REDISTRIBUTION TRENDS IN TURKEY: REGRESSIVE TAXES, STRUCTURAL CHANGE, AND DEMOGRAPHICS

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The CEQ logo is a stylized graphical representation of a Lorenz curve for a fairly unequal distribution of income (the bottom part of the C, below the diagonal) and a concentration curve for a very progressive transfer (the top part of the C).

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ABSTRACT

We employ Household Budget Surveys from 2003, 2007, 2011, 2015 and 2019 to estimate market, gross, disposable, consumable and final incomes following the framework developed by the Commitment to Equality Institute. Over the years, the overall redistributive effect of taxes, transfers, and social spending reduced the Gini coefficient by five more points (from 51 to 39 in 2003; and from 50 to 33 in 2019). Most of the reduction in income inequality is due to (i) continued expansion of the pension system; (ii) expansion of the formal wage employment, leading to higher effective income taxes; (iii) expansion of the healthcare system; (iv) quicker decline in enrollment of the children of the high-income households, driven by declining fertility among higher income groups. Indirect taxes are the largest source of taxes. They also cause most of the fiscal impoverishment. Compared to Latin American countries where comparable studies exist, the Turkish welfare system re-distributes more especially through the pension system, but it also causes relatively more fiscal impoverishment for low-income households.

JEL Codes: H22, H5, D31, I38

Keywords: fiscal incidence, social spending, taxes, transfers, income inequality, forbearance, Turkey

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Redistribution trends in Turkey: regressive taxes, structural change, and demographics

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Abstract: We employ Household Budget Surveys from 2003, 2007, 2011, 2015 and 2019 to estimate market, gross, disposable, consumable and final incomes following the framework developed by the Commitment to Equality Institute. Over the years, the overall redistributive effect of taxes, transfers, and social spending reduced the Gini coefficient by five more points (from 51 to 39 in 2003; and from 50 to 33 in 2019). Most of the reduction in income inequality is due to (i) continued expansion of the pension system; (ii) expansion of the formal wage employment, leading to higher effective income taxes; (iii) expansion of the healthcare system; (iv) quicker decline in enrollment of the children of the high-income households, driven by declining fertility among higher income groups. Indirect taxes are the largest source of taxes. They also cause most of the fiscal impoverishment. Compared to Latin American countries where comparable studies exist, the Turkish welfare system re-distributes more especially through the pension system, but it also causes relatively more fiscal impoverishment for low-income households.

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Section 1: Introduction

In Turkey, the capital's share of income is very high, comprising roughly two-thirds during the 2000s. Moreover, the effective taxation of corporate profits and wealth appears to be very light. The major source of tax revenue is indirect taxes on consumption, with taxes on labor income ranking as the second-largest contributor. Despite this inequality in the distribution of pre-tax income and tax burden, disposable income inequality Gini in Turkey fluctuated around 0.40 during the 2000s, a period in which the Justice and Development Party led by Erdoğan (AKP after its Turkish acronym) won numerous general and local elections. The discrepancy between macroeconomic variables such as functional income distribution and tax structures, and inequality statistics urged some researchers to question the validity of the latter.

Many political analysts suspect that poverty and inequality statistics do not reflect reality. Some researchers proposed that the working class was able to sustain their consumption levels by taking over more debt (Karaçimen, 2015) and social assistance (Aytaç, 2014). Other researchers claimed that AKP owes its electoral success to its appeal as an Islamist and nationalist movement (Tuğal, 2012; Akçay, 2019)[2], and/or unfair elections (Esen & Gumuscu, 2016; Somer, 2016; Yılmaz & Turner, 2019; Sözen, 2020). While not dismissing any of these explanations, we further acknowledge that income inequality is underestimated due to data limitations. Turkish inequality and poverty statistics are exclusively based on survey data without additional tax or administrative data. As Lustig (2020) documents, survey data suffers from "the missing rich" problem, where the highest-earning households rarely respond to surveys. Even when they do, there is a tendency to underreport property income and profits. Moreover, there is ample evidence for increased borrowing and non-economic voting.

However, we believe that macro and micro data can be reconciled. Additionally, it is important to note that evidence of non-economic voting does not indicate the absence of economic voting. Capital income includes property income (especially imputed rent for owner-occupied housing), and income from self-employment, which is widespread and does not only accrue to high earners. Voters may consider not only market income but also take into account the effect of redistribution through pensions, education and health in addition to market income. A comprehensive analysis

[2] These are local variations of working-class-voting-against-its-economic-interest argument.

addressing all these subtleties would require repeated estimations using different income definitions, such as gross income, disposable income, etc. to document the impact of policies over the years.

We employ the Commitment to Equity (CEQ) Institute methodology (Lustig, 2018) to estimate inequality and poverty statistics for market, gross, disposable, consumable, and final incomes for the years 2003, 2007, 2011, 2015, and 2019. The CEQ methodology constitutes a static accounting exercise, not considering behavioral responses, lifecycle implications or positive externalities of in-kind public services. Nevertheless, it corresponds to everyday understanding of who pays taxes and who benefits from transfers and public services, making it suitable for investigating the political economy puzzle of Turkey. Utilizing CEQ methodology also allows us to compare our results with studies using CEQ methodology in middle income countries in Latin America and Eastern Europe.

This study has five main contributions. First, we analyze the 2003-2019 period, covering most of the AKP era so far by presenting a broad evaluation of AKP's performance. Second, we do not simply apply the tax code when imputing taxes and social security contributions to incomes declared in the survey. We take into account informality and make differential adjustments for under-reporting of certain incomes. We rely on administrative reports when making these adjustments and we compare our tax and social security contribution estimates with actual tax revenues. Third, we consider the enrolment in social security system and the age of each household member when imputing in-kind health spending to households. Fourth, we carefully distinguish between results driven by deliberate policy changes, structural shifts, or the continuation of pre-existing trends. Fifth, we document that redistributive policies significantly reduce income inequality to the expense of increased poverty for low incomes because these redistributive policies are partly financed by indirect taxes.

In this paper, we utilize taxes, demographics, structural change, and health policy to analyze the political economy of welfare in Turkey. We categorize the developments into four groups: (i) those resulting from structural shifts; (ii) continuations of pre-existing trends; (iii) results of deliberate policy choices; and (iv) occurrences despite policy choices.

(i) Income from wages is effectively taxed at a higher rate compared to self-employment. The ongoing structural change from informal self-employment to wage employment in larger firms

coinciding with AKP government's era resulted in increased income tax revenues without a similar rise in tax rates; (ii) Retirement pensions are the single largest item of welfare in Turkey, with their impact in the current period being the result of decisions taken in the 1980s and 1990s. Changes in retirement age introduced in the AKP period only apply to new entrants and have not significantly affected redistribution during the study period; (iii) AKP governments initiated the Health Transformation Program in 2003; and its implementation was completed in 2010. This program substantially increased access to the healthcare system. As a result, final income inequality declined considerably; (iv) Fertility continued to decline despite the government's pronatalist policies. At the same period, upward trends in enrolment continued, especially for high school and tertiary education. The combined impact of fertility decline and increased enrolment led to a proportionally larger decline in the number of children in education for middle and upper income households. In other words, primary and secondary education became even more pro-poor redistribution despite government efforts to increase fertility.

The rest of the paper is organized as follows. In the next section, we review recent papers on tax and transfer incidence in Turkey. Section 3 lays out the main aspects of the CEQ methodology along with the description of relevant data used in this study. Section 4 presents the results associated with the impact of fiscal policy components on both income inequality and poverty. Section 5 discusses the drivers of the change over time and provides comparisons with other countries employing CEQ methodology. The concluding section addresses the limitations of our study.

Section 2: Literature Review

Many studies on Turkey point out the centrality of labor earnings for reducing poverty. Şeker and Dayıoğlu (2015) studying the 2005-2008 period conclude that the primary reason for exit from or entry into poverty in Turkey is increase or decrease in labor income. Şeker and Jenkins (2015) decompose the change in poverty rates into growth and distribution components for the period 2003-2012 and find that growth explains most of the decline in absolute poverty and conclude that the role of redistribution is small. Acar, et al. (2017) finds that the probability of being poor is reduced by home ownership, better education and with formal non-agricultural employment.

Tekgüç (2018) investigates the poverty impact of social assistance for the 2005-2014 period and concludes that social assistance played a minor role in decline in poverty and inequality.

Bayar and Günçavdı (2021) study the 2002-2013 period, but they focus on income distribution instead of poverty. They find that income inequality declined in this period, mostly due to the relative decline in entrepreneurial and financial income. Similarly, Yılmaz and Sefil-Tansever (2019) report that as average incomes increased in the 2006-2014 period, the Gini values declined indicating simultaneous general and relative welfare improvement. In all these studies, the focus is on disposable income.

Fiscal Incidence Studies on Turkey

Pınar (2004) is the first empirical study analyzing the fiscal incidence for Turkey. It diverges from current studies in scope. On the one hand, it excludes social security contributions and owner-occupied rents in estimation of market income. On the other hand, it includes spending on general government expenditures to in-kind services. Pınar (2004) compares 1994 and 2002 and documents that income taxes and public spending (except for university education) are progressive. More recently, Albayrak et al. (2016), Yılmaz et al. (2016), and Yılmaz and Sefil-Tansever (2019) report that income taxes reduce inequality as expected. However, these studies do not evaluate the impact of public transfers or in-kind services. On the other hand, Tekgüç (2018) investigates the poverty and inequality impact of social assistance and reports that they slightly reduce income inequality and poverty.

The bulk of the empirical fiscal incidence studies after Pınar (2004) focuses on the impact of consumption taxes since they constitute the majority of tax revenues in Turkey (or near majority if social security contributions are counted as taxes). Overall, they all find that consumption taxes are regressive. The exceptional cases are special tax on fuel because car ownership was rare for households in earlier years. At least by 2009, most studies agree that consumption taxes are regressive. Gökşen et al. (2008) analyze both VAT and special consumption tax. They find that the incidence is flat for the bottom 80% and decreases for the top decile as expected. Albayrak (2010) integrates taxes on imports via input-output tables to fiscal incidence analysis for 2003. Households in the top decile purchase more goods with imported inputs (such as fuel). She still

finds that taxes on consumption are regressive in Turkey. Albayrak (2011) shows that the regressivity of consumption taxes has increased from 2004 to 2009. Moreover, temporary tax reductions in response to the 2008-2009 crises benefited households in the top decile. Albayrak et al. (2016) shows that VAT is regressive every year. However, special taxes on fuels are not regressive in some years (e.g., 2006). Yilmaz et al. (2019) also documents that indirect taxes comprise two-thirds of general budget tax revenues in the 2002-2013 period, and they are slightly regressive (Kakwani index around -0.1). However, they differ from the other studies in finding the impact on Gini estimates of these indirect taxes to be negligible. Finally, Akkoç et al. (2023) reports that, for the 2004-2019 period, VAT is regressive while Special Consumption tax is progressive.

Cuevas et al. (2020) for 2016 and Ünal (2021) for 2019 are the only studies that follow CEQ methodology. We compare our findings to theirs in the discussion section. Our findings are broadly similar, especially with Cuevas et al. (2020). Both of these studies focus on single years and report very detailed fiscal incidence for each tax and transfer. We differ from them by focusing on changes over time in the 2003-2019 period. Our broader sweep compels us to present the poverty and inequality impacts of taxes and transfers under broader categories to save space.[3]

Section 3: Data and Methods

We follow CEQ methodology to perform incidence analysis (Lustig, 2018). CEQ methodology has an accounting perspective where taxes and transfers are added or subtracted (see Table 1). CEQ methodology's big advantage is that it provides a comprehensive framework not only to assess progressive/ regressive incidence of individual taxes, but also their overall and individual impact on inequality and poverty. Presentation of taxes and social spending's impact on inequality and poverty allows for explicit discussion of policies through equity perspective.

[3] The results of our study related to the impact of fiscal policy on both income and poverty are compared in Section 5 with other recent studies on a sample of middle-income countries and the USA using the CEQ methodology. Argentina (Rossignolo, 2016); Brazil (Higgins and Pereira, 2013); Chile (Martinez-Aguilar et al., 2017); Colombia (Martínez Pabón et al., 2021); Costa Rica (Sauma and Trejos, 2014); (Croatia (Inchauste and Rubil, 2017); Mexico (Scott et al., 2017); Poland (Goraus and Inchauste, 2016); Romania (Inchauste and Militaru, 2016); Russia (López-Calva et al., 2017); Tunisia (Jouini et al., 2018); Uruguay (Bucheli et al., 2013); US (Higgins and Lustig, 2016).

Imputed taxes in CEQ methodology generally underestimate taxes with respect to administrative records. Nevertheless, in CEQ methodology tax estimates are not calibrated to administrative records. Lustig (2020) points out that coverage of household surveys is incomplete due to the missing rich. Rich households are less likely to answer the surveys and their share in income can be substantial. Hence, calibrating the tax estimates to official records will impute excessive taxes to households responding to the survey. Moreover, coverage of HBS and official records are not perfectly aligned. For example, consumption taxes incurred by businesses (especially taxes on energy), tourists or unregistered immigrants are not covered by HBS. Table A.1 and A.2 present a comparison of our estimates with National Accounts and Budget, respectively.

Data

Household Surveys

We employ the Household Budget Surveys (HBS) for the years 2003, 2007, 2011, 2015, and 2019. The primary purpose of the HBS is to determine the weights of the consumption basket to be used in the consumer price index. The HBS is administered every month in order to catch the seasonality of consumption. Every member of the household is asked to keep track of their purchases for one month. The HBS also collects detailed data on individuals' demographics, labor market, and income characteristics, as well as household characteristics including data on dwelling conditions. Resulting micro datasets include 25,764, 8,548, 9,918, 11,491, 11,521 observations, respectively for 2003, 2007, 2011, 2015, and 2019. It is not possible to estimate the non-response rate for 2003 and 2007 because of replacement interviews, but non-response rates were 36%, 26%, 26% for 2011, 2015, and 2019 (Further details on the HBS are available in Appendix F).

Other data sources

Education and Health: We complement household surveys with various other data sources. We obtain education spending and number of students in public education from TURKSTAT (2021a) for later years. For 2003 and 2007, we relied on the Ministry of National Education Resources

(MONE, 2008). We obtained health spending statistics from TURKSTAT (2021b) and obtained the share of the population with access to public healthcare from the HBS survey.[4]

Tax Regulation: We obtained value added tax (VAT), Special Consumption Tax, and Special Communication Tax rates from various Official Gazette issues published by the Grand National Assembly of Turkey. We provide items by year tax rate and or amount per unit in Tables F.6-F.9. For income tax regulation, we consulted the Revenue Administration Annual Reports (Revenue Administration, 2021). Appendix F Tables F.1-F.5 and accompanying discussion provide details on tax rates on income and wealth.

Construction of Different Types of Incomes

We follow Lustig (2018) who defines six main types of income: market income, pension as deferred income (PDI hereafter), gross income, disposable income, consumable income, and final income. HBS measures disposable income. Other types of income have to be estimated from household data and imputed components such as imputed taxes paid or per capita health spending. Market income is income obtained from private sources including transfers between households. Market income corresponds to pre-tax and pre-transfer income. Many people regard pensions as deferred wages. Indeed, in Turkey, in everyday usage, pensions are referred to as "retirement wages" (*emekli aylığı* in Turkish). PDI corresponds to this commonplace definition; it is equal to market income plus pensions minus social security contributions.[5] Gross income is pre-tax, post-transfer income. It is equivalent to PDI income plus other direct government transfers to households including social assistance or scholarships. Disposable income is gross income minus direct taxes on income and wealth.[6] Consumable income is calculated by deducting consumption taxes from disposable income. Final income is calculated by adding the per person cost of health and education services to government onto consumable income. Table 1 provides formulas and brief definitions of components included in each income type. Estimated components are denoted

[4] We assumed that if anybody in the household responded "sagliks" question affirmatively, all household members have access to public health care.

[5] Another way of conceptualizing PDI is regarding pensions as savings for retirement. Then, pension income is consumption of previous savings by retirees, and social security contributions are savings for the future.

[6] The only difference between TURKSTAT and Lustig (2018) definitions of disposable income is that in Lustig (2018), imputed wealth taxes are also deducted from gross income. In Turkey, only sizeable wealth tax that can be estimated from household surveys is the annual motor vehicle tax (MTV after the Turkish acronym).

in italics. Other components are directly observed from the household surveys. HBS reports net incomes of households, so estimated components of income are taxes or social security contributions plus in-kind transfers included in the final income. In the next section, we discuss estimation of these components.

Table 1 is here.

Estimation of taxes and transfers

In this section, we provide a summary of estimation of direct taxes on labor earnings and in-kind transfers because assumptions on these items make the most difference. Detailed methodology for estimating taxes on capital income, motor vehicle tax, income tax credit, and indirect taxes are available in Appendix F.

Income and stamp taxes and social security contributions by wage earners

We rely on official data from the Revenue Administration to correct for over-estimation. The Revenue Administration (2021), withholding tax statistics, shows that more than two-thirds of income tax files for wages are for the minimum wage. In the surveys, wage levels are higher than administrative records. Unfortunately, we do not know which surveyed individuals declare their full income to the tax authorities. Hence, we applied the following rule: for the employees in the bottom half of wage distribution, we assume that their taxes and social security contributions are calculated over the minimum wage; for employees in the 50-65 percentile range, we assume that their taxes and social security contributions are the average amount corresponding to minimum wage and naive estimations; and for the 66-100th percentiles, we assume that they paid their taxes and contributions on the income declared in the survey. For 2015 and 2019, 50-65 percentile range is very condensed, so for those two years, we assume that bottom 65 % pay their contributions at minimum wage levels. As a result of these assumptions, estimated taxes and contributions are revised downward and are closer to official data.

Income taxes and Social Security Contributions by self-employed and employers

The Social Security Administration (2021) records show that self-employed people between 93% to 100% declare their income the legal minimum in that year (Tables F.3 and F.4). The observed self-employed and employer incomes in the surveys are significantly higher than legal minimums. When Cuevas et al. (2020) naively estimate SSC from surveys, their SSC estimates multiple times more than actual SSC from the self-employed for 2015. They then rescale individual estimates downward in order to correct for over-estimation. Their methodology is likely to result in many individuals estimated to pay less than legal minimum premiums. Instead, we assume that each self-employed person registered in the social security system pays the legal minimum irrespective of the survey income. We also calculate income and stamp taxes assuming that each formally registered self-employed person pays their taxes from the minimum amount.

Estimation of Health and Education in-kind transfers

We obtained the per student public education spending simply by dividing the total spending to total number of students (separately for primary and secondary students versus tertiary students). We assigned every student in the survey the estimated per capita amount (Table F.10). Students attending private schools are not identified in the survey.

We obtained per capita health spending by dividing total public health spending to population with access. Then, we scaled the average per capita health spending to individuals according to their age group following Mollahaliloğlu et al. (2006: 6, Table 1.8 panel C) health spending by age group estimates for Turkey (see also Table F.11). We follow Cuevas et al. (2020) and Ünal (2021) and impute the full cost of public health and education to HBS. The assumption is that rich households do not utilize public health and education system and households using public health and education system are represented in the surveys.[7]

[7] Alternatively, we scale down education and health in-kind transfers by a certain amount each year to account for the discrepancy between estimated total disposable incomes from HBS and reported total disposable incomes in National Accounts (Lusting and Higgins, 2013). In-kind transfers to households are reduced by 31.1% in 2003, 26.5% in 2007, 20.3% in 2011, 25.7% in 2015, and 18.7% in 2019. We obtain these figures (for 2011, 2015 and 2019) by comparing total disposable income in HBS to disposable income minus Gross Operating Surplus from National Accounts. Detailed National Accounts do not exist for 2003 and 2007, so we multiply 2011 value by the ratio of total spending in HBS versus National Accounts. As a result, estimated Gini coefficients are generally 0.01 point higher compared

Section 4: Findings

Aggregate Measures

Table 2 shows the breakdown of components of income and taxes. Table 2A (2B) presents the share of each item for gross (disposable) income. The bottom line is total estimated gross income indexed to 2019. Aggregate incomes increased for each four-year interval for both income types. The increase was fastest in the first four years (more than 6% per annum), and slowest in the last four-year period roughly (3% per annum). From the perspective of wage earners, take home is total of net wages and income tax rebate (AGİ in Turkish). For both income types, the share of take-home pay increased by 10 percent. The share of pension income also progressively increases throughout the period. In contrast, capital incomes and entrepreneurial incomes of the self-employed (farmers, urban self-employed and employers) declined throughout the period. The decline in self-employed income is also corroborated by decline in self-employment (see Figure 6 and accompanying discussion for details). However, the decline in capital incomes and profits can be due to coverage problems of surveys with respect to the missing rich.

Figure 1 complements Table 2 by presenting the distribution of incomes for all income types (only for 2019). Figure 1A presents the distributions of market income, PDI and gross income. Market income (orange bars) is income before taxes and transfers included, so it includes many households with almost zero incomes. PDI income (green bars) incorporates pensions, so most of the households at the bottom of the market income distribution moves towards the middle of the distribution. Gross income (blue bars) incorporates social assistance to PDI. Social assistance amounts are generally modest, and recipients are concentrated at the bottom, so the only discernable difference between PDI and gross income is at the bottom of the distribution. Figure 1B presents the distributions of disposable, consumable, and final incomes. We obtain disposable income by subtracting direct taxes from gross income; hence, the disposable income distribution skewed toward the left compared to gross income. Consumable income (grey bars) distribution is the most skewed to the left and the most unequal one. Finally, Figure 1B shows that in-kind

to the main estimates. 2003: 0.401 instead of 0.389; 2007: 0.347 instead of 0.337; 2011: 0.355 instead of 0.347; 2015: 0.376 instead of 0.361; 2019: 0.335 instead of 0.325.

transfers are especially important for below median households, and they push households at the bottom towards the middle.

Table 2 and Figure 1 are here.

Income Inequality

There has been a slight improvement in income inequality between 2003 and 2019 as indicated by the Gini coefficient measured at market income without any fiscal intervention (Figure 2A).[8] Although Gini coefficient decreased from 0.511 in 2003 to 0.497 in 2019, it's important to note that there was no consistent trend throughout the entire period. After a significant decrease in Gini coefficient from 0.511 in 2003 to 0.455 in 2007, it displayed an upward trend in the post-GFC period, peaking at 0.52 in 2015. This increasing trend was then reversed, with the Gini coefficient decreasing to 0.497 in 2019. However, it is worth mentioning that this level was still higher than the values observed in 2007 and 2011.[9]

Figure 2A also illustrates the impact of total transfers and tax on income inequality in Turkey between 2003 and 2019, as measured by the Gini coefficient. The combination of all taxes and transfers led to significant improvements in income inequality for the whole period resulting in lower Gini coefficients when measured at final income compared to the market income. Moreover, the effect of these policies on income inequality became increasingly stronger over the years, evident in the growing reduction of the Gini coefficient between 2003 and 2019, as depicted by the vertical distance between the top and bottom lines in Figure 2A. In 2003, fiscal policies in Turkey improved income inequality by reducing the Gini coefficient from 0.511 (measured at market income) to 0.389 (measured at final income), reflecting a reduction of 0.122. The gap

[8] Appendix C presents the comparisons of our estimates with recent tax incidence studies on Turkey. Table C.1 presents disposable income inequality estimates. All the studies estimate disposable income Gini around 0.37-0.40 after the early 2000s. Our estimates are in the middle of the pack. Table C.2 compares our estimates for 2015 and 2019 with Cuevas et al. (2020) and Ünal (2021), respectively, which also employ CEQ methodology. Our inequality estimates are close to Cuevas et al. (2020), except for final income and lower than Ünal (2021) estimates. Table C3 presents comparison of market, after tax before transfer, and after tax and transfer incomes with various studies. These studies vary by methodology and data set. Nevertheless, our estimates are again in the middle of the pack; and for market and after tax before transfer are close to Yılmaz et al. (2016).

[9] In Appendix B, we address the potential measurement issues, especially for 2007 and 2019. We also provide alternate estimates in Figure B.2 panels D and E. After correcting for potential measurement errors for top 5% in 2007 and 2019, 2011 became the least unequal year in most types of income. Nevertheless, our qualitative findings for the impact of taxes and transfers are the same: Their equalizing impact increased over the years.

between these two different Gini measurements started to widen further, especially after 2007, and reached its peak in 2019 at 0.172.

Figure 2B highlights the significant role of pension transfers as a key fiscal intervention in influencing income inequality. This reduction in income inequality is achieved by adding pension earnings to the market income and subsequently subtracting social security contributions. The narrowing of the Gini coefficient curves for all years when transitioning from market income to PDI underscores the importance of pension-related transfers in improving income equality. Furthermore, substantial contributions to reducing inequality are observed from in-kind transfers, such as those related to education and health. This reduction is evident through declining Gini coefficients in all observations when moving from consumable income to final income.

Figure 2 is here.

Financial Incidence of Taxes and Transfers

This section discusses the primary factors influencing the impact of taxes and transfers on inequality and poverty. Marginal contribution (Table 3) assesses the effect of a tax or transfer on inequality by comparing the Gini coefficient with and without that specific tax or transfer. These contributions are evaluated independently of the sequence of inclusion of taxes and transfers, in contrast to the approach used in the previous section, where the changes in Gini coefficients were computed in a sequential manner.

Marginal contributions depend on both the size of a tax or transfer relative to household income, and the degree of progressiveness associated with individual taxes and transfers. Table 3 provides the size of each tax or transfer as a percentage of disposable income. Concentration coefficients (Table 3 Panel C) are calculated based on the distribution of the total tax or transfer across deciles, offering an absolute measure of the distribution of a tax or transfer. Consequently, a higher concentration coefficient value indicates a more unequal distribution of the tax or transfer. When a tax is distributed more unequally than the income it is applied to, the concentration coefficient of the tax will exceed the Gini coefficient. Therefore, such a tax will have an equality-enhancing effect on income distribution.

Likewise, a transfer will be considered relatively progressive when the distribution of the transfer is less unequal (i.e. the concentration coefficient of the transfer will be smaller than the Gini coefficient) than the income to which it applies. Furthermore, a negative sign for the concentration coefficient suggests absolute progressiveness (not only progressive but also pro-poor) regarding the transfer, indicating that a larger share of the total transfer goes to each decile as income declines. Table 3 and Figure 3 summarize our fiscal incidence findings.

Pensions had a consistently significant and equality-enhancing impact on income distribution, emerging as the foremost contributor among all taxes and transfers. This positive effect exhibited a notable progress from 2003 to 2019, with the reduction in the Gini coefficient due to pension transfers increasing from 4.13 percentage points in 2003 to 6.89 points in 2019. The distribution of pensions across income deciles became more equal during this period, evident in declining concentration coefficient values, which fell from 0.366 in 2003 to 0.296 in 2019. The equality-enhancing impact of pensions became more pronounced over time, as reflected in the widening gap between the concentration coefficient and the Gini coefficient at market income. Although the size of pensions as a percentage of disposable income remained relatively stable except for 2019, it consistently constituted the most significant fiscal intervention relative to other fiscal tools over the entire period. Therefore, the size plays an essential role in the substantial equality-enhancing impact of pensions on income distribution, in addition to its relative progressiveness.

Table 3 is here.

In-kind education transfers, despite no significant change in their marginal contribution over the years, also contributed to the overall reduction in income inequality. The reduction in the Gini coefficient slightly increased from 2.45 percentage points in 2003 to 2.76 percentage points in 2019, with the highest point being 2.91 in 2015. In-kind education transfers were the only fiscal intervention that experienced a decline in their relative size, decreasing from 7.3 percent of disposable income to 6.3 percent in 2019. Both the negative sign of concentration index and the increasing magnitude over time (from -0.003 in 2003 to -0.13 in 2019) indicate the tendency of in-kind education transfers to become more favorable to lower-income individuals over time. Appendix Table D.2 reveals that the pro-poor characteristic of in-kind education transfers was primarily derived from primary and secondary education transfers, as these exhibited only negative and increasing values throughout the entire period.

The marginal contribution of in-kind health transfers remained consistently positive throughout the entire period, with its equality-enhancing impact on income distribution becoming more pronounced after 2007. The reduction in the Gini coefficient was 2.14 percentage points in 2003, rose to 3.42 in 2011, and then slightly decreased to 3.18 percentage points in 2019. Changes in the equality-enhancing impact of in-kind health transfers over time appeared to be driven more by improvements in its progressiveness rather than its relative size. The concentration coefficient for in-kind health transfers consistently decreased since 2003, indicating a gradual increase in its relative progressiveness, making it more evenly distributed than market income in 2019 compared to 2003.

While the equality-enhancing impact of other government transfers, including social assistance and income tax credits, nearly quintupled from 0.2 Gini points in 2003 to 0.98 points in 2019, their marginal contribution remained the lowest among all transfers. Other government transfers also experienced the highest growth rate in terms of their size relative to disposable income, increasing from 1.3 percent of disposable income in 2003 to 4.1 percent in 2019, which is mostly due to introduction of income tax credit. Most workers probably do not consider income tax credit as a government transfer since it is an instantaneous rebate of a portion of income tax. The concentration coefficient for other government transfers remained positive at the aggregate level, it turned negative in 2011 and became more pro-poor over time, especially when considering only social assistance, as evident in more detailed data (see Appendix Table D.2).

The marginal contribution of social security contributions showed a consistent upward trend over the entire period, leading to an increase in the reduction of the Gini coefficient from 1.11 percentage points in 2003 to 2.68 percentage points in 2019. Notably, the equality-enhancing impact of social security contributions on income distribution surpassed that of direct taxation, starting in 2007. One contributing factor to this heightened positive impact was the growing size of social security contributions relative to disposable income. The share of social security contributions as a percentage of disposable income increased from 12.2 percent in 2003 to 18.2 percent in 2019, making it the fastest-growing category among all taxes. Despite the distribution of social security contributions becoming somewhat less equal over the years, it remained more equitable than the distribution of income during the same period. Therefore, social security contributions in Turkey can be considered an example of Lambert's Conundrum, in which a

regressive tax can have a more equalizing effect than a system that excludes it (Enami et al., 2017: 25).

The marginal contribution of direct taxation increased from 1.28 percentage points in 2003 to 2.15 percentage points in 2019, peaking at 2.2 percentage points in 2015. The relative size of direct taxation began displaying an increasing trend, particularly after 2011, rising from 6.6 percent of disposable income in 2003 to 8.2 percent in 2019. In contrast to social security contributions and indirect taxes, there was a clear pattern of relative progressiveness in direct taxation throughout the entire period. A comparison of concentration coefficients with Gini coefficients over the entire period clearly indicates that the distribution of direct taxation was consistently more unequal than the income distribution. Therefore, both the size and the relative progressiveness of direct taxes contributed to its equality-enhancing impact on income distribution, particularly after 2007.

Indirect taxation was the only category between 2003 and 2019 that had a negative effect on income distribution in Turkey. Although the impact in terms of increasing the Gini coefficient rose from 0.12 percentage points in 2003 to 0.66 percentage points in 2007, the same impact slightly increased in 2019, reaching 0.77 percentage points. Low and declining values for the concentration coefficient between 2003 and 2019 indicate that the distribution of indirect taxes became less unequal and consistently remained below the Gini coefficient throughout the period.

Next, we document the proportion of taxes and transfers to disposable income for each decile. We chose disposable income because it consists of observed income with no imputation, except for estimated motor vehicle tax.

Figure 4 illustrates the total fiscal impact on different income deciles in Turkey over time, with observations from 2003, 2011, and 2019 for each decile. In this representation, a positive value indicates that the decile received more in transfers than it paid in Social Security contributions and overall taxes, while a negative value suggests the opposite. Figure D.3 in Appendix presents the decomposition of contribution of each tax and transfer for deciles for the years 2003, 2011, and 2019. Figures D.4-D.12 and accompanying text in the Appendix present the changes in taxes and transfers individually.

Figure 3 and 4 are here.

For the entire period, the bottom 70 percent of the population were net receivers, signifying that the sum of their transfers exceeded their Social Security contributions and total taxes. The fiscal incidence curve in both 2011 and 2019 clearly demonstrates a relationship between the amount of net receipts as a share of per capita disposable income for each decile and their position in the income distribution. However, this relationship was less distinct in 2003.

One of the most significant factors driving this change was the improvement in the net receiver position of the bottom three deciles, especially the lowest decile, between 2003 and 2011. The share of net received payments as a portion of per capita disposable income for the lowest decile surged from 40.7 percent in 2003 to 69.8 percent in 2019. The corresponding shares for the bottom second and third deciles in 2019 were 35.4 percent and 31.7 percent, respectively, compared to only 25.8 percent and 24.7 percent in 2003.

Furthermore, there was an increase in net payments from the top two deciles between 2003 and 2011, while the middle-range deciles either experienced no significant change or a slight reduction in their net receiver positions during the same period. The net payments of the highest decile as a share of per capita disposable income increased from 12.2 percent in 2003 to 24.2 percent in 2019. The corresponding shares for the ninth decile were 1.1 percent in 2003 and 10 percent in 2019.

Poverty Findings

Figure 5 Panel A illustrates that the poverty rate at market income (measured at $5.5 a day) experienced a significant decline between 2003 and 2007, dropping from 12.9% to 6.9%. However, it remained relatively stable at a lower plateau despite a slight upward trend after 2011.[10]

Figure 5 Panel B presents similar results regarding the impact of transfers and taxes on the poverty rate for a poverty threshold set at $10 per day. After the steep decline in the poverty rate at market income from 27.4% in 2003 to 17.3% in 2007, there was a more noticeable decreasing trend for

[10] Appendix E presents extra analysis for poverty. Figure E.1 presents cumulative distribution functions for disposable and consumable incomes for each year. Figure E.2 presents relative poverty (poverty threshold as 60 % of median). Figure E.3 reproduces Figure 6 when per capita incomes are not adjusted for household size with OECD scale.

the rest of the period, with the poverty rate at market income, reaching its lowest values at 14.2% in 2015 and 2019.

Figure 5 is here.

Table 4 documents the marginal impacts of different policies on the poverty rate (Panel A) and poverty gap ratio (Panel B) at $10 per day by comparing fiscal impoverishment and fiscal gains for the poor following Higgins & Lustig (2016). Like the previous discussion on inequality, pension transfers seem to have the most important marginal impact on poverty reduction. The net change as the difference between the poverty rate (gap) at market income and the poverty rate at PDI in 2003 indicates almost 55% (61%) reduction in the poverty rate (gap) as a result of including pension as a transfer. This reduction in the poverty rate (gap) due to pension transfer progressively increased over time and became almost 70% (76%) in 2019. The rising positive impact of other transfers on the poverty rate is also observed by gradual increase in fiscal gains to the poor measured at gross income. The poverty-reducing impact of direct taxes stayed more or less negligible for the period after 2007 because households paying direct taxes are generally above the poverty threshold. The negative effect due to indirect tax was much more visible for the whole period. The absolute fiscal impoverishment due to indirect taxes showed a gradual decrease after 2003. However, by 2015, indirect taxes were the primary cause of consumable income poverty. In 2003, 5.5% out of 20.8% were consumable income poverty due to indirect taxes. By 2019, 2.8% out of 5.2% were fiscally impoverished by indirect taxes. Similarly, in 2003, 0.021 of 0.066 poverty gap ratio was due to fiscal impoverishment by indirect taxes. This proportion increased to 0.015 of 0.021 by 2019. Relative fiscal impoverishment due to indirect taxes is better captured by the poverty gap ratio because every household pays indirect taxes and poverty rate captures only those which crosses poverty threshold whereas poverty gap takes into account all poor households, including the already poor before the tax imposed.

Table 4 is here.

Section 5: Discussion

Improvements due to structural change: Income taxes and social security contributions

In the fiscal incidence section, we document that direct taxes and social spending have become more redistributive over the years. Income taxes on labor earnings comprise two-thirds of all direct taxes in the study period, except 2003. The impact of income taxes and social security premiums has become more progressive over the years. However, higher progressivity did not necessarily arise from more progressive tax rates. Table D.3 in the Appendix shows that the effective tax rate did not change substantially over the study period. Likewise, as shown in Table F.1, social security contribution rates increased by only one percent in 2015. It is worth noting that social security contribution rates are the same for all workers and are capped at certain levels. Rather, the increased progressivity of income taxes and social security contributions' impact over the years can be attributed to structural changes in the labor market and forbearance (Holland, 2016). Holland (2016) notes that authorities in many middle-income countries are lenient towards certain activities like shanty towns or informal employment. In other words, authorities do not strictly enforce the building codes, or employment regulations as stipulated in the legal framework. She argues that Turkey and many Latin American countries (such as Colombia, Chile, and Peru) should not be regarded as weak states not having the power to enforce laws. Instead, in these countries, authorities selectively enforce certain rules.[11]

In the Methods section, we document that in Turkey, authorities turn a blind eye to the brazen under-declaration of incomes by self-employed individuals and employers enrolled in the social security system. Under-reporting of market income is also prevalent for wage earners, but not to the same extent (the proportion of wage earners declaring minimum wage never exceeds 65% throughout the period, whereas for self-employed individuals and employers, it is consistently around 99%).[12] Consequently, the effective tax rate for wage earners, as a whole, is higher than similar level entrepreneurial incomes. This lenient attitude towards violations of tax code on entrepreneurial and capital income is a fundamental part of political economy of fiscal policies in Turkey, and is a constant over the study period. Over the study period, the structure of economy

[11] Holland (2016; 233) defines forbearance as 'intentional and revocable government leniency toward violations of law'.

[12] Under-reporting and even total avoidance of some forms of capital income such as rental income is probably even larger.

continued to modernize, approximating that of developed countries, and the share of wage-employment increased from 50% to 70% (TURKSTAT, 2023c). These changes in employment are also reflected in incomes. Figure 6 shows an increase in the share of wage income across all income levels, including the top 10 %. The growing number of wage earners in the top income brackets made income taxes and social security contributions (despite the cap limiting the income subject to social security contributions) more progressive through differential effective taxation of various labor earnings. In other words, this source of improvement in redistribution is not an explicit policy choice but an unintended consequence of the interaction between structural change and political economy of Turkey. When the structural change is completed, this source of improvement in redistribution will probably stop.

Figure 6 is here.

Improvements due to the continuation of existing policies

Access to the pension system has continued to expand in the study period. Per capita pensions also increased in absolute terms but less than market incomes. In the last quarter century, the pension system has been reformed in 1999, 2008, and 2023. In 1999 and 2008 reforms, retirement age had been increased for new entrants (2023 reform reduced the retirement age for certain groups). People who enrolled first time before 1999 could retire in their 40s or early 50s (Saydam, 2018). The 2008 reform also reduced the replacement ratio for new participants (Saydam, 2018: 338). People who retired in the first two decades of the 21st century has enrolled in the pension system mostly before the AKP period, and their access is determined by decisions taken a long time ago. As a result, the share of households receiving pensions has increased over the years (Figure 7).

Figure 7 is here.

Improvements due to the government policies

The third source of increased redistribution is increase in access to the healthcare system and increases in per capita spending. The Health Transformation Program is one of the signature policies of Erdoğan governments in their first decade in power. Access to public healthcare

facilities increased substantially in the 2003-2010 period (Tekgüç and Atalay-Güneş, 2015; Dorlach, 2015; Yıldırım, 2017; Yardım and Uner, 2018; Özen, 2018). Furthermore, per person spending increased substantially between 2007 and 2019. Figure 8 shows a significant rise in the proportion of households with access to the healthcare system between 2003 and 2011. Likewise, average per capita health spending witnessed a notable increase, especially after 2010.

Social assistance is another policy arena where successive AKP governments are very active. Indeed, social assistance programs were expanded significantly during the study period (see Figure D.6 and Table D.2 for details). As a result, social assistance programs became more pro-poor over the years. Nevertheless, social assistance programs have the least equalizing effect simply because the overall size of these programs is small relative to the pension transfers, or public health, or education spending.

Improvements despite the government policies

Another source of increased redistribution is education spending. We impute equal education spending for each child in our estimations and families with multiple children are more likely to be at the lower half of income distribution. Primary and secondary education spending has always been pro-poor (with a negative concentration index) because of equal amount of spending per pupil and more children in lower income groups. Over the years, number of children in public primary and secondary education declined for every decile (see Figure 8 Panel C). However, the decline is much larger both in absolute and proportional levels for higher income deciles. As a result, education spending has become even more pro-poor. The relative decline in the number of children in education happened despite increasing school enrollment rates. In other words, this decline is driven by decline in fertility.[13] The fertility decline is not the result of policy. On the contrary, President Erdoğan (who served as either the prime minister or president throughout the 2003-2019 period) is a well-known pronatalist and introduced many policies to arrest and reverse fertility decline (Dildar, 2022). Dildar (2022) finds that the official pronatalist position has changed the

[13] Total fertility declined from 2.94 in 1992 to 2.32 in 2001 during the decade before AKP came to power and continued to decline to 2.15 in 2012 (World Bank, 2023). As of 2019, total fertility rate further declined to 1.97.

attitude of religious women in favor of higher fertility but the actual fertility rate continued its long-term secular decline.

Figure 8 is here.

Impact on Poverty

Our estimates for poverty and poverty gap in the Results Section relies on incomes adjusted for household size and equivalence with the OECD scale. Arguably, for very low incomes where the spending on food takes up a large share of household budget, there should be less scope for household equivalence scales. At the bottom panel of Table 6 (and in Figure E.3), we present poverty estimates when household size is not adjusted for equivalence. In that case, almost all the reduction achieved by transfers between market and disposable incomes are reversed by indirect taxes on consumption. Revenue from indirect taxes on households is large and similar in magnitude to spending on health and education. However, these indirect taxes come with a serious downside: they increase consumable income poverty significantly.

International Comparison with other CEQ Country Studies

Table 5 presents international data on Gini coefficients from a sample of middle-income countries employing CEQ methodology. Notably, when we examine the Gini coefficients measured at market income for Turkey, they appear lower than those of most countries in Latin America but are much closer to those in European countries. Analyzing the redistributive impact of fiscal policy for corresponding years by considering the difference in Gini coefficients between market and final incomes, we observe that all countries exhibit an overall equality-enhancing effect of transfers and taxes. However, several insights emerge.

First, although Turkey initially had Gini coefficients at market income similar to Eastern European countries, these similarities diminish due to the substantially more significant positive impacts of transfers and taxes observed in Eastern Europe. The lowest observed Gini coefficient estimates for Turkey at final income remains higher than that of any other European country.

Second, when focusing on the separate impact of pension transfers (market-PDI column), it becomes evident that the role of pensions was relatively lower in Latin American countries

compared to Eastern European ones. Eastern European countries witnessed significant reductions, 11 to 12 points in the Gini coefficient, measured at market income after pension transfers. While Turkish pension transfers contributed to progress in reducing income inequality over time, their impact, even in 2019, was lower than that observed in all the European countries in the sample.

Lastly, when considering the rest of the tax and transfers, it's worth noting that, except for Colombia and the Russian Federation, the overall equality-enhancing impact of the sum of other transfers, direct taxes, indirect taxes, and in-kind transfers in all countries in the sample was larger than the same impact in Turkey, as observed in the last column of Table 5.

Table 5 is here.

Table 6 presents the poverty rate and the impact of transfers and tax on the poverty rate for a sample of middle-income countries. While the lowest poverty rates at market income are observed in Chile and Russia, Turkey's poverty rates for per capita income, not adjusted for household size (See the Notes below Table 6), are closer to Eastern European countries as well as some countries from America such as Argentina, Uruguay, and Costa Rica. Although almost all countries experienced poverty-reducing impact of all transfers and direct tax, this impact varied across countries. There are very limited improvements associated with all transfers and direct tax especially in those countries where the rate of poverty at market income is measured at the highest level such as Brazil, Colombia, or Mexico. Turkey had one of the highest reductions in poverty rate along with countries such as Argentina, Uruguay, Russia, and Poland once the impact of transfers and direct tax is taken into account. The strong poverty-increasing effect of indirect tax is evident in almost all countries with the sole exception of Ecuador. In all other countries, the poverty rate measured at consumable income either got very close to the poverty rates at market income or even exceeded it.

Table 6 is here.

Section 6: Conclusion

In this paper, we document that the progressive redistributive impact of taxes and transfers has increased over the years. The impact of taxes and transfers on inequality and poverty are driven by four different kinds of factors: (i) Interaction of forbearance of self-employment and capital

income under-reporting with structural transformation towards more wage employment; (ii) Continuation of pre-existing policies such as continued expansion of pension system; (iii) Declining fertility despite the government policies, making public education even more pro-poor; (iv) Reduction in final income inequality due to new government policies such as the Health Transformation Program or expansion of social assistance.

Overall, increasing share of wages and pensions, decline in consumption from own production, and self-employment are indicative of the modernization process. More people are living in cities and working for a wage in the formal sector. The share of formal employment has increased, resulting in the expansion of social security contributions and in the enlargement of the pension system. Tax receipts from indirect taxes also increased as the share of the formal commercial transactions rose even without any increase in tax rates. Furthermore, fertility decline in 2000s is the continuation of pre-existing trends and cannot be attributed to deliberate policy changes, which remained pronatalist throughout the period. The Health Transformation Program and expansion of certain social assistance policies are novel, and implemented deliberately to improve social welfare during the AKP era. In the first two decades of the 21st century, benevolent impacts of taxes and transfers are mostly driven by structural changes in the economy and/or by the proliferation of nuclear families rather than the deliberate new policies. Once the structural change is completed or slowed down, these benevolent effects may stop improving social welfare.

Limitations of our study

One consequential limitation of our study is that it relies on household surveys, which generally fail to cover rich households (Lustig, 2020). Entrepreneurial and capital incomes are probably concentrated among the truly rich, which is mostly missing from the data set. Hence, the extent of uncollected taxes due to under-reporting of (i.e. forbearance) capital and entrepreneurial incomes could be much larger than our estimations. In other words, we are likely overlooking a significant part of the impact of the forbearance of under-reporting of certain types of incomes on inequality. The truly rich are totally absent from the surveys, making it hard to comment on any changes within this group in the 2003-2019 period. Turkish tax authorities do not share any tax data on truly rich; and therefore, future studies first need to estimate the incomes of the truly rich, and then assess their effective tax rate over the years.

The second limitation of our study is that we do not evaluate transfer between capitalists and working-class households. Nevertheless, total taxes paid, and total transfers received by households seem roughly equal during the study period, suggesting a limited number of transfers between classes. In Figure D.3, the rightmost columns for average taxes and transfers show that total taxes paid by households and total transfers to households are more or less equal to each other. To the extent that we can analyze, the Turkish welfare regime redistributes income from younger households to older households and households with children.

The third limitation of our methodology is that we equate per-capita spending for in-kind services as value of these services to households. However, in recent years, many upper income households are opting out of public education system because of Islamization of curriculum in public schools (ERG, 2017; Gürcan, 2015; Karapehlivan, 2019). These families are still paying taxes, but do not receive public services. Turkey is not a high tax country in terms of direct taxes on income and wealth; however, there is a widespread concern about over-taxation. We suspect that this feeling is driven as much by the perceived inadequacy of public services, especially education.

Opting out of upper middle class from public schools is potentially harmful to the long-term viability of the taxation base to support public services. Korpi and Palme (1998) demonstrate that Scandinavian welfare spending is not as well targeted as the Anglo-Saxon ones; however, it is more successful in reducing poverty and inequality compared to the US or UK welfare spending because of a much larger welfare spending. The large Scandinavian welfare states are supported by a broad-based coalition of working-class and middle classes because these taxes pay for generous pensions and high-quality health and education services. Widespread exit of upper-income households from the education system in Turkey can be a harbinger of evolution towards smaller and targeted welfare systems that are less likely to be successful in eliminating poverty and reducing income inequality.

The fourth limitation of our study is that it is not suitable to study gender gaps in taxation and transfers because of methodological and data-related issues. Methodologically, domestic care labor provided by women is not monetized; and hence, it cannot be incorporated into our accounting framework. Moreover, labor force participation is very low in Turkey; and even many of the women with a job are unpaid family workers that are employed informally. Hence, a great majority of women do not pay any tax or social security contribution in any given year.

Additionally, pension data in the HBS does not distinguish between own pensions and survivor pensions; they are combined in the same variable. Because women have longer life expectancy than men, most of the survivor pensioners are women; yet, in this data set, we cannot directly identify survivor pensions from own pensions. As a result, comparing taxes and social security contributions paid and transfers received by gender will probably produce an over-estimation of transfers received by women.

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Table 1: Components of alternative definitions of Income

Income types	Components
Market income	W +SE+ IC + AC + IROH + PTran + ***IT + SSC – ITC***
PDI	Market Income + SSP – ***SSC***
Gross Income	PDI + GT + ***ITC***
Disposable Income	Gross Income – ***(IT+MTV)***
Consumable Income	Disposable Income – ***IndT***
Final Income	Consumable Income + ***InkindT***

Notes: W: Wages and salaries income, cash or in-kind, formal or informal. SE: income from self-employment or being employer. IC: Capital income (rent, dividend, interest, profit, etc), formal or informal, excluding gifts. AC: Consumption from self-production. IROH: imputed rent for owner-occupied home. PTran: Transfers from other households (gifts, charity, alimony, etc.) IT: Direct taxes on W, SE and IC, e*stimated by authors.* SSP: Social security pension. SSC: social security contributions, *estimated by authors.* GT: cash or in-kind government transfers, mostly social assistance. ITC: income tax credit (*asgari geçim indirimi* Turkish), e*stimated by authors.* MTV: motor vehicle tax (Turkish acronym), e*stimated by authors.* IndT: Indirect taxes; value added tax, special consumption tax, special communication tax, e*stimated by authors.* InkindT: health and education services directly provided to public, *estimated by authors.*

Table 2: Share of income, tax and transfer items

Panel A: Gross income shares

	2003	2007	2011	2015	2019
net wages	35.4%	41.1%	42.9%	42.1%	42.1%
income tax rebate			1.9%	2.4%	3.1%
self-employment income	25.7%	18.4%	16.5%	16.5%	13.8%
income from capital	5.2%	3.5%	4.3%	4.1%	4.0%
private transfers	1.9%	2.1%	2.7%	2.2%	2.4%
imputed rent	10.2%	12.2%	10.5%	10.4%	9.4%
cons. own prod.	1.2%	0.7%	0.9%	0.7%	0.7%
taxes on earnings	5.4%	6.2%	5.2%	6.3%	6.8%
taxes on financial income	0.3%	0.1%	0.1%	0.1%	0.0%
pensions	13.5%	14.2%	13.7%	14.2%	16.6%
other public transfers	1.2%	1.5%	1.4%	1.2%	1.1%
	100%	100%	100%	100%	100%
total gross inc. (millions)*	827,046	1,057,383	1,288,123	1,617,298	1,833,040

Panel B: Disposable income shares

	2003	2007	2011	2015	2019
net wages	37.7%	44.3%	45.6%	45.3%	45.6%
income tax rebate**	0.0%	0.0%	2.0%	2.5%	3.3%
self-employment income	27.4%	19.8%	17.6%	17.8%	15.0%
income from capital	5.5%	3.8%	4.6%	4.4%	4.3%
private transfers	2.0%	2.2%	2.8%	2.4%	2.6%
imputed rent	10.9%	13.2%	11.2%	11.2%	10.2%
cons. own prod.	1.2%	0.7%	0.9%	0.7%	0.7%
pensions	14.4%	15.2%	14.6%	15.3%	17.9%
other public transfers	1.3%	1.6%	1.5%	1.3%	1.2%
vehicle tax	-0.4%	-0.8%	-0.8%	-0.8%	-0.8%
	100%	100%	100%	100%	100%
total disposable inc. (millions)*	776,426	982,950	1,209,841	1,502,068	1,694,174
indirect taxes, % of disp. inc.	-11.4%	-13.4%	-15.7%	-15.0%	-14.9%
Consumable income	687,788	851,340	1,020,038	1,276,317	1,441,895

*: indexed to 2019 with CPI. **: As of 2019 a single person wage earner annual take home pay was 26,543 TL which 2,303 was income tax rebate (8.6% of annual take home pay). Income tax rebate is proportional to minimum wage so its share in take home pay declines with income. For 2019 we estimate that income tax rebate is 6.7% of take home wage income (3.3/48.9).

Table 3. Marginal Contribution of Taxes and Transfers

Panel A	**2003**	**2007**	**2011**	**2015**	**2019**
Marginal Contribution (as percentage Gini points*100)					
pensions	-4.13	-4.69	-4.72	-6.09	-6.89
SS contributions	-1.11	-1.63	-1.88	-1.97	-2.68
other gov't transfers	-0.20	-0.46	-0.80	-0.98	-0.98
direct taxes	-1.28	-1.30	-1.74	-2.20	-2.15
indirect taxes	0.12	0.66	0.74	0.72	0.77
health	-2.14	-2.13	-3.42	-3.45	-3.18
education	-2.45	-2.23	-2.31	-2.91	-2.76
Panel B					
Size (% of disposable income)					
pensions	16.0	16.4	15.9	16.2	19.8
SS contributions	12.2	13.7	13.9	16.0	18.2
other gov't transfers	1.3	1.5	3.3	3.3	4.1
direct taxes	6.6	7.4	6.6	7.8	8.2
indirect taxes	11.4	12.8	15.3	13.9	14.3
health	8.9	6.5	9.8	8.3	9.0
education	7.3	6.3	5.9	6.4	6.3
Panel C					
Concentration index					
pensions	0.366	0.331	0.302	0.284	0.296
SS contributions	0.440	0.420	0.470	0.466	0.459
other gov't transfers	0.259	0.091	0.152	0.122	0.134
direct taxes	0.569	0.498	0.619	0.634	0.586
indirect taxes	0.385	0.303	0.331	0.338	0.295
health	0.148	0.039	0.016	-0.007	0.003
education	-0.003	-0.039	-0.072	-0.104	-0.130
Gini at market income	**0.511**	**0.455**	**0.488**	**0.520**	**0.497**
Gini at final income	0.389	0.337	0.345	0.361	0.325

Table 4: Fiscal Impoverishment and Gains of the Poor, threshold $10 PPP per day

Panel A: Headcount poverty ratio

Headcount poverty ratio	**2003**	**2007**	**2011**	**2015**	**2019**
Market income	27.4%	17.3%	15.1%	14.2%	14.2%
FI of SSC	1.1%	0.3%	0.3%	0.3%	0.4%
FGP of pensions	-13.4%	-9.1%	-8.9%	-9.2%	-10.4%
PDI	15.1%	8.5%	6.5%	5.2%	4.2%
FGP of other transfers	-0.7%	-1.0%	-1.3%	-1.9%	-1.9%
Gross income	14.4%	7.4%	5.2%	3.4%	2.3%
FI of direct taxes	0.8%	0.1%	0.1%	0.1%	0.1%
Disposable income	15.3%	7.6%	5.3%	3.5%	2.4%
FI of indirect taxes	5.5%	4.1%	4.5%	3.7%	2.8%
Consumable income	20.8%	11.6%	9.7%	7.2%	5.2%

Panel B: Poverty Gap Ratio

Poverty gap ratio	**2003**	**2007**	**2011**	**2015**	**2019**
Market income	0.122	0.069	0.060	0.059	0.063
FI of SSC	0.002	0.001	0.001	0.001	0.001
FGP of pensions	-0.077	-0.043	-0.038	-0.041	-0.049
PDI	0.047	0.027	0.023	0.018	0.015
FGP of other transfers	-0.004	-0.007	-0.008	-0.010	-0.009
gross	0.043	0.020	0.015	0.008	0.006
FI of direct taxes	0.002	0.001	0.000	0.000	0.000
disposable	0.045	0.021	0.016	0.008	0.006
FI of indirect taxes	0.021	0.017	0.024	0.021	0.015
consumable	0.066	0.037	0.040	0.030	0.021

Notes: PDI: market income + pensions – social security contr.; Gross: PDI + social assistance; Disposable: Gross – direct taxes; Consumable: Disposable – indirect taxes. FI: Fiscal impoverishment; FGP: Fiscal Gains to the poor; FI and FGP is equal to per capita FI/FGP as a % of z. See Higgins & Lustig (2016) for the calculation of FI and FGP. Poverty gap ratio is equal to the total of absolute gap between poverty line ($10 PPP per day or 7,701.5 TL per year in 2019) and individual income for the poor divided by poverty line and population.

Table 5: Comparison with CEQ Inequality Estimates for Select Countries

Country	year	market	PDI	disposable	consumable	final	market - PDI	PDI - final
Brazil	**2008**	0.593	0.573	0.545	0.542	0.479	0.020	0.094
Uruguay	**2009**	0.544	0.505	0.467	0.468	0.418	0.039	0.087
Chile	**2013**	0.503	0.494	0.467	0.464	0.420	0.009	0.074
Colombia	**2014**	0.575	0.575	0.566	0.559	0.515	-0.001	0.061
Mexico	**2014**	0.528	0.528	0.494	0.490	0.442	0.000	0.086
Tunisia	**2010**	0.410	0.431	0.397	0.381	0.352	-0.021	0.079
Russia	**2010**	0.492	0.379	0.348	0.351	0.323	0.113	0.056
Poland	**2014**	0.526	0.412	0.345	0.355	0.291	0.114	0.121
Croatia	**2014**	0.513	0.392	0.325	0.355	0.291	0.121	0.101
Romania	**2016**	0.487	0.378	0.334	0.336	0.307	0.109	0.071
USA	**2011**	0.484	0.448	0.376	0.378	0.331	0.036	0.117
Tekgüç & Eryar (2023)								
Turkey	**2003**	0.511	0.445	0.431	0.438	0.389	0.066	0.056
Turkey	**2007**	0.455	0.386	0.377	0.382	0.337	0.069	0.049
Turkey	**2011**	0.488	0.415	0.390	0.405	0.345	0.073	0.070
Turkey	**2015**	0.520	0.442	0.412	0.429	0.361	0.078	0.081
Turkey	**2019**	0.497	0.401	0.371	0.388	0.325	0.096	0.076

Resources: CEQ Metadata table. https://commitmentoequity.org/datacentes Sources cited in CEQ Metadata: Higgins and Pereria (2013) – Brazil; Bucheli et al. (2013) – Uruguay; Martínez-Aguilar et al. (2017) – Chile; Martinez Pabon et al. (2021) – Colombia; Scott et al. (2017) – Mexico; Jouini et al. (2018) – Tunisia; Higgins et al. (2015) – USA; Lopez-Calva et al. (2017) – Russia; Gorasu and Inchauste (2016) – Poland; Inchauste and Rubil (2017) – Crotia; Inchauste and Militaru (2018) – Romania.

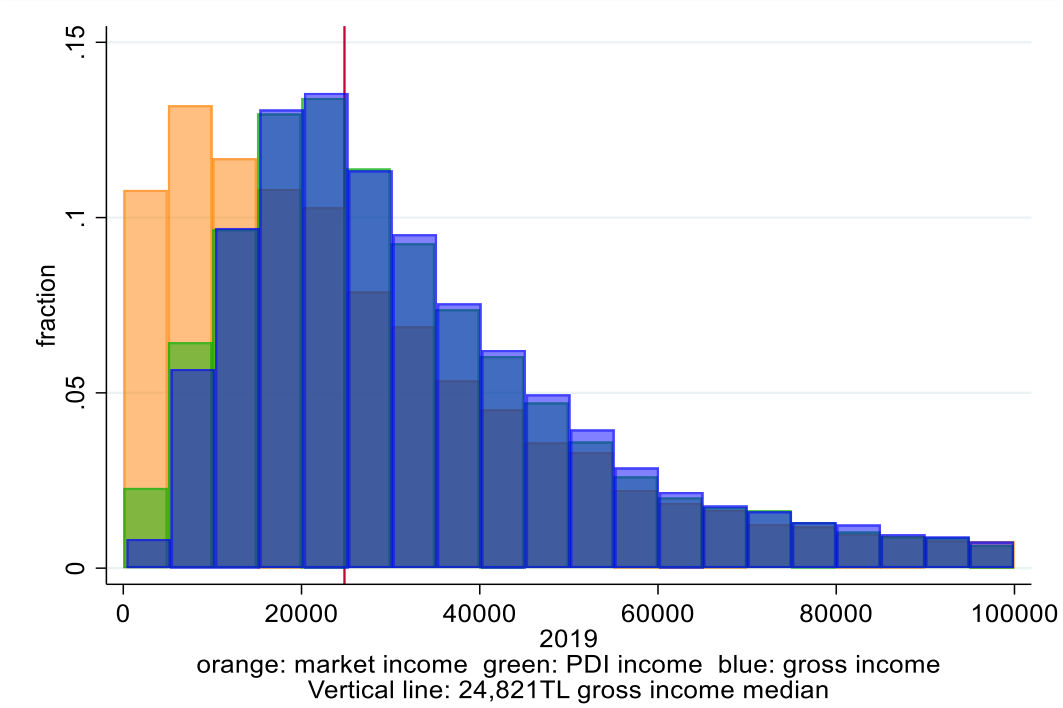
Table 6: Comparison for CEQ Absolute Poverty Estimates for Select Countries

Country	year	Poverty Threshold: $4 2005 PPP/per day converted to 2011 PPP	Market	Disposable	Consumable
Argentina	2012	*	12.3%	7.3%	12.5%
Uruguay	2009	4.3	16.5%	12.2%	15.7%
Brazil	2008	4	29.5%	27.6%	32.9%
Chile	2013	5.2	7.5%	4.4%	5.7%
Colombia	2014	5.2	32.0%	31.2%	31.8%
Costa Rica	2010	4.9	10.8%	9.3%	11.1%
Ecuador	2011	4.8	24.2%	21.1%	20.4%
Mexico	2014	4.4	26.9%	25.1%	25.9%
Tunisia	2010	4.6	14.3%	14.9%	14.7%
Croatia	2014	4.9		5.3%	11.5%
Russia	2010	4.8	6.1%	4.4%	5.1%
Romania	2016	5.5	13.9%	12.1%	15.4%
Poland	2014	5.3	8.8%	3.0%	4.5%
Tekgüç & Eryar (2023)					
Turkey	2003	5.5	12.9%	3.5%	5.5%
Turkey	2007	5.5	6.9%	1.4%	3.0%
Turkey	2011	5.5	5.7%	1.0%	2.9%
Turkey	2015	5.5	6.0%	0.5%	2.0%
Turkey	2019	5.5	6.7%	0.4%	1.4%
Turkey*	2003	5.5	30.6%	23.4%	29.5%
Turkey*	2007	5.5	19.3%	13.4%	18.2%
Turkey*	2011	5.5	16.6%	10.2%	15.9%
Turkey*	2015	5.5	13.0%	7.2%	12.2%
Turkey*	2019	5.5	12.2%	5.6%	10.0%

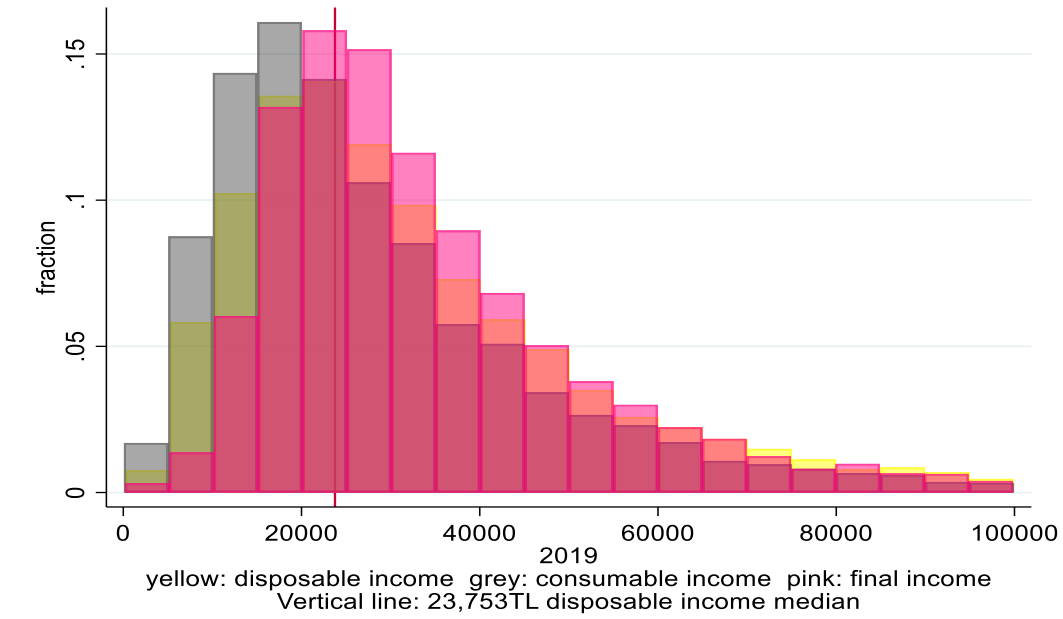
Notes: *Turkey estimates are converted to household per capita from OECD equalized in order to produce comparable estimates in the literature. Tunisia is equalized household size. Romania, Poland, and Costa Rica household size correction methodology is not available. Other countries' poverty statistics calculated per capita household size. Resources: CEQ Metadata table. Sources cited in CEQ Metadata: Rossignolo (2016) – Argentina; Bucheli et al. (2013) – Uruguay; Higgins and Pereria (2013) – Brazil; Martínez-Aguilar et al. (2017) – Chile; Martinez Pabon et al. (2021) – Colombia; Sauma and Trejos (2014) – Costa Rica; Llerena Pinto et al. (2015) – Ecuador; Scott et al. (2017) – Mexico; Jouini et al. (2018) – Tunisia; Lopez-Calva et al. (2017) – Russia; Gorasu and Inchauste (2016) – Poland; Inchauste and Rubil (2017) – Crotia; Inchauste and Militaru (2018) – Romania.

Figure 1: Distribution by Income type for 2019

Panel A: Market, PDI and Gross Incomes



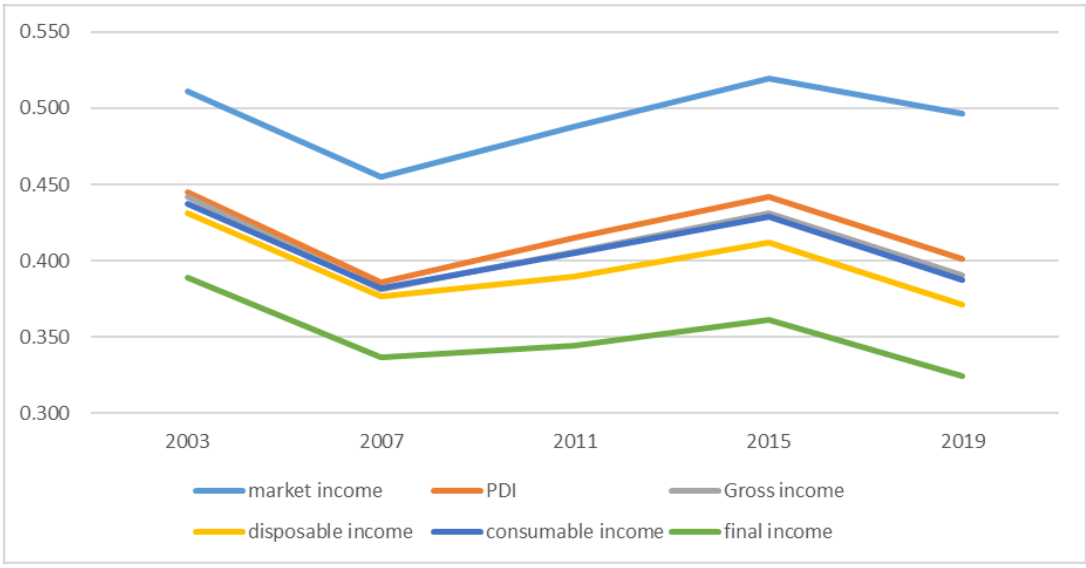
Panel B: Disposable, Consumable and Final Incomes



Notes: We limit the maximum with 100,000 to make graphs legible.

Figure 2: Gini Coefficients

Panel A: Gini coefficients by type



Panel B: Gini Coefficients by year and income type

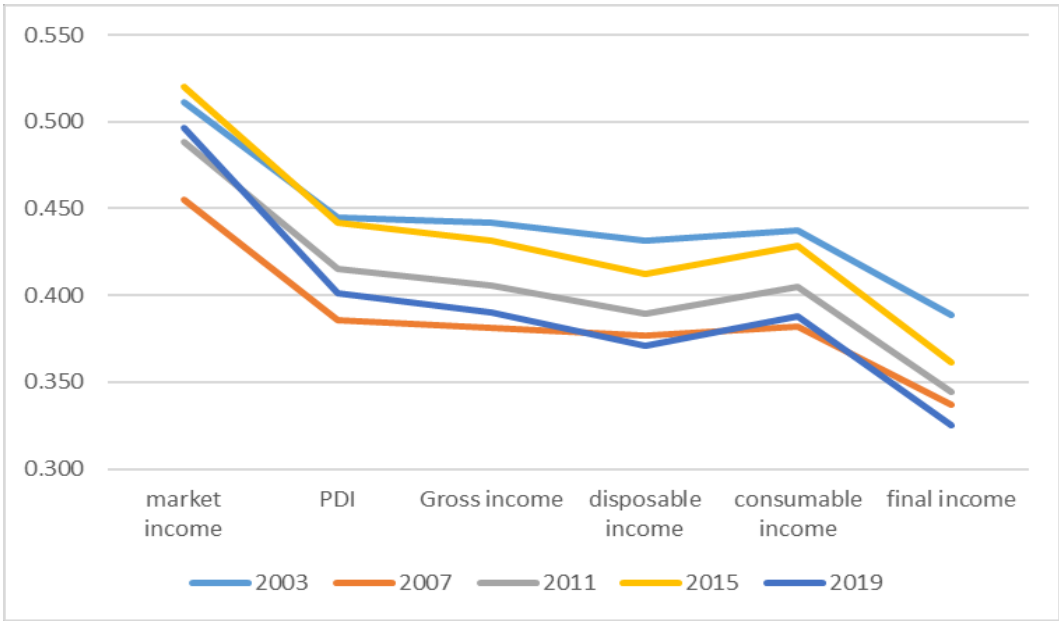
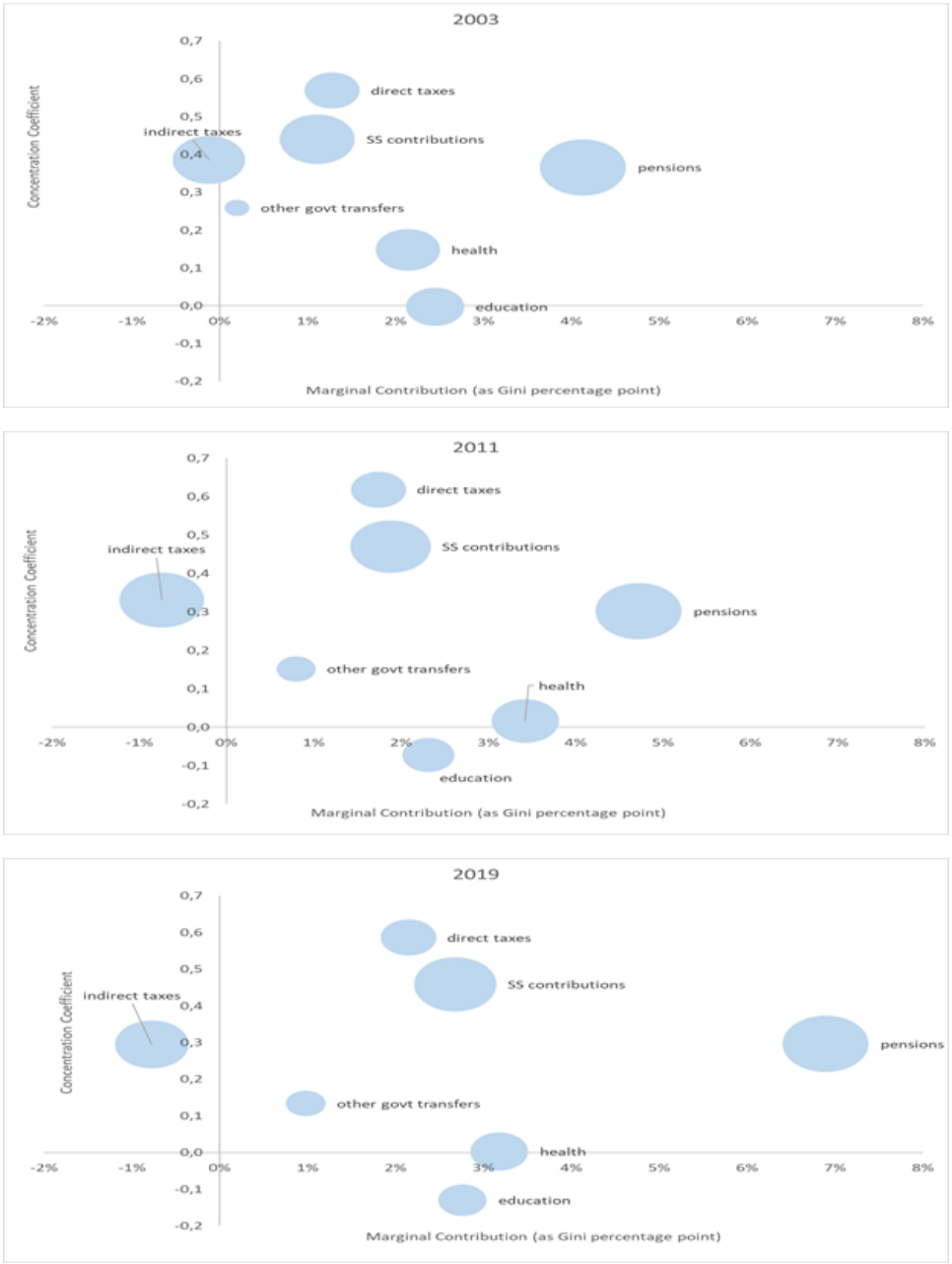
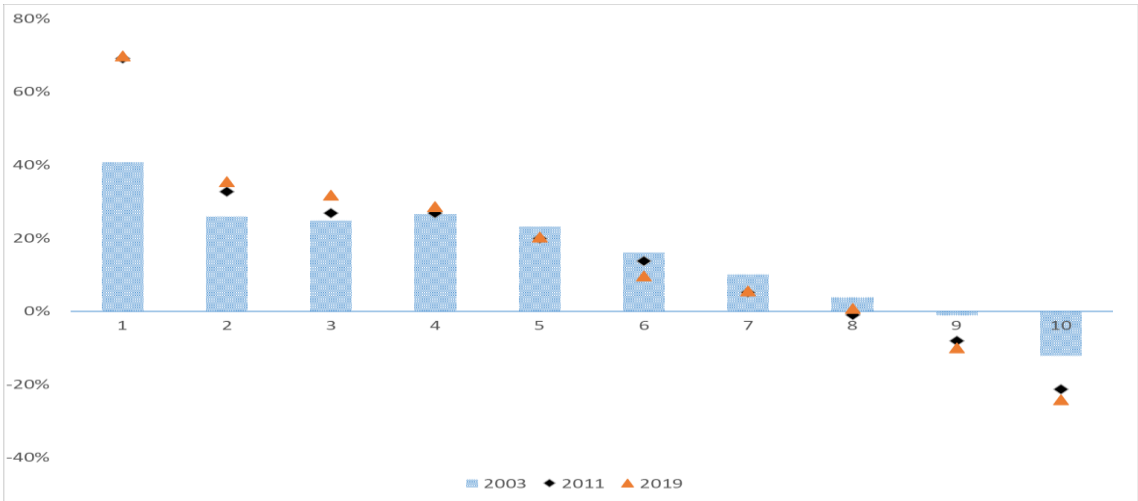


Figure 3 Marginal Contribution, Concentration Coefficient, and Size of Fiscal Interventions



Note: Marginal contributions of each fiscal intervention in terms of reductions in Gini coefficient in Table 3 are indicated as positive values along the horizontal axis on this graph in order to capture their equality-enhancing impact. The areas of bubbles show the size of each fiscal intervention relative to disposable income. Concentration coefficients are used along the vertical axis.

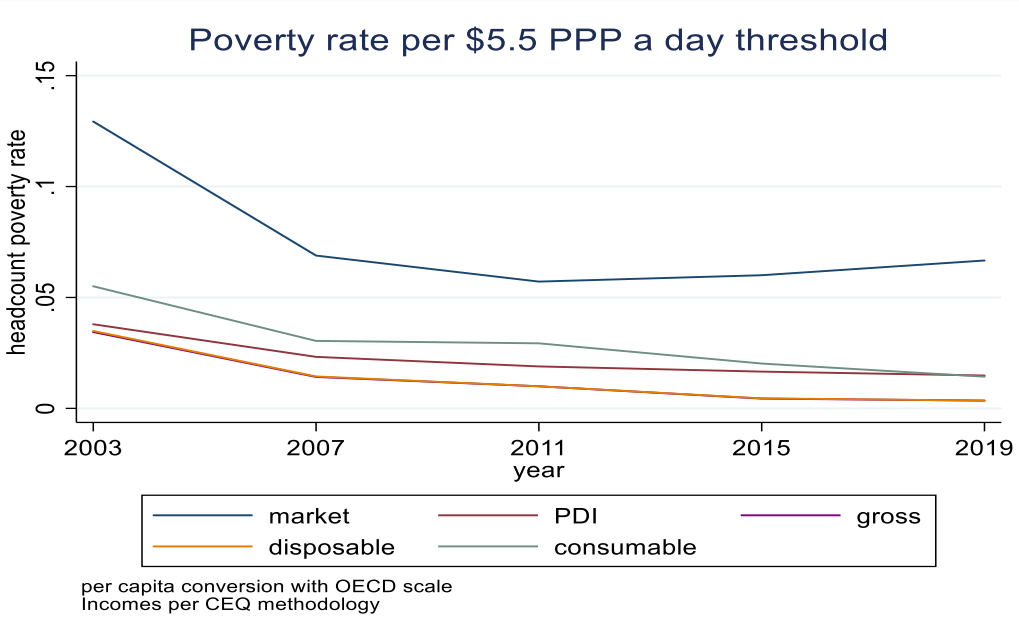
Figure 4 Fiscal Incidence of Total Transfers and Taxes 2003, 2011, and 2019



Notes: Households are ranked by disposable income.

Figure 5: Absolute poverty rates by different income types and cut-offs

Panel A: $5.5 a day per person



Panel B: $10 a day per person

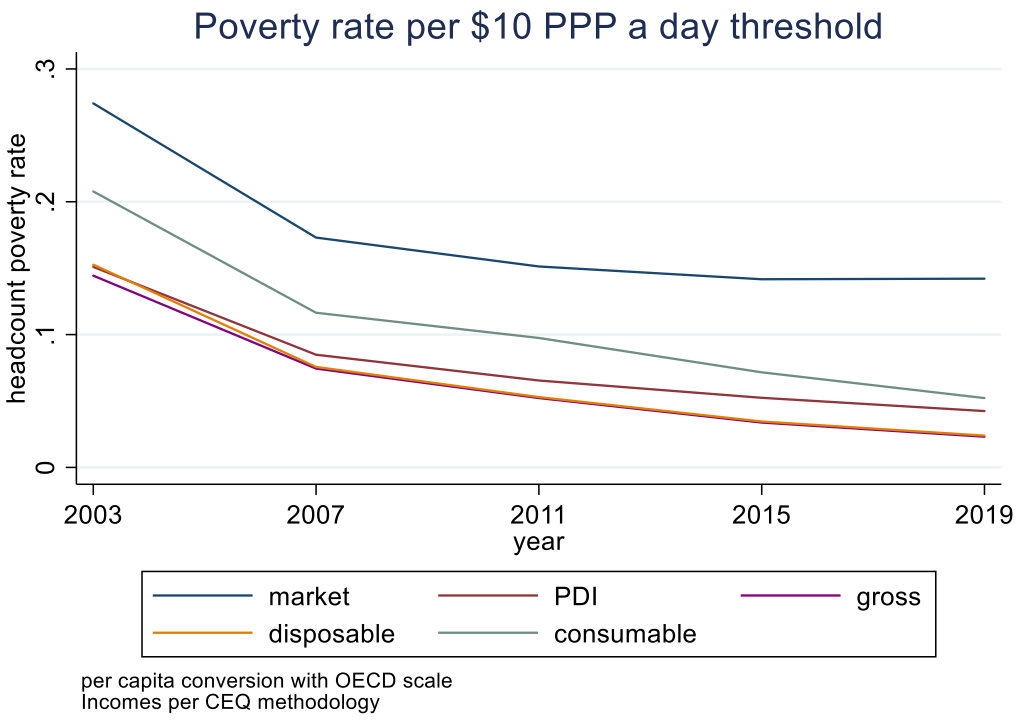
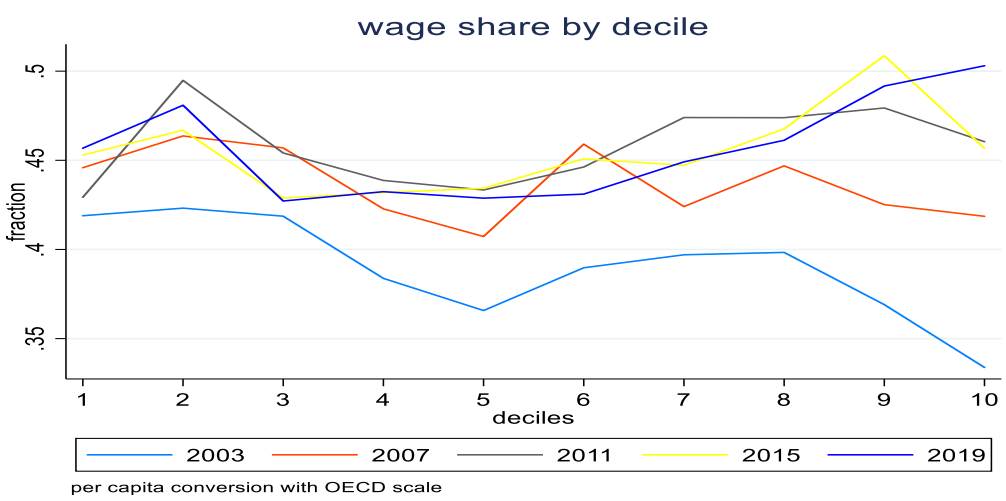


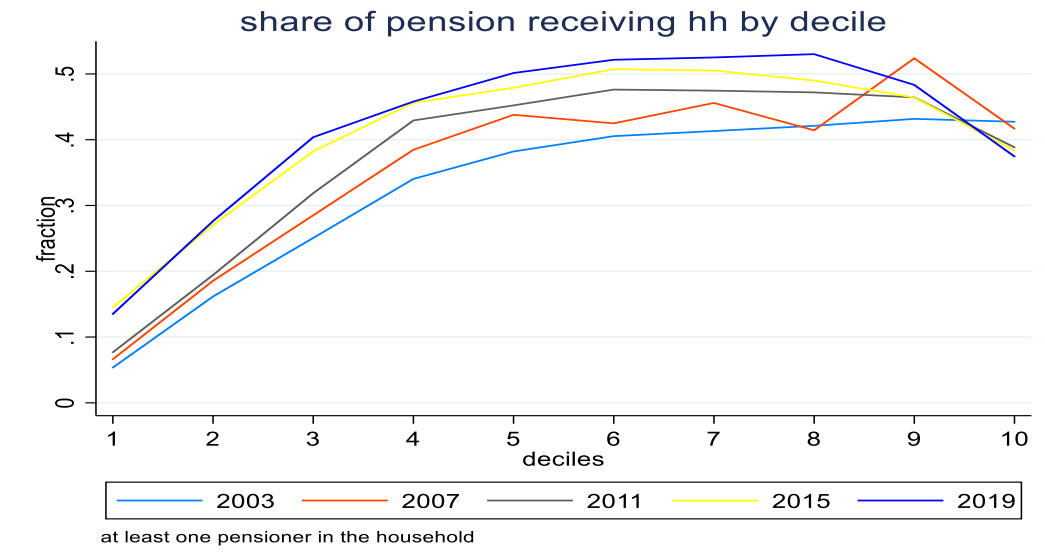
Figure 6: Net wage income share by decile



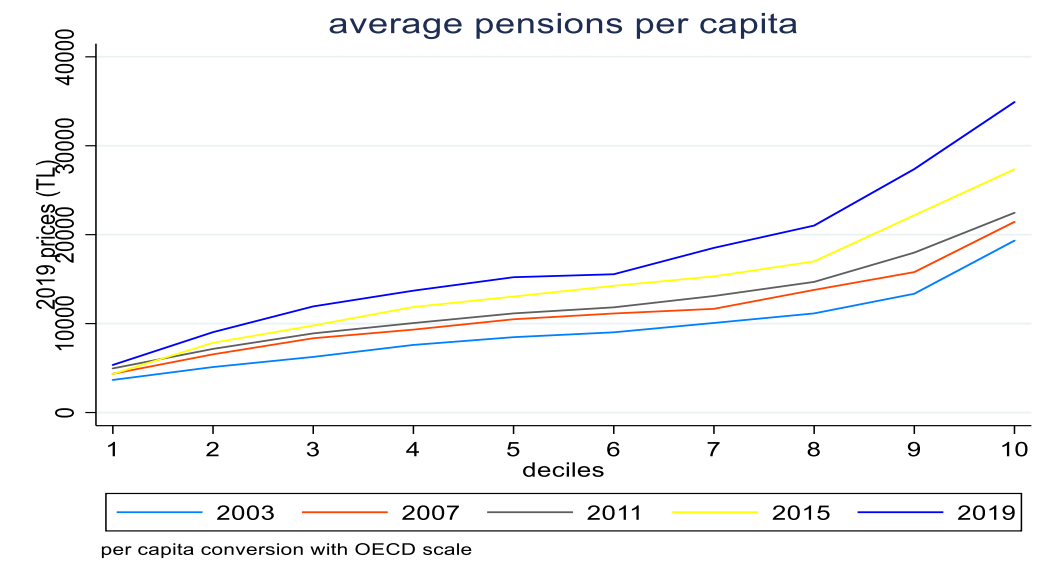
Notes: Households are ranked by disposable income. Net wage income includes instantaneous income tax rebate.

Figure 7: Distribution and level of pensions

Panel A: Share of households with pension income



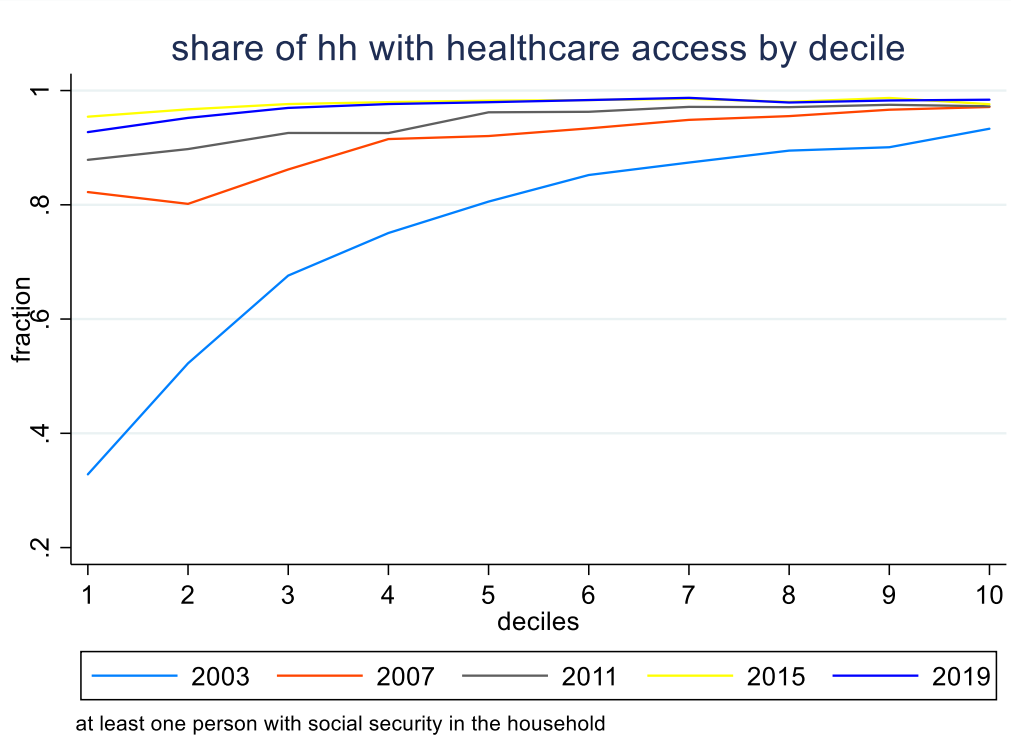
Panel B: Average pension by decile



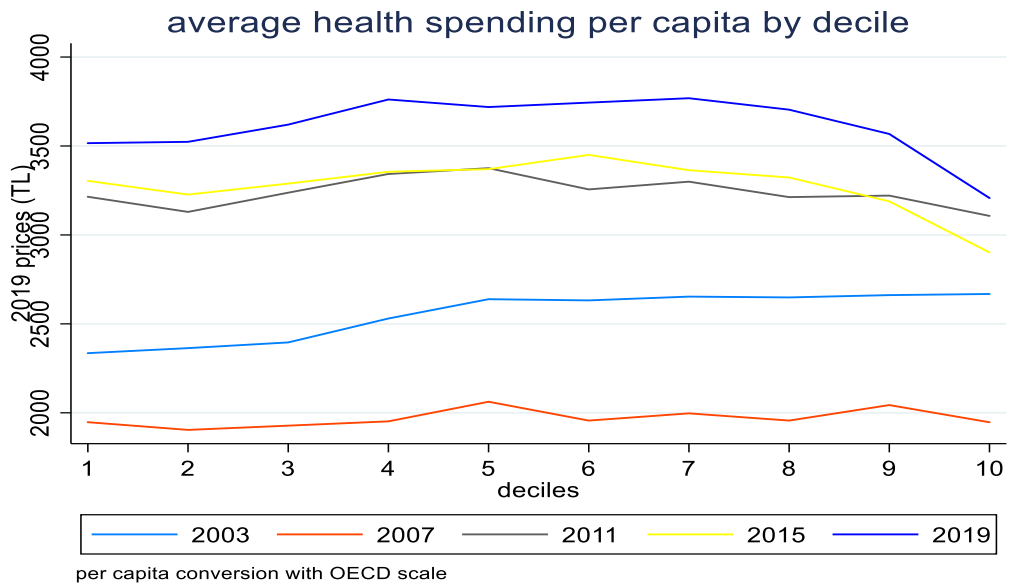
Notes: Households are ranked by disposable income. Average pensions is calculated for households with pension, survivors' or unemployment benefits.

Figure 8: Health and Education Spending

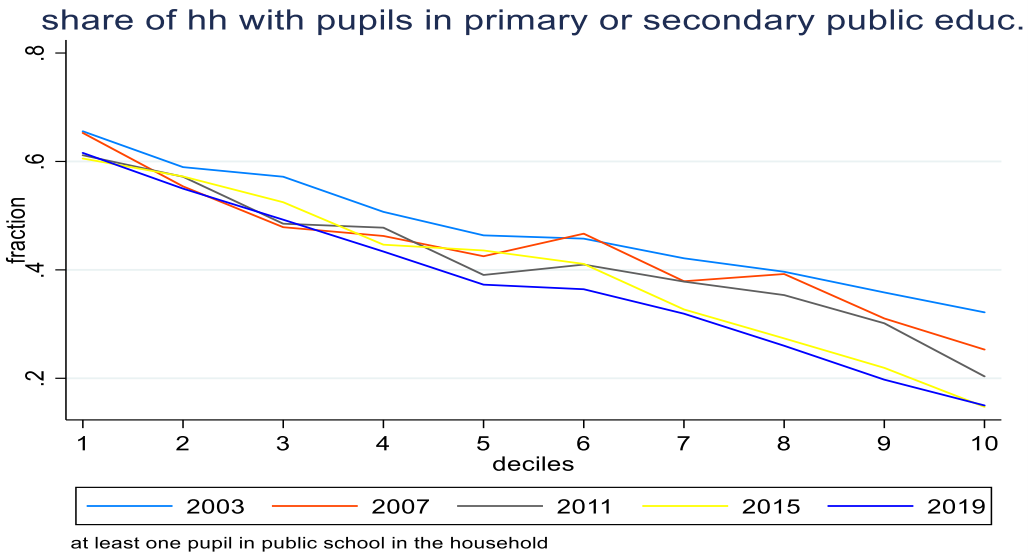
Panel A: Access to public healthcare system



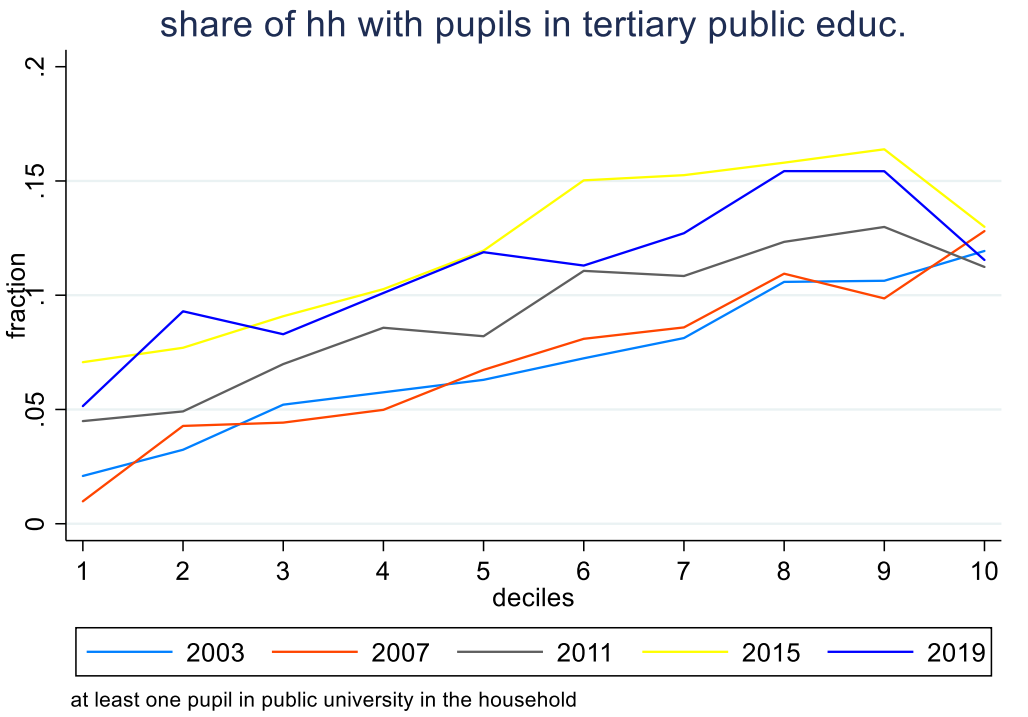
Panel B: Average health spending per person by decile



Panel C: Share of households with children in public primary & secondary education



Panel D: Share of households with members in public tertiary education



Notes: per capita spending for education is flat across deciles. Per capita spending for primary and secondary education is similar to health spending in the sense that over the years, per student amounts increased significantly. However, per student public spending for tertiary education actually was highest in 2003, and has declined in 2007 and 2011 and recovered only partially in 2015 and 2019. Graphs for per student education spending is available upon request.

Appendix A: Comparisons with Official Data

Table A.1: Comparison with National Accounts

		2011	
(million TL, nominal values)	**HBS**	**NA**	**HBS/NA**
Mixed income, except own final use	107,231	296,286	36%
Own final use	66,970	87,690	76%
Gross wages	349,781	372,235	94%
Capital income (gross)	25,836	241,530	11%
Public & private transfers	115,467	130,835	88%
Direct taxes	(35,693)	(55,752)	64%
Social Security contr.	(77,960)	(103,937)	75%
disposable income	551,633	968,887	57%
Total Spending	507,464	876,892	58%
		2015	
(million TL, nominal values)	**HBS**	**NA**	**HBS/NA**
Mixed income, except own final use	180,171	450,611	40%
Own final use	109,431	127,769	86%
Gross wages	617,943	682,611	91%
Capital income	41,623	443,891	9%
Public & private transfers	196,852	207,892	95%
Direct taxes	(70,507)	(94,513)	75%
Social Security contr.	(156,423)	(195,345)	80%
disposable income	919,089	1,622,915	57%
Total Spending	824,253	1,403,965	59%
		2019	
(million TL, nominal values)	**HBS**	**NA**	**HBS/NA**
Mixed income, except own final use	284,259	798,022	36%
Own final use	184,573	199,158	93%
Gross wages	1,244,931	1,346,679	92%
Capital income (gross)	73,389	557,249	13%
Public & private transfers	367,110	427,172	86%
Direct taxes	(138,865)	(175,278)	79%
Social Security contr.	(321,223)	(372,404)	86%
disposable income	1,694,175	2,780,598	61%
Total Spending	1,525,118	2,441,247	62%

Notes: HBS: Household Budget Survey. NA: National Accounts. In HBS, we classified all incomes from entrepreneurial activities under mixed income. Undoubtedly some of these entrepreneurial incomes are from profits from incorporated firms. Unfortunately, there is no information in HBS to identify which entrepreneurial activities are incorporated firms. Social security contributions include unemployment contributions.

Table A.2: Tax and Social Security Contribution Estimates Vis-à-vis Administrative Data, nominal values

Panel A: 2003

(million TL, nominal values)	HBS	Admin. data	HBS/ Admin.
Income taxes	11,309	8,563	132%
Vehicle registry tax	665	938	71%
Taxes on goods and services	20,951	37,156	56%
Social security contributions	21,262	21,178	100%
Social Spending	28,737	25,174	114%
Pensions	26,349	25,174	105%
Social assistance*	2,388		
In-kind services	33,267	31,933	104%

*: Separate reporting for social assistance in administrative reports starts in 2004.

Panel B: 2007

(million TL, nominal values)	HBS	Admin. data	HBS/ Admin.
Income taxes	24,311	26,497	92%
Vehicle registry tax	2,621	5,232	50%
Taxes on goods and services	43,552	72,538	60%
Social security contributions	42,642	44,052	97%
Social Spending	54,868	62,847	87%
In-kind services	48,177	49,188	98%

Panel C: 2011

(million TL, nominal values)	HBS	Admin. data	HBS/ Admin.
Income taxes	34,974	46,324	75%
Vehicle registry tax	4,683	8,607	54%
Taxes on goods and services	86,542	115,543	75%
Social security contributions	71,185	89,560	79%
Social Spending	88,564	110,248	80%
In-kind services	98,357	103,046	95%

Panel D: 2015

(million TL, nominal values)	HBS	Admin. data	HBS/ Admin.
Income taxes	69,546	85,622	81%
Vehicle registry tax	7,452	13,015	57%
Taxes on goods and services	138,133	190,559	72%
Social security contributions	138,545	159,480	87%
Social Spending	151,697	176,410	86%
In-kind services	169,458	165,842	102%

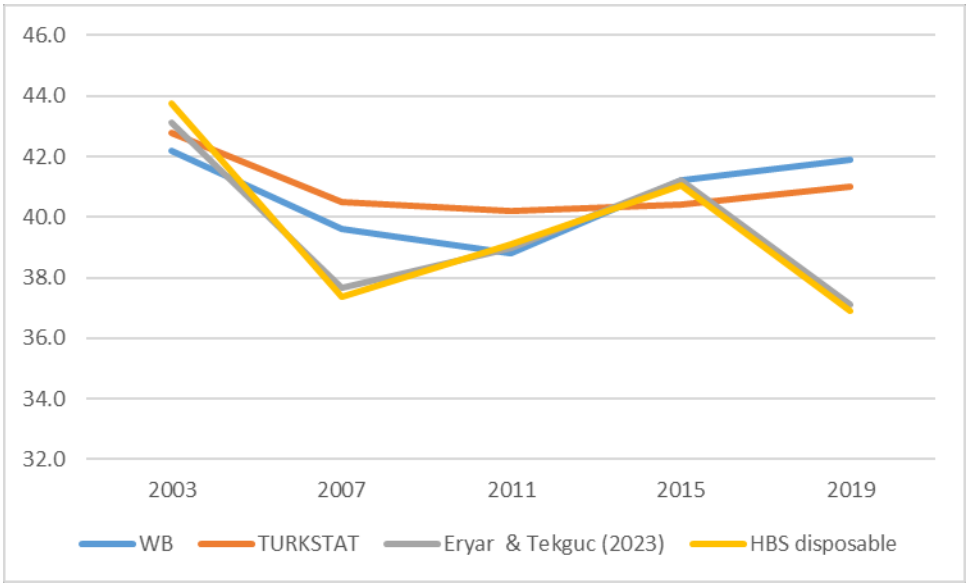
Panel E: 2019

(million TL, nominal values)	HBS	Admin. data	HBS/ Admin.
Income taxes	138,075	140,089	99%
Vehicle registry tax	12,773	20,961	61%
Taxes on goods and services	252,280	297,118	85%
Social security contributions	293,474	293,828	100%
Social Spending	323,388	412,292	78%
In-kind services	312,473	303,655	103%

Notes: HBS: Our estimates from household budget surveys. Administrative data: Tax data is from Revenue Administration (GIB after Turkish acronym) tax collection data (tax accruals are also available). Social security contributions and social spending data is obtained from Strategy and Budget Office of the President. Total health and education spending is obtained from TURKSTAT education and health statistics. Social security contributions exclude unemployment contributions.

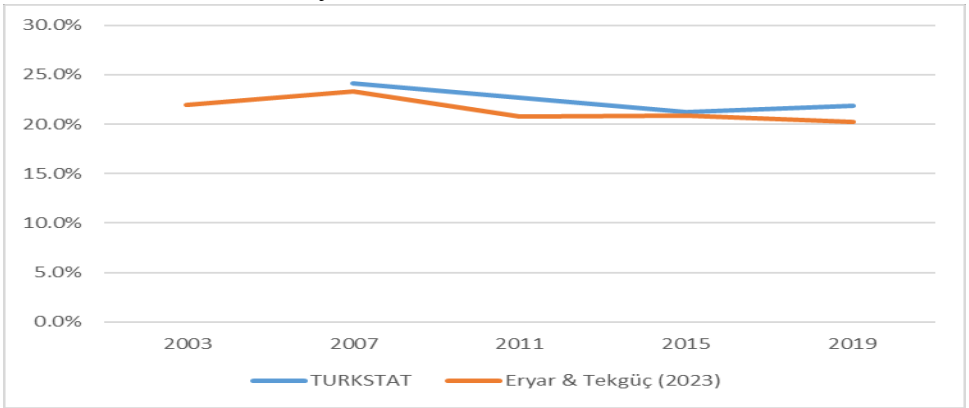
Figure A.1: Comparison with TURKSTAT for disposable income

Panel A: Gini Estimates



Notes: TURKSTAT started to use SILC survey for inequality analysis in 2005, so we used 2005 estimate for 2003.

Panel B: Relative Poverty, 60% of median income



Note: TURKSTAT start to estimate relative poverty rates in 2006.

Appendix B: Reconciling HBS and SILC Data sets

Difference between data sets: Poverty estimates are very similar from both data sets. However, inequality estimates from data sets diverge for 2007 and 2019. Figure B.1 shows that incomes of the top five percent in 20007 and 2019 are lower than the previous period. Alternatively, Figure B.2 Panel A shows that the decline in inequality observed in HBS data set in 2007 and 2019 are driven by decline of real income of top five percent in both years. The decline is 2007 is reversed in 2011 (blue versus orange line). Both for 2007 and 2019 real incomes increased substantially in the previous four years for each ventile except the top five percent (Figure B.2 Panel B). This decline in real incomes of top ventile resulted in a low disposable income Gini for 2007 and 2019. Alternatively, we assume that net market income of top 5% increased by 19.7% and 5% (same as 19th ventile) in 2007 and 2019 respectively. As a result, Gini coefficient increases by 2 and 3 points and approximates TURKSTAT estimate from SILC (Figure B.2 Panel C). Panel D and E reproduces Figure 2 with 2007 and 2019 alternate incomes.

Figure B.1: Average disposable income by ventiles

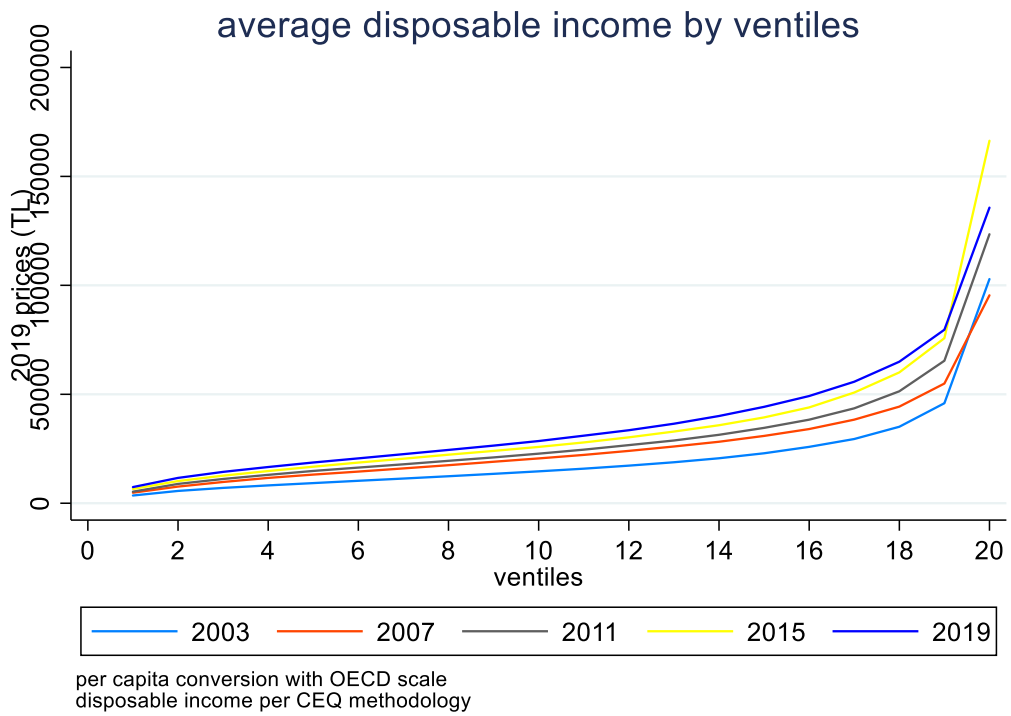
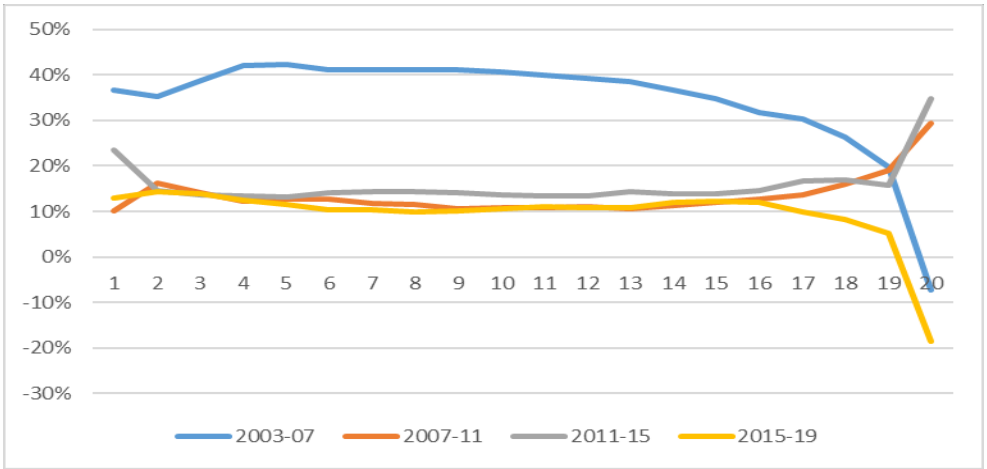
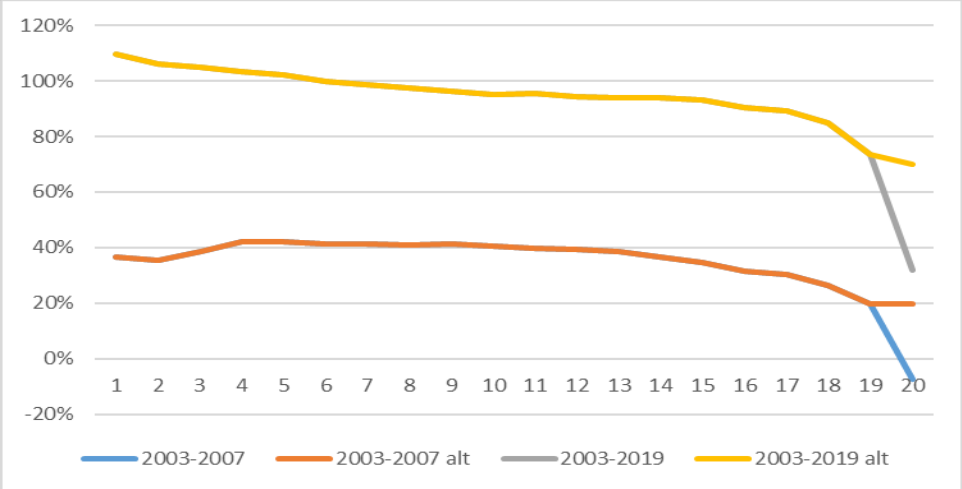


Figure B.2: Change in disposable income by ventiles.

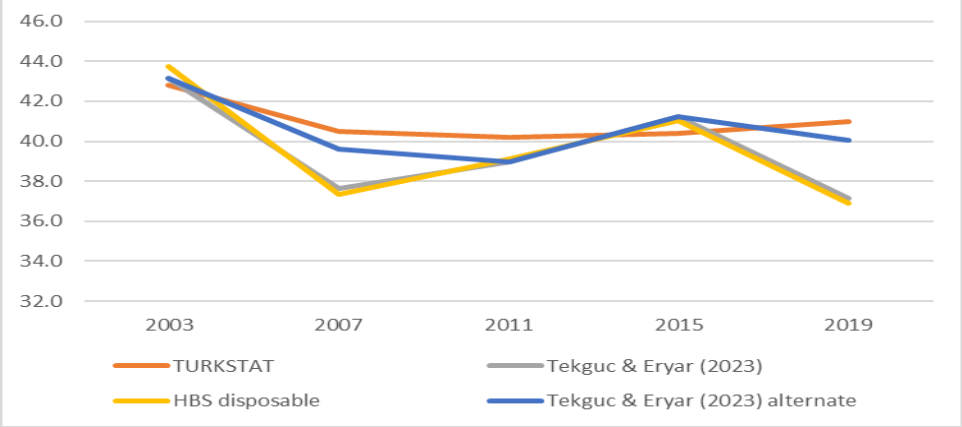
Panel A: Change in ventile incomes by four-year intervals



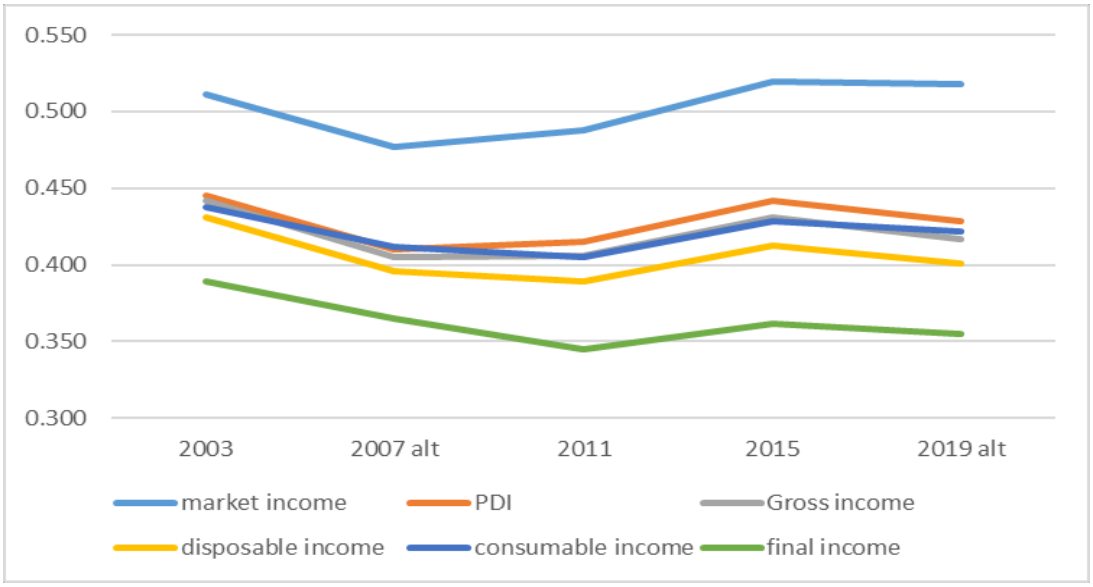
Panel B: Cumulative Change from 2003 to 2019



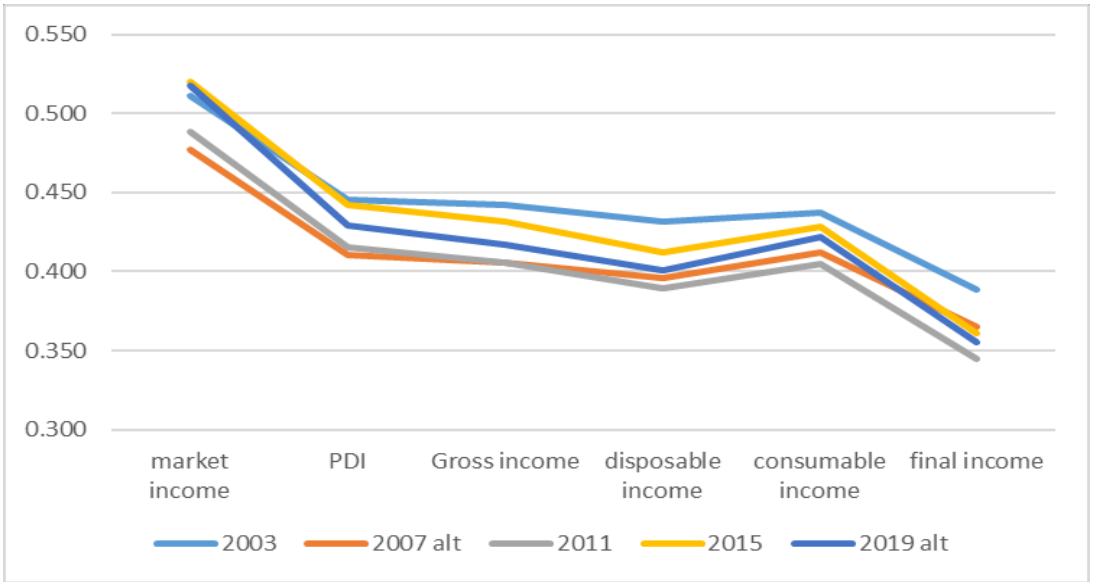
Panel C: Gini impact of alternative income for top five percent in 2019.



Panel D: Gini coefficients by type (2007 and 2019 alternate)



Panel E: Gini coefficients by year (2007 and 2019 alternate)



Note: For 2007 and 2019 we replace top five percent where real incomes assumed to increase by 19.2% and 5% (same as second top 5%) instead of observed 7.2 and 18.5% decline, respectively.

Appendix C: Comparison with recent studies on Turkey

Table C.1: Comparison of disposable income estimates from alternative sources

	Tekgüç & Eryar (2023)	Albayrak (2011, Table 2)	Yılmaz et al (2016)	TURKSTAT	OECD	Bayar et al (2021, Fig. 1)
2003	0.431		0.405			0.439
2004		0.419	0.388			
2007	0.377		0.355	0.405		0.384
2009		0.404	0.377	0.402		
2011	0.390		0.368	0.402	0.403	0.397
2015	0.412			0.404	0.404	0.403
2018				0.395	0.397	0.395
2019	0.371			0.410		

Notes: TURKSTAT and OECD estimates are from Survey of Income and Living Conditions. All other studies employ Household Budget Surveys.

Table C.2: Comparison with CEQ Methodology Turkey papers, Cuevas et al (2020) & Ünal (2021)

	Cuevas et al (2020)	Tekgüç & Eryar (2023)	Ünal (2021)	Tekgüç & Eryar (2023)*
year	2016	2015	2019	2019
income inequality				
market	0.485	0.520		0.531
PDI	0.444	0.442	0.470	0.449
disposable	0.419	0.412	0.430	0.422
consumable	0.437	0.429	0.460	0.437
final	0.378	0.361	0.370	0.378
poverty				
market	16.0	13.0		12.2
PDI	11.1	9.0	11.8	7.4
disposable	10.3	7.2	10.2	5.6
consumable	16.4	12.2	17.7	10.0

*: Ünal (2021) estimates per capita income (not adjustment for household economies of scale), so we present estimates similar to his.

Table C.3: Comparison of pre- and post-tax and transfer estimates from alternative sources

	Tekgüç & Eryar (2023)			Yılmaz et al (2016) Table 14			OECD			Bayar et al (2021) Figure 13			TURKSTAT (2023b)	
	market income	after taxes, before transfers	after taxes & transfers	market income	after taxes, before transfers	after taxes & transfers	market income	after taxes, before transfers	after taxes & transfers	market income	after taxes, before transfers	after taxes & transfers	after taxes, before transfers	after taxes & transfers
2003	0.511	0.488	0.431	0.516	0.483	0.405				0.470	0.450	0.445		
2007	0.455	0.424	0.377	0.456	0.430	0.355				0.420	0.410	0.397	0.441	0.405
2011	0.488	0.453	0.390	0.473	0.443	0.368		0.427	0.403	0.445	0.427	0.405	0.448	0.405
2012								0.422	0.399				0.451	0.400
2015	0.520	0.487	0.412					0.429	0.404	0.450	0.430	0.407	0.465	0.404
2018							0.492		0.397	0.425	0.405	0.395	0.463	0.395
2019	0.497	0.454	0.371				0.502		0.415				0.470	0.410

Notes: In all of the above studies taxes refer to direct taxes. OECD and TURKSTAT do not estimate the impact of consumption taxes. Yılmaz and Sefil-Tansever (2019) study 2006-2014 period but unlike other financial incidence studies, they include pensions to market income. In other words, their definition of pre-tax, pre-transfer income is closer to CEQ methodology PDI income. As a result, they estimate the difference between pre- and post- redistribution Gini as roughly stable at 4 percentage points (pre-redistribution Gini declines from 0.48 to 0.44, while post-redistribution Gini declines from 0.44 to 0.40). Their 2014 estimates for pre-tax, pre-transfer income and after-taxes and transfers income is close to our 2015 estimates of PDI and disposable income for 2015. TURKSTAT, OECD and Yılmaz and Sefil-Tansever (2019) estimates are from Survey of Income and Living Conditions. All other studies employ Household Budget Surveys.

Appendix D: Incidence of Taxes and Transfers

Figure D.1 and D.2 present fiscal incidence by year and decile for direct and indirect taxes, respectively. Panels A, B, and C in Figure D.3 depict the individual contributions of each fiscal instrument to the overall incidence for the years 2003, 2011, and 2019, respectively. One of the most important insights drawn from figures D.1, D.2 and D.3 is that the relative improvement in the incidence for the bottom deciles is attributed to the expansion of both direct and in-kind transfers after 2003, rather than a progressive tax policy favoring these groups. Similar to the previous discussion regarding the total incidence in Figure 5, a comparison of the three panels also highlights the significant shift in transfers towards the bottom deciles primarily between 2003 and 2011, which continued to a lesser extent after 2011. Another noteworthy observation from these panels is the increasing importance of pensions, especially for the deciles in the middle range, particularly between the fourth and seventh deciles. Finally, in each year average per capita transfers and taxes are roughly the same underscoring the fact that household sector as a whole finances transfers within itself.

Figure D.1: Fiscal incidence of direct taxes & transfers

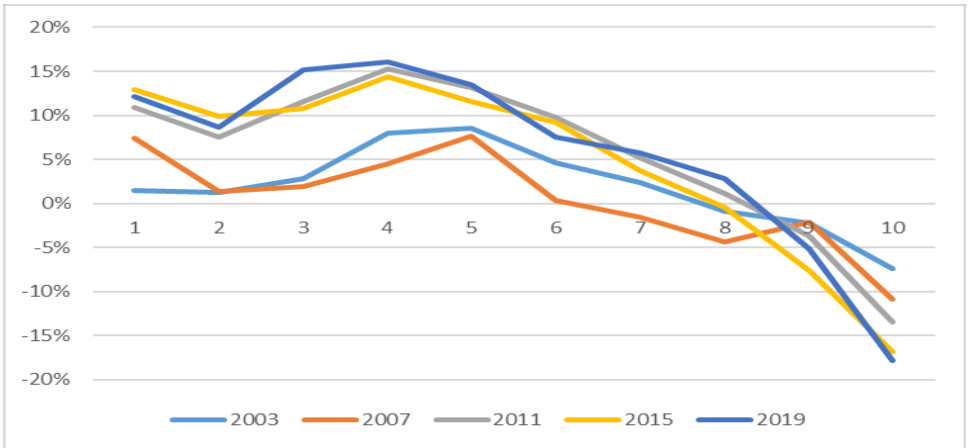


Figure D.2: Fiscal incidence of indirect taxes

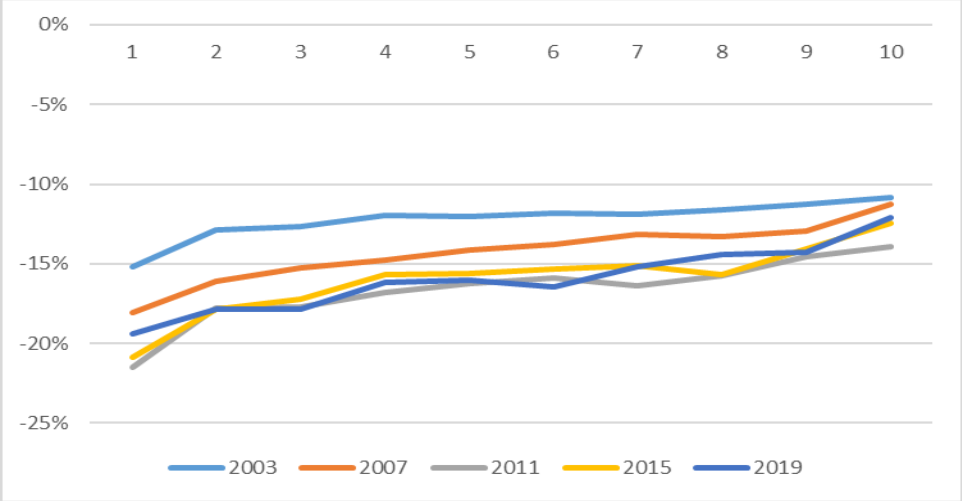
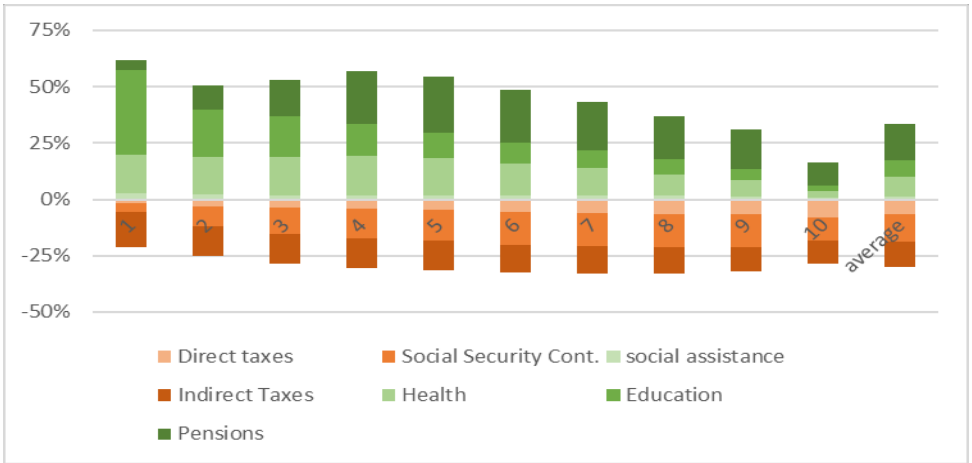
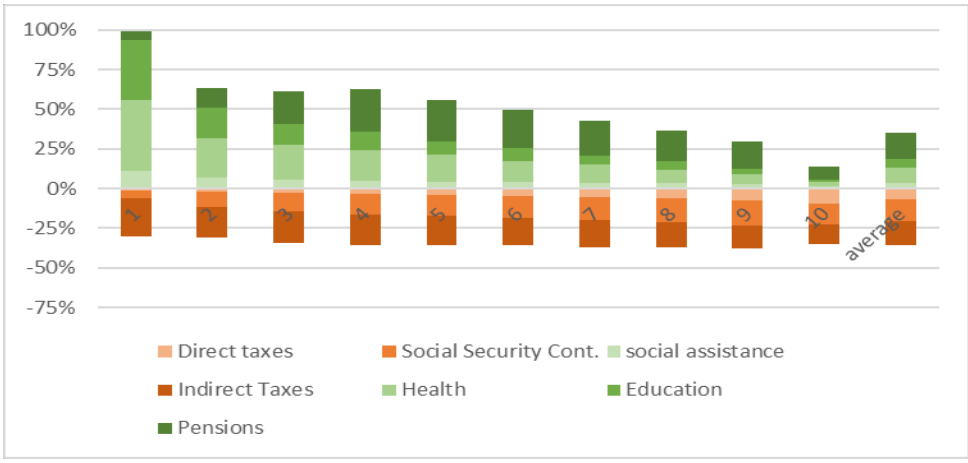


Figure D.3: Tax and transfer incidence by disposable income decile

Panel A: 2003



Panel B: 2011



Panel C: 2019

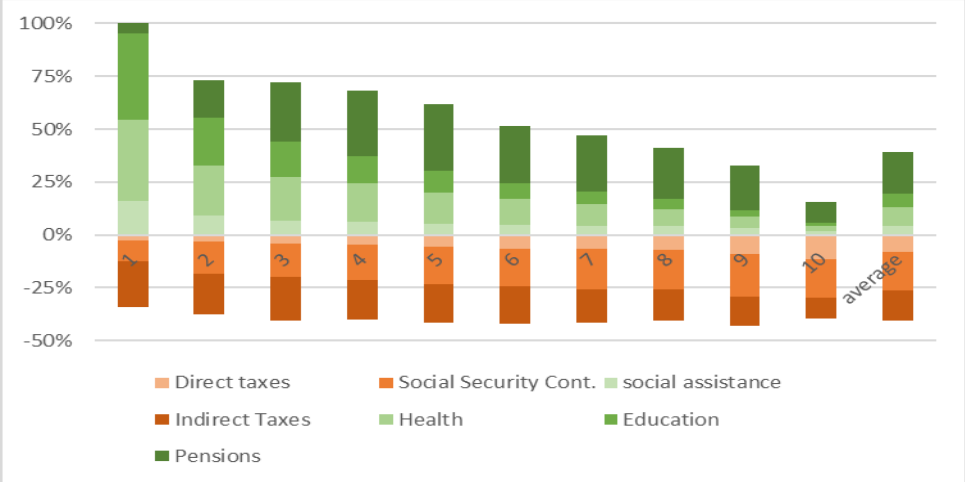


Figure D.4 presents changes in in-kind education transfers as a share of disposable per capita income between 2003 and 2019 for all income deciles. These transfers increased only for the bottom two deciles during this period. In contrast, the educational transfers for all other deciles decreased. There was a significant gap between the bottom decile and the rest of the population even in 2003, which further widened in subsequent years. Education-related transfers for the bottom decile increased from 37.8 percent in 2003 to 41 percent in 2019.

Figure D.4. In-Kind Education Transfers as a share of Disposable per Capita Income (by deciles)

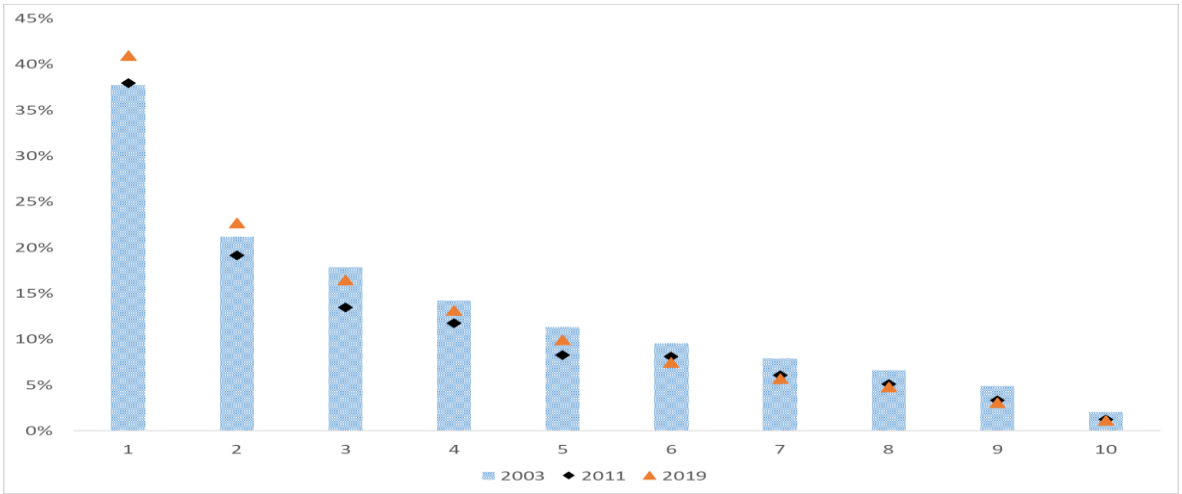
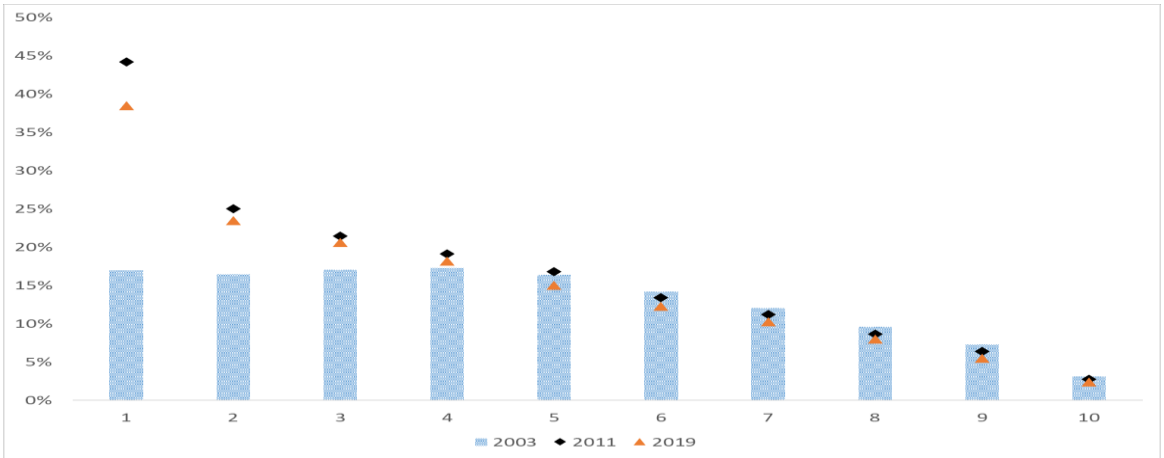


Figure D.5 displays in-kind health transfers as a share of disposable per capita income for all deciles. In 2003, the share was nearly equal for each decile in the bottom 50 percent of the population. However, this picture changed significantly in later years, primarily due to substantial increases in the shares of the bottom deciles, especially the poorest group. In-kind health transfers for the bottom decile more than doubled, rising from 17 percent in 2003 to 44 percent in 2011.

Although there was a decrease in this share between 2011 and 2019, it remained at 38.4 percent in 2019. There were also increases in the shares of the other groups in the bottom of the income distribution, albeit to a lesser extent. The share of in-kind health transfers increased from 16.4 to 23.4 percent for the lowest second decile and from 17 to 20.6 percent for the lowest third decile. There was evidence of slight decrease in the respective in-kind health transfers as a share of disposable per capita income for individuals in the top 60 percent of the population. Overall, these significant increases for individuals at the bottom were critical drivers in improving their net receiver position between 2003 and 2019.

Figure D.5. In-Kind Health Transfers as a share of Disposable per Capita Income (by deciles)



One significant factor contributing to the reduction in inequality through fiscal policy, by improving the net receiver position of the lowest deciles, is the provision of social assistance in the form of direct transfers (Figure D.6). In 2003, the social assistance received by the lowest decile was not significantly different from other deciles, except for the top one. However, between 2003 and 2011, there was an overall increase in social assistance for all groups, with a particularly noticeable rise for the lowest deciles. For instance, the share of social assistance in disposable per capita income increased fourfold for the poorest decile, rising from 2.7 percent in 2003 to 11.2 percent in 2011. Similar increases were observed for the second and third lowest deciles, going from 2.1 percent to 6.9 percent and from 1.8 percent to 5.8 percent, respectively. Unlike other deciles, the impact of social assistance continued for the two lowest deciles between 2011 and 2019, with the share of social assistance in disposable per capita income reaching 16.1 percent for the lowest decile in 2019.

Figure D.7 illustrates changes in pensions as a share of disposable per capita income across all deciles in the income distribution. With the exception of the top decile, all deciles experienced a significant increase in pensions between 2003 and 2019. While the highest pension shares were typically observed for deciles in the middle range (fourth to seventh deciles) in 2003, the bottom three deciles also saw substantial improvements, especially between 2011 and 2019. The pension share for the third decile increased from 16 percent in 2003 to 28 percent in 2019, surpassing the share of pensions for the top 50 percent of the income distribution. Pensions emerged as the most

crucial fiscal policy tool in terms of disposable per capita income for all deciles, except the bottom 20 percent, in 2019 (see Figure D.3, Panel C).

Figure D.6. Social Assistance as a share of Disposable per Capita Income (by deciles)

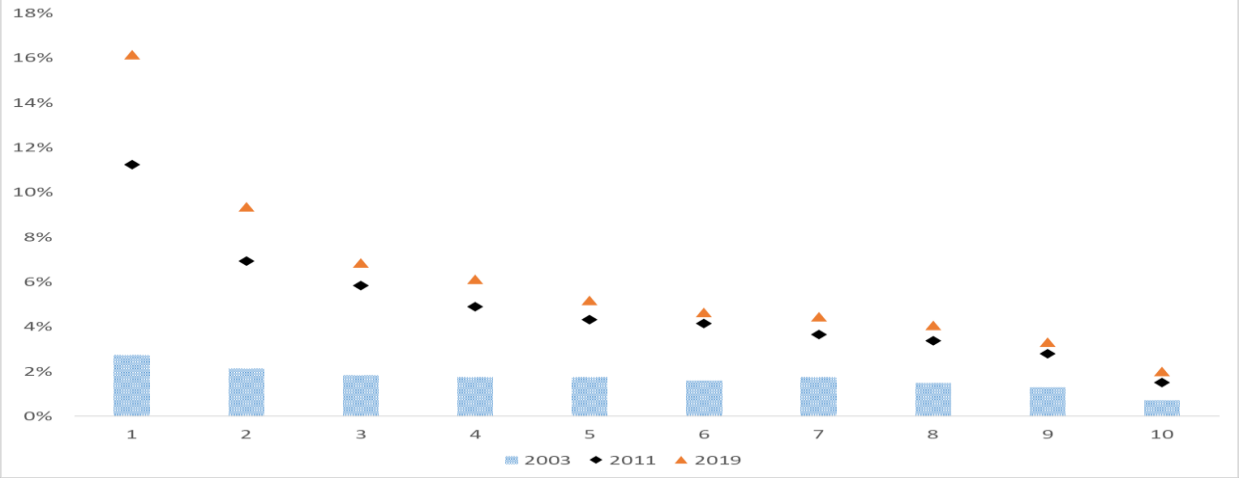


Figure D.7. Pensions as a share of Disposable per Capita Income (by deciles)

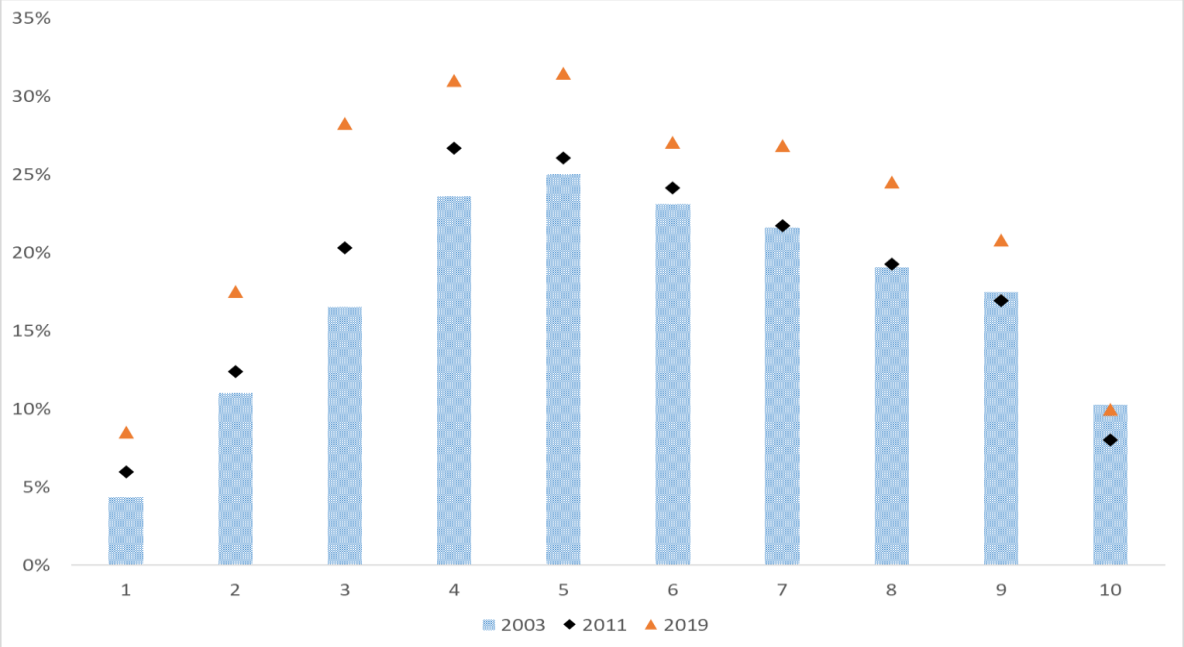


Figure D.8 presents the share of total transfers in relation to disposable per capita income across all income deciles. In 2003, there was little variation in the share of total transfers among the

bottom 50 percent of the population, while the fourth and fifth deciles received even more transfers than the second and third deciles. However, within the top 50 percent, a clear pattern emerged in which the share of total transfers in income decreased as you moved up the deciles.

This pattern shifted in 2019, favoring the lower deciles, particularly the lowest one. Although the growth rate of total transfers for the bottom 50 percent of the income distribution was notable, it was even more impressive for the lowest three deciles. Total transfers for the lowest decile grew by 68 percent between 2003 and 2019, making this group the largest recipient of total transfers. As previously shown in figures D.5 and D.6, almost half of this increase was attributed to a substantial rise in health-related transfers, primarily occurring between 2003 and 2011. Another significant contribution came from higher social assistance observed throughout the entire period. With the second (43.8 percent) and third deciles (35.6 percent) also experiencing high growth rates in transfers, the inequality-reducing impact of total transfers became more evident in 2019 compared to 2003.

The top decile was the only group experiencing a net decline in total transfers as a share of disposable per capita income in the same period. Their share decreased from 16.2 percent in 2003 to 15.5 percent in 2019.

Figure D.8. Total Transfers as a share of Disposable per Capita Income (by deciles)

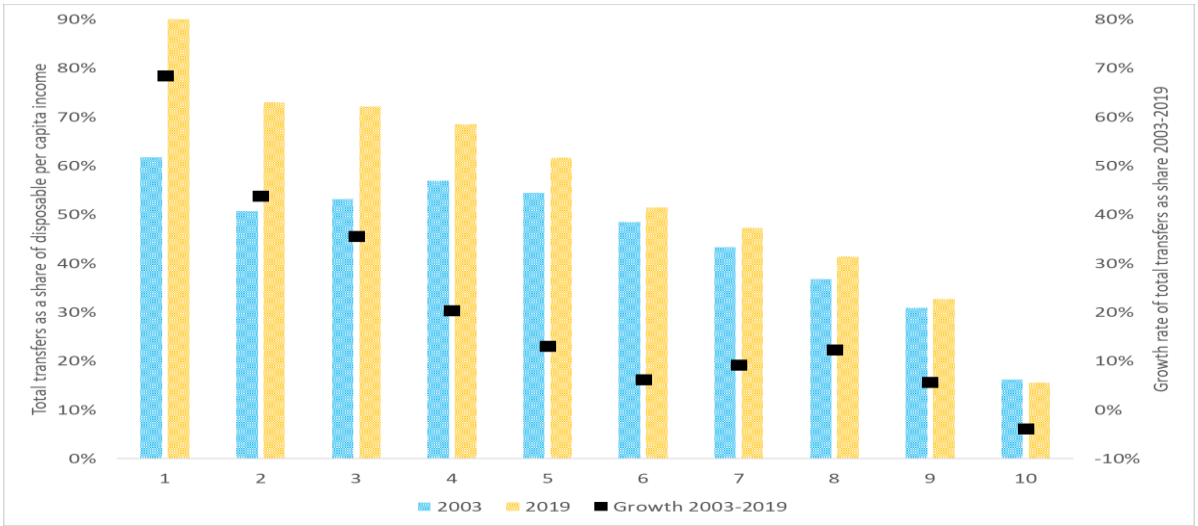
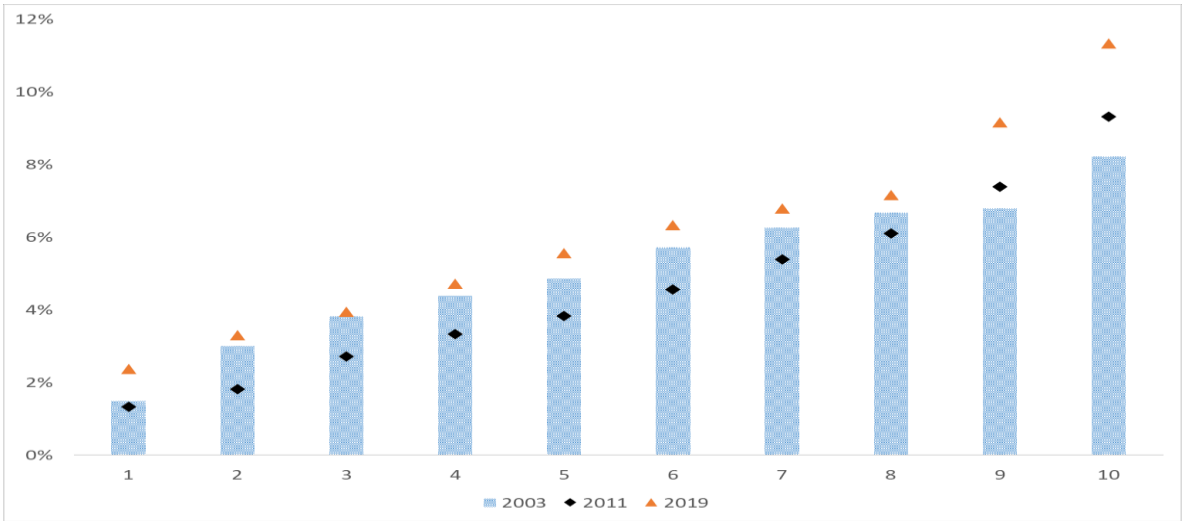


Figure D.9 illustrates the share of direct taxes as a proportion of disposable per capita income from 2003 to 2019. The positive relationship displayed in Figure D.9 clearly indicates the progressive nature of direct taxation throughout this period. Although there was a decrease in the share of direct taxes between 2003 and 2011 for all deciles except the bottom 10 percent and the top 20 percent, the subsequent increase in these shares between 2011 and 2019 resulted in values slightly higher than those in 2013 for the same deciles.

Figure D.9 Direct tax as a share of Disposable per Capita Income (by deciles)

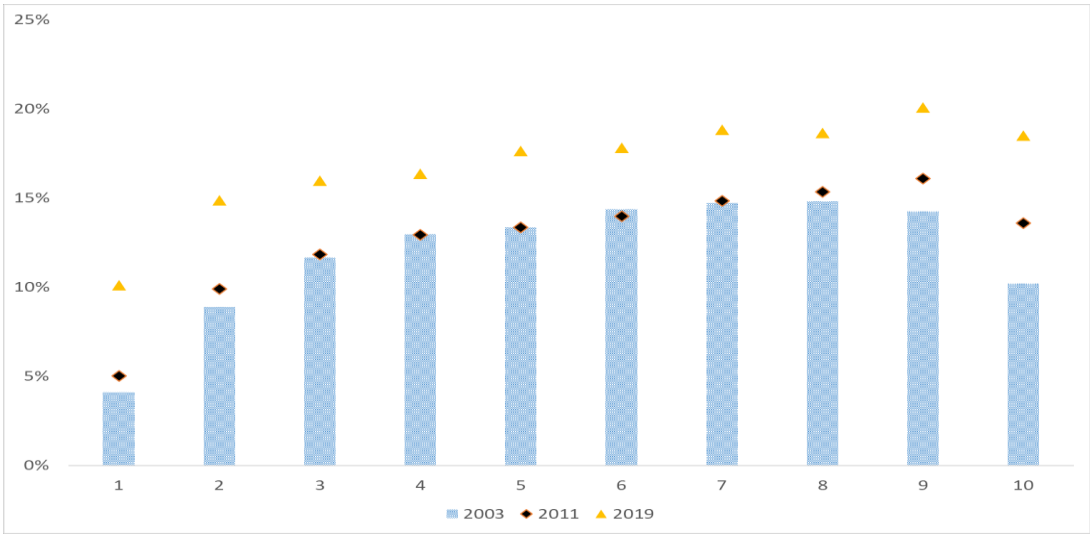


The bottom 10 percent and the top 20 percent of the income distribution exhibited different trends regarding changes in the share of direct taxes as a proportion of disposable per capita income during the same period. While the share of direct taxes for the top 20 percent continued to rise throughout the entire period, and the gap between the top 20 percent and the rest of the population became more pronounced between 2003 and 2019, the most significant proportional increase in the share of direct taxes was experienced by the poorest 10 percent, at nearly 60 percent (from 1.5 percent in 2003 to 2.4 percent in 2019)

Figure D.10 illustrates the social security contributions as a share to disposable per capita income in 2003, 2011, and 2019. Notably, there was a significant increase in this proportion across all income deciles, particularly after 2011. The most growth in social security contributions occurred within the lowest decile. Specifically, the share of social security contributions for the lowest decile more than doubled, rising from 4 percent in 2003 to 10 percent in 2019. Another noteworthy increase in this proportion was observed within the highest decile, climbing from 10.2 percent in

2003 to 18.5 percent in 2019. This change brought the share of social security contributions for the top decile into a similar range as the rest of the top half of distribution, in contrast to the situation in 2003.

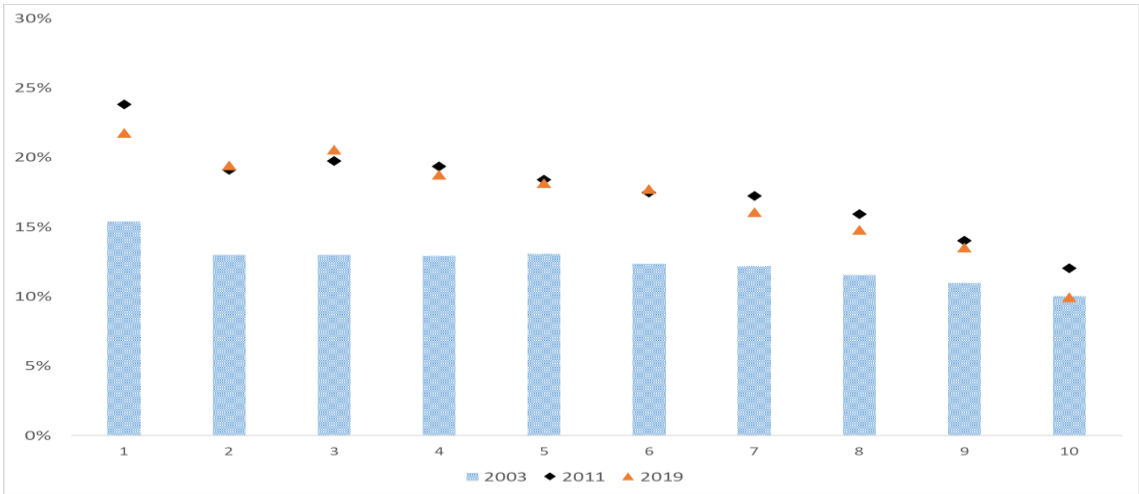
Figure D.10. Social security contributions as a share of disposable per capita income (by deciles)



In contrast to direct taxation, Figure D.11 reveals a regressive pattern for indirect taxation as a share of disposable per capita income in Turkey. In 2003, the lowest decile bore the highest burden of indirect taxes, with a gradual reduction in this burden, particularly for the top 30 percent of the income distribution. Notably, the lowest decile paid nearly 1.5 times more (as a share of disposable income) in indirect taxes than the highest decile.

Over time, the regressive nature of indirect taxation worsened, causing lower deciles to bear an even greater proportion of their disposable per capita income as indirect taxes. Although there was a slight decrease in their income tax burden between 2011 and 2019, the share of income paid by the bottom decile increased from 15 percent in 2003 to 22 percent in 2019. In 2019, this group paid more than double the share of indirect taxes compared to the top decile.

Figure D.11. Indirect tax as a share of Disposable per Capita Income (by deciles)



The share of total taxes (including SS contributions) as a percentage of disposable income in 2003 exhibited a progressive pattern up to the seventh income decile, with the top three deciles paying lower percentage as total taxes than those in the middle range (Figure D.12). Surprisingly, in 2003, the top decile's share of total taxes was even lower than that of the third decile. Although the share of total taxes, especially within the top two deciles, increased at a faster pace than most groups in the middle range between 2003 and 2019, the contributions of the top decile remained below those of the bottom third decile, much like the situation in 2003.

The total tax shares of the two lowest deciles experienced significantly faster growth compared to the rest of the population from 2003 to 2019. The share of the lowest decile increased from 21 percent in 2003 to 34 percent in 2019, with its ratio to the population's average reaching nearly 86 percent in 2019, up from 71 percent in 2003.

As discussed in Figures D.10 and D.11, the primary drivers of the rapid growth in total taxes, particularly for the lowest two deciles, were substantial increases in both social security contributions and indirect taxes. These developments, which tend to exacerbate inequality, were partially offset by relatively lower yet noticeable increases in the contributions of the two highest deciles between 2003 and 2019. The growth in total taxes for these groups was primarily attributed to higher direct taxes and higher social security contributions as a percentage of disposable per capita income, as opposed to indirect taxes.

Figure D.12. Total Taxes as a share of disposable per capita income (by deciles)

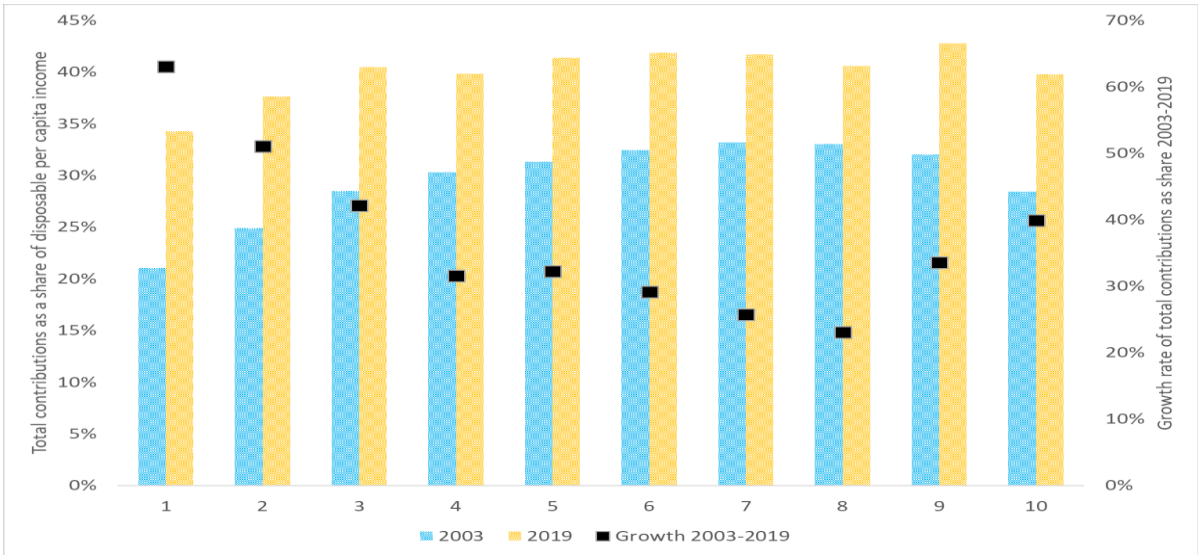


Table D.1: Kakwani Progressivity Indices for taxes and transfers

Kakwani Progressivity Index	2003	2007	2011	2015	2019
direct taxes	0.178	0.165	0.258	0.247	0.241
VAT & SCT	-0.036	-0.061	-0.051	-0.066	-0.070
Government transfers*	0.285	0.377	0.338	0.375	0.305
health	0.290	0.340	0.382	0.429	0.377
primary & secondary educ.	0.571	0.528	0.578	0.654	0.629
tertiary educ.	0.147	0.083	0.195	0.249	0.237

Positive values of Kakwani Index indicate progressiveness and vice versa. *: Government transfers include social assistance and for 2011-2019 income tax credit.

Table D.2: Concentration Indices for taxes and transfers

Concentration Index	2003	2007	2011	2015	2019
Pensions	0.366	0.331	0.302	0.284	0.296
Social security contr.	0.440	0.420	0.470	0.466	0.459
Direct taxes	0.569	0.498	0.619	0.634	0.586
Income tax credit			0.310	0.292	0.289
Social assistance	0.259	0.091	-0.084	-0.243	-0.319
Indirect taxes	0.385	0.303	0.331	0.338	0.295
Health	0.148	0.039	0.016	-0.007	0.003*
Primary & secondary educ.	-0.142	-0.157	-0.187	-0.242	-0.252
Tertiary educ.	0.290	0.297	0.208	0.185	0.174

Concentration Index ranking variable is per capita disposable income (adjusted for OECD household size). *: Not different than zero. All other coefficient estimates are statistically significantly different from zero.

Table D.3: 2003-2019 Effective Income and stamp tax rates

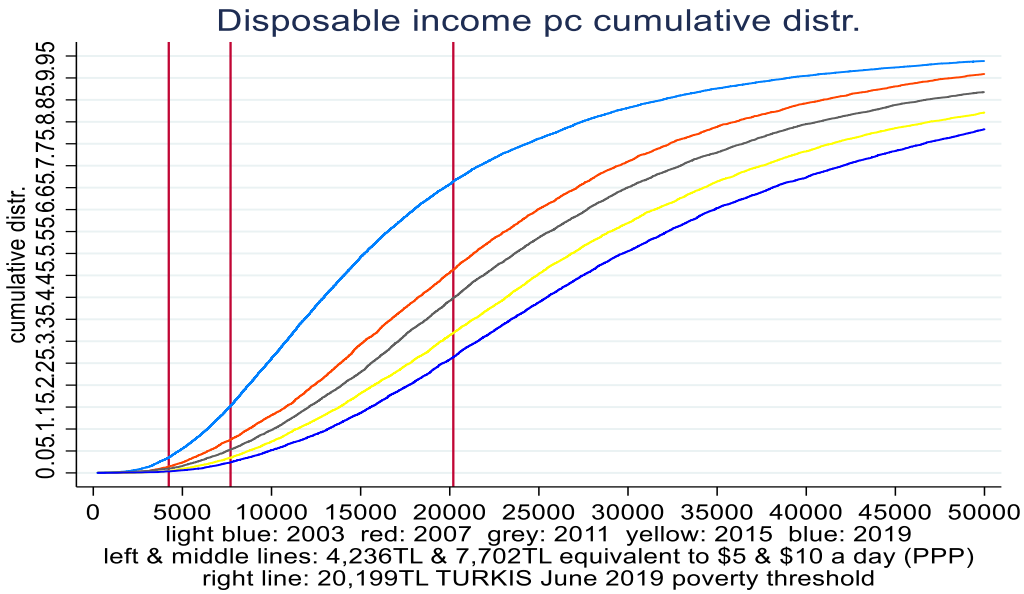
	2003		2007		2011		2015		2019	
real gross income	Income tax	Effective %	Income tax	Effective %	Income tax	Effective %	Income tax	Effective %	Income tax	Effective %
25,000	3,942	16%	3,867	15%	3,969	16%	4,019	16%	4,100	16%
55,000	10,154	18%	9,867	18%	10,288	19%	10,552	19%	11,150	20%
95,000	20,154	21%	20,498	22%	21,088	22%	21,352	22%	21,950	23%
175,000	43,827	25%	45,702	26%	42,688	24%	43,093	25%	45,710	26%
550,000	173,251	32%	176,952	32%	173,902	32%	174,343	32%	179,460	33%
1,000,000	353,251	35%	334,452	33%	331,402	33%	331,843	33%	359,460	36%

Not: We estimate the income tax for the income for each year per corresponding year's income tax scheme. We convert the 2019 figures in first column to respective years by dividing 2019 values with the following CPI values: 2003= 4.231, 2007= 3.022, 2011= 2.193, 2015=1.634, 2019=1.

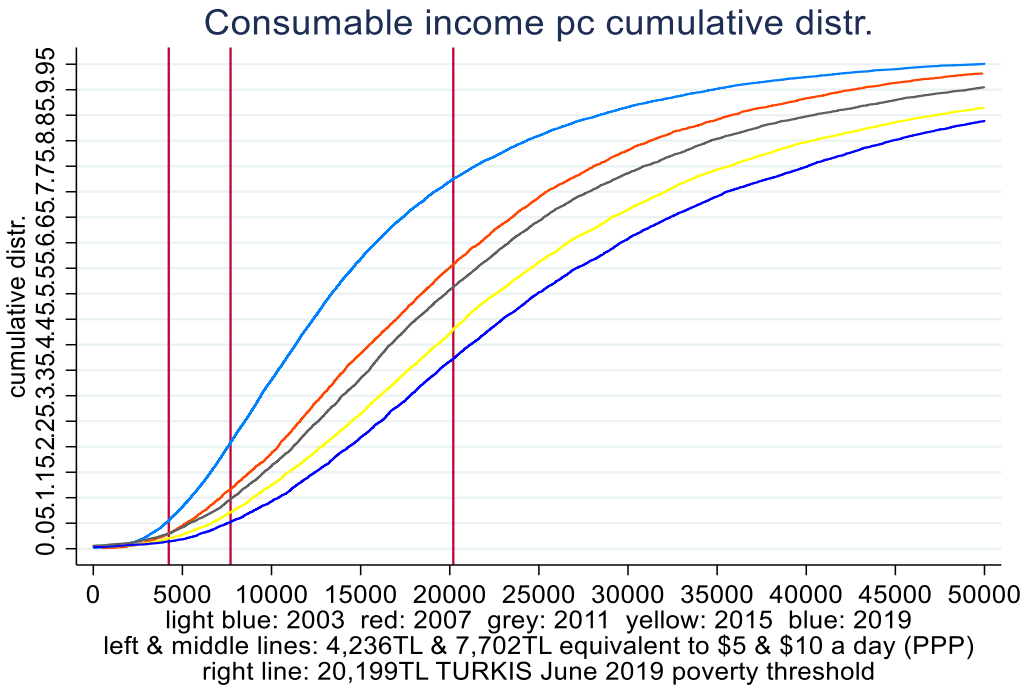
Appendix E: Additional Graphs for Poverty Analysis

Figure E.1: Cumulative distribution of income and poverty lines

Panel A: Disposable income



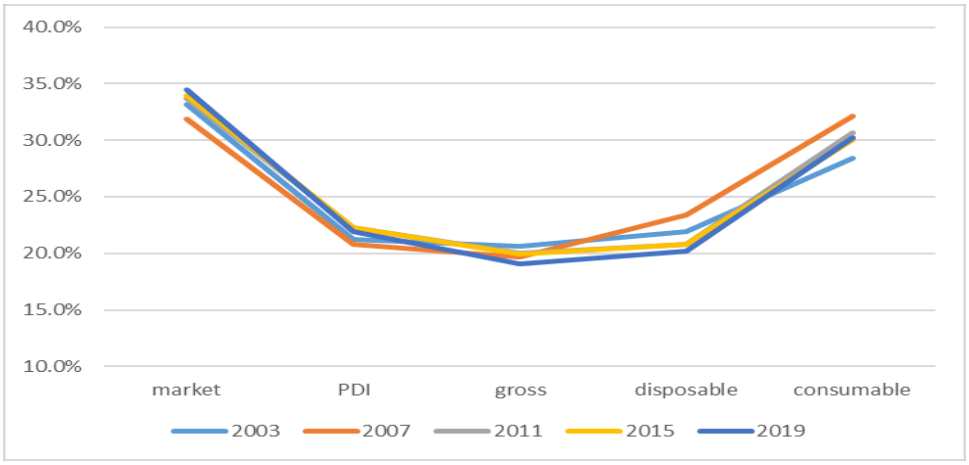
Panel B: Consumable Income



Notes: We limit the maximum with 50,000 to make graphs legible. All incomes are indexed to 2019 with CPI.

Figure E.2: Relative Poverty (60 % of Median)

Panel A: By year



Panel B: By income type

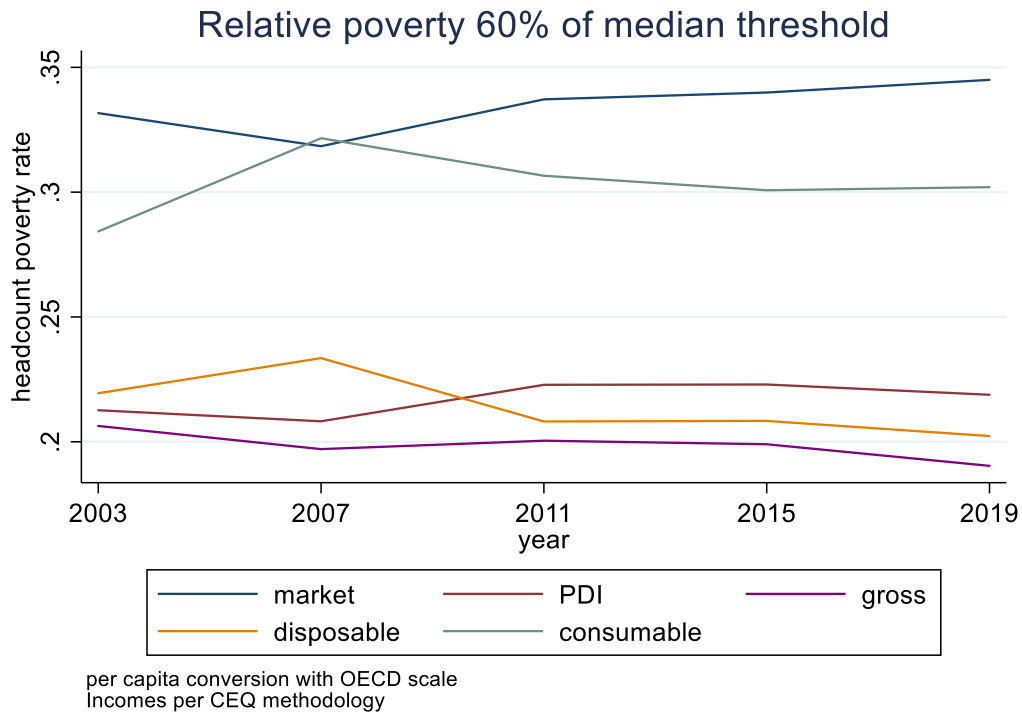
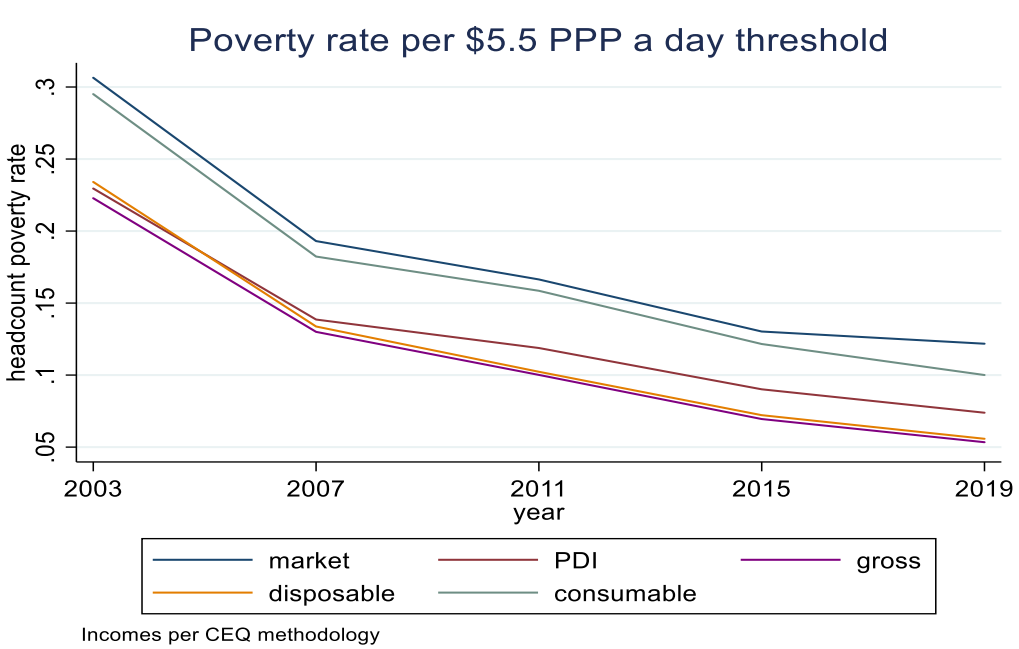
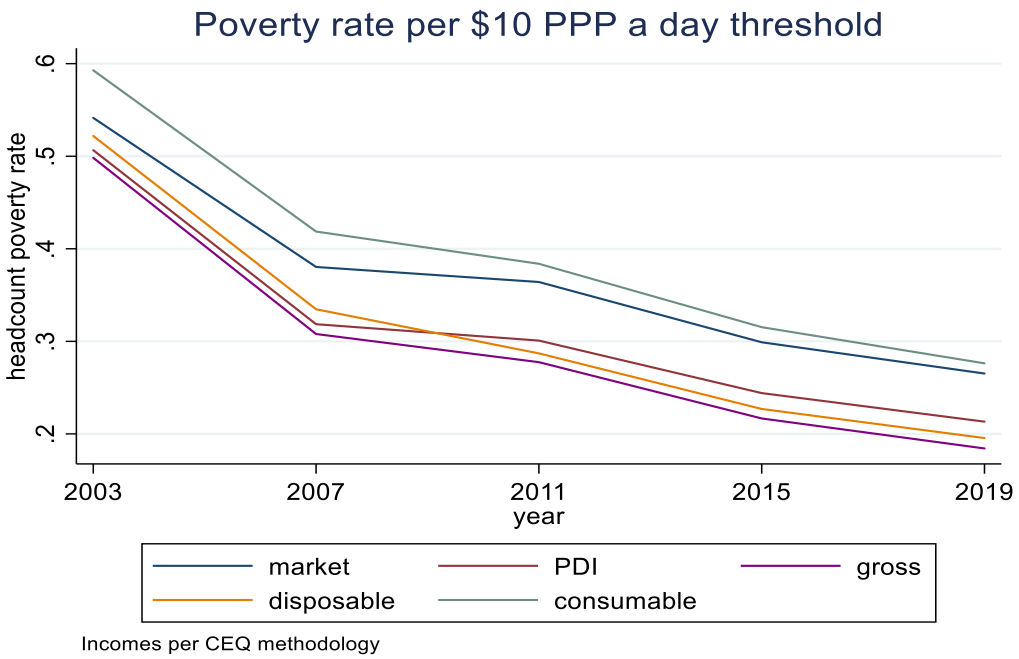


Figure E.3: Absolute poverty rates by different income types and cut-offs

Panel A: $5.5 a day per person



Panel B: $10 a day per person



Notes: No household size adjustment for economies of scale.

Appendix F: Imputation of Taxes and Transfers

Data Sources

Household Budget Surveys

Between 2002 and 2005 HBS was also the source of poverty and income inequality statistics for Turkey. Since 2006 income and poverty statistics are produced of Survey of Income and Living Conditions (SILC).

SILC sample size is significantly larger than HBS in order to produce regional estimates for income inequality and poverty. HBS sample size is significantly less because it is only representative at the national level except for 2003. However, it is the only data set that simultaneously contains data on both the income and consumption of the household. Taxes on consumption constitute the majority of tax revenue in Turkey throughout the 2000s so we choose HBS as the main source for financial incidence analysis.

Sample size for HBS are 2,160 per month (annually 25,920) for 2003; 720 per month (annually 8,640) for 2007; 1,296 per month (annually 15,552) for 2011-2019. HBS 2003 sample size is large in order to create regional estimates. All other years are representative only at national level. In 2009 TURKSTAT changed the methodology for dealing with non-responses: between 2002-2008 substitute interviews were conducted for non-responding households. Starting in 2009, TURKSTAT started to correct for non-response bias via weights and increased the annual sample size from 8,640 to 15,552 (TURKSTAT 2023a).

Estimation of direct taxes

We estimate income taxes (and social security contributions, SSC) for three main types income: wages and salaries (W); self-employment income (SE), financial income (interest, dividends etc.) and rental incomes (IC in Lusting and Higgins framework). We assume that consumption from self-production (AC), imputed rent for owner occupied housing (IROH) and private transfers are not taxed. According to withholding tax returns, income taxes on wages comprise the majority of direct tax revenue in every year: 52% (2003), 60% (2007), 65% (2011), 65% (2015), and 64%

(2019).[1] In each year taxes paid by self-employed are around 2-3 % of income taxes. Taxes on rental income and ranges between 5% to 7% of income taxes (paid both by households and corporations). Income taxes on financial incomes ranges from 23% in 2003 to 10% in 2015. The rest is taxes on miscellaneous incomes that do not match with incomes in HBS.

For wage and self-employment incomes, naïve methods over-estimate taxes and social security contributions paid compare to Revenue and Social Security Administrations. Furthermore, rate of under-reporting is much more for self-employment incomes. Table 2 Panel B shows that in the surveys, income from wages ranges between less than double and three-fold of self-employment income during the study period. However, Revenue Administration reports that taxes on wages are 25 to 30 times more than taxes on self-employment. The vast difference between incomes and taxes paid by two kinds of labor earnings is mainly due to vast under-reporting of self-employment income. Hence we need to make different assumptions when estimating income taxes and social security contributions accrued to these individuals.

When we apply valid tax rates to declared incomes in household surveys (i.e. naïve estimates), we over-estimate taxes paid by wage-earners and self-employed and under-estimate taxes paid on rental and financial incomes (compare to official records). In HBS rental income and income from financial assets (income from capital, IC) are grossly under-reported. This is probably both due to the missing rich and item non-response problems (Lustig 2020). Rich households are less likely to respond to surveys and responding households are less likely to respond to certain income questions where tax evasion is common. IC are very likely to be concentrated among rich households. In our data set most of the IC is financial incomes. For rental incomes, once we take into account deductions, tax accrual estimates were marginal so we ended up not imputing any rental income to households. Taxes on interest income from the financial assets is deducted by financial service firms on maturity. So we simply applied the valid rates (16% for 2003, 15% for other years) to net financial incomes. Given the available data in HB, incomes from capital and taxes accrued on them are vastly under-estimated.

[1] Revenue Administration (2021). 2003: p. 221; 2007: p.173; 2011: p. 70-72; 2015: pp.135-137; 2019: 128-131.

Income and stamp taxes and Social Security Contributions by wage earners

We estimate income taxes and SSC only for workers stating that they are registered with social security administration. In Turkish tax legislation, employees and employers are jointly responsible for social security contributions (including health, retirement and unemployment contributions).[2] In Turkish legislation, gross wages are defined as total of net wages, income and stamp taxes and social security contribution of the worker and wage cost to the employer comprises gross wages plus social security contribution by employer on behalf of the workers. We assume that employers based their employment decisions and net wage offers to total cost of workers to employer. Hence, all social security contributions at the end are paid by the employee.[3] Table D.3 provides effective income and stamp tax rates for different income levels. Income tax rates are pretty stable over the years. Table F.2 presents an example for the derivation of gross wage and cost to employer starting from net wage reported in survey.

Social Security Administration (2021) records shows that between 93% to 100% of self-employed declare their income the legal minimum in that year (tables F.3 and F.4). The observed self-employment incomes in the surveys are significantly higher than legal minimums. We assume that each self-employed person registered in the social security system pays legal minimum irrespective of the income. We also calculate income and stamp taxes assuming that each formally registered self-employed person pays her taxes from the minimum amount.

Table F.1. Ratios of Social Security Contributions to Gross Wages for Wage Earners

	2003	2007	2011	2015	2019
Social Security Contribution (SSC)	0.140	0.140	0.140	0.140	0.140
Social Security Contribution (Unemployment)	0.01	0.01	0.01	0.01	0.01
Social Security Employer Contribution (Social Security + Unemployment)	0.145	0.145	0.145	0.155	0.155
Social Security Employer Contribution (Unemployment)	0.02	0.02	0.02	0.02	0.02
Social Security Contribution (Employee + Employer)	0.285	0.285	0.285	0.295	0.295
Social Security Unemployment Contribution (Worker + Employer)	0.030	0.030	0.030	0.030	0.030

Note: Ratios obtained from https://www.verginet.net/dtt/MaasHesaplama.aspx. Bağ-Kur premiums are 40% for 2003 and 2007, 33.5% for 2011 and 2015, and 29.5% for 2019.

[2] Table S1 in Supplementary Materials provide details for premiums for each year: total premiums range between 31.5%-32.5%. For self-employed premiums are 40% for 2003 and 2007, 33.5% for 2011 & 2015, and 29.5% for 2019.
[3] In other words, what we call gross wage in this paper is equivalent to cost-to-the-employer in Turkish tax legislation. Table S2 provides a step-by-step calculation of cost-to the-employer for 2015.

Table F.2. Gross Wage-SSK and Unemployment Premiums Example, 2015

Annual Net Wage Income (a)	Cumulative Tax Base Income (b)	Gross Wage (c)	b/c
15,600	16,883	19,862	85%
Social Security Workers' Contribution (SSC+ Unemployment) (d)	Social Security Contribution (Worker + Employer) (e)	Social Security Unemployment Contribution (Worker + Employer) (f)	Cost to Employer (g)
2,979	5,859	596	23,338
d/c	e/c	f/c	b + d- c
15%	29.5%	3%	0.0

Table F.3. Distribution of Actively Insured According to Earnings Brackets (Law 1479)

	2011	2015
Earnings Range (Daily) TL	27.9	42.45
Actively Insured at minimum rate	2,002,128	2,094,577
Total Actively Insured	2,151,520	2,140,178
Ratio	93%	98%

Source: SSI Statistical Yearbook, Workplace and Insurance Statistics

Table F.4 Distribution of Actively Insured by Brackets (Law 2926)

Panel A

Brackets	2003	2007
1-13	932,708	1,091,134
Total	933,441	1,093,241
Ratio	100%	100%

Panel B

	2011	2015
Earnings Ranges (Daily) TL	27.9	42.45
Actively Insured at minimum rate	1,120,941	797,691
Total Actively Insured	1,121,777	797,856
Ratio	100%	100%

Source: SSI Statistical Yearbook, Workplace and Insured Statistics

Income Tax Credit

In 2008, income tax credit (ITC) has replaced consumption tax credit which was a government transfer to wage earners in return for filing receipts.[4] With ITC, A portion of income tax is immediately credited to wage earners depending on their marital status and number of children. This credit is a part of net wage received by employees. Hence, we first deduct ITC from net wages and calculate gross wage from the remaining amount. Consumption tax credit (available in HBS) is part of government transfers in 2003 and 2007. In 2011, 2015, and 2019 we estimate ITC and include it in the calculation of gross wage. As Table 2 shows ITC accounts for all the increase in the share of take home pay of wage earners.

Motor Vehicle Tax

In Turkey annual motor vehicle taxes increases with engine size (owners of cars with larger engines pay more tax) and age of car (owners of newer cars pay more taxes). HBS only provide the number of motor vehicles that household owns but there is no detail on engine size or age. Cuevas et al. (2020) point out there is assortative matching between household income and car features and assigning average motor vehicle tax to each car will over-estimate this tax for poor households and under-estimate for richer households. For example, they assume that car owners in the bottom three deciles pay the lowest motor vehicle tax (Cuevas et al, 2020: 46). We follow them and assign the following rates: the bottom three deciles: 20% of mean tax amount; 4th and 5th deciles: 60% of mean tax amount; 6th, 7th and 8th deciles: mean tax amount; 9th decile 150% of mean tax amount; 10th decile: 200% of mean tax amount (see Table S3 for annual amounts).

Table F.5. Number of Vehicles, Total and per Vehicle Motor Vehicle Tax

Year	Motor Vehicle Tax (Thousand TL)	Total Number of Motor Vehicles (TURKSTAT - thousand units)	Motor Vehicle Tax per Vehicle (TL)
2003	938,270	8,655	108
2007	5,232,330	13,023	402
2011	8,606,658	16,089	535
2015	13,014,993	19,994	651
2019	20,961,000	23,157	905

[4] The original rationale was to encourage people to collect their receipts after purchases in order to increase VAT compliance. https://verginet.net/dtt/4/Asgari_Gecim_indirimi.aspx

Assortative matching: Multiply the mean vehicle tax with the following multipliers for the car-owning households depending on disposable income deciles: the bottom three deciles: 0.2; 4th and 5th deciles: 0.6; 6th, 7th, and 8th deciles: 1; 9th decile 1.5; 10th decile: 2.

Estimation of Indirect Taxes

There are three kinds of consumption taxes in Turkey: value added tax (VAT), special consumption tax and special communication tax. The general level of VAT is 18%, 8% for unprocessed food and 1% for bread. Table F.6 documents all the changes to VAT rates between 2003 and 2009. Special consumption taxes are only applied to certain goods such as tobacco products, alcoholic beverages and energy (oil and natural gas). Special consumption taxes can be a percentage of price (Table F.7), or minimum amounts per unit (Table F.8) or both (in case of both, whichever is higher is applied). Special communication taxes (Table F.9) are levied on mobile phones and cable services. VAT is also levied on goods and services with special consumption or communication taxes. In such cases, first special or communication taxes are levied and VAT is levied on top of price plus special consumption tax amount.[5] In HBS individuals are asked to keep track of their purchases for a month. This consumption module is the source of household consumption data.

Table F.6. Items with VAT rate changes by years

HBS Code	Short Description	2003	2007	2011	2015	2019
3121	Men's clothing	18%	8%	8%	8%	8%
3122	Women's clothing	18%	8%	8%	8%	8%
3123	Children's clothes	18%	8%	8%	8%	8%
3131	Other clothing materials	18%	8%	8%	8%	8%
3211	Men's shoes	18%	8%	8%	8%	8%
3212	Women's shoes	18%	8%	8%	8%	8%
3213	Children's shoes	18%	8%	8%	8%	8%
5121	Carpets and other floor coverings	18%	8%	8%	8%	8%
5211	Home textiles	18%	8%	8%	8%	8%
5316	Sewing and knitting machines	18%	18%	8%	8%	8%
6121	Other medical products	18%	8%	8%	8%	8%
6131	Tools and equipment used in treatment	18%	18%	8%	8%	8%
6211	Medical services (doctor)	18%	8%	8%	8%	8%
6221	Dental services	18%	8%	8%	8%	8%
6232	Services of medical assistants	18%	8%	8%	8%	8%

[5] We provide examples estimation of taxes for beer and wine in Supplementary Materials.

6233	Other non-hospital related services	18%	8%	8%	8%	8%
6311	Hospital services	18%	8%	8%	8%	8%
9422	Museums, zoological gardens, etc.	18%	8%	8%	8%	8%
11111	Restaurants	18%	8%	8%	8%	8%
11112	Cafes, bars, etc.	18%	8%	8%	8%	8%
11211	Accommodation Services	18%	8%	8%	8%	8%

Table F.7. Change in SCT Rates

		SCT Rates				
HBS Code	Description	2003	2007	2011	2015	2019
2111	Spirits and liqueurs	2.756	2.756	-	-	-
2121, 2122	Wine	2.756	2.756	-	-	-
2131	Beer	0.63	0.63	0.63	0.63	0.63
2211, 2212, 2213	Cigarette	0.55	0.58	0.58	0.73	0.67
5311	Refrigerators and freezers	0.067	0.067	0.067	0.58	0.58
5312	Washing machines, tumble dryers and dishwashers	0.067	0.067	0.067	0.067	0.067
5314	Heaters, air conditioners	0.067	0.067	0.067	0.067	0.067
5316	Sewing and knitting machines	0.067	0.067	0.067	0.067	0.067
5317	Other basic appliances (devices) used by households	0.067	0.067	0.067	0.067	0.067
5321	Small electrical appliances	0.067	0.067	0.067	0.067	0.067
5411	Glass and crystal ware	0.067	0.067	0.2	0.2	0.2
5412	Cutlery, tableware, and silverware	0.067	0.067	0.2	0.2	0.2
7111	Purchase of new cars	0.067	0.067	0.8	0.8	0.50
7121	Motorbikes	0.08	0.067	0.22	0.22	-
7331	Passenger transport by air	0.005	0.067	0.067	0.005	0.005
7341	Passenger transport by sea and water	-	0.067	0.067	0.067	0.067
9111	Equipment for the reception, recording, and reproduction of sounds	0.067	0.067	0.067	0.067	0.067
9112	Television sets, video cassette players, and tape recorders	0.067	0.067	0.067	0.067	0.067
9121	Photographic and cinematographic equipment	0.067	0.067	0.2	0.2	0.2
9122	Optical Instruments	0.067	0.067	0.2	0.2	0.2
9131	Data processing equipment	0.067	0.067	0.067	0.067	0.067
9141	Tools used in recording pictures and sounds	0.067	0.067	0.067	0.067	0.067
12311	Jewelry, watches and wristwatches.	-	0.067	0.2	0.2	0.2

Resource: Republic of Turkey Official Gazette No 24783, 24831, 24876, 24917, 24977, 25003, 25020, 25066, 25081, 25082, 25109, 25130, 25156, 25213, 25219, 25259, 25266, 25268, 26133, 26317, 26688, 27449, 27506, 27652, 27743, 27857, 28054, 28083, ,28096, 29223, 30761, 30859.

Table F.8. Changes in the Maximum/Minimum Lump Sum Values

		Lump Sum/Minimum Lump Sum Amount, ₺				
HBS Code	Description	2003	2007	2011	2015	2019
2111	Spirits and liqueurs	-	56.994	95.8	124.23	241.7315
2121, 2122	Wine	-	7.0815	8.1725	11,95	33,7374
2131	Beer	-	0.595	1.325	2.125	1.7694
2211,2212,2213	Cigarette	-	1.2	3.164	3.942	0.42
4521	Natural Gas	0.00563802	0.023	0.023	0.023	0.8599
4522	Liquefied hydrocarbons	0.006462005	0.93	1.21	1.494	0.8105
7221	Fuels and oils	0.707758	1.4765	1.52	1.63	1.7945

Resource: Republic of Turkey Official Gazette No 24783, 24831, 24876, 24917, 24977, 25003, 25020, 25066, 25081, 25082, 25109, 25130, 25156, 25213, 25219, 25259, 25266, 25268, 26133, 26317, 26688, 27449, 27506, 27652, 27743, 27857, 28054, 28083, ,28096, 29223.

Table F.9. Items with Special Communication Tax

Item code	Short description	2003	2007	2011	2015	2019
4441	Other housing-related services	-	12.8%	11.6%	10.5%	7.5%
8311	Telephone and telefax services	25%	25%	25%	25%	7.5%

Source: Republic of Turkey Official Gazette.

Examples of Indirect tax calculation

According to the Republic of Turkey Ministry of Finance (2015b), if a product has both Special Consumption Tax (SCT) and Value added Tax (VAT) on it, the product's price with SCT is calculated first, and then VAT is calculated over the price with SCT. For example, the raw cost of a product is 100₺, the SCT tax rate is 7%, and the VAT rate is 18%. The SCT of this product is calculated as 100*0.07=7 ₺, and the price with SCT is calculated as 100+7=107₺. On the other hand, VAT on the product is calculated as 107*0.18=19.26₺, and the final price of the product reaching the consumer is 107+19.26=126.26₺.

The purpose of the minimum amount for SCT is to ensure that if the SCT amount of the product whose SCT rate is calculated is lower than the minimum amount, the SCT of the product is calculated over the minimum amount. For example, let the SCT rate of a unit product with a raw cost of 100₺ be 7%, and the minimum lump sum amount is 8₺. In this case, if we use the specified rate, we calculate the SCT as 7₺. However, since the minimum lump sum amount, 8₺, is higher

than the SCT amount we calculate with the rate, the SCT of the product is renewed as 8₺. In the opposite case, the SCT amount of the product calculated with the rate is taken as the basis.

For example, in 2011, the minimum lump sum per liter of beer was set at 0.53₺. Assuming that consumers in Turkey generally prefer packaging containing 500 ml of beer, we calculate 0.53*0.5= 0.265₺ for the minimum lump sum on a bottle. In addition to this, since the alcohol level of beer is 5%, we calculate 0.265*5=1.325 and regulate the minimum lump sum on a bottle of beer (Buzrul, 2016). While the minimum lump sum per liter of wine was 13.665₺ in 2011, we can express the minimum lump sum on a bottle of wine as 13.665*0.75 =10.248₺.

We calculated the total Special Communication Tax in Turkey based on households' consumption of internet, fixed, and mobile phone services by transferring the tax rates we obtained to the consumption module of the TURKSTAT Household Budget Survey (HBA). The figures for the special communication tax are given in Table F.9.

Methods for Summary Statistics

We use well-known tools to demonstrate our results. We estimate Gini coefficients, headcount poverty rate, and poverty gap for each income type. In our main results, we convert total household income to per capita income by adjusting household size by OECD-modified scale[6] parallel to TURKSTAT. Household equivalence scales can make a significant difference especially for poverty estimates with absolute thresholds. Hence, we also provide poverty estimates for per capita estimates not corrected for equivalence scales for international comparisons (Table 6). For poverty analysis, we use thresholds $5.5 PPP and $10 PPP per day (main text), and 60% of the median income in order to compare our estimates to official estimates (see Figure E.2 Panel B). We estimate the marginal effects of each tax/transfer by excluding that tax/transfer and re-calculating the final income (main text). We further document the fiscal incidence of taxes and transfers by estimating taxes and transfers' share in each deciles' disposable income, Concentration Index and Kakwani progressivity indices for taxes and transfers (Appendix D). For taxes Kakwani Index is calculated as the difference between Concentration curve of transfers and the Lorenz curve of

[6] OECD-modified scale assigns 1 to the first adult, 0.5 to each additional adult and of 0.3 to each child (younger than 14). https://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf

income. Kakwani Index will be positive if taxes are more concentrated relative to income. For transfers Kakwani Index is calculated as the difference between the Lorenz curve of income and Concentration curve of transfers. Kakwani Index will be positive if transfers are more concentrated relative to income. We perform all estimates with Stata 15 software.

Comparison of Tax and SSC estimates with official data

We compare our total income and tax estimates with official data as a sanity check. Table A1 provides comparisons with National Accounts data for 2011, 2015 and 2019 (detailed breakdowns in National Accounts are available only after 2009). It shows HBS coverage is pretty good for most income types except capital incomes.[7] Table B1 reports the comparisons of taxes and transfers in HBS versus Revenue Administration records. We over-estimate taxes only for 2003. All other years our estimates are lower than Revenue Administration records. Discrepancy between our estimates from HBS and official records decline from 2007 to 2019. Furthermore, some of the discrepancy between HBS and official records are expected, especially indirect taxes. For example, non-residents such as tourists also incur indirect taxes. Informal enterprises also pay indirect taxes like special consumption taxes on fuels. Finally, Figure A.1 Panel B compares our poverty and inequality estimates for disposable income with TURKSTAT estimates. Our poverty estimates are very close to TURKSTAT estimates. Our disposable income inequality Gini coefficient estimates differs from TURKSTAT estimates for 2007 and 2019. In Appendix B we demonstrate that the discrepancy is due to raw data. In HBS top 5% income is inexplicably low in those years. When we impute more reasonable amounts for top 5% incomes in those years, the discrepancy between Gini estimates mostly disappear.

[7] Unregistered migrants are excluded from survey.

Table F.10. Public Expenditure per Student

Public expenditure	Primary and secondary education	University	Primary and secondary education (% change)	University (% change)
2003	10,582,870,763	3,888,367,594		
2007	21,289,051,000	6,509,816,000	101%	67%
2011	35,318,624,000	13,147,184,000	66%	102%
2015	62,247,769,000	21,472,671,000	76%	63%
2019	113,813,013,000	33,023,355,000	83%	54%

Number of students	Primary education	High School	University	Primary and secondary education	High School	University
2003	10,479,538	3,014,392	1,201,747			
2007	11,279,377	3,151,480	1,542,495	8%	5%	28%
2011	11,751,233	4,618,122	2,671,531	4%	47%	73%
2015	11,079,517	5,335,032	3,059,235	-6%	16%	15%
2019	11,700,503	5,073,180	3,203,751	6%	-5%	5%

Expenditure per student	Primary and secondary education	University	Primary and secondary education	University
2003	784	3,236		
2007	1,475	4,220	88%	30%
2011	2,158	4,921	46%	17%
2015	3,792	7,019	76%	43%
2019	6,785	10,308	79%	47%

Sources: National Education Statistics, Formal Education, BUMKO

Table F.11. Public Health Expenditures per Insured Individuals (at current prices)

	2003	2007	2011	2015	2019
Panel A: Public health expenditure per insured person					
SSI population*	48,094,450	56,423,907	64,088,909	67,330,236	70,704,680
Public health expenditure** (000)	17,461,910	21,389,304	54,579,701	82,121,209	156,818,716
public health expenditure per capita	363	379	852	1,220	2,218
Panel B: Health expenditure per capita (by fixed age group weights)					
0-4	372	392	881	1,168	2,040
5-14	203	214	481	637	1,113
15-44	237	250	561	743	1,298
45-59	574	606	1,362	1,805	3,153
60+	845	891	2,003	2,654	4,637

Notes: *: Access to health insurance was obtained from HBA surveys based on the answers to the *sagliks* question: If any person in the household is insured, it is assumed that all individuals in that household have access to the health system. May not match with SSI official data. Sampling weights are used. ** Source: TURKSTAT, Health Expenditure Data.

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