011 shows that its conditional performance has been systematically higher than its unconditional performance.** This means that Turkey’s performance has been better than its expected value given a set of observable characteristics, including initial poverty level, contemporaneous global growth and country’s growth during this period, in particular for the 2.5 USD-PPP poverty line (Figure 4.1). The question is whether or not Turkey has the conditions to continue on the same path with the same speed. Inclusive economic growth leading to a just society is hard to achieve without covering all segments in the society including the most vulnerable and the poorest. A society needs to be able to maximize human and productive potential regardless of exogenous circumstances such as gender, place of birth, parental background and so forth. This section briefly discusses challenges Turkey may encounter to reduce poverty and boost shared prosperity.

Figure 4.1: Benchmarking performance of Turkey in poverty reduction based on 1.25, 2.50 and 5 USD/PPP 2005 poverty line in 2008-2011, %



Note: Conditional variables: FGT0, GDP per capita, landlocked, fragility, global growth rate, country growth rate. Benchmarking methodology as described by Newman, John L., João Pedro Azevedo (2013) "Setting reasonable performance targets for public service delivery," Policy Research Working Paper Series 6385, The World Bank (<http://ideas.repec.org/p/wbk/wbrwps/6385.html>). Computation using Stata ADO benchmark by Minh Cong Nguyen and Joao Pedro Azevedo. Data: ECAPOV data was used to the ECA numbers for all other regions POVCALNET estimates extracted from WDI as of March 3rd 2014. Computation and visualization produced by Joao Pedro Azevedo and Minh Nguyen (ECA Team for Statistical Development). Computation using Stata ADO benchmark by Minh Cong Nguyen and Joao Pedro Azevedo.

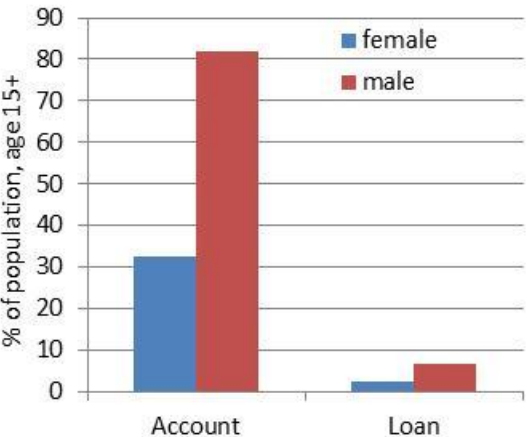
35. **The key to sustaining Turkey’s recent gains in poverty reduction and shared prosperity lies in the labor market.** Turkey has achieved remarkable success in creating new jobs after the Global

economic crisis and this has contributed to continued welfare improvements. However, given demographic changes Turkey will need to sustain the pace of job creation and increase productivity, all the more so, if more women start entering the labor market. Turks are getting better educated, and evidence suggests that returns to education in Turkey are still high. However, the decline in returns to education over the last decade is of concern, especially if it foreshadows difficulties among the youth to find jobs that match their skills. Creating good jobs is thus an enduring challenge for both growth and shared prosperity (Grun et al., 2013).

36. **As illustrated in this analysis, female labor force participation is very low in Turkey and female contribution to poverty and inequality reduction was rather limited.** According to Uraz et al. (2010), such a low level of female labor force participation can be associated with a combination of different supply and demand factors as shown by the following observations: (i) there is a large gap in earnings for low skilled men and low skilled women which reduces the incentive to join the labor market; (ii) urban low-skilled women face high opportunity costs of working because of the absence of affordable childcare; and (iii) urban low skilled women are less likely to work if the wealth of the household increases and the education of the head of household is higher. Increasing female participation in the economy could be one of the important factors for boosting shared prosperity and reducing poverty. Initially, more educated women and hence more middle class households will tend to benefit, but over time, rising female labor force participation and reduced inequalities in access to education should become equalizing forces. Policies in this area are thus important for growth as well as social inclusion.

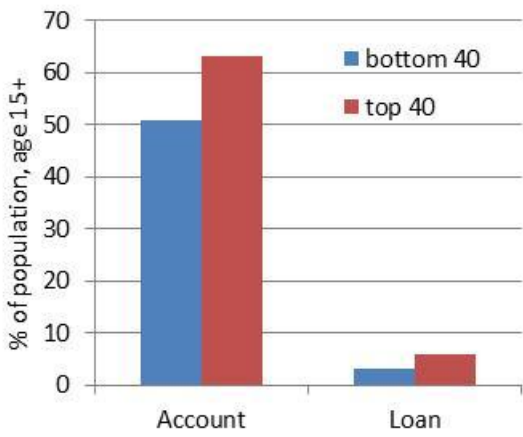
37. **Equal access to markets is one of the preconditions to sustainable and shared economic growth.** As data on financial inclusion demonstrates, access to financial services (measured by access to banking accounts and loans) is slightly higher in Turkey than the average for the ECA region. However, compared to the European Union (EU), access to financial services in Turkey is lagging behind. For example, 58 percent of the population older than 15 in Turkey has accounts in formal financial institutions. The average for ECA is 45 percent and 91 percent for the EU.

Figure 4.2: Access to financial institutions in Turkey, ECA and Euro area countries, % of population +15



Source: Findex.

Figure 4.3: Access to financial institutions in Turkey across groups with different level of income, % of population +15



Source: Findex.

38. **Unequal access to financial services among different groups is a more important problem than the level of financial intermediation per se.** There is a huge gender gap in access to banking accounts in favor of men. In particular, 82 percent of men older than 15 have access to financial accounts, compared to only 33 percent of women (figure 4.2). The gap also exists across groups with different level of income. Among the top 60 percent of the population, 63 percent have access to financial accounts in formal institutions, compared to only 51 percent among the bottom 40 percent (figure 4.3). Financial inclusion is thus an important policy agenda to sustain shared prosperity going forward.

39. **Further poverty reduction in Turkey will depend tremendously not only on intra-generational class mobility, but also on intergenerational mobility.** Hentschel et al. (2010) demonstrated that intergenerational transmission of inequity is powerfully affecting Turkey's youngest generation today. The authors show that circumstances, or factors any single person can do nothing about, are very important in determining life chances in Turkey. In particular, factors such as one's area of birth and parental education explain two-thirds of the inequality of opportunity related to the wealth distribution in the country. The socioeconomic background of families is an important factor driving inequality of opportunities in education as well. While Turkey has been making progress in reducing the importance of socio-economic background for education outcomes (see OECD, 2013), it still ranks among the countries in the OECD with the largest effect of these factors on individual achievement. Early childhood education and measures to improve the quality of education particularly in schools in disadvantaged regions and districts are important to sustain and accelerate recent improvements.

40. **Turkey will continue to benefit from demographic dividends, but after 2025 the situation will change dramatically.** As shown in figure A.9 in annex, Turkey has been benefiting from demographic window of opportunity since the 1980s. The share of children and elderly was declining, while the share of working age population was increasing and will be highest in the 2020s. However, once the window closes, Turkey will face the challenge of aging. While the elderly are not among those most likely to be affected by poverty (children are more at risk) and pensions in fact contribute significantly to income growth in the bottom 40 percent, the pension system is projected to continue to run significant deficits given a low effective retirement age and relatively generous replacement rates. Rising health care costs will add to the fiscal burden of aging. Encouraging longer working lives will be important to manage these costs as well as ensure resources can be concentrated on reducing vulnerability in old age.

41. Summing up, Turkey had a remarkable performance in reducing poverty and boosting shared prosperity. As a result, there was a strong upward intra-generational mobility expanding the size of the middle class in the country. The main drivers of these positive changes were coming from the labor market, social assistance and pensions. Nevertheless, continuing the same path will require addressing several challenges including: (i) improving access to markets with a focus on reducing gender and rural/urban gaps, (ii) increasing female labor force participation, and (iii) reducing intergenerational inequality by weakening the link between circumstances people cannot be held accountable for and socio-economic outcomes.

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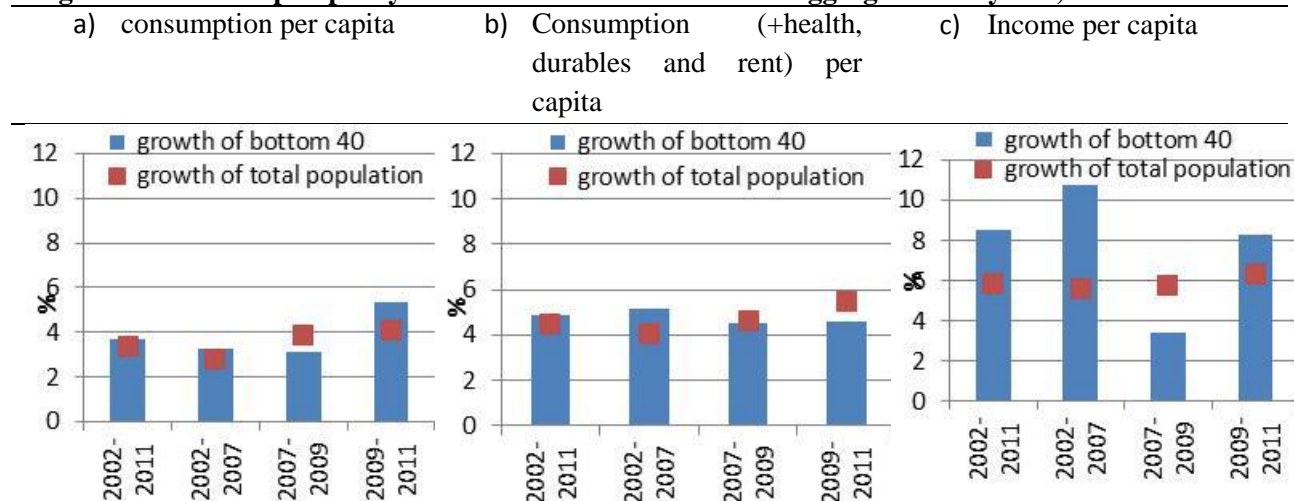
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Annexes

A1. Other figures and tables

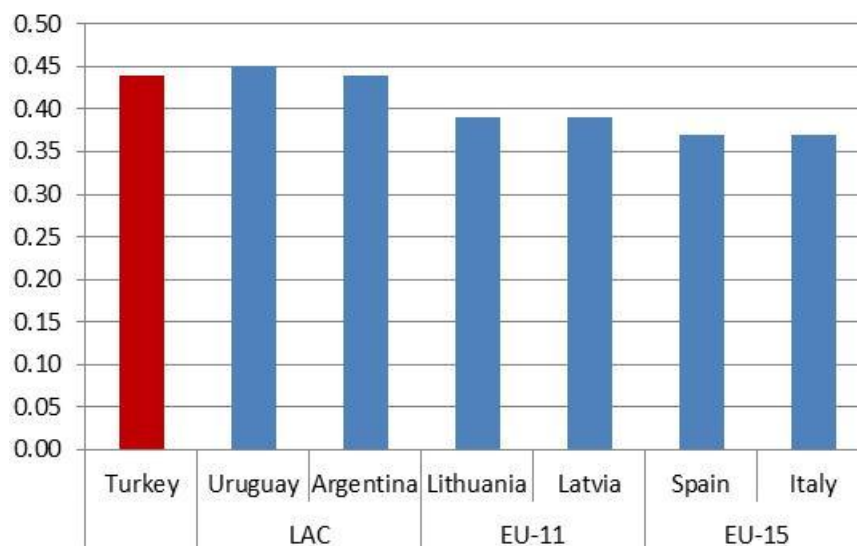
Figure A1: Shared prosperity indicator for different welfare aggregates and years, %



Source: World Bank Staff calculation based on ECAPOV.

Notes: Annualized growth rate is calculated using geometric mean.

Figure A2: Income per capita Gini for Turkey and selected EU and LAC countries



Source: ECATSD's calculations for ECA countries. For LAC countries the source is Azevedo, Davalos, Diaz-Bonita, Atuesta, Castaneda (2013).

Notes: For EU and Turkey the source is EU-SILC.

Table A.1: Summary of the distribution comparison for all years between 2002-2011

Comparison groups	Mean	Pen parade	Generalized Lorenz curve
Consumption per capita is compared with consumption per adult equivalent, 2002-2012	<i>below</i>	<i>below</i>	<i>below</i>

Source: World Bank Staff calculation based on ECAPOV.

Notes: Lower Pen parade means stochastic dominance of the first order. Lower Generalized Lorenz curve means stochastic dominance of the second order. Alorezn ado written by Joao Pedro Azevedo and Samuel Franco was used. To download it, within Stata type: "ssc install alorezn".

Table A.2: Consumption per capita model

	coefficient
Female head of household	-0.159***
Literate	0.107***
Primary	0.318***
Primary completed	1.673***
Secondary	0.462***
Vocational	0.616***
Lyceum	0.542***
Lyceum vocational	0.781***
2 years college	0.886***
4 years college	1.216***
Master	1.333***
Number of children below 6	-0.294***
Number of children 7-15	-0.260***
Number of children below 6, squared	0.016***
Number of children 7-15, squared	0.011***
Rural areas	-0.441***
Interactions of rural dummy and education	yes
Date of birth cohort	yes
Date of birth cohorts and education	yes

Rsq=0.41.7

Source: Authors' calculations based on ECAPOV data.

Notes: Welfare aggregate is consumption per capita including health, durables and rent. Sample: heads of household 25-55 years of age. Base category for education illiterate.

*** Significant at 1 percent.

Table A.3: Mobility matrix, 2002-2011, lower bound

	Origin (In 2002)		Percentage moving to 2011		Total
	Poor	Poor	Vulnerable	Middle Class	
Poor	43	58	41	0	100
Vulnerable	37	1	58	40	100
Middle class	20	0	2	98	100
Total	100	22	38	40	100

Source: Authors' calculations based on ECAPOV data.

Notes: transition matrix is based on a synthetic panel for 2002-2011. Welfare aggregate is consumption per capita including health, durables, and rent. Sample: heads of household 25-55 years of age. Detailed results of the regression used for prediction is presented in table A.1 in the annex.

Table A.4a: Mobility matrix for urban areas, 2002-2011, upper bound

	Origin		Percentage moving to 2011			Share of each group in total population in 2011
	(In 2002)	Poor	Vulnerable	Middle Class	Total	
Poor	39	29	46	25	100	58
Vulnerable	37	12	42	46	100	72
Middle class	24	5	25	69	100	91
Total	100	15	38	47	100	72

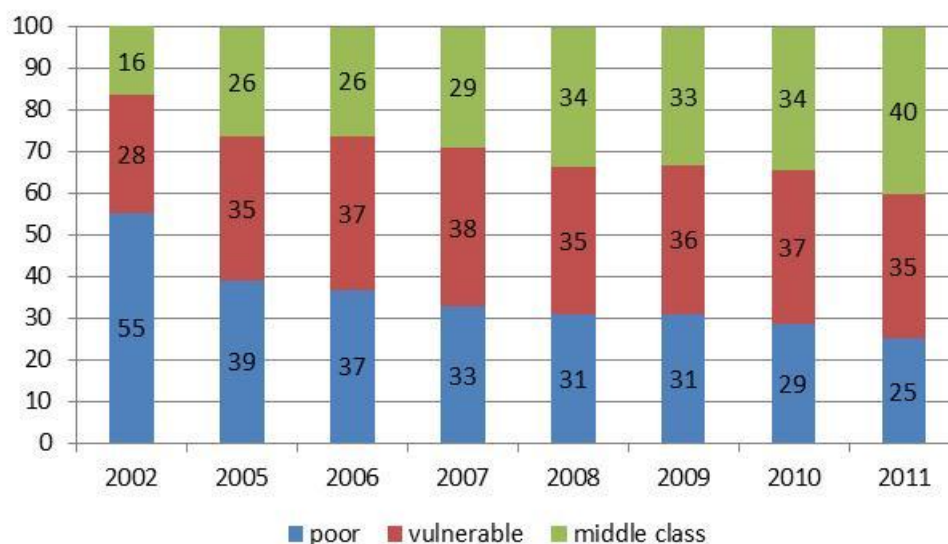
Table A.4b: Mobility matrix for rural areas, 2002-2011, upper bound

	Origin		Percentage moving to 2011			Share of each group in total population in 2011
	(In 2002)	Poor	Vulnerable	Middle Class	Total	
Poor	52	55	31	14	100	42
Vulnerable	35	30	44	26	100	28
Middle class	13	16	35	50	100	9
Total	100	42	37	22	100	28

Source: Authors' calculations based on ECAPOV data.

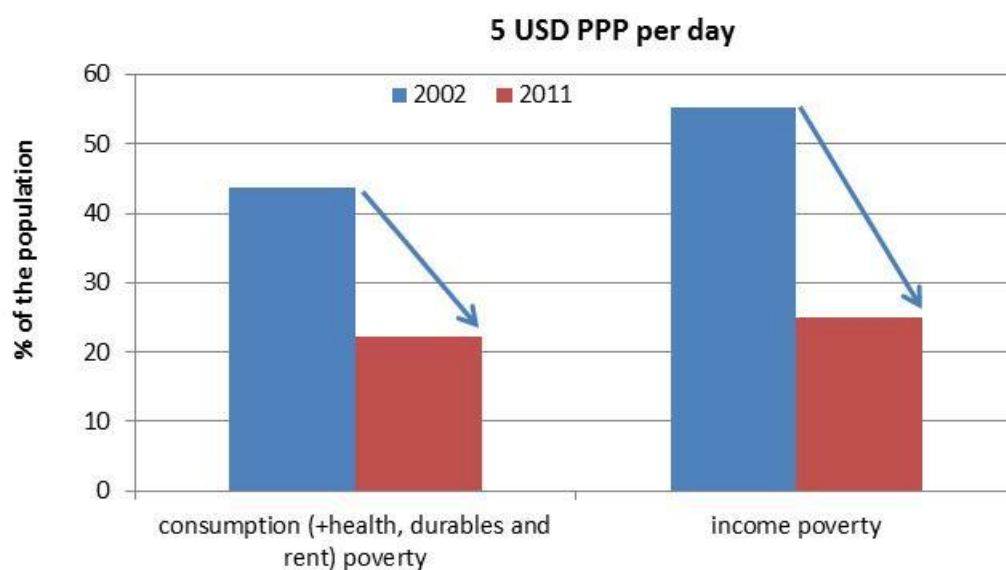
Notes: transition matrix is based on a synthetic panel for 2002-2011. Welfare aggregate is consumption per capita including health, durables, and rent. Sample: heads of household 25-55 years of age. Detailed results of the regression used for prediction is presented in table A.1 in the annex.

Figure A3: Poor, vulnerable and middle class in Turkey during 2002-2011 based on income per capita, %



Source: Authors' calculations based on ECAPOV data.

Figure A4: Income and consumption per capita poverty in Turkey, %



Source: Authors' calculations based on ECAPOV data.

Table A.5. Likelihood of being poor, vulnerable or in middle class by individual characteristics in 2002 and 2011, %

	2002				2011			
	poor	vulnerable	middle class	total	poor	vulnerable	middle class	total
Residence								
urban	53.1	27.2	19.8	100	18.2	34.7	47.1	100
rural	59.7	29.2	11.2	100	40.1	34.2	25.7	100
Education, 15+								
none/<1-4	67.25	25.13	7.62	100	38.97	37.18	23.85	100
incomplete 5-12	53.78	31.6	14.62	100	21.49	38.91	39.6	100
gen sec	33.44	35.96	30.6	100	10.66	32.92	56.42	100
spec sec	30.11	35.64	34.25	100	8.36	29.63	62.01	100
tertiary	9.68	24.79	65.53	100	2.21	11.22	86.57	100
Gender, 15+								
female	49.9	31.6	18.5	100	19.34	34.41	46.25	100
male	51.39	29.84	18.77	100	21.64	34.41	43.94	100
Marital status, 15+								
married	50.0	31.3	18.8	100	20.1	35.6	44.3	100
never	52.8	29.9	17.3	100	22.0	32.5	45.6	100
widowed	50.6	29.4	20.1	100	22.0	30.5	47.5	100
divorced/separated	44.0	20.6	35.4	100	11.1	28.2	60.8	100

Labor force status, 15+								
employee	48.7	29.4	22.0	100	12.4	30.5	57.1	100
self-employed	50.7	31.4	17.9	100	26.2	33.2	40.5	100
unemployed	67.8	23.5	8.7	100	33.6	34.1	32.3	100
retired	27.3	39.0	33.7	100	5.9	35.3	58.9	100
student	46.0	33.2	20.8	100	22.4	37.3	40.4	100
OLF	54.3	30.0	15.7	100	26.4	38.2	35.4	100
Age groups								
<5	66	23	11	100	34	37	28	100
5-15	69	21	10	100	40	34	26	100
15-50	54	29	17	100	22	34	44	100
50-65	38	37	25	100	13	33	54	100
65+	46	36	18	100	20	40	40	100

Source: Authors' calculations based on ECAPOV data.
Note: Income per capita was used to identify different classes. Income was used instead of consumption to be consistent with welfare decomposition by classes.

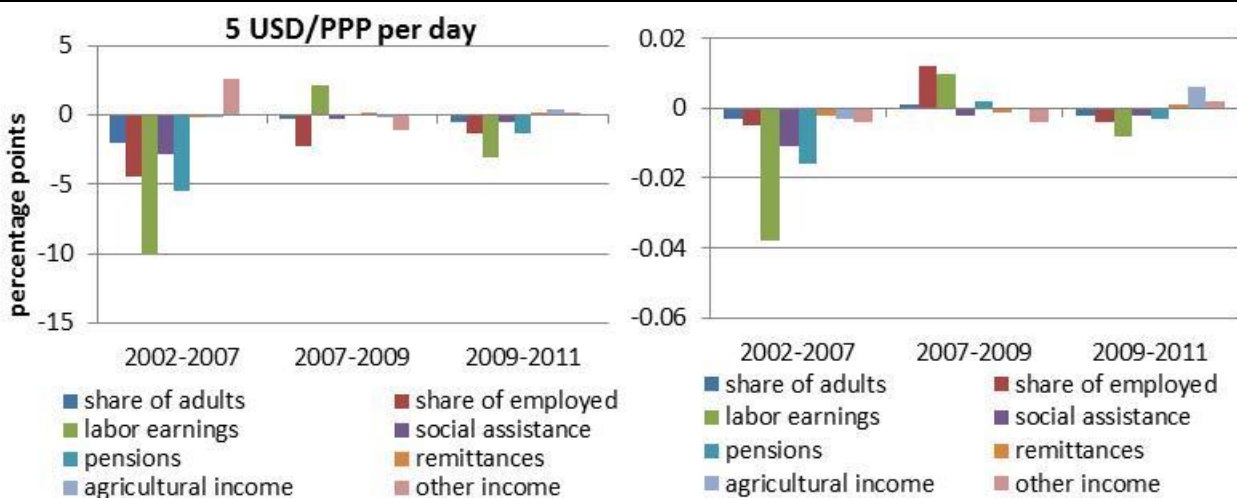
Table A.6: Profile of population in the bottom 40 percent for selected years

	Bottom 40				Top 60			
	2002	2007	2009	2011	2002	2007	2009	2011
Residence								
urban	50.1	57.9	56.1	57.0	64.0	77.5	77.4	75.4
rural	49.9	42.1	43.9	43.0	36.0	22.5	22.6	24.6
Education, 15+								
none/<1-4	28.4	29.0	29.2	29.4	13.9	11.8	12.5	11.7
incomplete 5-12	63.9	58.5	59.2	58.0	58.0	54.1	53.2	51.8
gen sec	5.7	9.2	6.1	6.8	14.9	18.3	12.9	12.3
spec sec	1.6	2.2	4.2	4.1	5.2	5.6	8.5	9.1
tertiary	0.5	1.1	1.3	1.6	7.9	10.2	12.8	15.1
Gender, 15+								
female	52.9	52.0	52.8	52.5	51.9	50.4	49.9	50.0
male	47.1	48.0	47.2	47.5	48.2	49.6	50.1	50.0
Marital status, 15+								
married	66.5	68.0	68.2	66.7	67.6	68.5	68.1	68.0
never	27.1	25.3	24.8	26.1	25.4	24.4	24.3	24.7
widowed	5.7	5.7	5.7	5.6	6.0	5.4	5.7	5.2
divorced/separated	0.7	1.0	1.3	1.6	1.1	1.8	1.9	2.1
Labor force status, 15+								
employee	17.7	22.6	21.8	26.0	25.0	31.1	31.0	35.1
self-employed	32.2	21.2	25.7	20.7	22.5	14.9	18.7	16.1
unemployed	6.0	4.8	6.8	5.2	3.3	2.4	4.4	3.5
retired	2.4	4.0	2.8	3.3	7.4	10.5	8.8	9.0
student	5.3	6.5	6.4	6.7	7.9	6.1	6.8	7.0
OLF	36.5	41.0	36.4	38.1	33.9	35.1	30.4	29.4
Total	100	100	100	100	100	100	100	100

Source: Authors' calculations based on ECAPOV data.

Note: Consumption per capita plus health, durables and rent was used to identify the bottom 40 and top 60 percent of the population.

Figure A.5: Income poverty decomposition by years **Figure A.6: Income Gini decomposition by years**



Source: Authors' calculation based on ECAPOV data.
Notes: Poverty line is 5 USD/PPP per day. Welfare aggregate is income per capita.

Source: Authors' calculation based on ECAPOV data.
Notes: Welfare aggregate is income per capita.

Table A.7: Profile of households in the bottom 40 percent for selected years

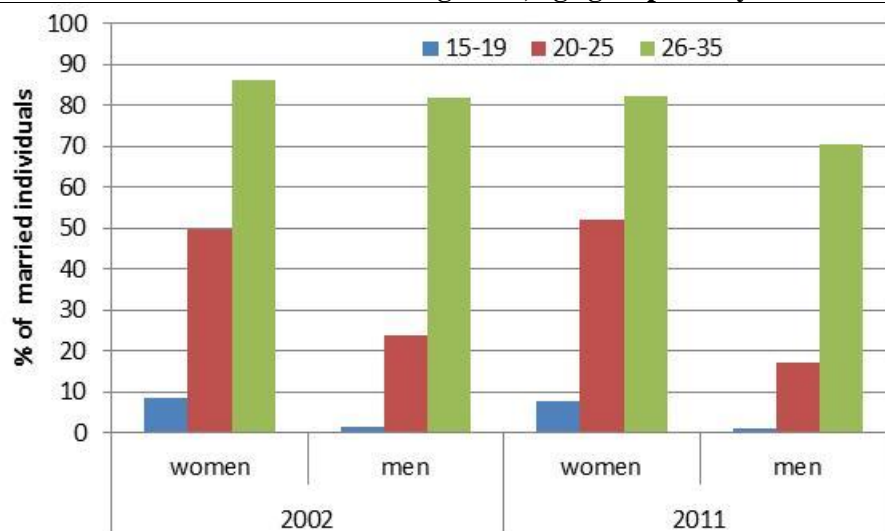
	Bottom 40				Top 60			
	2002	2007	2009	2011	2002	2007	2009	2011
Number of children in HH								
0-1	31.0	34.6	35.6	37.1	65.7	70.0	71.4	73.2
2	25.5	26.6	28.8	28.6	22.9	21.9	21.2	20.1
3	20.3	18.8	18.3	16.8	7.4	6.3	5.6	4.9
4	11.5	8.8	8.2	7.5	2.6	1.3	1.1	1.4
5+	11.8	11.3	9.2	10.0	1.4	0.5	0.8	0.5
Dependency ratio	0.43	0.43	0.42	0.41	0.3	0.3	0.3	0.3
Size of the household								
1	0.4	0.3	0.7	0.8	1.4	1.5	2.0	2.3
2	3.0	2.8	3.9	3.7	10.7	11.9	13.2	14.8
3	6.0	8.8	8.9	9.2	18.6	23.1	23.6	24.8
4	17.4	19.9	21.3	21.7	31.5	31.2	30.5	30.2
5	18.1	21.5	20.5	20.6	18.4	16.3	16.2	15.2
6-10	47.3	38.5	39.8	37.6	18.4	15.0	13.8	12.2
10+	7.9	8.2	5.0	6.4	1.1	1.0	0.7	0.7
HH education								
none/<1-4	27.0	22.0	23.2	21.9	8.2	6.7	7.9	7.8
incomplete 5-12	67.1	67.2	67.3	67.0	62.7	60.2	56.7	54.3
gen sec	3.8	7.4	4.4	5.2	12.3	15.0	10.6	10.1
spec sec	1.7	2.2	4.1	4.2	6.2	5.8	9.8	9.9
tertiary	0.5	1.3	1.0	1.7	10.6	12.3	15.0	17.9
HH labor force status								

employee	35.7	43.7	36.8	43.6	43.7	47.4	45.5	49.4
self-employed	41.7	30.3	33.8	29.8	33.9	25.1	27.2	24.8
unemployed	5.0	4.4	7.6	5.2	1.6	1.1	3.4	2.0
retired	6.5	8.8	6.6	7.5	14.1	19.7	15.6	16.3
student	0.0	0.0	0.2	0.0	0.1	0.2	0.3	0.3
OLF	11.1	12.8	14.9	13.8	6.7	6.6	8.1	7.2

Source: Authors' calculations based on ECAPOV data.

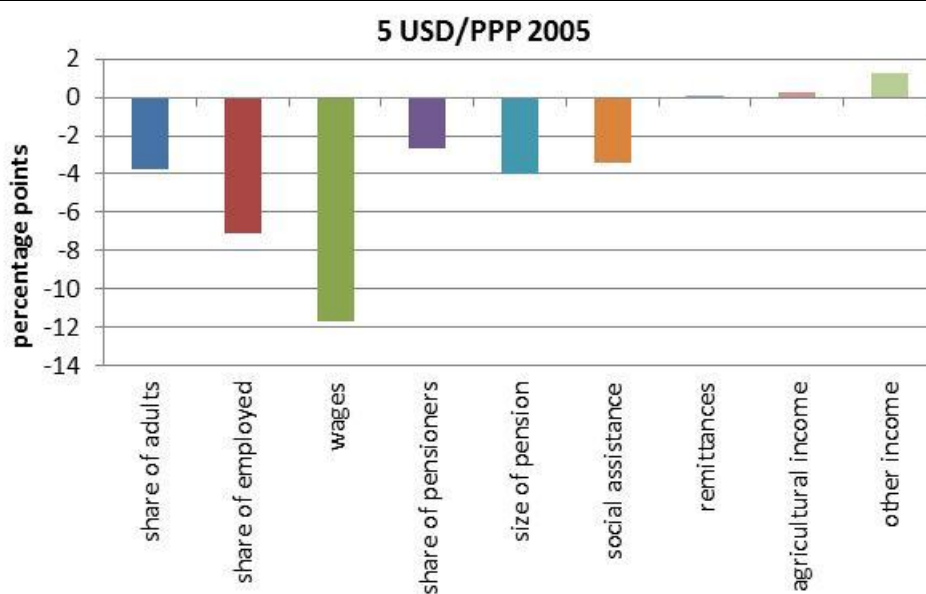
Note: Consumption per capita plus health, durables and rent was used to identify the bottom 40 and top 60 percent of the population.

Figure A.7: Share of married individuals across gender, age groups and years



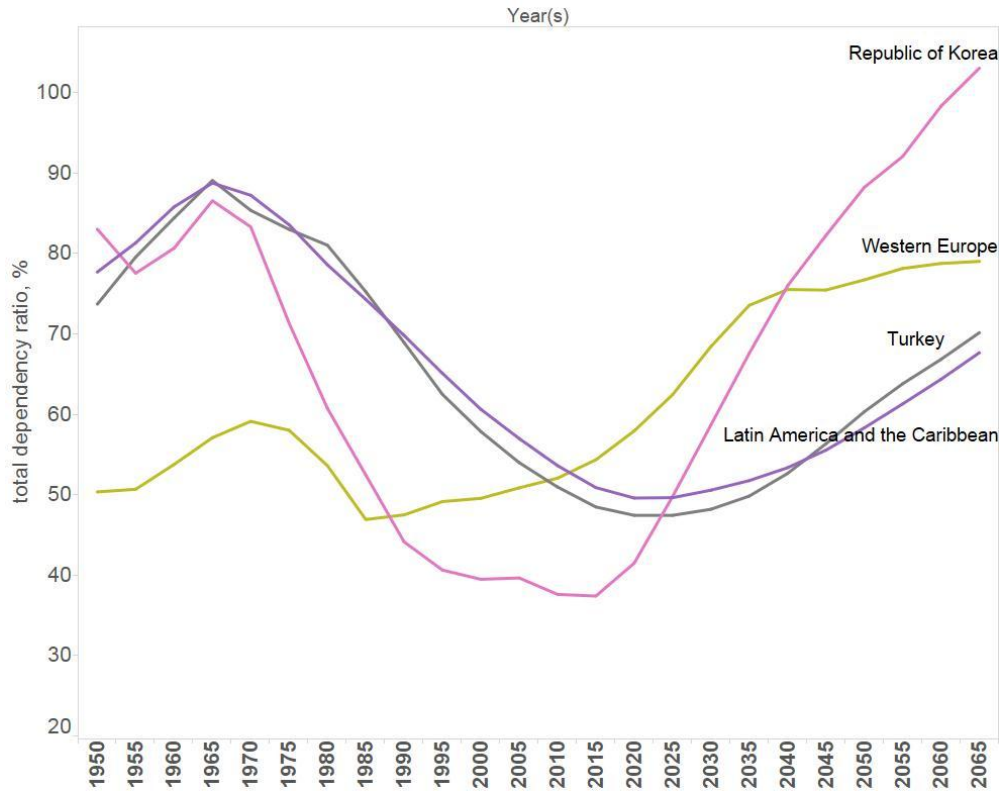
Source: Authors' calculations based on ECAPOV data.

Figure A.8: Income poverty decomposition by size of pensions and the share of pensioners



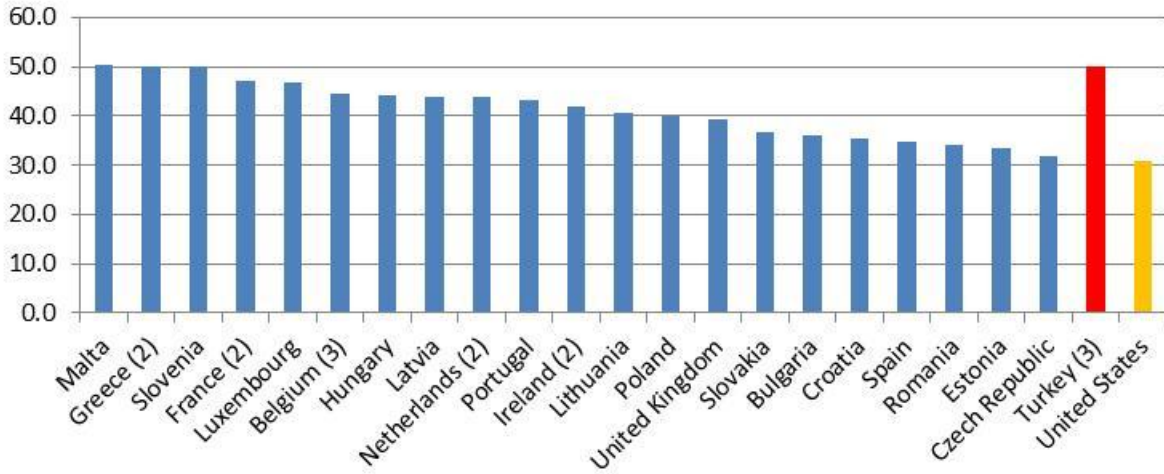
Source: Authors' calculations based on ECAPOV data.
Notes: Welfare aggregate is income per capita.

Figure A.9: Estimates and projections of total dependency ratios, 1950-2065



Source: United Nations, Department of Economic and Social Affairs, Population Division (2013): World Population Prospects: The 2012 Revision. New York.
Note: The total dependency ratio is the ratio of the sum of the population aged 0-19 and that aged 65+ to the population aged 20-64.

Figure A.10: Minimum wages as proportion of the mean value of average gross monthly earnings, 2012



(1) NACE Rev. 2 Sections B-S; Denmark, Germany, Italy, Cyprus, Austria, Finland and Sweden: no statutory minimum wage.
(2) 2011. (3) 2010. Source: Eurostat (online data code: earn_mw_avgr2)

A2. Methodology to create “synthetic panel” to estimate intra-generational mobility

Assume that we have two rounds of cross-sectional surveys (denoted as round 1 and round 2). A linear model of consumption or income in each round can be given by:

$$y_{i1} = x_{i1}'\beta_1 + \varepsilon_1 \quad (1)$$

$$y_{i2} = x_{i2}'\beta_2 + \varepsilon_2 \quad (2)$$

where y_{i1} is the consumption or income of household i in round 1, y_{i2} is the consumption or income of household i in round 2, x_{i1} is the vector of observed time-invariant characteristics of household i in period 1 observed both in round 1 and 2, and x_{i2} is the vector of observed time invariant characteristics of household i in period 2 observed both in round 1 and 2.

The challenge to study mobility using cross sectional data is that we do not observe consumption or income for the same households in two rounds. Dang et al. (2011) present two methods to overcome this problem. The methods are similar except for the assumptions about the correlation between ε_1 and ε_2 . The methodology can be summarized in four steps:

STEP 1: Estimate models 1 and 2 above and construct residuals for both rounds:

$$\hat{\varepsilon}_{i1}^1 = y_{i1}^1 + x_{i1}^1 \hat{\beta}_1 \quad (3)$$

$$\hat{\varepsilon}_{i2}^2 = y_{i2}^2 + x_{i2}^2 \hat{\beta}_2 \quad (4)$$

where superscript denotes the round of the observations that are used, y_{i1}^1 is the consumption or income of household i in period 1 using observations in round 1, y_{i2}^2 is the consumption or income of household i in period 2 using observations in round 2, x_{i1}^1 is the observed time invariant characteristics of household i in period 1 using observations in round 1, x_{i2}^2 is the observed time invariant characteristics of household i in period 2 using observations in round 2, $\hat{\beta}_1$ is the OLS estimation of β_1 , $\hat{\beta}_2$ is the OLS estimation of β_2 , and $\hat{\varepsilon}_{i2}^2$ and $\tilde{\varepsilon}_1^2$ are residuals terms.

STEP 2: Estimate round 1 consumption using observations from round 2:

$$\hat{y}_{i1}^2 = x_{i1}^2 \hat{\beta}_1 + \tilde{\varepsilon}_1^2 \quad (5)$$

where \hat{y}_{i1}^2 is the consumption or income of household i in period 1 using observations in round 2, x_{i1}^2 is the observed time invariant characteristics of household i in period 1 using observations in round 2. The origin of $\tilde{\varepsilon}_1^2$ depends on the assumptions about ε_1 and ε_2 . We expect ε_1 and ε_2 to be positively correlated; i.e. households fixed effects or non-transitory shocks to consumption. The authors propose two alternatives:

- a. **Upper bound estimation:** The method assumes zero correlation between ε_1 and ε_2 . Under this assumption, the authors propose to obtain $\tilde{\varepsilon}_1^2$ by randomly drawing with replacement from the empirical distribution of the residuals in round 1 estimations. Under this method, estimations are likely to overstate mobility.
- b. **Lower bound estimation:** The method assumes correlation equal to 1 between ε_1 and ε_2 . Under this assumption, $\tilde{\varepsilon}_1^2$ can be obtained by using the residuals estimations in round 2, that is $\hat{\varepsilon}_{i2}^2$. Under this method, estimations are likely to understate mobility.

STEP 3: Calculate flows into and out of poverty using \hat{y}_{i1}^2 , y_{i1}^1 , and a poverty line p . For example, the probability of exiting poverty is:

$$P(\hat{y}_{i1}^2 < p \mid y_{i2}^2 > p) \quad (6)$$

STEP 4: In the case of the upper bound estimation, repeat steps 1 through 3 R times.

This technique does not substitute actual panel data, but helps to overcome empirical challenges associated with panel databases. The first challenge is that panel data is costly and complex to administer. Using “synthetic panel” can be easily replicated for all countries with cross sectional data. Secondly, non-random attrition may significantly bias results (Antman and McKenzie 2007).

A.3 Methodology for income poverty decomposition

This methodology was taken from the paper by Azevedo et al. (2013). In order to decompose the contribution of each factor to poverty reduction, we need a framework that allows us to measure the contribution of each factor to the total change in poverty. We begin by following Barros et al. (2006), and model household per capita income as:

$$Y_{pc} = \frac{Y_h}{n} = \frac{1}{n} \sum_{i=1}^n y_i. \quad (2)$$

Income per capita is the sum of each individual's income; it depends on the number of household members, n . If we recognize that only individuals older than 15 contribute to family income, income per capita depends on the number of adults in the family, n_A , so income per capita can be written as:

$$Y_{pc} = \frac{n_A}{n} \left(\frac{1}{n_A} \sum_{i=1}^n y_i \right). \quad (3)$$

Income per adult includes labor income, y_i^L , and nonlabor income, y_i^{NL} ; nonlabor income includes public social transfers, pensions, remittances, and other income:

$$Y_{pc} = \frac{n_A}{n} \left(\frac{1}{n_A} \sum_{i \in A} y_i^L + \frac{1}{n_A} \sum_{i \in A} y_i^{NL} \right). \quad (4)$$

Finally, not all adults in the household are occupied and household labor income per capita depends on the income of employed adults. Therefore we can decompose the labor income per occupied adult as:

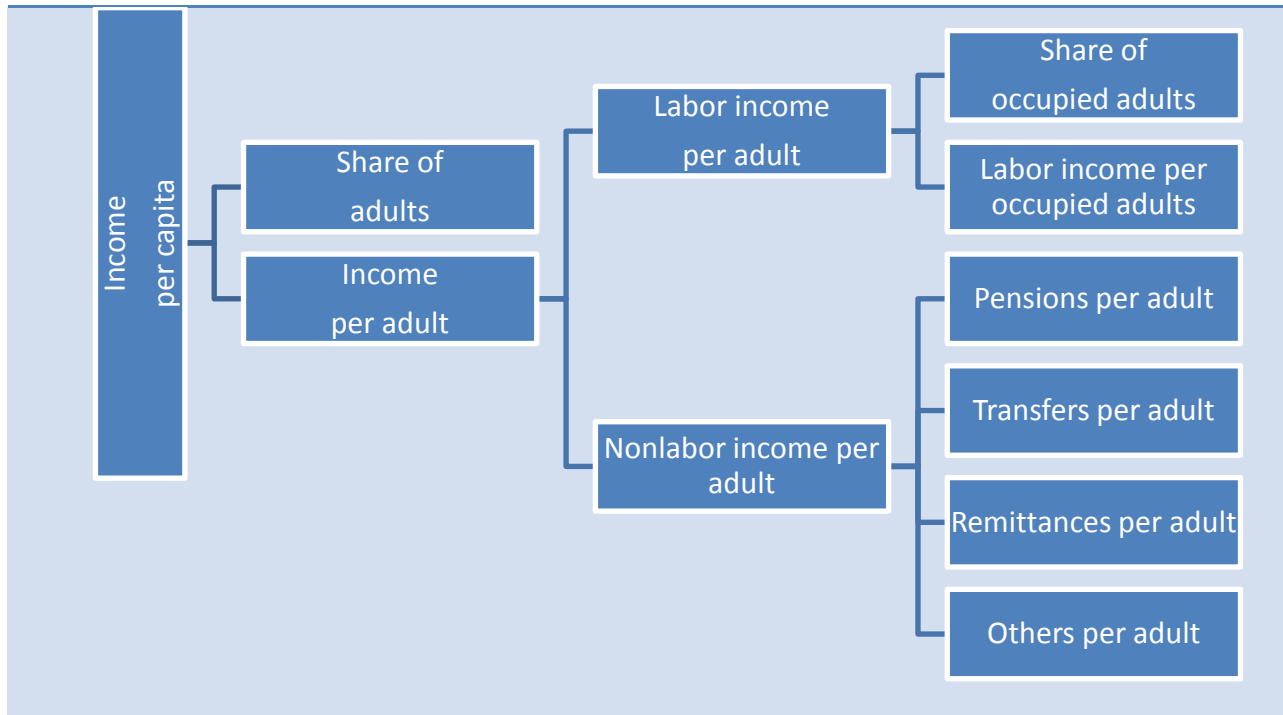
$$Y_{pc} = \frac{n_A}{n} \left[\frac{n_o}{n_A} \left(\frac{1}{n_o} \sum_{i \in A} y_i^L \right) + \frac{1}{n_A} \sum_{i \in A} y_i^{NL} \right], \quad (5)$$

where n_o is the number of occupied adults.

Note that official poverty rates in some countries are calculated on the basis of household income, moreover very often consumption and income poverty have similar trends. In these cases, equation (5) is sufficient to decompose the contribution of demographic factors, labor income, and non-labor income to observed poverty reduction.

With this framework, we can separate the demographic, labor, and nonlabor components discussed earlier. The determinants of per capita income are summarized in box 2.

Box 2. Illustrative diagram of proposed decomposition of income per capita



Source: Authors' adaptation of Barros et al. (2006).

Measuring the contributions to poverty reduction

Let $F(\cdot)$ be the cumulative density function of the distribution of welfare. Since poverty rates depend on $F(\cdot)$, then we can decompose household consumption in each household by the factors in equation (6). As a result, any poverty measure can be written as a function of each of these components. Therefore the contribution of each component towards changes in poverty or distribution can be expressed as a function of these indicators in the initial and end periods.

Following Barros et al. (2006), we can then simulate the distribution of welfare by changing each of these components one at a time, to calculate their contribution to the observed changes in poverty. In particular, let ϑ be a measure of poverty, inequality or any other distributional statistic. Then, this measure will be a function of the cumulative density function, $F(\cdot)$, which in turn depends on each of the factors above:

$$\vartheta = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{n_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right), \quad (7)$$

where

$$y_{PO}^L = \frac{1}{n_o} \sum_{i \in A} y_i^L$$

and

$$y_{PA}^{NL} = \frac{1}{n_A} \sum_{i \in A} y_i^{NL}.$$

Given that the distribution of per capita income for period 0 and period 1 are known, we can construct counterfactual distributions for period 1 by substituting the observed level of the indicators in period 0, one at a time. For each counterfactual distribution, we can compute the poverty measures, and interpret those counterfactuals as the poverty that would have prevailed in the absence of a change in that indicator. For example, to see the impact of the change in the share of occupied adults, we can compute $\hat{\vartheta}$, where we substitute the value of $\frac{n_o}{n_A}$ observed in period 0 to the observed distribution in period 1. We can then compute:

$$\hat{\vartheta} = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{\hat{n}_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right), \quad (8)$$

such that the contribution of the share of occupied adults is the difference between the observed ϑ in period 1 and the estimated counterfactual, $\hat{\vartheta}$. Similarly, each of the other components in the income per capita distribution in period 1 can be substituted by their values in period 0 so that their contribution to changes in poverty can be computed.

Since we don't have panel data, we do not observe period 1 households in period 0. Therefore, we use a rank-preserving transformation to assign first-period characteristics to the second period. This method uses an idea first proposed by Juhn, Murphy, and Pierce (1993), who decomposed changes in wages by running Mincer-type Ordinary Least Squares (OLS) regressions that make it possible to decompose labor income inequality, using any measure of inequality, in three parts. The first are quantity effects, which refers to the distribution of observable workers' characteristics, such as education and labor market experience, and are included as regressors in the equation. The second are price effects, which captures changes in returns to observed characteristics through the regression's coefficients. The third is the regression residual (unobservables), which reflect changes in inequality within education and experience

groups. While counterfactuals for the quantity effects can be created by assigning the mean observable characteristic from one period to the other, and the counterfactual for the price effects can be created by substituting regression coefficients from one period to another, to complete that analysis, the authors needed to assign a value to the residuals in each period. So they created a counterfactual by ordering households by their earnings in each period, and then taking the average residual value in each quantile from the first period and assigning it to all households in the same quantile in the second period.

In this case, instead of running a Mincer model, we create counterfactuals by ordering households by their total household income, and then taking the average value of each characteristic in equation (5) for each quantile in period 0 and assigning it to each household in that same quantile in period 1. For example, if we are decomposing the effect of labor income, we order households into quantiles by their observed total household income in periods 0 and 1. Then for every quantile in period 1, we replace the period 1 labor income with the average labor income in period 0 from households that were in the same quantile.

Box 3. Barros et al. (2006) Methodology

1.	$\vartheta_0 = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{n_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Initial poverty rate
2.	$\widehat{\vartheta}_{a1} = \Phi \left(F \left(Y_{pc} \left(\frac{\widehat{n}_A}{n}, \widehat{y}_{PA} \right) \right) \right)$	Contribution of the interaction between share of adults and income per adult is $\widehat{\vartheta}_{a1} - \vartheta_0$
3.	$\widehat{\vartheta}_{nA} = \Phi \left(F \left(Y_{pc} \left(\frac{\widehat{n}_A}{n}, y_{PA} \right) \right) \right)$	Contribution of share of household adults is $\widehat{\vartheta}_{nA} - \widehat{\vartheta}_{a1}$
4.	$\widehat{\vartheta}_{a2} = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{n_o}{n_A}, \widehat{y}_{PO}^L, \widehat{y}_{PA}^{NL} \right) \right) \right)$	Contribution of the interaction between labor and nonlabor income is $\widehat{\vartheta}_{a2} - \widehat{\vartheta}_{nA}$.
5.	$\widehat{\vartheta}_{NL} = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{n_o}{n_A}, y_{PO}^L, \widehat{y}_{PA}^{NL} \right) \right) \right)$	Contribution of nonlabor income is $\widehat{\vartheta}_{NL} - \widehat{\vartheta}_{a1}$.
6.	$\widehat{\vartheta}_{a3} = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{\widehat{n}_o}{n_A}, \widehat{y}_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Contribution of the interaction between labor income and the share of occupied adults is $\widehat{\vartheta}_{a3} - \widehat{\vartheta}_{NL}$.
7.	$\widehat{\vartheta}_{no} = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{\widehat{n}_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Contribution of the share of occupied adults is $\widehat{\vartheta}_{no} - \widehat{\vartheta}_{a3}$.
8.	$\vartheta_F = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{n_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Final poverty rate, ϑ_F . The contribution of labor income, y_{PO}^L , is calculated as a residual: $\vartheta_f - \widehat{\vartheta}_{a3}$.

Barros et al. (2006) compute each counterfactual simulation in a nested fashion (box 3). They identify the contribution that interactions between variables have in poverty reduction by first computing the joint impact of a subset of variables, and then subtracting the marginal impact of each variable, one at a time. For instance, in step 2 in box 3, they first compute the joint impact of inserting both the share of adults and the income per adult from the first period into the distribution of the second period. They then compute the impact of changing only the share of adults, and take the difference of these two simulations to approximate the marginal impact that changing the share of adults had on the distribution. However, in step 4, instead of computing the impact of income per adult on its own, they compute the impact of changing both the labor and nonlabor income per adult. This is done because, in principle, the sum of

labor and nonlabor income should be equivalent to changing total income per adult. The results of these two simulations are different, however, and the simulation of labor income is not done explicitly, but rather ends up being a “residual” in step 8 to ensure that the cumulative effect adds up to the total distributional change.

We modify the procedure in three ways: (1) we focus on consumption as a measure of welfare; (2) we compute a cumulative counterfactual distribution by adding one variable at a time; and (3) we compute Shapley-Shorrocks estimates of each component. In contrast to the Barros et al. (2006) approach, this method does not separately identify the contribution of the interaction between variables in the observed distributional changes; doing so is partial at best, given that changing any variable can potentially affect all other variables. Instead, the impact of changes in each variable and its interactions with all other variables is calculated as the difference between the cumulative counterfactuals. Box 4 shows an example for one possible path. For illustrative purposes, nonlabor income is made up of pensions, transfers, capital income, and other income.

The second methodological change is to address the fact that this methodology suffers from path-dependence, as much of the micro-decomposition literature does. In other words, the order in which the cumulative effects are calculated matters.¹⁰ One of the major contributions of this paper is that we apply the best known remedy for path-dependence, which is to calculate the decomposition across all possible paths, and then take the average between them following the method proposed by Azevedo, Nguyen, and Sanfelice (2012).¹¹ This involves calculating the cumulative decomposition in every possible order, and then averaging the results for each component. Because we have eight variables, this adds up to 40,320 potential decomposition paths (the result of 8!). The average effect for each variable is also known as the Shapley-Shorrocks estimate of each component.¹²

There is one remaining caveat to this approach: The counterfactual income distributions on which these decompositions rely suffer from equilibrium-inconsistency. Because we are modifying only one element at a time, the counterfactuals are not the result of an economic equilibrium, but rather a fictitious exercise in which we assume that we can in fact modify one factor at a time and keep everything else constant.

Box 4. Proposed Methodology along One Possible Path

1.	$\vartheta_0 = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{n_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Initial inequality rate
2.	$\widehat{\vartheta}_1 = \Phi \left(F \left(Y_{pc} \left(\frac{\widehat{n}_A}{n}, \frac{n_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Contribution of share of household adults is $\widehat{\vartheta}_1 - \vartheta_0$
3.	$\widehat{\vartheta}_2 = \Phi \left(F \left(Y_{pc} \left(\frac{\widehat{n}_A}{n}, \frac{\widehat{n}_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Contribution of the share of occupied adults is $\widehat{\vartheta}_2 - \widehat{\vartheta}_1$

¹⁰ Path-dependence is common in the micro-decomposition literature. See Essama-Nssah (2012), Fortin et al. (2011), and Ferreira (2010) for recent reviews of the literature.

¹¹ A Stata ado file by Azevedo, Sanfelice, and Nguyen implements this approach. To download it, within Stata type: “ssc install adecomp”

¹² See Shapley (1953) and Shorrocks (1999).

4.	$\hat{\vartheta}_3 = \Phi \left(F \left(Y_{pc} \left(\frac{\hat{n}_A}{n}, \frac{\hat{n}_o}{n_A}, y_{PO}^L, \widehat{y_{PA}^{Pens}}, \widehat{y_{PA}^{Trans}}, \widehat{y_{PA}^{Cap}}, \widehat{y_{PA}^{OthNL}} \right) \right) \right)$	Contribution of pensions is $\widehat{\vartheta}_3 - \widehat{\vartheta}_2$
5.	$\hat{\vartheta}_4 = \Phi \left(F \left(Y_{pc} \left(\frac{\hat{n}_A}{n}, \frac{\hat{n}_o}{n_A}, y_{PO}^L, \widehat{y_{PA}^{Pens}}, \widehat{y_{PA}^{Trans}}, \widehat{y_{PA}^{Cap}}, \widehat{y_{PA}^{OthNL}} \right) \right) \right)$	Contribution of transfers is $\widehat{\vartheta}_4 - \widehat{\vartheta}_3$
6.	$\hat{\vartheta}_5 = \Phi \left(F \left(Y_{pc} \left(\frac{\hat{n}_A}{n}, \frac{\hat{n}_o}{n_A}, y_{PO}^L, \widehat{y_{PA}^{Pens}}, \widehat{y_{PA}^{Trans}}, \widehat{y_{PA}^{Cap}}, \widehat{y_{PA}^{OthNL}} \right) \right) \right)$	Contribution of capital income is $\widehat{\vartheta}_5 - \widehat{\vartheta}_4$
7.	$\hat{\vartheta}_6 = \Phi \left(F \left(Y_{pc} \left(\frac{\hat{n}_A}{n}, \frac{\hat{n}_o}{n_A}, y_{PO}^L, \widehat{y_{PA}^{Pens}}, \widehat{y_{PA}^{Trans}}, \widehat{y_{PA}^{Cap}}, \widehat{y_{PA}^{OthNL}} \right) \right) \right)$	Contribution of other nonlabor income is $\widehat{\vartheta}_6 - \widehat{\vartheta}_5$
8.	$\vartheta_F = \Phi \left(F \left(Y_{pc} \left(\frac{n_A}{n}, \frac{n_o}{n_A}, y_{PO}^L, y_{PA}^{NL} \right) \right) \right)$	Final inequality rate. Contribution of labor income is $\widehat{\vartheta}_F - \widehat{\vartheta}_3$

A.4 Welfare aggregates

Both income and consumption welfare aggregates are used in this paper. The main source for them is ECAPOV database. The ECAPOV database presents a collection of harmonized databases for ECA countries based on household budget surveys (HBS) and Living Standard Measurement surveys (LSMS). A unique standardization methodology has been developed and implemented for construction of harmonized consumption aggregates. The ECA databank consumption aggregate includes households' expenditures for food, cloth, utilities, transport, education, communication, travel, recreation and miscellaneous. The aggregate excludes expenditures on health, rents and durable goods. The aggregate takes into consideration inter-countries regional price differences and CPI adjustment. The consumption aggregates are expressed in per capita terms.

In this paper consumption aggregate includes expenditures on health and durable goods. Income aggregate includes the following components: labor market earnings, pensions, social assistance benefits, remittances, agricultural and other income (detailed description of each component is given in table A8). The income aggregate is expressed in per capita terms. For inter year comparison, consumption and income aggregates were transformed into consistent set using PPP 2005 consumption conversion factor (ICP 2005).

Table A.8: Income components	
Income aggregate	components
Labor earnings	Wages, business income, benefits in kind and cash, proceeds from the copyright etc.
Pension	Public, private pensions, pensions for widows and orphans.
Social assistance	Cash and in-kind benefits, allowances on electricity, gas and water, subsidized rent, transport, fuel etc.
Agricultural income	Net income from crop and animal products.
Remittances	Transfers from household members, friends abroad
Other	income from property (bonds, foreign currency, land, transport, dividends), unemployment benefits*

Note: (*) the authors have also treated unemployment benefit as a separate component, but results were not qualitatively different.