WHAT ARE THE POVERTY AND INEQUALITY IMPACTS OF FISCAL POLICY IN TURKEY?

P. Facundo Cuevas, Leonardo Lucchetti and Metin Nebiler

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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

Fiscal policy is central to not only macroeconomic stability and growth, but also to poverty and inequality reduction. This paper provides the most comprehensive assessment of the distributional incidence of Turkey's fiscal policy to date. It analyzes the combined and individual incidence of direct and indirect taxes, transfers, and social spending and benchmarks Turkey's achievements against peer countries. The results show that fiscal policy significantly reduces income inequality in Turkey, driven by social spending on education and health, and complemented by direct taxes and transfer schemes that countervail the inequality-increasing impact of indirect taxes. At the bottom of the income distribution, targeted transfers are insufficient to compensate for the effect of taxes, resulting in net increases in poverty. In the context of upper-middle-income countries, Turkey's performance is below the median. This is driven by the relatively larger negative impacts of indirect taxes and the more limited positive impacts of direct transfers and taxes. From a policy perspective, the paper contributes to identifying entry points for improving the equity impact of the fiscal package. Among these, targeting the minimum subsistence allowance (AGI) program toward the poor could be an efficient way forward. More broadly, the study represents a platform to simulate the distributional implications of a variety of fiscal changes to inform stakeholders and the policy debate.

JEL Codes: H22, I38, D31

Keywords: fiscal policy, incidence, social spending, transfers, taxes, poverty, inequality, Turkey

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What Are the Poverty and Inequality Impacts of Fiscal Policy in Turkey?

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Abstract

Fiscal policy is central to not only macroeconomic stability and growth, but also to poverty and inequality reduction. This paper provides the most comprehensive assessment of the distributional incidence of Turkey's fiscal policy to date. It analyzes the combined and individual incidence of direct and indirect taxes, transfers, and social spending and benchmarks Turkey's achievements against peer countries. The results show that fiscal policy significantly reduces income inequality in Turkey, driven by social spending on education and health, and complemented by direct taxes and transfer schemes that countervail the inequality-increasing impact of indirect taxes. At the bottom of the income distribution, targeted transfers are insufficient to compensate for the effect of taxes, resulting in net increases in poverty. In the context of upper-middle-income countries, Turkey's performance is below the median. This is driven by the relatively larger negative impacts of indirect taxes and the more limited positive impacts of direct transfers and taxes. From a policy perspective, the paper contributes to identifying entry points for improving the equity impact of the fiscal package. Among these, targeting the minimum subsistence allowance (AGI) program toward the poor could be an efficient way forward. More broadly, the study represents a platform to simulate the distributional implications of a variety of fiscal changes to inform stakeholders and the policy debate.

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1. Introduction

Fiscal policy can play an important role in fostering inclusive growth and advancing poverty and inequality reduction in a country. However, a comprehensive analysis of the distributional impact of fiscal policy in Turkey is missing. A core objective of this paper is to fill in that knowledge gap.

Turkey has made significant progress in reducing poverty in the new century. The poverty headcount ratio is less than a third of what it was in 2003. The proportion of the population living with a budget below the poverty line for upper-middle-income countries decreased from 36.5 to 9.9 percent between 2003 and 2016.[1] Robust economic growth, through more employment and higher labor incomes, has been the main driver of poverty reduction (World Bank 2016). After the severe financial crisis of 2001, real domestic product grew annually at about 5.7 percent between 2002 and 2016.

Despite these valuable achievements, significant challenges remain. The poverty downward trend has stagnated in recent years and almost 8 million individuals still live in absolute poverty. In addition, Turkey has one of the highest relative poverty rates among OECD countries, with 17 percent of the population living below the relative poverty line.[2] Moreover, even though income inequality fell significantly in the 2000s, the trend was reversed after the global financial crisis. Income inequality, measured by the Gini coefficient, increased from 0.39 to 0.42 between 2009 and 2016. Fiscal policy could be instrumental to strengthen the link between growth and inclusion in order to achieve further social gains going forward.

This paper assesses the effectiveness of Turkey's fiscal policy in reducing poverty and inequality, examines its comparative performance, and identifies the constraints faced by the fiscal package in promoting equity. In essence, the paper aims to answer the following four questions: (a) what is the overall impact of fiscal policy on inequality and poverty in Turkey? (b) how do individual taxes and transfers affect distributional outcomes? (c) how does Turkey compare with peer countries in terms of the distributional impact of its fiscal policy? and (d) how can the analysis be used to inform policy reform?

[1] Poverty is measured using the World Bank's absolute poverty line for upper-middle-income-countries (UMIC), set at $5.50 per-person per-day in 2011 Purchasing Power Parity (PPP) (World Bank 2017). The data are publicly available in the Poverty and Equity Data Portal (World Bank 2018). Unlike other countries, Turkey's Institute of Statistics (TUIK) does not publish a national poverty line using cost of food and non-food basic needs. It stopped doing so in 2009.

[2] Measured as the share of people whose income falls below the OECD relative poverty line; taken as half the median household income of the total population (OECD 2018).

The approach of the paper is largely based on the Commitment to Equity (CEQ) methodology (Lustig 2018). As such, the paper builds a comprehensive incidence analysis by sequentially quantifying the poverty and inequality impact of direct and indirect taxes, non-contributory direct transfers, contributory pensions, and social spending on health and education.[3] To do so, we use the 2016 Household Budget Survey (HBS), and the 2016 Survey of Income and Living Conditions (SILC) collected by Turkey's Institute of Statistics (TUIK), together with administrative information on transfers and taxes from Turkey's Ministry of Treasury and Finance (MoTF). The data allow for relatively good coverage of fiscal interventions for this class of studies. The analysis covers about 46 percent of total revenues—including 74 percent of social contributions and 45 percent of tax revenue—and about 50 percent of government spending—including 87 percent of social spending.

The main findings of the paper are that: (a) fiscal policy significantly decreases inequality in Turkey, and (b) among low-income households the magnitude of targeted transfers does not fully mitigate the effect of taxes, resulting in net poverty increases. In driving these changes, social spending on education and health have the largest impact on inequality, complemented by direct taxes and direct transfers that counter the inequality-increasing impact of indirect taxes. Turkey's relative performance, however, is below median compared to peer countries. In particular, Turkey's indirect taxation is comparatively more inequality-and-poverty-increasing, while direct transfers and taxes are less inequality-and-poverty-decreasing than in the median upper-middle-income economy. From a forward-looking stand, the diagnostic identifies some potential entry points for policy change. The large-scale Minimum Subsistence Allowance program (*AGI* in Turkish) presents an opportunity if its design were more targeted to the poor and vulnerable, while keeping a neutral fiscal position. Overall, the paper offers a platform to simulate the distributional implications of a variety of policy changes and inform the policy debate among stakeholders. Finally, the analysis provides a building block for future policy research to dig deeper into the reasons that could explain Turkey's performance relative to peers.

The paper makes three contributions to the literature. First, the paper analyzes the cumulative impact of the fiscal system as a whole on poverty and inequality in Turkey; in contrast to existing studies which have focused on specific fiscal interventions of Turkey's system. In fact,

[3] EUROMOD is another initiative that aims to comprehensively analyze taxes and transfers. However, since it is based on household income, it does not consider household spending and therefore does not estimate the impact of indirect taxes like VAT.

the empirical literature on the distributional impact of fiscal interventions in Turkey is relatively scarce. On the tax side, Albayrak (2010) finds that indirect taxes increase income inequality using data from 2003. Albayrak (2011) compares the distributional impacts of tax policies implemented before and after the 2008 financial crisis and finds that the decrease in Value Added Tax (VAT) and Special Consumption Tax (SCT) rates introduced after the crisis made indirect taxes more regressive. Cross-country studies show that the social security system in Turkey is the least redistributive among all OECD countries since the coverage of the population is lower (OECD, 2008). In addition, while the share of VAT is uniform across income groups in Turkey, excise taxes are regressive (OECD/Korea Institute of Public Finance, 2014).

On the spending side, although public spending on education, health and employment constitutes an important and increasing share of the national budget in Turkey, the articles assessing the redistributive effects of social spending are very few. Koç and Sarisoy (2010) show that social spending decreased poverty in Turkey between 2002 and 2008. Caner and Okten (2012) find that publicly financed higher education in Turkey is progressive since students from rich families select themselves into private universities while students from poor families enroll in public universities. OECD cross-country studies find that the distributional impact of overall cash transfers is very limited in Turkey, and that while the contributory pension system is progressive, its performance is below the OECD average (Causa and Hermansen 2019, Joumard et al, 2012).

The second contribution of the paper, building on the fact that the CEQ methodology has been applied in over 50 countries, is to benchmark Turkey's performance with peer upper-middle-income economies, such as Argentina, Brazil, Chile, Croatia, Mexico, Poland, and the Russian Federation, and with the developed context of the United States.[4] Third and finally, the paper introduces some innovations to the methodology by incorporating tax avoidance in consumption taxes in a distributionally-sensitive form, and by constructing Fiscal Incidence Curves (FICs) to visualize the incidence of each fiscal intervention along the income distribution.[5]

The next section summarizes the tax and transfer system in Turkey, while Section 3 covers the methodology. The data set used and the empirical approach implemented in Turkey are described in Section 4. Sections 5 and 6 present the main results, and Section 7 concludes. Annexes A and B include a more detailed empirical approach and results table, respectively.

[4] A regularly updated list of countries can be found in www.commitmentoequity.org.
[5] These curves are the analogous of the growth incidence curves that Ravallion and Chen (2003) introduced to assess the incidence of economic growth along the income distribution.

2. Turkey's Fiscal System

2.1. Tax System in Turkey

Turkey is not a federal country, thus most revenue collection takes place at the central level of government. In total, central government revenue (including social security contributions) amounts to 28.3 percent of gross domestic product (GDP), while local government revenue reaches 4.2 percent of GDP. The main source of revenue of the central government comes from indirect taxes (10.3 percent of GDP), followed by social security contributions (7.1 percent of GDP), and direct taxes (5.8 percent of GDP). The revenue structure of the central government is shown in more detail in Table 1.

Direct Taxes

Direct taxes amount to about a fifth of total revenues, with personal income tax raising almost two-thirds of proceeds among direct taxes. Turkey's personal income tax (PIT) is levied on individual income from several sources. PIT consists of two main components; withholding tax (WHT) where the tax is paid at the source before the individual receives the gross amount of specific earnings, and PIT based on declaration (PITBD) where the individual is obliged to declare the annual earnings to the state.

The major share of the WHT is given by the payroll tax, which is paid by the employer to the state on behalf of the employee. The PIT on employee's income adopts a progressive tax bracket scheme. The main features of this scheme are that: a) it does not include a zero-tax bracket, b) the lowest tax rate is 15 percent, and c) the highest marginal tax rate is 35 percent.[6]

Taxes on interest income from bank accounts, private pension, rent and agricultural activity are also withheld, and the tax is paid directly to the government by the responsible entities. For those income sources, the WHT rates vary for each type of income but remain constant regardless of the amount of the earnings.

[6] A detailed description of all direct taxes is included in the Annex.

Table 1. Central Government Budget Revenue, 2016

Source	Million Turkish Lira (TL)	Percent of GDP	Share of Government Revenue
Total Revenues (I+II+III)	**738,585**	**28.3**	**100.0**
I. Taxes	**459,002**	**17.6**	**62.1**
I.1) Taxes on Income, Profits and Capital Gains	**139,574**	**5.4**	**18.9**
a) Corporate Tax	42,970	1.6	5.8
b) Personal Income Tax	96,605	3.7	13.1
Withholding Tax	89,752	3.4	12.2
Based on Declaration	4,522	0.2	0.6
Other	2,331	0.1	0.3
I.2) Taxes on Property	**10,606**	**0.4**	**1.4**
I.3) Taxes on Goods and Services	**268,165**	**10.3**	**36.3**
a) Domestic VAT + VAT on Imports	130,822	5.0	17.7
b) Special Consumption Tax	120,402	4.6	16.3
c) Gambling Tax	900	0.0	0.1
d) Special Communication Tax	4,976	0.2	0.7
e) Others	11,065	0.4	1.5
I.4) Other Taxes	**40,657**	**1.6**	**5.5**
II. Social Security Contributions	**184,446**	**7.1**	**25.0**
II.1) Retirement	122,963	4.7	16.6
II.2) Health	61,481	2.4	8.4
III. Other Revenue*	**95,138**	**3.6**	**12.9**

Source: Ministry of Treasury and Finance.
*Other revenues include taxes on international trade and transactions, stamp duties, fees, government property income, grants and aids and special revenues, interest, shares and fines, capital revenues, collection from loans, revenue from special budget institutions and revenues from regularity and supervisory institutions.

Individuals are obliged by law to declare their income from different sources every year, and pay taxes accordingly. Any income that is taxed with WHT will be deducted from the total amount of taxes that should be paid. PITBD has a relatively complicated schedular structure whereby every individual is expected to calculate their taxes from different incomes and combination of certain incomes. The following categories are distinctively considered for the purposes of calculating the taxable income of individuals in Turkey: 1) Business profits, 2) Agricultural profits, 3) Salaries and wages, 4) Income from independent personal services, 5)

Income from immovable property and rights (rental income), 6) Income from capital investment, and 7) Other incomes and earnings.

Property taxes are paid according to the type of the property. The residence property tax is paid according to the value of the residence in the administrative records, rather than the actual market value of the property. The rate is 0.1 percent in rural areas and 0.2 percent in urban areas. The motor vehicle property tax is paid according to the characteristics of the vehicle (i.e., age, cylinder, power).

Social Security Contributions

Social security contributions comprise a quarter of total revenues. In Turkey, employers and employees are obliged by law to pay social insurance contributions for health services, unemployment benefit, and retirement pensions. Contributions are paid directly from the salaries of formally employed workers. Overall, total contributions represent 32.5 percent of the gross salary. While formal employees are obliged to pay their contributions, self-employed or employees working in the informal sector can pay voluntary contributions. The informality rate in Turkey amounts to 32.7 percent of workers.[7]

Indirect Taxes

Indirect taxes are the main tax collection channel in Turkey, raising 36 percent of total revenue. Among them, VAT on domestic and imported goods is the largest revenue source, amounting to almost half of indirect tax revenue. The VAT rate in Turkey is 18 percent, but some items have reduced tax rates. For instance, food and beverages are subject to 8 percent VAT, while bread purchases pay only 1 percent.

The second largest indirect tax is the special consumption tax (SCT). Certain products that are considered to be harmful to the health of the population, create pollution or are considered luxury items are taxed under the SCT. Those include alcoholic beverages, tobacco products, energy products, motor vehicles and luxury items.

Finally, certain taxes are collected according to household consumption of specific services. Households pay 1-5 percent of their electricity use and 3 percent of their water

[7] Measured as the share of persons working without social security in their main job (TUIK Labor Force Statistics, December 2016).

consumption as taxes to the state. Those taxes aim to generate funds for some specific state activities. For instance, environment and cleaning tax is collected as a share of the water consumption and aims to provide cleaning services for each municipality. Finally, taxes are also collected from gambling and from communication expenditure.

2.2. Social Spending in Turkey

Overall government budget expenditures in Turkey amounted to 30.9 percent of GDP in 2016. Social spending, the largest allocation, made up around 58 percent of total expenditures and almost 18 percent of GDP. Within social expenditures, contributory benefits and spending on education and health absorb the majority of resources, with almost 8 percent of GDP allocated to each of them. Non-contributory transfers are contained to 1.2 percent GDP. Table 2 presents Turkey's public spending details across categories.

Non-contributory Transfers

There are 40 social assistance programs or schemes in Turkey, focusing on supporting access to 5 critical needs: basic income, housing, food, education, and health. Income-support transfers to direct beneficiaries are the most common modality to support vulnerable populations. These include in-kind household transfers of food and coal; conditional cash transfers (CCT) to promote children's access to education and health; and cash transfers to widow women, elderly, disabled, and home-based caretakers of elderly and disabled.

Another important feature of Turkey's social assistance system is that it is highly targeted based on socio-economic vulnerability. Compared to other countries, Turkey stands out in this regard. The proportion of social assistance spending on targeted programs is significantly higher than the average high- or middle-income country. While targeted programs make up about 60 percent of the budget in upper-middle settings, they make up about 96 percent in Turkey (Cuevas *et al* 2019).

Table 2. Central Government Expenditure, 2016

Source	Million Turkish Lira (TL)	Percent of GDP	Share of Government Expenditure
Central Government Expenditure (A+B)	**805,205**	**30.9**	**100**
A) Social Spending (I+II+III+IV+V)	**465,434**	**17.8**	**57.8**
I. Non-contributory Benefits	**32,007**	**1.2**	**4.0**
Old-Age Benefit	1,580	0.1	0.2
Family Benefit	3,253	0.1	0.4
Disability Benefit	3,182	0.1	0.4
Home Care Benefit	5,039	0.2	0.6
Scholarship Benefit	2,357	0.1	0.3
Near Cash Benefit	5,387	0.2	0.7
Health Premium Fee Waiver	7,003	0.3	0.9
Widow Transfer for Women	810	0.0	0.1
Birth Support	512	0.0	0.1
Others	2,884	0.1	0.4
II. Contributory Benefit	**205,691**	**7.9**	**25.5**
Disability Transfers	3,128	0.1	0.4
Unemployment Transfers	3,713	0.1	0.5
Retirement Pension	160,372	6.1	19.9
Widow and Orphan Pension	38,478	1.5	4.8
III. Agricultural Support	**3,244**	**0.1**	**0.4**
IV. Minimum Subsistence Allowance (AGI)	**23,864**	**0.9**	**3.0**
V. In-kind Transfers	**200,628**	**7.7**	**24.9**
Education	106,616	4.1	13.2
Health	94,012	3.6	11.7
B) Other Spending*	**339,771**	**13.0**	**42.2**

Source: Ministry of Treasury and Finance.
*Other Spending includes: General public services, defense, public order and safety, economic affairs, environmental protection, housing and community amenity, recreation, culture and religious services, and social security and aid.

Contributory Benefits

The system of pensions (retirement, widow, orphan, and disability), health insurance, work injury, non-pension disability benefits, and unemployment benefits constitute Turkey's traditional model of social security. They are all linked to employment in the formal sector and are financed by employer and employee contributions. The widow and orphan pensions correspond to survivors' benefits when relatives receive the retirement pension of the deceased person.

Retirement pensions amount to 6.2 percent of GDP and a fifth of total spending, and this increases to a quarter when adding in widow and orphan pensions. Contributory disability and unemployment benefits constitute a very small share of the overall contributory pension system, under 1 percent of total spending.

Finally, an important program within Turkey's system is the Minimum Subsistence Allowance (AGI), with a budget almost as high as the social assistance transfers. The AGI program is the exclusion of tax for formal employees who are over 16 years of age, with the size of the benefit depending on marital status and the number of children, but not on level of income. AGI functions as a tax allowance by subtracting the amount of the entitled transfer from the payroll tax paid by the employee. The AGI is paid to the employee by the employer on behalf of the state and deducted from the employer's income tax. We treat AGI as a transfer instead of a tax allowance in the analysis.

3. Methodology

To study the distributional impact of fiscal policy in Turkey, we use the CEQ methodology (Lustig 2018). The CEQ is a comprehensive incidence analysis that uses data from household surveys and national accounts to assess the impact of taxes and public transfers on household poverty and inequality. The approach has been applied in over 70 countries, which allows to benchmark Turkey's performance with relevant peer countries.[8]

The method is based on an accounting approach; it adds and subtracts taxes and transfers to household per capita income to measure income *before* and *after* each fiscal intervention. The per capita household income after transfers and taxes Y_h for household h is given by

$$Y_h = I_h - \sum_i T_i S_{ih} + \sum_j B_j S_{jh} \quad (1)$$

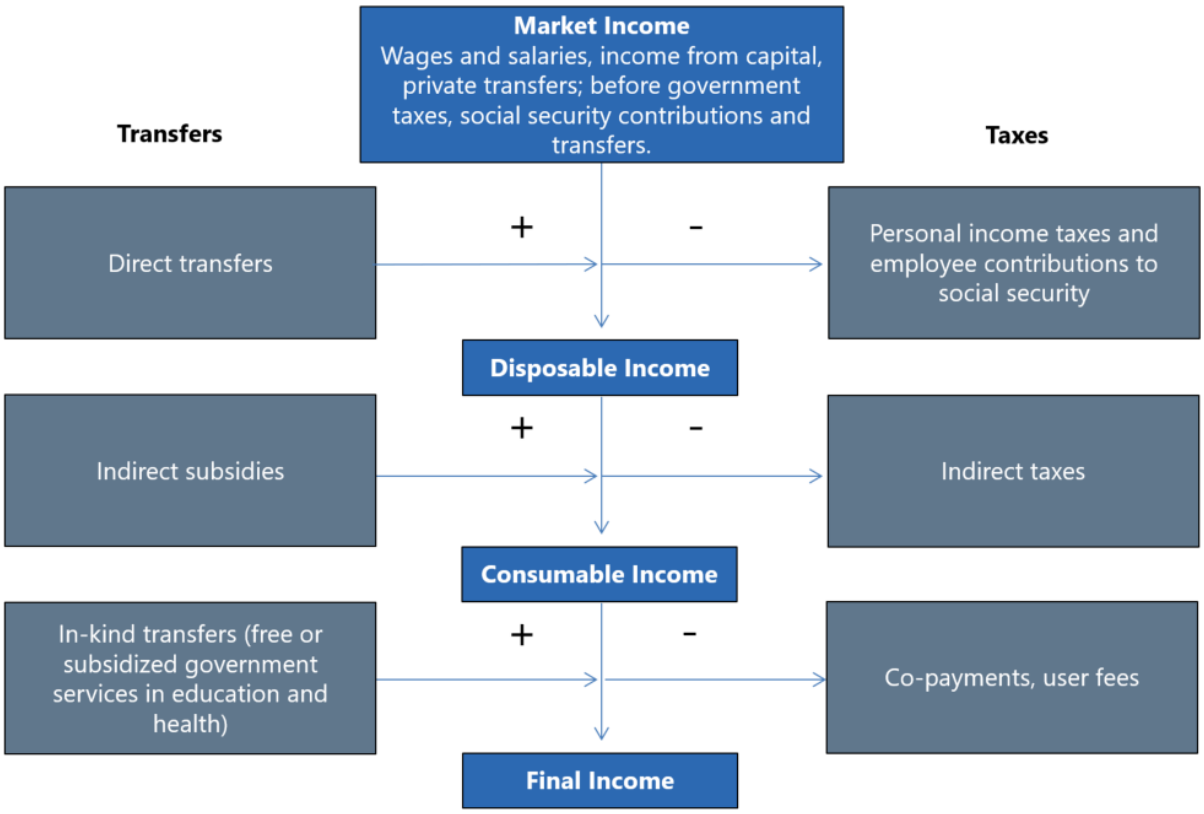
where I_h is the income before taxes and transfers, T_i are the taxes paid by households (i is the range of taxes analyzed), B_j are the transfers received by households (j is the range of transfers studied), and S_{ih} and S_{jh} are the share of tax i and transfer j paid and received by households, respectively.

The CEQ measures the distributional impact of fiscal policy sequentially by defining four income concepts (Figure 1). First, *Market Income* is the income received by each household before

[8] CEQ analysis has been completed in a total of 55 countries. In addition, 19 countries have a CEQ study ongoing. Source: www.commitmentoequity.org accessed January 30, 2020.

taxes and transfers. It includes wages and salaries, income from capital (e.g., rents, profits, and dividends), private transfers (e.g., remittances), and other income; all before government taxes, social security contributions, and transfers. Second, *Disposable Income* adds the impact of direct cash transfers and subtracts personal income taxes and employee contributions to social security from market income. Third, *Consumable Income* subtracts the impact of indirect taxes on consumption (e.g., VAT and excises) and adds indirect subsidies to the disposable income. Lastly, *Final Income* adds the social spending on education and health as in-kind public transfers to consumable income.

Figure 1. Income concepts under the CEQ analysis



Source: Lustig (2018).

There is no consensus in the literature on how to treat contributory pensions and the corresponding contributions. Two treatments are usually given: [i] consider contributory pensions as individual deferred income (and the corresponding contributions as savings), or [ii] consider contributory benefits as transfers (and the corresponding contributions as taxes). Both treatments have their merits and reality, in the context of Turkey, is somewhere in between. The pension

benefit level that each retiree receives has a positive relationship with the contributions made while working, but there are also government subsidies depending on the case. Therefore, following the CEQ approach, we present results under two scenarios. In the base scenario, we treat pensions as deferred income and the corresponding contributions as savings. In this scenario, contributory pensions are considered part of *Market Income*. In a second scenario, contributory pensions are considered transfers and the corresponding contributions as taxes. Under this scenario, pensions are added (and contributions substracted) to *Market Income* to generate *Disposable Income*.

Relative to standard incidence analysis, the CEQ methodology's main strength is to provide a framework to analyze not only the individual impact of different taxes and transfers, but also their overall combined impact on poverty and inequality. As such, the CEQ is a tool that enables the generation of evidence on both the 'small picture' (the impact of a specific fiscal intervention), and the 'big picture' of overall taxes and spending for policy research. Moreover, once the overall system has been estimated, it offers a platform to simulate policy changes, assess their distributional implications, and contribute an equity lens to policy discussions about fiscal reform.

At the same time, the CEQ shares certain limitations with standard incidence analysis. Among these caveats are: (a) it is a partial equilibrium analysis: it does not model behavioral responses, lifecycle and spillover effects; (b) it does not consider externalities, for instance long-term increases in national productivity that arises from higher investment in education; (c) the approach assumes that indirect taxes and contributions are borne entirely by the income earner, and indirect taxes are borne entirely by the consumer; (d) the methodology cannot analyze all taxes and spending, and interventions such as corporate profit taxes, corporate subsidies, infrastructure investment (e.g., water projects) are left out; and (e) the approach does not consider the quality of public services provided.

All in all, the CEQ is a first-order approximation to the impact of taxes and social spending on poverty and inequality, but the most comprehensive methodology to do so up-to-date.

4. Data and Empirical Approach

Data

We use multiple sources of data to assess the distributional impact of fiscal policy in Turkey. The main source of information is the 2016 Household Budget Survey (HBS) collected by the Turkish Statistical Institute (TUIK). The HBS is a nationally representative household survey that collects

detailed information on consumption (302 expenditure items in total), labor income, social assistance, pensions, remittances, financial income, assets, housing characteristics, accessibility to labor and financial market, health services, education opportunities, and individual characteristics such as education, health, and labor market status and experience. The survey has been collected on an annual basis since 2002. We use the 2016 round, which was the latest available HBS round at the start of the study. That year, the survey interviewed 12,092 households, encompassing 42,605 individuals.[9]

In addition, we use the Survey of Income and Living Conditions (SILC), collected by TUIK to monitor living standards following a methodology consistent with the European Union (EU) SILC initiative. The survey aims to provide comparable data on income distribution, living conditions, access to services, material deprivations, and relative poverty. Although it does not collect data on consumption, one of the main advantages of SILC is that its sampling design allows to conduct analysis representative at subnational NUTS2 level (26 regions). We use the 2016 round, which includes 22,441 households, to allocate in-kind benefits in education across households while taking into account regional differences in spending and personnel. Annex A includes a detailed explanation of the approach.

Third, we use IPSOS Consumption Expenditure Panel, a nationally representative survey that collects detailed information on household purchases (food and beverages, cleaning products, personal care, and other products), their channel of purchase, and socio-economic status of the household. We use this data set to account for informality in consumption, by identifying the share of purchases that are made without invoice and avoid paying VAT. This allows to consider VAT evasion in a distributionally-sensitive form and represents an innovative element of the paper relative to the standard CEQ approach.

These micro-data sets are complemented by administrative data on transfers and taxes from the Ministry of Treasury and Finance (MoTF), as well as the Turkish tax code and laws to understand the design features of each specific fiscal intervention.

Empirical Approach

[9] Since 2014, HBS as well as other surveys conducted by TUIK cannot produce urban/rural disaggregations, due to changes introduced in administrative divisions throughout the country.

There are largely three steps involved in the empirical approach of a CEQ. First, assess the coverage of the study. Second, measure taxes and transfers in the survey. Third, construct poverty and inequality measures for distributional analysis. While these are all important steps on its own, the second step is, by far, the most complex and labor-intensive component of the exercise.

Step 1: The first step in the approach is to examine the HBS questionnaire, assess what information is being collected about the interaction of the household with the economy and its different markets, evaluate how questions are asked, and inventory which fiscal interventions can be plausibly studied. This determines the coverage of the study.

As a result, it was assessed that the following taxes and transfers can be analyzed using the HBS questionnaire, and subsequently captured in the study:

- *Direct taxes:* Payroll Income Tax, Personal Income Tax, (including Agricultural Income Tax, Rent Income Tax from Workplace, Interest Income Tax, Private Pension Income Tax(Individual Retirement System Income Tax)), Motor Vehicle Tax, and Residence Property Tax.
- *Indirect taxes*: VAT and Special Consumption Taxes.
- *Direct transfers:* Total Direct Transfers, Old Age Transfer, Family Transfers, Disability Benefit, Home Care Benefit, Health Premium Fee Waiver, Disability Contributory Benefit, Scholarship Transfers, Unemployment Transfers, Near Cash Transfers, Sickness Transfer, Agricultural Support Transfer, and AGI.
- *In-kind transfers*: health and education services.

Step 2: The second step in the approach is to measure taxes and transfers for households in the HBS. Using laws, codes, program rules, plausible assumptions, and household survey responses we calculate how much each household is paying in taxes, and how much is receiving in transfers. For some interventions, the task is more straightforward, such as when the survey has a specific question to ask if a household is a beneficiary of a certain transfer program. Other interventions are more intricate to treat and need further elaboration and assumptions. All details of the country's taxes and transfers system, and how they are identified and assigned to households using the data sources described above, are presented in the methodological Annex A.

One methodological contribution we make to the approach is to treat VAT non-compliance in a distributionally-sensitive manner. Incidence studies typically treat VAT as if all households

pay the statutory rates in their purchases, or as if they contribute an effective VAT rate calculated from national accounts. In the former case, households are assumed to fully comply with VAT in all their purchases. In the latter, the full compliance assumption is lifted, but all households are assumed to pay the same rate, regardless of their socio-economic background. The majority of CEQ studies fit the latter case, treating VAT evasion as uniformly distributed.

In developing countries, however, where the informal economy is more prevalent, VAT compliance is a function of consumer behavior and purchase channel, and this varies across the household income distribution. Lower income households tend to make a larger share of their purchases in informal outlets without invoice. Using this observation, we depart from previous studies and lift the assumption of uniformly distributed non-compliance.

To do that, we use data from the IPSOS consumption survey to estimate the share of purchases made in places that normally do not invoice (like open bazaars) by each socio-economic segment of the population. We then apply these shares of no-VAT purchases to adjust the calculation of VAT in the purchases declared by each socio-economic segment in the HBS. As expected, the share of purchases in places like open bazaars is higher among lower-income households than higher-income households. This small tweak in the methodology matters from a distributional viewpoint.[10]

After calculating taxes and transfers for all households, we aggregate them and compare the aggregates to the public administrative records. Table 3 below present the results of the comparison. We find that HBS does a relatively good job in capturing the magnitudes of fiscal interventions. Overall, HBS captures 46 percent of total government revenue (as presented in Table 1), including 74 percent of social contributions and 50 percent of direct and indirect tax revenue; and about 50 percent of government spending (as shown in Table 2), including 87 percent of social spending.

[10] The approach is described in more detail in Annex A.

Table 3. Fiscal Interventions in the HBS: Amounts and Comparison with Administrative Records

a. Government Revenue

	Amount in HBS, million TL	Ratio HBS / Administrative data, %
Total Revenue (I+II+III)	**342,692**	**46.4**
I. Tax	**207,057**	**45.1**
1.Taxes on Income, Profits and Capital Gains	**69,272**	**49.6**
a) Corporate Tax	0	0.0
b) Personal Income Tax	69,272	71.7
Withholding Tax	65,627	85.2
Based on Declaration	3,644	100.0
Other	0	0.0
2. Taxes on Property	**5,259**	**49.6**
3. Taxes on Goods and Services	**132,526**	**49.4**
a) Domestic VAT + VAT on Imports	76,149	58.2
b) Special Consumption Tax	52,767	43.8
c) Gambling Tax	64	7.2
d) Special Communication Tax	3,545	71.2
e) Others	0	0.0
4. Other Taxes	0	0.0
II. Social Contributions	**135,635**	**73.5**
III. Other Revenue	0	0.0

b. Government Spending

	Amount in HBS, million TL	Ratio HBS / Administrative data, %
A) Social Spending (I+II+III+IV+V)	**396,319**	**86.9**
I. Non-contributory Benefits	**15,507**	**48.4**
Old Age Benefit	1,475	93.4
Family Benefit	1,133	34.8
Disability Benefit	1,518	47.7
Home Care Benefit	3,035	60.2
Scholarship Benefit	717	30.4
Near Cash Benefit	1,288	23.9
Health Premium fee waiver	4,957	70.8
Widow Transfer for Women	819	101.1
Birth Support	565	110.2
Others	0	0.0
II. Contributory Benefit	**160,552**	**78.1**
Disability Transfer	1,540	49.2
Unemployment Transfers	1,891	50.9
Sickness Transfers	882	
Retirement Pension	126,551	78.9
Widow and Orphan pension	29,688	77.2
III. Agricultural Support	**2,999**	**92.5**
IV. Minimum Subsistence Allowance (AGI)	**16,632**	**69.7**
V. In-kind transfers	**200,628**	**100.0**
Education	106,616	100.0
Health	94,012	100.0
B) Other Spending	0	0.0

Source: authors' calculations.

Step 3: Poverty and inequality outcomes are measured as follows. The poverty headcount ratio is measured as the proportion of individuals with a household per capita income below the poverty line. We use the upper-middle-income-country (UMIC) poverty line, which is calculated globally by the World Bank and takes the value of $5.50 per-person per-day in 2011 Purchasing Power Parity (PPP).[11] The headcount ratio is complemented by the poverty gap index, which measures how far below individuals are from the poverty line, as a proportion of the line. Finally, inequality is measured using the Gini coefficient, with 0 representing perfect equality, and 1 representing perfect inequality. Since the Gini is more sensitive to changes in the middle of the distribution, we use the 90/10 ratio as complementary measure. This ratio compares the income of the 90th percentile to the income of the 10th percentile.

Finally, taking advantage of the global scale of the CEQ initiative, the findings are benchmarked to international comparators. To choose comparators relevant to Turkey, we used the following criteria: a) the country is (at least) upper-middle-income, and b) a CEQ study has been produced in the last 5 years. As a result, we benchmark Turkey's performance in comparison to the following eight countries: Argentina, Brazil, Chile, Mexico, Croatia, Poland, Russia, and the United States.

5. Overall Impact of Taxes and Spending on Poverty and Inequality

5.1 Impact on Income Inequality

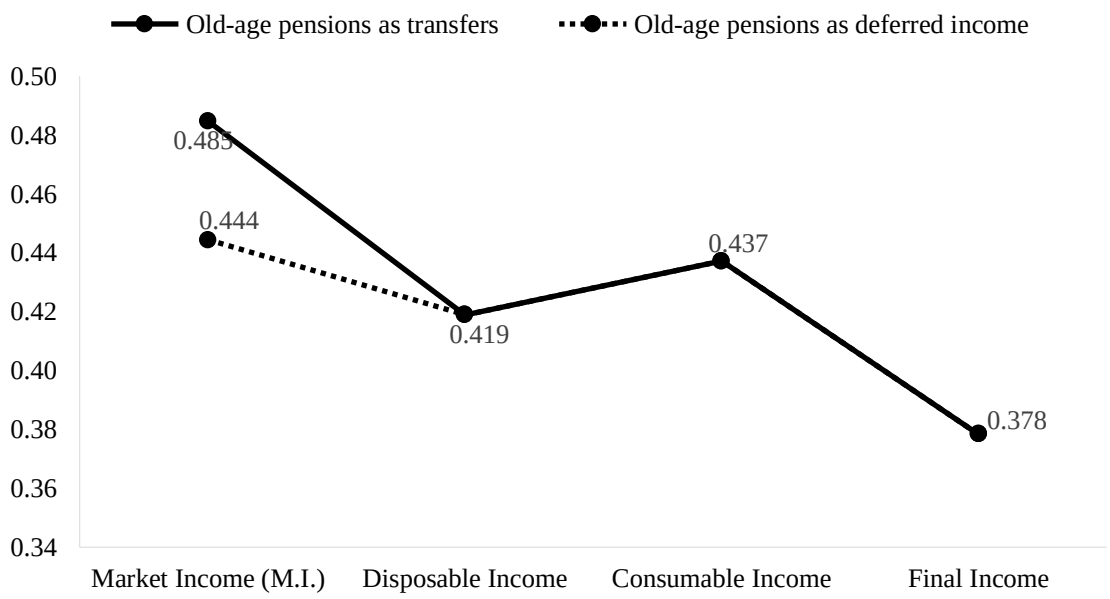
The overall system of taxes and spending in Turkey leads to a significant reduction in income inequality. Figure 2 shows the overall impacts on the Gini coefficient and the 90/10 ratio following the income concepts described in Figure 1. The country achieves a reduction in Gini of about 0.07, down from 0.44, in the base scenario when old-age contributory pensions are treated as deferred income. The reduction is around 0.11 when those pensions are considered as transfers. Before any fiscal intervention, Market Income Gini is 0.48 (0.44 if pensions are added). The Disposable Income Gini drops to 0.42 once direct taxes and direct transfers are considered. Indirect taxes have a slight unequalizing effect, making the Gini coefficient of Consumable Income increase to 0.44. Of all the fiscal tools, in-kind benefits in education and health have the largest impact on inequality; the Gini coefficient of Final Income drops to 0.38.

[11] Turkey's National Institute of Statistics (TUIK) does not calculate a national poverty line based on local cost of food and non-food basic needs. It stopped doing so in 2009.

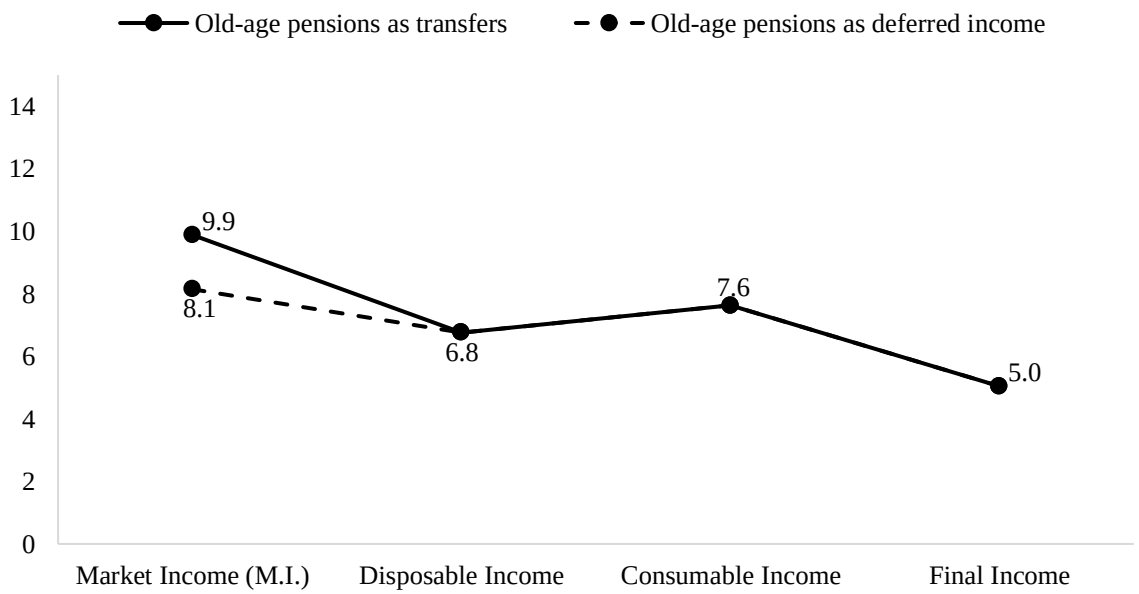
The 90/10 ratio displays a similar trend. Before fiscal interventions, high-income households (90th percentile of the distribution) have an income that is 8.1 times higher than low-income households (10th percentile) when pensions are treated as deferred income (and almost when pensions are treated as transfers). The 90/10 ratio drops to 5 after all fiscal interventions.

Figure 2. Inequality before and after fiscal policy in Turkey, 2016

a. Gini Coefficient



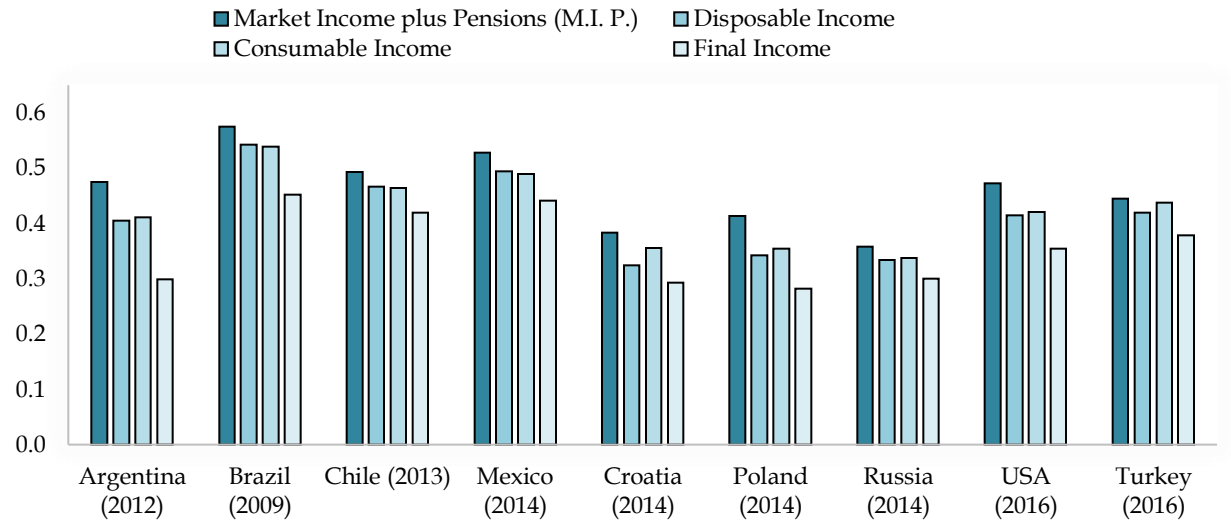
b. 90/10 ratio



Source: Own estimates based on Turkey 2016 HBS. Note: The figure shows the Gini coefficient for each income concept described in Figure 1. M.I. refers to before and after fiscal interventions, Disposable income refers to after direct taxes and transfers, Consumable Income refers to after indirect taxes and Final Income refers to after in-kind (education and health) transfers.

Figure 3 presents the overall impact of fiscal policy on inequality in peer countries to benchmark Turkey's performance. For comparability, in all cases the baseline scenario considers market income plus pensions as starting point, treating old-age pensions as deferred income. Qualitatively speaking, income inequality falls in all countries after taxes and transfers, which implies that there is fiscal redistribution in all these economies. The differences are in the magnitudes. The highest absolute decrease in the Gini is observed in Argentina, at 0.18 Gini points, and the smallest drop is found in Russia, at 0.06. Among peer countries, Turkey shows a below median performance, close to Mexico and just ahead of Chile and Russia. The differential performance with comparator countries is driven by the inequality-increasing impacts of indirect taxes, first, and the relatively moderate inequality-decreasing impacts of direct transfers and taxes, second.

Figure 3. Gini coefficient before and after fiscal policy in Turkey and peer countries



Source: Argentina (Rossignolo 2017); Brazil (Higgins and Pereira 2017); Chile (Martinez-Aguilar et al. 2016); Croatia (Inchauste and Rubil 2015); Mexico (Scott et al. 2018); Poland (Goraus and Inchauste 2016); Russia (Popova et al. 2018); US (Higgins et al. 2016). Turkey: Own estimates based on Turkey 2016 HBS. Note: The figure shows the Gini coefficient for each income concept described in Figure 1.

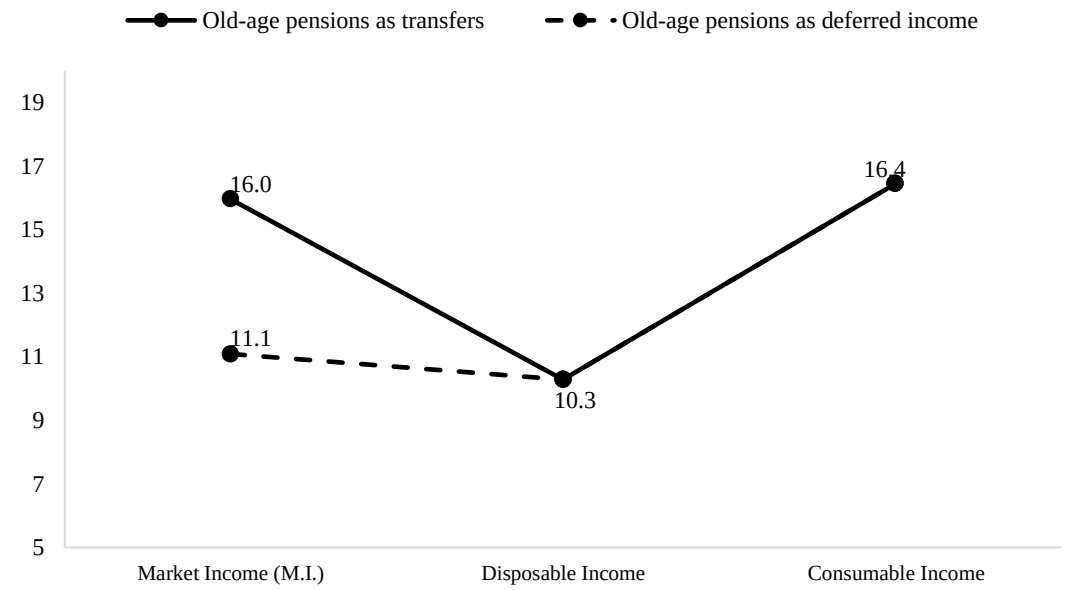
5.2 Impact on Poverty

The overall impact of taxes and transfers on poverty is positive. In the base scenario, when pensions are considered as deferred income, the bulk of taxes and direct transfers increase poverty from 11.1 to 16.4 percent. When pensions are treated as transfers, the impact is significantly muted, from 16 to 16.4 percent. Figure 4 shows the impact on the poverty rate (panel a) and the poverty gap (panel b) following the income concepts described in Figure 1.[12]

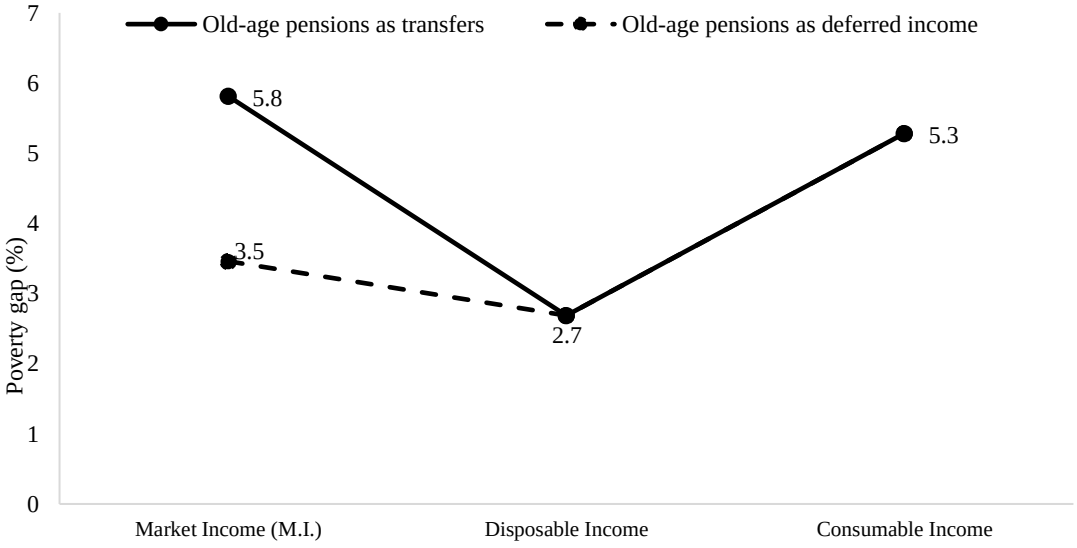
[12] Since conceptually it is not sound to include the value of the government's social spending on health and education in the household income aggregate for poverty measurement, we do not present the poverty rates for Final Income.

Figure 4. Poverty rate and Poverty gap before and after fiscal policy in Turkey, 2016

a. Poverty rate



b. Poverty gap



Source: Own estimates based on Turkey 2016 HBS. Note: The figure shows the poverty rate and the poverty gap for income concepts described in Figure 1.

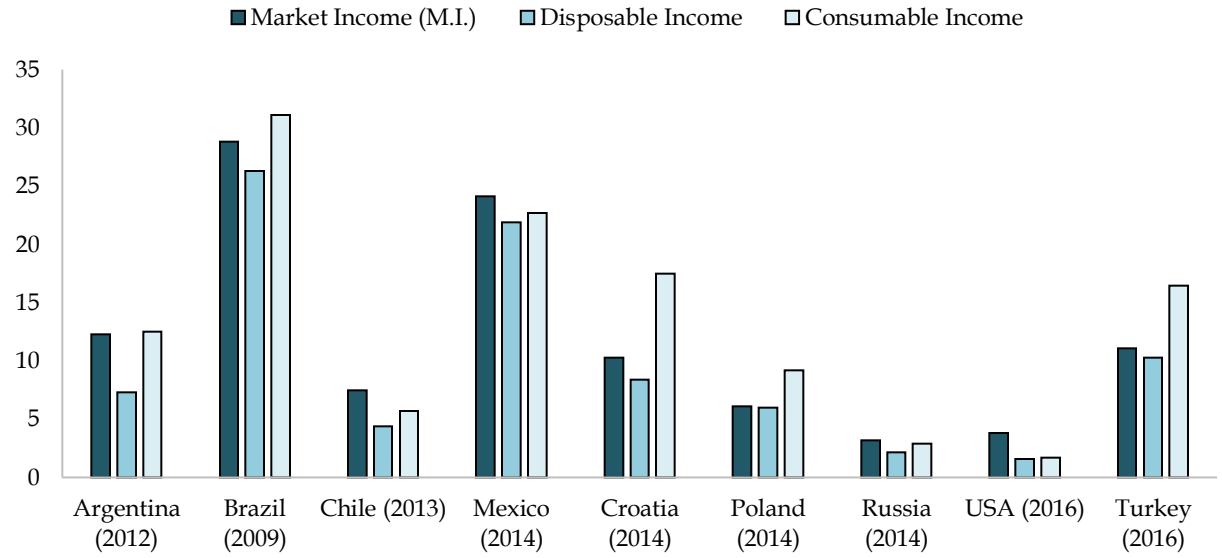
The combined impact of direct taxes and direct transfers reduces the incidence of poverty. The poverty headcount ratio decreases from 11.1 to 10.3 percent, when pensions are treated as deferred income. Similarly, the poverty gap is strongly reduced by the combined action of direct taxes and transfers.

Indirect taxes, however, lead to substantial increases in poverty. While all individuals are affected by indirect taxes along the income distribution, the less well-off suffer a relatively higher impact (as shown in the inequality results of Figure 3). As such, poverty rises by more than 5 percentage points from Disposable to Consumable income. The poverty gap increases by almost 50 percent, from 2.7 to 5.3 percent.

In comparative terms, the overall impact of taxes and transfers on poverty in Turkey and peer countries is mixed (Figure 5). Poverty decreases in 4 countries, increases in 4 others, and stays constant in one of them. A common pattern across countries is that indirect taxes are poverty increasing, since low-income households allocate all their income to consumption. Turkey's relative performance is below-median, driven by the relatively stronger poverty-increasing impact of indirect taxes, and the comparatively smaller poverty-decreasing impact of transfers and direct taxes. While the poverty rate for Consumable income is higher than for Disposable income in all upper-middle-income countries with available data, the magnitude of the increase in Turkey is among the highest of the lot.

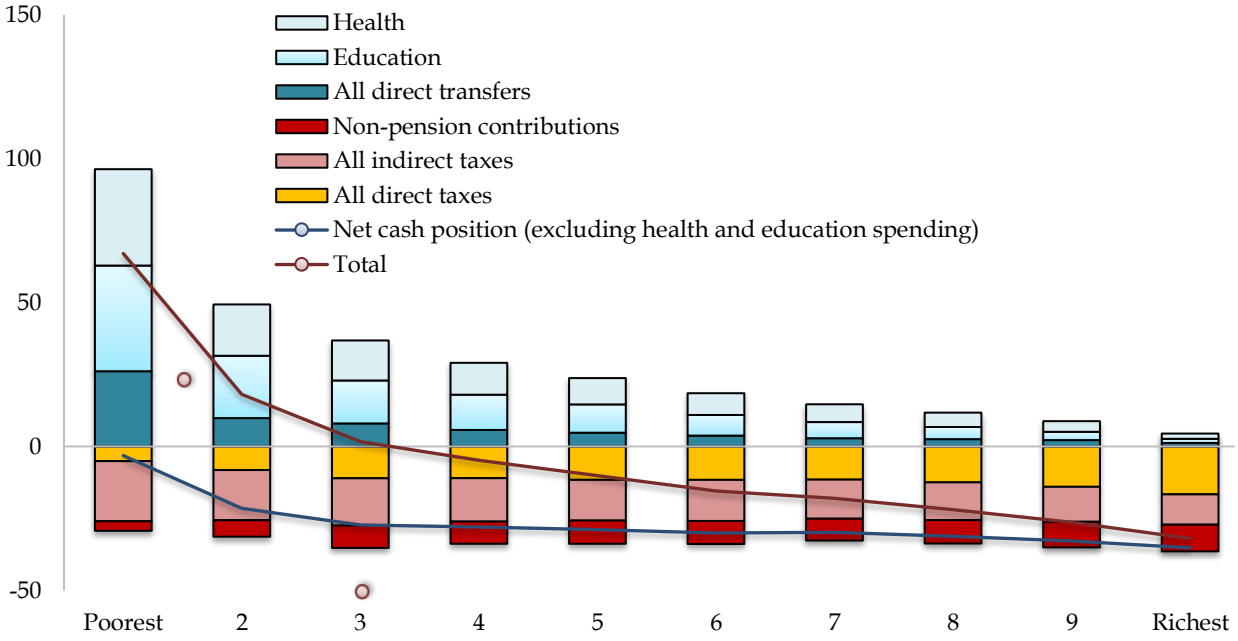
For a better understanding of the changes in inequality and poverty presented so far, the final result we present in this section looks at the incidence of fiscal interventions across deciles of the distribution, as a share of market income plus pensions. Results are shown in Figure 6. The strong progressive profile of the education and health transfers, with benefits relatively more concentrated in the bottom deciles, explain the sharp reduction obtained in the Gini of Final income. In addition, these in-kind transfers lift the impact of fiscal policy in the bottom of the distribution. If we consider only in-cash transfers, we observe that they are not sufficient to offset the burden of taxes across all deciles of the distribution. But once in-kind transfers kick in, they have a boosting effect on the final position of low-income households, making them net receivers of fiscal resources. From decile 4 and above, households are net payers to the fiscal authority.

Figure 5. Poverty rate before and after fiscal policy in Turkey and peer countries



Source: Argentina (Rossignolo 2017); Brazil (Higgins and Pereira 2017); Chile (Martinez-Aguilar et al. 2016); Croatia (Inchauste and Rubil 2015); Mexico (Scott et al. 2018); Poland (Goraus and Inchauste 2016); Russia (Popova et al. 2018). Turkey: Own estimates based on Turkey 2016 HBS. Note: Argentina, Brazil, Chile, Mexico, and Russia are based on a $4/day poverty line in 2005 PPP. Croatia and Poland are based on $5/day poverty line in 2005 PPP. Turkey is based on 5.5/day poverty line in 2011 PPP. The figure shows the poverty rate for each income concept described in Figure 1.

Figure 6. Distribution of taxes and transfers across income deciles in Turkey, 2016



Source: Own estimates based on Turkey 2016 HBS. Note: The figure shows each fiscal intervention as a share of Market income plus pensions, by decile of Market income plus pensions. The figure also shows the net cash position of each household as the difference between the cash transfers received and the taxes paid (excluding in-kind transfers in health and education).

6. Individual Contributions of Taxes and Spending to Poverty and Inequality Reduction

The section unpacks the aggregate results presented in the previous section, and analyzes the separate contribution of each fiscal intervention to poverty and inequality. Interventions are analyzed in terms of their progressivity and marginal contribution to poverty and inequality.

To measure progressivity we follow the standard practice and use the Kakwani index (Kakwani 1977). A tax (benefit) is progressive whenever its burden (entitlement) rises (decreases) with income. In the case of transfers, the index is defined as the difference between the Gini coefficient of Market income plus pensions (when pensions are treated as deferred income) and the concentration coefficient of the transfers. While for each tax the Kakwani index is calculated as the difference between the concentration coefficient of the tax and the Gini coefficient of Market income plus pensions. A Kakwani index for taxes will be positive (negative) if a tax is globally progressive (regressive), while a Kakwani index for transfers is positive if a transfer is progressive in relative terms.

To analyze if a tax or transfer is equalizing, we use the marginal contribution of taxes and transfers to income inequality measured by the Gini coefficient.[13] The marginal contribution measures the marginal reduction in inequality due to a tax or a transfer, and is the difference between the Gini coefficient without the particular fiscal intervention and the Gini coefficient of all income components together.[14] The intervention is equalizing whenever the marginal contribution is positive. By comparing the marginal contribution and the Kakwani index we can determine whether a fiscal intervention is equalizing (unequalizing) despite being regressive (progressive).

6.1 Direct Taxes and Transfers and Their Effects on Inequality

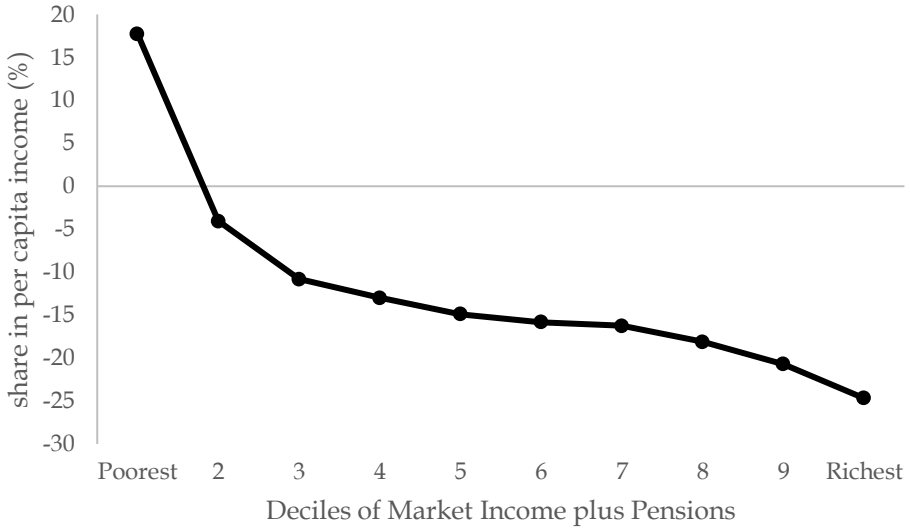
The Fiscal Incidence Curve of Disposable Income shows how direct taxes and transfers impact different deciles of the income distribution (Figure 7). The first decile is a net receiver, the direct

[13] If there was a single fiscal intervention in the system, then the Kakwani index would be sufficient to determine whether that intervention is unambiguously equalizing. However, this is no longer the case when there is more than one intervention. As Lambert (2001) shows, a tax or transfer can reduce (increase) inequality despite being regressive (progressive).

[14] Since there is path dependency, the sum of the marginal contributions of each intervention is not equal to the total change in inequality (Enami, Lustig, and Aranda 2017).

transfers they receive are higher than the direct taxes they pay. All other deciles are net payers. For the poorest decile, these taxes and transfers represent an income increase of 18 percent, while for the richest decile these bring about an income decrease of 25 percent.

Figure 7. Fiscal Incidence Curve of Direct Taxes and Transfers



Source: Own estimates based on Turkey 2016 HBS. Note: changes calculated from Market income plus pensions to Disposable income.

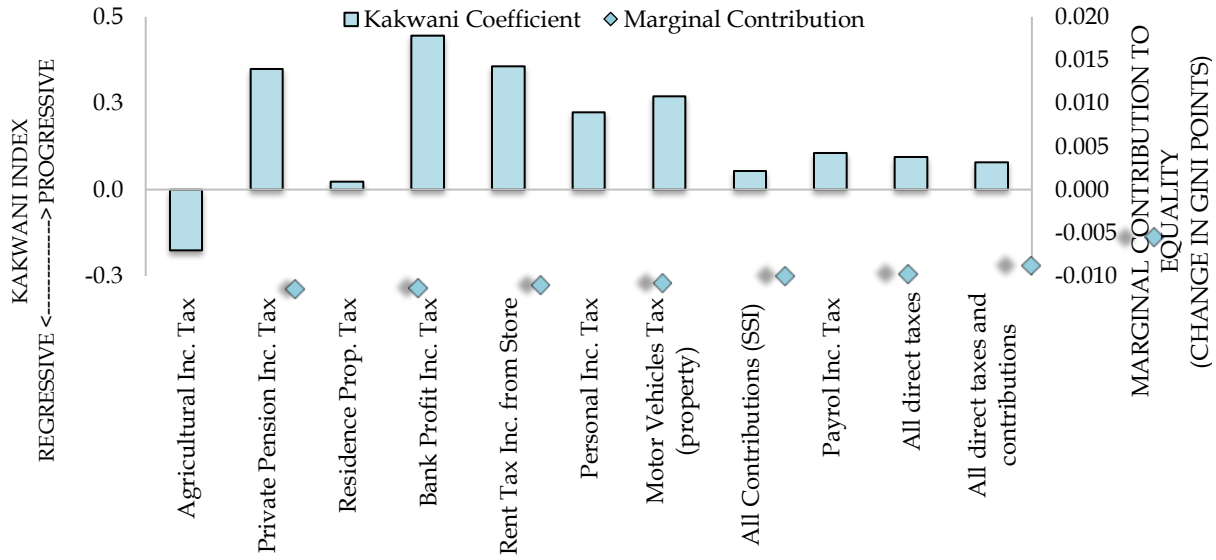
Panel (a) of Figure 8 shows the Kakwani coefficient and the marginal contribution to inequality of all direct taxes in Turkey in 2016. In general, direct taxes are progressive; the Kakwani coefficient for most of the direct taxes is positive. They are also broadly inequality-reducing as shown by a positive marginal contribution to the Gini coefficient. However, there is substantial heterogeneity across tax categories. For instance, payroll income tax is progressive and the most inequality-reducing, while agricultural income tax is regressive and does not contribute to reduce inequality.

Relative to its peers, the equalizing effect of direct taxes in Turkey is similar to Chile, Poland and Mexico, but lower than Russia, Croatia and the United States (panel (b) of Figure 8). Most countries' direct taxation is more progressive than Turkey's. It is also the case that, with the exception of Mexico and Croatia, all peer countries collect more direct taxes than Turkey, as a share of GDP.[15]

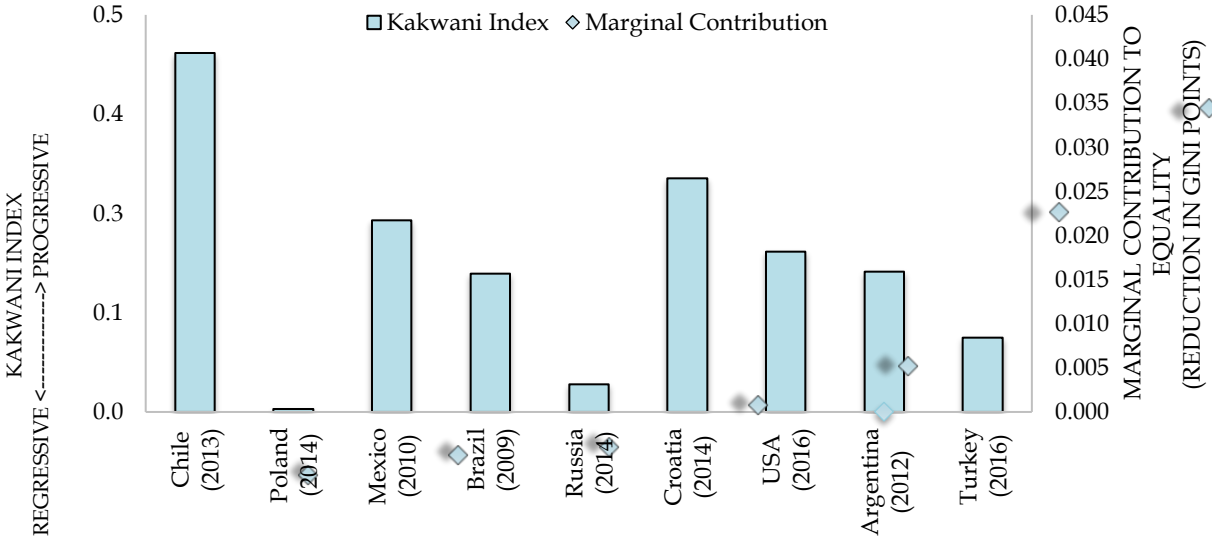
[15] Revenue from direct taxes in percent of GDP: Turkey 5.8, Chile 6.6 Poland 6.3 Mexico 5.1 Brazil 9.5 Russia 9.1 Croatia 5.4 Argentina 8.4. Source: CEQ Data Center on Fiscal Redistribution.

Figure 8. Progressivity and redistributive impact of direct taxes

a. Direct taxes in Turkey, 2016



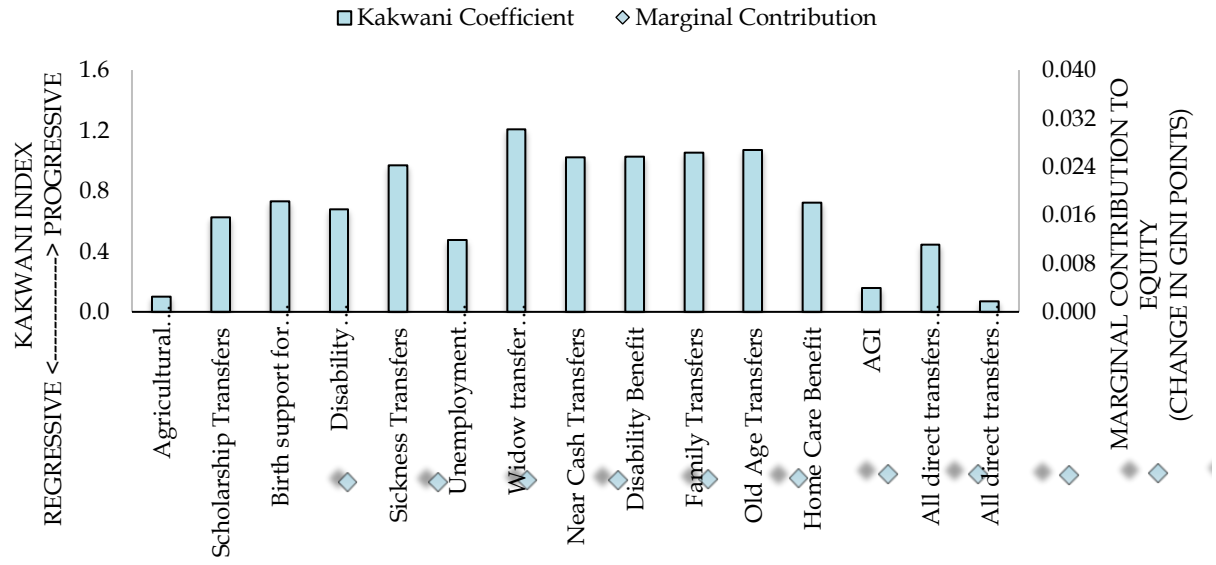
b. Direct taxes in selected countries (excluding contributions)



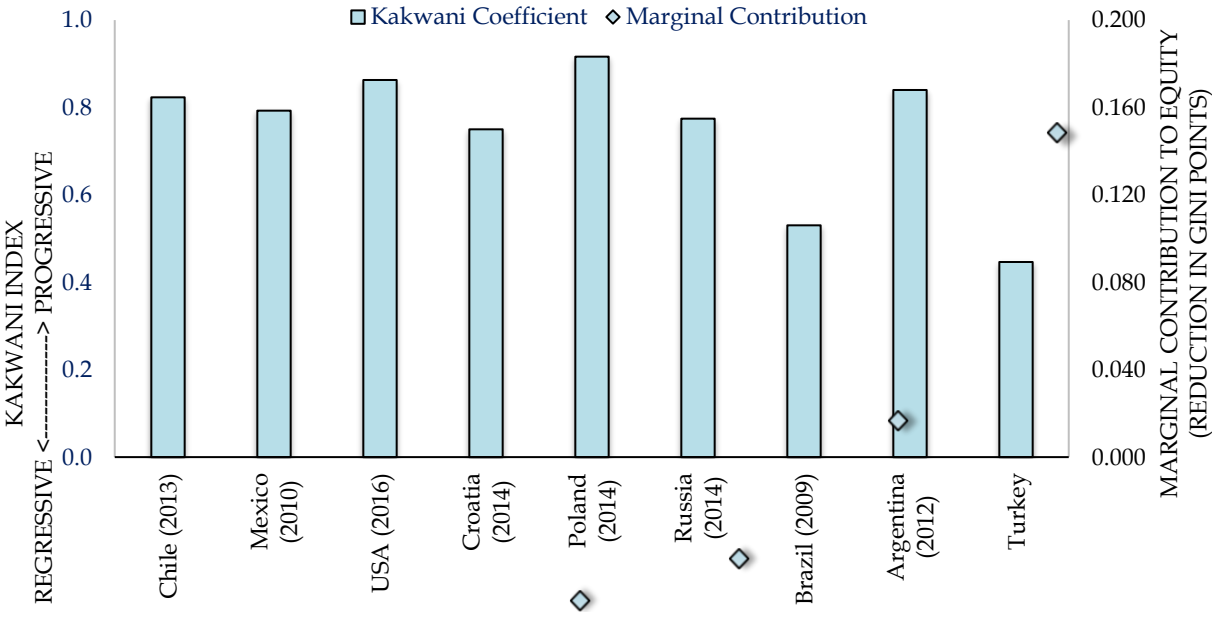
Source: Argentina (Rossignolo 2017); Brazil (Higgins and Pereira 2017); Chile (Martinez-Aguilar et al. 2016); Croatia (Inchauste and Rubil 2015); Mexico (Scott 2013); Poland (Goraus and Inchauste 2016); Russia (Popova et al. 2018); US (Higgins et al. 2018). Turkey: Own estimates based on Turkey 2016 HBS. Note: Marginal contribution to equality is the difference between the Gini coefficient without the particular fiscal intervention and the Gini coefficient of all income components together. There is no marginal contribution calculated for Argentina. USA results are preliminary.

Figure 9. Progressivity and redistributive effect of transfers in Turkey, 2016

a. Direct transfers in Turkey, 2016



b. Direct transfers in selected countries (excluding contributory)



Source: Argentina (Rossignolo 2017); Brazil (Higgins and Pereira 2017); Chile (Martinez-Aguilar et al. 2016); Croatia (Inchauste and Rubil 2015); Mexico (Scott 2013); Poland (Goraus and Inchauste 2016); Russia (Popova et al. 2018); US (Higgins et al. 2018). Turkey: Own estimates based on Turkey 2016 HBS. Note: Marginal contribution to equality is the difference between the Gini coefficient without the particular fiscal intervention and the Gini coefficient of all income components together. There is no marginal contribution calculated for Argentina and Brazil. USA results are preliminary.

With regards to transfers, all exhibit a progressive pattern; Kakwani coefficients are all positive (Figure 9). These transfers are also inequality-reducing as most of the marginal contributions are also positive, but there is marked heterogeneity across them. Social assistance transfers are strongly progressive, given their poverty-targeted design, though taken individually their marginal impacts look relatively small, given their limited benefit levels. Despite having low progressivity, the AGI program has the largest distributional impact among all programs, since it channels a relatively large budget.

From a policy perspective, the AGI offers an interesting entry point to consider. It has a budget that is almost two-thirds of the budget of all social assistance transfers, and has a design with good space for improvement in terms progressivity. Reforming AGI towards a design more targeted to low-income households could be a policy option to explore to improve the equalizing impact of the fiscal system in Turkey. For example, an alternative design could consider introducing a ceiling around the minimum wage for eligibility to receive AGI. This would generate savings from the current AGI budget, that could then be allocated to: i) increase the amount that AGI gives to low wage earners, and/or ii) increase benefit levels in targeted social transfers to provide more adequate support to existing beneficiaries.

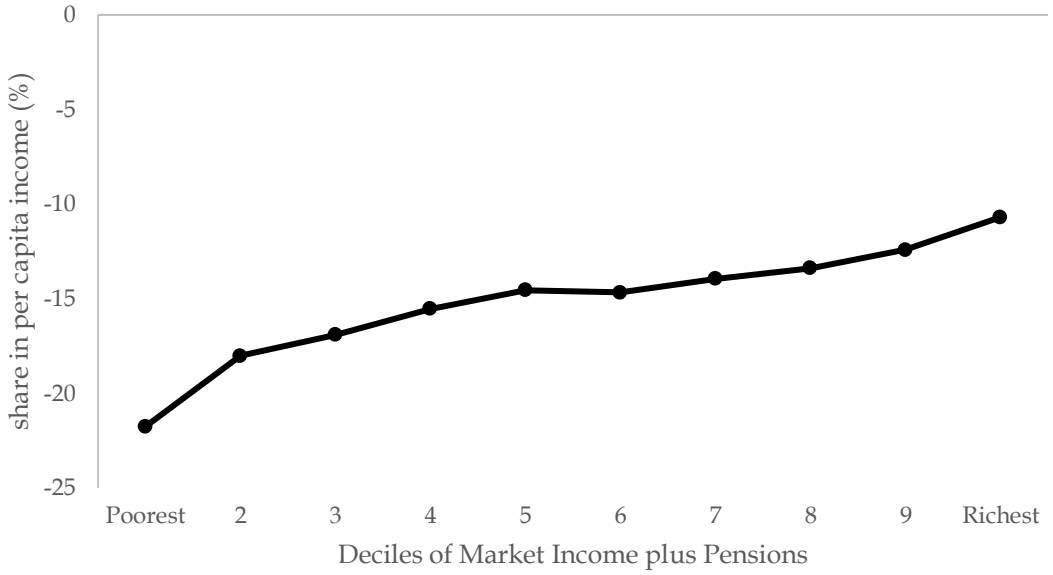
In comparison to its peers, Turkey is below the median. Overall, the progressivity and inequality reducing nature of social transfers is relatively lower than in comparator countries (panel (b) of Figure 9). Turkey's transfers show a better equalizing performance than Chile's and Mexico's, but are less equalizing than in the rest of the countries. However, Turkey allocates a smaller budget to social transfers than most of its peers, as a share of GDP.[16]

6.2 Indirect Taxes and Their Effect on Inequality

The Fiscal Incidence Curve of Consumable Income shows how indirect taxes affect incomes across different deciles of the distribution (Figure 10). The negative incidence of these taxes is higher for lower income households. For the poorest decile, these taxes represent an income decrease of 22 percent, while for the richest decile these bring about an income decrease of 11 percent.

[16] Spending in social transfers (non-contributory) in percent of GDP: Turkey 1.2 Chile 1.6 Mexico 1.0 Russia 5.3 Brazil 5.4 Argentina 5.8. Source: CEQ Data Center on Fiscal Redistribution.

Figure 10. Fiscal Incidence Curve of Indirect Taxes



Source: Own estimates based on Turkey 2016 HBS. Note: changes calculated from Market income plus pensions to Disposable income.

All indirect taxes combined lead to an increase in inequality, as presented in Figure 2. Panel (a) of Figure 11 presents the Kakwani coefficient and the marginal contribution to inequality of each indirect tax taken separately. We find that most indirect taxes are regressive, as shown by a negative Kakwani coefficient. Moreover, nearly all indirect taxes contribute to higher inequality, that is their marginal contribution to the Gini coefficient is negative. There is, however, substantial heterogeneity between taxes. Taxes on alcohol and tobacco, and food and beverages are the most regressive, and, in particular, the SCT on alcohol and tobacco has the largest unequalizing effect. The VAT on motor vehicles is slightly progressive but unequalizing.

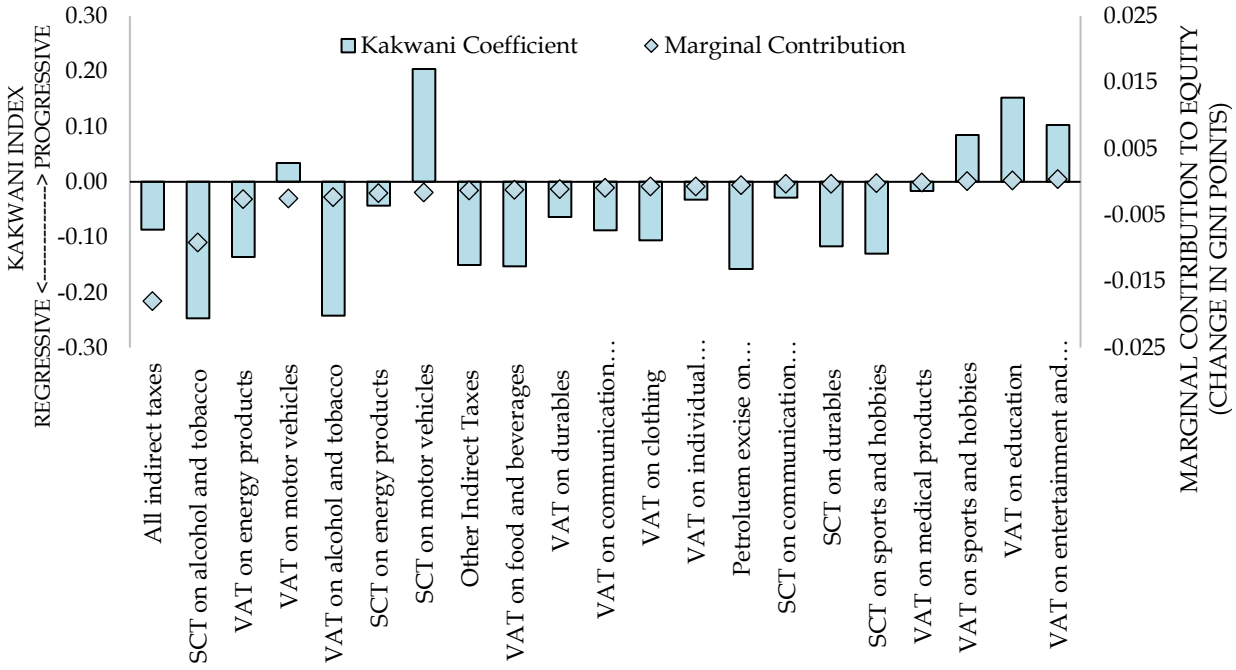
The unequalizing effect of indirect taxes on income distribution in Turkey is significantly higher than in nearly all peer countries (panel (b) of Figure 11), even though Turkey's indirect tax burden is not particularly high. Turkey ranks in the median in terms of revenues collected through indirect taxation, as a share of GDP.[17] Turkey's indirect taxes are not among the most regressive either. On the one hand there are countries with a more regressive but less burdensome (less revenue) combination of indirect taxes than Turkey, like Russia, and on the other hand there are

[17] Revenue from indirect taxes, in percent of GDP: Turkey 10.3 Croatia 17.0 Poland 10.8 Russia 7.7 Brazil 14.5 Chile 9.8 Mexico 4.4 Argentina 15.3. Source: CEQ Data Center on Fiscal Redistribution.

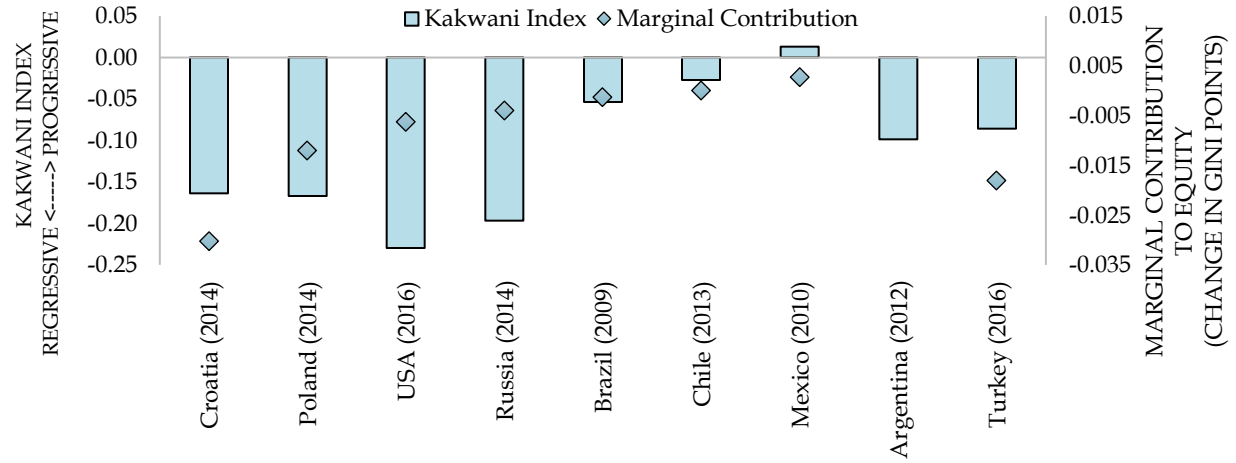
countries with a less regressive but more burdensome mix, like Brazil. In both cases, however, indirect taxes are less unequalizing than in Turkey.

Figure 11. Progressivity and redistributive impact of indirect taxes

a. Indirect taxes in Turkey, 2016



b. Indirect taxes in selected countries



Source: Argentina (Rossignolo 2017); Brazil (Higgins and Pereira 2017); Chile (Martinez-Aguilar et al. 2016); Croatia (Inchauste and Rubil 2015); Mexico (Scott 2013); Poland (Goraus and Inchauste 2016); Russia (Popova et al. 2018); US (Higgins et al. 2018). Turkey: Own estimates based on Turkey 2016 HBS. Note: Marginal contribution to equality is the difference between the Gini coefficient without the particular fiscal intervention and the Gini coefficient of all income components together. There is no marginal contribution calculated for Argentina. USA results are preliminary.

6.3 Taxes and Transfers and Their Effects on Poverty

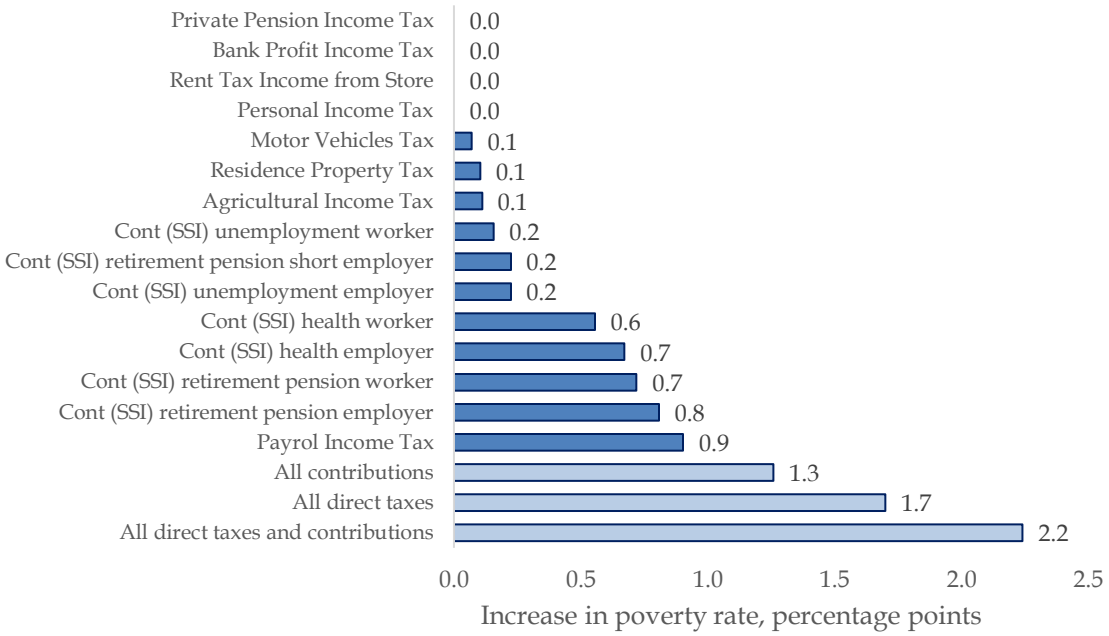
Panels (a) and (b) of Figure 12 show the increase in poverty due to each direct and indirect tax, respectively. These results vary widely depending on the taxes considered. On the direct tax side, the payroll income tax has the highest poverty-increasing effect, raising the share of poor by about one percentage point. Private pensions income tax, interest income tax, rent tax income from workplace, and personal income tax leave poverty unchanged since they mainly affect those who are better-off, distant from the poverty line.

Indirect taxes lead to higher overall increases in poverty than direct taxes. Among them, the SCT on alcohol and tobacco, which was found to be the most unequalizing indirect tax (panel b of Figure 11), increases poverty by about two percentage points. Others, like VAT on education does not affect poverty because it is a tax paid by those that enroll their children in private education, which have incomes far enough from the poverty line.

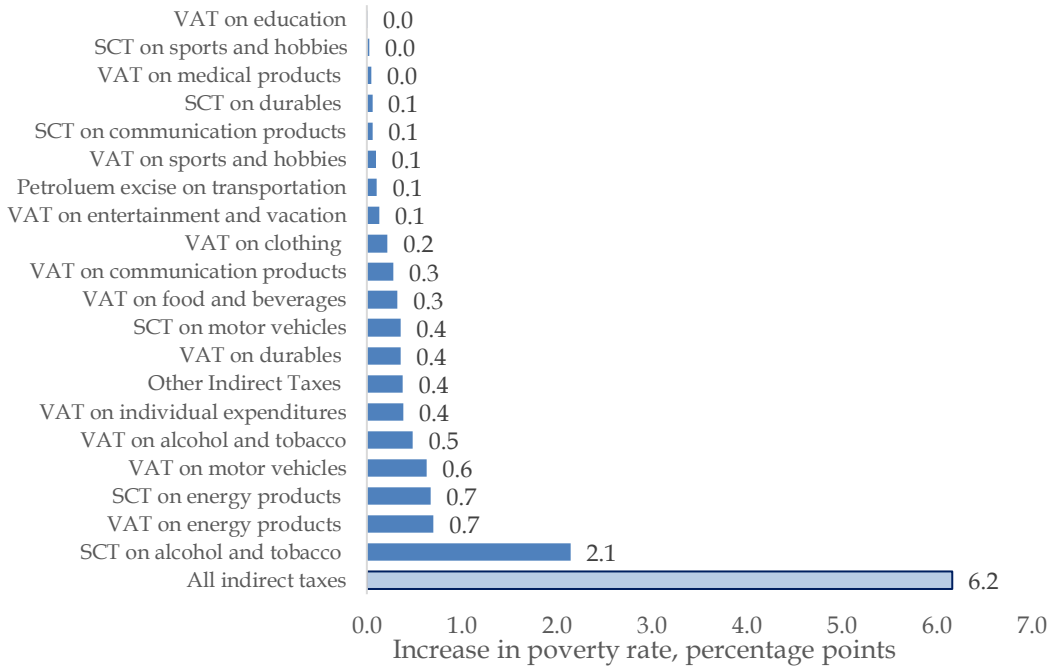
With regards to direct transfers, they reduce the poverty headcount ratio by 3 percentage points when old-age contributory pensions are treated as deferred income. Their impact rises to about ten percentage points when old-age contributory pensions are treated as transfers (Figure 13). In any case, the program with the strongest impact on poverty is the AGI, reducing the headcount by 0.6 percentage points. The individual impact of each of the social transfers is relatively small—even though they are targeted to low-income households, they all have budgets that are far lower than AGI's. As mentioned before, if AGI adopted a more targeted approach, the distributional impacts of fiscal policy could be improved.

Figure 12. Marginal contribution of taxes to poverty

a. Direct taxes in Turkey, 2016

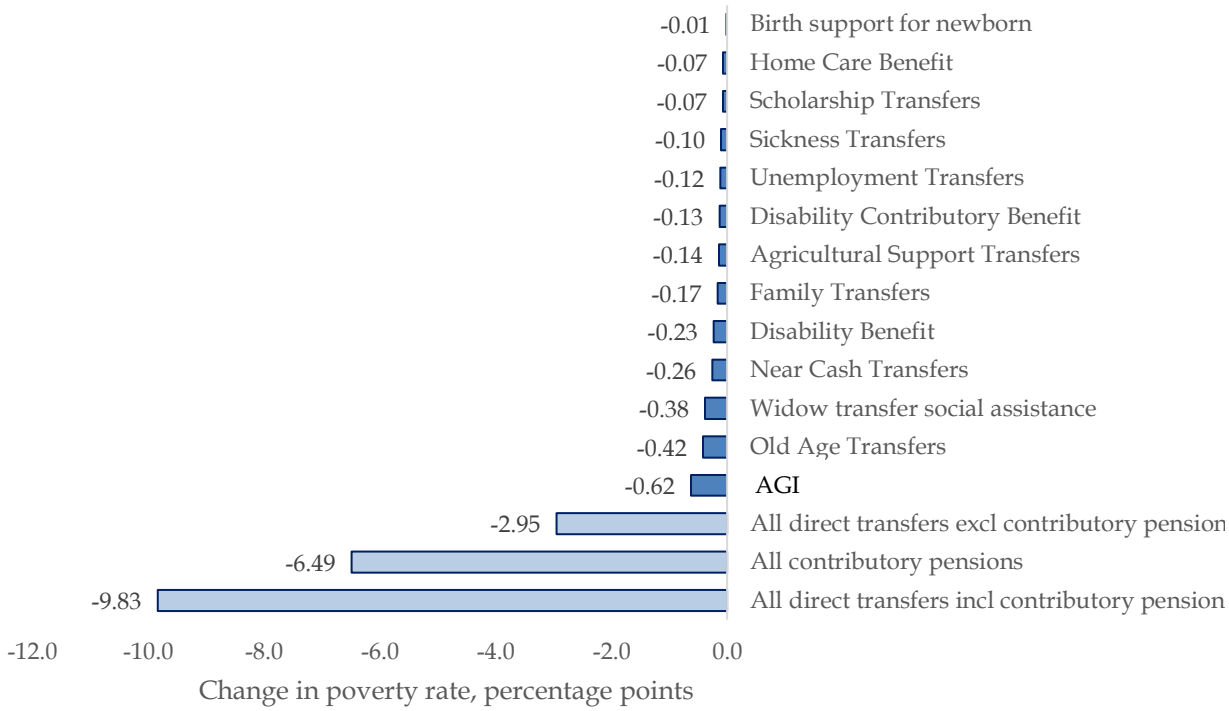


b. Indirect taxes in Turkey, 2016



Source: Own estimates based on Turkey 2016 HBS. Note: Marginal contribution to poverty is the difference between the poverty rate without the particular fiscal intervention and the poverty rate of all income components together.

Figure 13. Marginal contribution of direct transfers to poverty reduction, 2016



Source: Own estimates based on Turkey 2016 HBS. Note: Marginal contribution to poverty is the difference between the poverty rate without the particular fiscal intervention and the poverty rate of all income components together.

7. Conclusions

This paper contributes the most comprehensive analysis of the poverty and inequality impacts of fiscal policy in Turkey to date, by considering both the combined and individual incidence of direct and indirect taxes and social spending. While fiscal interventions can be pivotal instruments in the policy toolkit to foster inclusive growth, an integrated analysis of the distributional implications of fiscal policy was missing.

The paper finds that Turkey's overall tax and social spending policy significantly reduces income inequality in the population. The observed inequality-reducing impact is driven primarily by the strong equalizing effect of social spending on education and health. Direct taxes and transfer schemes are also equalizing and help mitigate the inequality-increasing impact of indirect taxes. In contrast, with regards to poverty, the system of direct transfers and direct taxes cannot counterweight the poverty-increasing impact of indirect taxes, and therefore net increases are observed in poverty indicators.

In comparative terms, relative to other upper-middle-income countries where similar studies have been conducted, Turkey shows a below median performance in the distributive impact of taxes and transfers. The differential performance with comparator countries is explained by, first, Turkey's larger inequality-increasing effect of indirect taxes, and, second, Turkey's relatively moderate inequality-decreasing impacts of direct transfers and taxes. Turkey's indirect taxation, however, is not particularly burdensome relative to its peers, as share of GDP; but most peer countries collect more direct taxes and spend more on social transfers than Turkey, relative to their GDPs.

In addition to providing a comprehensive diagnostic of the distributional impacts of the existing system of taxes and transfers, the paper offers a platform to simulate the potential impacts of changes to the existing system. A forward-looking use of the platform to contribute to policy discussions would be to think beyond the current architecture of taxes and transfers and consider changes in their design to identify marginal improvements in the distributional incidence of fiscal policy. Simulations would be limited by lack of behavioral change considerations and the partial equilibrium approach, but they would be useful to obtain first-order estimates of the distributional impacts of these changes.

One such entry point could be to consider changes to the Minimum Subsistence Allowance (AGI) program, either by making it more progressive, or by reallocating some of its resources to the poverty-targeted social transfers. Given AGI's relatively large budget, these changes bear promising potential to bring about marginal improvements in the poverty and inequality impacts of fiscal policy.

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Annex A. Detailed Empirical Approach to Measure the Incidence of Fiscal Policy

I. Direct Taxes and Contributions

Personal income tax (PIT) is paid by individuals based on their income and earnings in a year. Everyone is subject to pay taxes for his/her share of income, profits and earnings. The following categories are considered for taxable income of individuals in Turkey:

- Business profits
- Agricultural profits
- Salaries and wages
- Income from independent personal services
- Income from immovable property and rights (rental income)
- Income from capital investment
- Other incomes and earnings

PIT consists of two main components; withholding tax (WHT), which is the tax withheld at the source before the individual receives the gross amount of specific earnings, and PIT based on declaration (PITBD), namely on the basis of the annual earnings that the individual declares to the state. Almost all above-mentioned sources of income are subject to WHT. At the end of the fiscal year individuals are obliged to declare their income and also pay PITBD accordingly. Taxpayers pay the difference between the WHT and PITBD if the amount of WHT is lower than the PITBD.

Tax on Salaries and Wages (Payroll Income Tax)

The payroll income tax is withheld by employers and paid to tax offices in Turkey. It is calculated based on the taxable payroll income, which refers to gross wages after social contributions have been paid. Turkey's payroll tax has a progressive structure with marginal tax rates that increase with income. Table A1 presents the marginal tax rates applicable to each income bracket for the 2016 payroll income tax. This tax is paid each month by calculating the yearly cumulative income tax base. For instance, if an employee's tax base is 5,000 TL in January 2016, the employer pays 750 TL for this employee for this month since the taxable income is in the first tax bracket (5,000 TL x 15% = 750 TL). By March, the employee moves to the second tax bracket since his/her cumulative tax base is 15,000 TL (greater than 12.600 TL). In March, the employer pays 390 TL ((12,600-10,000) TL x 15%) + 480 TL ((15,000 -12,600) TL x 20%) for this employee. In other words, employee pays 870 TL of payroll income tax in March.

Table A4 - Personal Income Tax Brackets in Turkey, 2016

Income Bracket (cumulative TL in the tax year)	Marginal Tax Rate (in %)
Up to 12,600 TL	15
Between 12,600 TL and 30,000 TL (in addition to 1,890TL tax for 12,600TL earned income in previous months)	20
Between 30,000 TL and 69,000 TL (for salary income, threshold is between 30,000 TL and 110,000 TL) (in addition to 5,370TL tax for 30,000TL earned income in previous months)	27
Higher than 69,000 TL (in addition to 15,900TL tax for 69,000TL earned income in previous months), (for salary income, threshold is 110,000 TL (in addition to 26,970TL tax for 110,000TL earned income in previous months))	35

Source: Income Tax Brackets 2016, http://www.gib.gov.tr/node/179

Calculating the payroll income tax paid by each household in the survey

Wage income is reported in net values in the Household Budget Survey (HBS). To calculate the payroll income tax paid by each wage earner, we first calculate the gross wage for each tax bracket. We then calculate the taxable wage income for each category in Table A2 (gross wage net of social contributions).

Table A5 - Calculation of Gross Wages in 2016

Income bracket: up to 12,600 TL
NW= (**GW** - 0.14*__GW__ - 0.01*__GW__)*.85 – (0.0076*__GW__)
Income bracket: between 12,600 TL and 30,000 TL
NW= (**GW** - 0.14*__GW__ - 0.01*__GW__) – 1,890 – (__GW__*.85 – 12,600)*0.20 – 0.0076*__GW__
Income bracket: between 30,000 TL and 110,000 TL
NW= (**GW** - 0.14*__GW__ - 0.01*__GW__) – 5,370 – (__GW__*.85 – 30,000)*0.27 – 0.0076*__GW__
Income bracket: higher than 110,000 TL
NW= (**GW** - 0.14*__GW__ - 0.01*__GW__) – 26,970 – (__GW__*.85 – 110,000)*0.35 – 0.0076*__GW__

Notes: NW=net wage, GW= gross wage, 0.14 is the share of social contributions for the employee, 0.01 is the unemployment contribution, 0.00076 is the stamp tax rate.

Once taxable wage income is calculated for the four cases in Table A2, we identify the case that satisfies the conditions in Table A1. We then assign the corresponding payroll income tax for each wage earner according to the income tax bracket they fall into. It is important to note that only formal wage earners are subject to payroll income tax, while individuals working in the informal sector are not subject to payroll income tax.

The total tax collected in Turkey from payroll income tax is lower than the one calculated in the household survey. In Turkey, most of the formal workers in registered firms are earning around the minimum wage.[19] Employers may prefer to do so in order to pay lower social security contributions to the government and then pay the rest of the wage in cash to employees. Using this information, we scale down the payroll income taxes that are paid by wage earners by the same amount. When we scale down the payroll income tax, we do not allow any worker to earn less than the minimum wage.

Empirical Approach

a) Identifying those individuals who work formally is an essential part of the calculation of the payroll income tax. The survey does not include a direct question on whether the individual is formally employed or not. We identify formally employed individuals using two variables from the survey; i) type of health insurance ii) wage income. We assume that individuals are formally employed if they have public health insurance and earn at least the minimum wage. To identify the type of health insurance, we use the question in the survey on what type of health insurance individuals have. To identify whether individuals are paid at least the minimum wage we use the net wage income in the "last 12 months". Since individuals are interviewed starting January 2016, but HBS does not share month of interview in their public release, we use the statutory minimum wage corresponding to 2015 (1,000 TL per month).

   To check the robustness of the approach, we then divide the sample into 16 different categories according to certain characteristics i.e. gender (2 categories), full/part-time worker (2 categories) and employment status (4 categories). According to the official statistics, informality rate in Turkey was 33.5 percent in 2016 while our estimates report 36.9 percent. Moreover, the official informality rates (published by TUIK using Labor Force Survey (LFS)) for males and females were 28.8 percent and 44.2 percent in 2016, while our estimates calculate informality rates of 32.2 percent and 47.6 percent, respectively. Detailed results are presented in Table A3.

b) We assume that employers register the salaries of their employees lower than their actual salaries to pay lower social contributions. Since the calculated payroll income tax from the survey is higher than the amount collected by the government, we scale down the payroll income tax for every formal worker by 30 percent to match the survey amount with the administrative records.[20]

[19] World Bank "Jobs Diagnostics", 2019.

[20] For some individuals we scale down their payroll income taxes less than 30 percent if their salary falls below the minimum wage.

Table A6 - Official and Estimated Informality Rates in 2016

	Approach	Official Rate[21]	Survey Rate
Employee – male – ft	Have public health insurance, monthly wage >= to 1000TL	15.8	15.8
Employee – female – ft	Have public health insurance, monthly wage >= to 1000TL	19.1	20.3
Employee – male – pt	Have public health insurance, hourly wage >= to minimum hourly wage and working weekly 20 hours or less	66.5	94.6
Employee – male – pt	Have public health insurance, hourly wage >= to minimum hourly wage and working weekly 20 hours or less	47.5	95.2
Employer – male – ft	Have public health insurance	15.6	7.0
Employer – female – ft	Have public health insurance	12.2	2.4
Employer – male – pt	Have public health insurance and not working in agriculture sector	46.4	19.4
Employer – male – pt	Have public health insurance and not working in agriculture sector	34.6	21.2
Se – male – ft	Have public health insurance, no income from retirement pension and working as managers and professionals	54.0	50.4
Se – female – ft	Have public health insurance, no income from retirement pension and not working in agriculture sector	72.5	63.2
Se – male – pt	Have public health insurance, no income from retirement pension and working as managers and professionals	81.0	77.5
Se – male – pt	No one is formal	96.8	100
Npfw – male – ft	No one is formal	84.3	100
Npfw – female – ft	No one is formal	90.4	100
Npfw – male – pt	No one is formal	93.7	100
Npfw – male – pt	No one is formal	95.5	100

Note: ft refers to full-time, pt refers to part-time, Se refers to Self-employed, Npfw refers to non-paid family worker.

Tax on Rental Income from Workplace

The Turkish tax system treats rental income from residences and workplaces separately. If an individual rents his/her workplace, the tenant is obliged to pay the rental income tax on behalf of the owner. The tenant declares the gross rent to the authorities and pays 20 percent of the gross rent to the tax office. The remaining 80 percent is paid to the owner as rent. The tax on income from renting workplaces therefore functions like a withholding tax since the owner never receives the gross rent.

If the amount of the rental income is lower than 30,000 TL, the owner is not obliged to declare this income and pay personal income tax. If the amount is higher than 30,000 TL, the owner is obliged to declare this income and pay personal income tax, which is the difference between the actual amount of the tax and the withheld tax paid. The tax rates in Table A1 apply to tax on rental income from workplaces as well.

[21] Source: Household Labor Force Survey, 2016.

The taxpayer can use two methods to deduct the expenses from the taxable income on rents: a) actual expenses where the individual can deduct certain expenses from the taxable income i.e. infrastructure expenses, insurance expenses, etc., and b) average expenses where the individual can deduct 25 percent of the rent income from taxable rent income.

Calculating the tax on rental income from workplaces

The HBS includes a question on the net income from renting properties in the last 12 months. We can identify the type of property and income from each property for each household in the survey. We use this information and calculate the gross rental income from workplaces. We calculate the gross rental income as *Gross rental income = Net rental income / 0.8*

Empirical Approach

1. We consider that 20 percent of the rent income from workplaces is withheld by tenant and paid to tax offices.
2. We assume rent income from workplaces is not declared separately to tax offices.

Taxes on Interest Income from Bank Accounts

Interest income is another source of income that is subject to personal income tax in Turkey. Interest income received from bank accounts are subject to withholding income tax. The bank withholds the tax on gross earnings. Tax rates for TL accounts vary from 10% to 15% by maturity. Interest income subject to income tax withholding is not included in yearly income tax return.

Empirical Approach

1. We use the effective tax rate for taxes from bank profits which was 14.3 percent in 2016.
2. We assume interest income from bank accounts are not declared separately to tax offices.

Private Pension Income (Individual Retirement System)

Private pension income is also subject to personal income tax in Turkey. The insurance companies withhold

i) 15 percent of the private pension if the individual paid contributions less than 10 years
ii) 10 percent of the private pension if the individual paid contributions 10 years or more contribution
iii) 5 percent of the private pension if individual entitled to retirement benefit or left the system due to compulsory reasons such as death or disability.

Pension income subject to withholding income tax is not included in yearly income tax return.

Empirical Approach

1. We use the effective tax rate for private pension income which was 10.1 percent in 2016.

Tax on Agricultural Income

Income from agricultural activity is subject to personal income tax in Turkey. Individuals are obliged to declare agricultural income with earnings from other sources and pay personal income tax accordingly. Also, when they sell their agricultural product to publicly regulated markets and third parties (in this case the third party will sell the product to publicly regulated markets), the buyers are obliged to pay a withholding tax on behalf of farmers. Those people who earn income from agricultural activity pay 1, 2, or 4 percent of withholding tax on their income. depending on the type of agricultural activity and market they sell their products. Agricultural income subject to income withholding tax is not included in the yearly income tax return, if the size of agricultural business does not exceed the thresholds in the law.

Empirical Approach

1. We assume individuals pay 2 percent withholding tax on their agricultural income.
3. We assume agricultural income is not declared separately to tax offices.

Personal Income Tax Based on Declaration

PITBD has a relatively complicated tax structure where every individual should calculate their taxes from different income sources and combination of certain incomes. Any income that is taxed with WHT will be deducted from the total taxes that should be paid.

Incomes from independent personal services are subject to personal income tax based on declaration since those incomes are difficult to identify or register in the system. Almost all other abovementioned incomes are taxed at the source. We therefore assume that individuals do not declare the incomes from sources that withholding tax is paid. We assume individuals only declare their income from independent personal services and rent income from residences.

Combination of incomes from different sources have different rules. For instance, rent income from residences are not obliged to be declared if the total annual income is lower than 3.800 TL. Moreover, 3.800 TL is deducted from the taxable rent income.[22] However, if the total income of the individual is in the fourth tax bracket (higher than 110.000 TL), the 3.800TL tax exemption is not applied.

[22] For instance, if an individual earns 20.000 TL annual rent income, the taxable rent income is 20.000TL-3.800TL=16.200TL.

Empirical Approach

1. We assume individuals do not declare incomes from renting workplaces, interest incomes and agricultural activities.
2. We assume individuals only declare their income from independent personal services and rent income from residences.
3. We assume that individuals who have public health insurance, pay their contributions to the government and therefore they also declare their incomes to tax authorities. The ones who do not have public health insurance are assumed to be informal and do not declare their incomes and do not pay PITBD.
4. We assume that individuals underreport their incomes when they declare it to tax authorities. PITBD is calculated to be 30 billion TL from the HBS in 2016 given the assumptions above. The Turkish government however collected only around 4 billion TL in 2016. We therefore scale down everyone's PITBD by 8 times to match the official records.

Social Insurance Contributions

In Turkey, employers and employees are obliged to pay social insurance contributions for health services, unemployment benefit and retirement pensions for formal employees. Contributions are paid directly from the salaries of formal workers. The total amount of contributions is around 37.5 % of the gross salary. While formal employees are obliged to pay their contributions, self-employed or employees working in informal sector can pay voluntary contributions.

In addition, Universal Health Insurance (UHI) contributions are mandatory for each citizen to have access to health services in Turkey. If it is not paid, it is considered as a debt to the government. Those individuals who work formally are exempted from UHI contributions since they pay health contributions from their salaries. Ministry of Family, Labor and Social Services pay the contributions of eligible low-income households to Social Security Institutions (SSI). UHI contributions of the poor are considered as social assistance by the government of Turkey. Within the CEQ methodology we treat UHI contributions as negative direct tax. Conceptually they are not treated as transfers since they are not physically received by beneficiaries.

Calculating the social insurance contributions

After calculating the gross income, we calculate the contributions accordingly. Contributions in Turkey is shown in Table A4. We assume that all formal employees' contributions are paid by their employers according to final gross wage amount.

Table A7 - Rates of Social Insurance Contributions in 2016

	Employer (in %)	Employee (in %)	Total (in %)
SSI Retirement	11	9	20
SSI Retirement Short	2	0	2
SSI Health	7.5	5	12.5
Unemployment	2	1	3
Total	22.5	15	37.5

Empirical Approach

1. We assume that employers' contributions are shifted entirely on employees.
2. We assume UHI contributions are negative direct taxes.

Property Taxes

Owners of buildings and lands are obliged to pay property taxes in Turkey. There are four types of property taxes on buildings and lands. Property taxes are calculated based on the value of the building/land in the administrative records. These taxes are paid semi-annually in two equal installments to the municipality where the property is located. Table A5 lists the property tax rates in 2016.

Table A8 - Property tax rates on buildings and lands

	Non-metropolitan Areas	Metropolitan Areas
Buildings - Residence	0.1 %	0.2 %
Buildings – Other	0.2 %	0.4 %
Land – Construction Allowed	0.3 %	0.6 %
Land – Other	0.1 %	0.2 %

Calculating the property tax paid by each household

The Household Budget Survey (HBS) includes information on property ownership for each household. Households provide information on the number of properties they own, the type of property, and the rent collected from each property (if it is rented). To calculate the property tax paid by households, one needs to know the value of each property as defined in the administrative records. The HBS covers owner-occupied residences. The information provided in the survey reflects however the self- declared value of the residence by the owner instead of the value of the residence as stated in the administrative records. These two values can diverge significantly in certain areas.

Empirical Approach

1. We calculate the property tax only for owner-occupied residences since the survey does not provide information on the value of other property types.

2. We use the self-declared value of the residence instead of the value of the property in the administrative records. The divergence between the two values can be significantly large especially in wealthy neighborhoods.
3. We use the property tax rate at the metropolitan areas (0.2 percent) since a large portion of Turkish population resides in metropolitan areas. The HBS does not provide any regional information; we therefore cannot determine whether the residence is in a metropolitan area or not.

Motor Vehicle Tax (MVT)

Motor vehicles in Turkey are subject to the MVT. Motor vehicles are categorized in three groups; i) cars, motorcycles and terrain vehicles etc., ii) minibuses, panel vans, motorized caravans, busses, trucks etc., iii) planes and helicopters. MVT is calculated based on the age, type, number of seats, cylinder capacity, maximum gross weight, maximum take-off weight.

Calculating the motor vehicle tax paid by each household

Although the HBS includes information on motor vehicle ownership, it does not provide more detailed information that are required to calculate the exact amount of MVT paid by each household.

Empirical Approach

1. For motorbikes we assume a flat tax amount which equals to the average motorbike tax in the country, 71 TL a year (calculated by the Ministry of Finance).
2. For cars, since there is a large heterogeneity, we are hesitant to apply the same tax rate for all cars. We assume assortative matching between cars and households per capita income levels. In other words, we assume that the car with the lowest tax is owned by the lowest income family while the car with the highest tax is owned by the wealthiest household in Turkey. For instance, the first three income deciles (of car owners) are assumed to pay the lowest amount of MVT since by assumption they own the oldest and lowest motor size cars (Age – 16 and above, Motor size – 1300cm^3 and below). The MVT amounts are listed in Table A6.

Table A9 - Property tax rates on vehicles in 2016

Motor Size	**Age**	**MVT (in TL)**	*% cars among all cars owned*
1300 cm³ and below	16 and above	66	*2.78*
1301 - 1600 cm³	16 and above	118	*29.04*
1300 cm³ and below	12 - 15 age	184	*1.71*
1601 - 1800 cm³	16 and above	192	*0.91*
1300 cm³ and below	7 - 11 age	243	*2.52*
1801 - 2000 cm³	16 and above	295	*2.89*
1301 - 1600 cm³	12 - 15 age	307	*8.92*
1300 cm³ and below	4 - 6 age	434	*3.37*

1301 - 1600 cm³	7 - 11 age	434	*13.23*
2001 - 2500 cm³	16 and above	446	*0.40*
1601 - 1800 cm³	12 - 15 age	495	*0.17*
1300 cm³ and below	1 - 3 age	623	*2.62*
2501 - 3000 cm³	16 and above	623	*0.21*
1301 - 1600 cm³	4 - 6 age	748	*12.40*
1801 - 2000 cm³	12 - 15 age	748	*0.77*
1601 - 1800 cm³	7 - 11 age	810	*0.17*
3001 - 3500 cm³	16 and above	877	*0.09*
1301 - 1600 cm³	1 - 3 age	997	*13.12*
2001 - 2500 cm³	12 - 15 age	1,127	*0.24*
1801 - 2000 cm³	7 - 11 age	1,255	*1.29*
3501 - 4000 cm³	16 and above	1,255	*0.04*
1601 - 1800 cm³	4 - 6 age	1,376	*0.03*
2501 - 3000 cm³	12 - 15 age	1,696	*0.16*
1601 - 1800 cm³	1 - 3 age	1,760	*0.02*
4001 cm³ and above	16 and above	1,760	*0.10*
2001 - 2500 cm³	7 - 11 age	1,886	*0.34*
1801 - 2000 cm³	4 - 6 age	2,136	*0.88*
3001 - 3500 cm³	12 - 15 age	2,389	*0.03*
1801 - 2000 cm³	1 - 3 age	2,772	*0.56*
2001 - 2500 cm³	4 - 6 age	3,019	*0.15*
2501 - 3000 cm³	7 - 11 age	3,151	*0.28*
3501 - 4000 cm³	12 - 15 age	3,151	*0.02*
2001 - 2500 cm³	1 - 3 age	4,158	*0.15*
4001 cm³ and above	12 - 15 age	4,535	*0.03*
3001 - 3500 cm³	7 - 11 age	4,785	*0.01*
2501 - 3000 cm³	4 - 6 age	5,043	*0.15*
2501 - 3000 cm³	1 - 3 age	5,797	*0.11*
3501 - 4000 cm³	7 - 11 age	7,059	*0.02*
3001 - 3500 cm³	4 - 6 age	7,943	*0.00*
3001 - 3500 cm³	1 - 3 age	8,828	*0.00*
4001 cm³ and above	7 - 11 age	10,089	*0.02*
3501 - 4000 cm³	4 - 6 age	11,985	*0.00*
3501 - 4000 cm³	1 - 3 age	13,880	*0.00*
4001 cm³ and above	4 - 6 age	17,035	*0.01*
4001 cm³ and above	1 - 3 age	22,716	*0.01*

II. Indirect taxes

There are several indirect taxes in Turkey. Value added tax and special consumption tax (also called excise taxes) are the two biggest revenue sources for the government budget. Other indirect taxes include special communication tax and banking and insurance transactions tax.

Value-Added Tax (VAT)

The Turkish taxation system levies VAT on the supply and the importation of goods and services. In Turkey, consumers pay VAT on all goods and services they purchase, and sellers pay then the VAT to tax offices.

The standard VAT rate in Turkey is 18 percent since May 2001. There are two reduced rates; 1 percent for bread, and 8 percent for other food.

Calculating the VAT amount paid by each household

The HBS includes the consumption expenditure of each household. Each household lists the quantities consumed and the estimated values of own production, daily, over a 30-day period. There are 302 consumption items listed in the survey.

Empirical Approach

1. We use the statutory tax rates imposed by law to calculate the VAT amount paid by each household. The following formula is used to calculate the VAT amount,

*VAT amount on X = Annual expenditure on X * VAT/(1+VAT)*

2. To capture the magnitude of tax evasion across the income distribution, we use a consumer behavior survey (CBS) collected by IPSOS, a marketing and social research company. The survey is conducted weekly and is nationally representative. The sample size is 14,000 households. The survey collects information on a wide range of consumption items (food and beverages, cleaning products, personal care products and other products), quantities purchased, unit prices and place of purchase. Purchases made in certain places, like open markets, tend to be done without invoice. We calculate the share of purchases done without invoice by socioeconomic class (class E refers to the lowest income class) defined by the CBS, and use these coefficients to adjust the amount of VAT paid by each class of the HBS.
3. Purchases of food and beverages from open bazaar, specialized stores, small stores and medium sized markets are treated as without invoice and therefore without VAT.

Table A10 - Informality in Indirect Taxes in 2016

	Share of Expenditure on Food without VAT	Share of Class
Class E	56.56	8.02
Class D	55.43	23.14
Class C1	49.18	31.83
Class C2	43.88	24.52
Class B	39.89	9.58
Class A	29.63	2.91

Special Consumption Tax (SCT)

There are four groups of products that are subject to SCT:

a. Petroleum products, natural gas, lubricating oil, solvents and derivative of solvents
b. Land, air and sea vehicles (cars and other vehicles, motorcycles, planes, helicopters, yachts etc.)
c. Alcoholic beverages and cola soda pops, cigarettes and other tobacco products
d. Other consumption goods (caviar, furs, mobile phones, white goods and other electrical household machines etc.)

Calculating the SCT amount paid by each household

SCT rates can vary for the same product depending on the quality of the product. The survey however does not include any information on the quality of the consumption items. For instance, the SCT rate for the purchase of new cars varies from 45 percent to 160 percent depending on ratable value, cylinder cycle etc.

Empirical Approach

1. We use effective tax rates to calculate the SCT amount paid by each household. Since the survey does not include any information on the quality of the consumption item, we cannot determine which tax rate should apply. The effective tax rates for each consumption item are calculated by the Ministry of Finance. The following formula is used to calculate the VAT amount,

$$SCT\ amount\ on\ X = Annual\ expenditure\ on\ X * SCT$$

Special Communication Tax (SCmT)

According to the Turkish tax system, telecommunication services are subject to special communication tax. The SCmT rates are listed below,

a. On mobile electronic communication services, 25 percent
b. Services regarding the transmission of radio and television broadcasts on satellite platforms and cable mediums, 15 percent
c. Internet providing services by wired, wireless and mobile, 5 percent
d. Electronic communication services not listed above, 15 percent

Empirical Approach

1. We use the statutory tax rates to calculate the SCmT amount paid by each household. The following formula is used to calculate the VAT amount,

$$SCmT\ amount\ on\ X = Annual\ expenditure\ on\ X * SCmT / (1 + SCmT)$$

Banking and Insurance Transactions Tax (BITT)

Banking and insurance transactions in Turkey are subject to BITT which is paid by client/consumer to the banks, bankers or insurance companies to be remitted to the tax offices by those offices. Since it constitutes

a small share of total indirect taxes (2.5 percent of indirect taxes) and there is no information on this item in the HBS, we do not include BITT in this analysis.

III. Social Spending

Social spending in Turkey consists of direct transfers and in-kind education and health spending. Direct transfers include contributory and non-contributory transfers. There are 40 social assistance programs or schemes in Turkey, focusing on supporting access to 5 different dimensions of wellbeing or needs: basic income, housing, food, education, and health.

Calculating the social spending received by households

The main source of identification is the HBS for the direct transfers. For most of the transfer programs, we assume the reported amounts in the survey reflect the actual amount received by each household. For some transfers, we simulate the beneficiaries and assign monetary values for each beneficiary.

Empirical Approach

1. *Old Age Transfer* – We assume that reported old-age transfers cannot exceed the maximum amount (228.35 TL x 12 months = 2,740 TL) and amounts above this threshold are retirement pension payments. This assumption is necessary since total spending on old-age pension identified from the HBS exceeds the administrative records. This could happen due to misreporting or confusion over the transfer programs. Since individuals are more likely to underreport their income in surveys, we assume it is the latter.
2. *Family Transfers* - In Turkey, most transfers are delivered in terms of cash transfers. There are around 7-8 cash programs, however these are not addressed separately in the questionnaire. Instead, almost all related questions are gathered under family transfers. We therefor assume that family transfers constitute/include (constitutes means it consists of this/ includes means it also includes this) all cash social assistance transfers given by the state.
    a. *Birth Support Program* – We simulate the beneficiaries of this program and allocate the transfer amount to households as cash transfer. The Ministry of Family, Labor and Social Services (MoFLSS) provides one-time cash support for households with newborn babies. The benefit amount is 300 TL for the first baby, 400 TL for the second baby and 600 TL for other children.
        i. Since this program can also be included under the family transfers in the survey, we eliminate these simulated beneficiaries from the family transfer program to prevent duplication.

b. *Non-Contributory Transfer for Widowed Women* – We simulate the beneficiaries for this *program* and assign 12-month value (250 TL x 12 months = 3,000 TL) of the transfer to those beneficiaries. We use the eligibility criteria for the transfer to simulate the beneficiaries. We therefore assume widow women with household income per capita below the one-third of the minimum wage are beneficiaries.
    i. Since this program can also be included under the family transfers in the survey, we eliminate these simulated beneficiaries from the family transfer program to prevent duplication.

3. *Contributory Widow/Orphan Transfer* – We assume that contributory widow/orphan transfer is contributory pension since those individuals receive the contributory retirement pension of their parents or husbands. The analysis assumes that retirement pensions is deferred income and the same assumption is also valid for contributory widow/orphan pensions.
4. *Disability Benefit* – In the HBS, both contributory and non-contributory disability transfers are reported in the same question, we therefore assume that reported non-contributory disability transfers cannot exceed the maximum amount (514.38 TL x 12 months = 6,173 TL) and amounts above this threshold are contributory disability transfers. Non-contributory disability transfer is paid for individuals who have a disability of 40 percent or higher and income per capita less than one-third of the minimum wage. The contributory disability transfer functions as a retirement pension and is received when an individual gets disabled at the workplace where his/her contributions paid to the government. The contributory disability transfers can therefore be higher than the non-contributory benefits.
5. *Home Care Benefit* – In Turkey home care benefit is provided to individuals who are taking care of a disabled family member at home. In the HBS, the amount of homecare benefit is reported under the wage question. Beneficiaries of home care transfer are considered employed in certain sectors in the survey (according to information provided by the Turkish Statistical Office). We assume that individuals who work in these sectors and report a wage that does not exceed the maximum threshold for the home care benefit are beneficiaries while individuals report above the maximum threshold are considered wage workers.
6. *Unemployment Transfer* – We assign full amount of unemployment transfer to individuals who report themselves as recipients. We refrained from simulating the recipients of unemployment transfer since the eligibility criteria are unobservable from the survey i.e. not to leave the job voluntarily, paying contributions for 120 days before the unemployment and 600 days in last three years.
7. *Other Transfers* – Other direct transfers that are provided by the state to households are also considered in the analysis. Among those programs, scholarship, agricultural subsidy, sickness

payment and in-kind transfers are reported in the survey separately. We assume that reported transfers in the survey are the actual amounts received by beneficiaries without any further assumption.

8. *In-kind Health Spending* – We assume that every individual who uses the public health services benefits equally from the health spending of the government and assign an average amount to the users of public health services. To identify the users of public health services, we use the information on the type of health insurance people have. We assume individuals with public health insurance are users of public health services. This includes people who pay their health contributions as well as people whose health insurance is paid by the state due to low household income.
9. *In-kind Education Spending* - We identify the users of public education system from the survey. Although there is no direct identification from the HBS, we use the consumption module to determine students in public education. If households spend more than a certain threshold per child on education, we assume those students attend private schools. In contrast, households with no or low levels of education spending per student are considered to benefit from the public education spending.

   There are large regional differences in education spending in Turkey. Since there is no regional identifier in the HBS, we use a different survey that includes NUTS 2 level of regional disaggregation. The Survey of Income and Living Conditions (SILC) allows us to construct an index of personnel spending. We assume that the number of teachers in each region is a proxy for personnel spending (salaries of teachers) in each region. An average spending for a teacher (or per teacher) is calculated by dividing the total amount spent on personnel by the total number of teachers in Turkey. We use the information on the number of teachers in each province from the Ministry of Education. We calculate the number of teachers in each 26 NUTS 2 regions in the SILC and allocate personnel spending for each region depending on the number of teachers. We then calculate the average spending for each percentile and allocate the same amount to households in the corresponding decile in the HBS.

   For investment, we assume an average amount for every student who attends public education system. For tertiary education, we also consider R&D spending of the government and allocate an average amount to each public university student.
10. *Minimum Subsistence Allowance (AGI)* – AGI has been applied effective from 1 January 2008. The amount of AGI is calculated by multiplying the rate applied to the first income tax bracket of the income tax tariff with 50 percent for the taxpayer, 10 percent for his/her spouse not working or not having any income, 7.5 percent for the first two children and 5 percent for each of the children remaining, of the annual gross amount of the minimum wage amount when the wage is earned. This amount should be deducted from the income tax to be calculated over the wage. AGI amounts that

will be applied in 2016 are shown in table A8. We distribute AGI to all formally employed individuals according to their household characteristics and employment status.

Table A11 - Minimum Subsistence Allowance (AGI) rates in 2016

UNEMPLOYED SPOUSE *(01 Jan 2016 – 31 Dec 2016)*	
Status	**Minimum Subsistence Allowance**
Single	123,53 TL
Married	148,23 TL
One Child	166,76 TL
Two Children	185,29 TL
Three Children	209,99 TL
Four Children	209,99 TL
Five Children	209,99 TL
Six Children	209,99 TL
EMPLOYED SPOUSE *(01 Jan 2016 – 31 Dec 2016)*	
Status	**Minimum Subsistence Allowance**
Single	123,53 TL
Married	123,53 TL
One Child	142,05 TL
Two Children	160,58 TL
Three Children	185,29 TL
Four Children	197,64 TL
Five Children	209,99 TL
Six Children	209,99 TL

Annex B. Detailed Results

Table B1. Distributional Impacts of Individual and Overall Taxes, Transfers and Social Spending in Turkey

	Size	Concentration Coefficient	Kakwani Coefficient	Marginal Contributions	
				Inequality Effect	Poverty Effect
Direct Transfers					
Old Age Transfers	0.0014	-0.6263	1.0707	0.0014	0.0042
Widow transfer social assistance	0.0008	-0.7621	1.2064	0.0009	0.0038
Birth support for newborn	0.0005	-0.2889	0.7333	0.0005	0.0001
Family Transfers	0.0011	-0.6102	1.0546	0.0012	0.0017
Disability Benefit	0.0015	-0.5807	1.0251	0.0013	0.0023
Home Care Benefit	0.0029	-0.2761	0.7205	0.0016	0.0007
Disability Contributory Benefit	0.0015	-0.2339	0.6783	0.0006	0.0013
Scholarship Transfers	0.0007	-0.1801	0.6245	0.0004	0.0007
Unemployment Transfers	0.0018	-0.0323	0.4767	0.0007	0.0012
Near Cash Transfers	0.0012	-0.5763	1.0207	0.0013	0.0026
Sickness Transfers	0.0009	-0.5241	0.9685	0.0007	0.0010
Agricultural Support Transfers	0.0029	0.3425	0.1019	0.0000	0.0014
AGI	0.0161	0.2870	0.1574	0.0037	0.0062
All direct transfers excl contributory pensions	0.0334	-0.0022	0.4466	0.0148	0.0295
All direct transfers incl contributory pensions	0.1849	0.3749	0.0695	0.0377	0.0983
Contributory Retirement Pensions	0.1227	0.4680	-0.0236	0.0170	0.0490
Contributory Widow/Orphan Pensions	0.0288	0.4167	0.0277	0.0059	0.0131
All contributory pensions	0.1514	0.4582	-0.0138	0.0225	0.0649
Direct Taxes					
Payrol Income Tax	0.0598	0.5496	0.1053	0.0056	-0.0090
Personal Income Tax	0.0035	0.6681	0.2237	0.0011	0.0000
Agricultural Income Tax	0.0009	0.2685	-0.1759	-0.0001	-0.0011
Rent Tax Income from Store	0.0021	0.8007	0.3563	0.0009	0.0000
Bank Profit Income Tax	0.0007	0.8902	0.4458	0.0004	0.0000
Private Pension Income Tax	0.0000	0.7941	0.3498	0.0000	0.0000
Residence Property Tax	0.0038	0.4669	0.0225	0.0002	-0.0010
Motor Vehicles Tax (property)	0.0051	0.7140	0.2696	0.0017	-0.0007
All direct taxes	0.1351	0.5382	0.0938	0.0126	-0.0170
All direct taxes and contributions	0.2190	0.5231	0.0787	0.0193	-0.0224
All contributions	0.0838	0.4987	0.0543	0.0039	-0.0126
Cont (SSI) health worker	0.0191	0.4987	0.0543	0.0005	-0.0056
Cont (SSI) health employer	0.0286	0.4987	0.0543	0.0009	-0.0067
Cont (SSI) unemployment employer	0.0076	0.4987	0.0543	0.0002	-0.0022
Cont (SSI) unemployment worker	0.0038	0.4987	0.0543	0.0001	-0.0016
Cont (SSI) retirement pension worker	0.0343	0.4987	0.0543	0.0011	-0.0072
Cont (SSI) retirement pension employer	0.0419	0.4987	0.0543	0.0014	-0.0081
Cont (SSI) retirement pension short employer	0.0076	0.4987	0.0543	0.0002	-0.0022

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	Size	Concentration Coefficient	Kakwani Coefficient	Marginal Contributions	
				Inequality Effect	Poverty Effect
Indirect Taxes					
All indirect taxes	0.1279	0.3584	-0.0860	-0.0180	-0.0617
VAT on food and beverages	0.0061	0.2909	-0.1535	-0.0012	-0.0032
VAT on alcohol and tobacco	0.0059	0.2026	-0.2418	-0.0023	-0.0048
SCT on alcohol and tobacco	0.0252	0.1971	-0.2473	-0.0092	-0.0215
VAT on clothing	0.0034	0.3391	-0.1053	-0.0006	-0.0022
VAT on energy products	0.0126	0.3079	-0.1365	-0.0026	-0.0070
SCT on energy products	0.0146	0.4012	-0.0432	-0.0016	-0.0067
VAT on durables	0.0078	0.3806	-0.0638	-0.0011	-0.0036
SCT on durables	0.0013	0.3276	-0.1168	-0.0003	-0.0006
VAT on medical products	0.0013	0.4283	-0.0161	-0.0001	-0.0005
VAT on motor vehicles	0.0101	0.4784	0.0341	-0.0025	-0.0063
SCT on motor vehicles	0.0077	0.6485	0.2041	-0.0016	-0.0035
VAT on communication products	0.0049	0.3571	-0.0872	-0.0009	-0.0028
SCT on communication products	0.0015	0.4153	-0.0291	-0.0003	-0.0006
VAT on sports and hobbies	0.0035	0.5289	0.0845	0.0001	-0.0010
SCT on sports and hobbies	0.0008	0.3148	-0.1296	-0.0002	-0.0003
VAT on education	0.0014	0.5971	0.1527	0.0002	-0.0001
VAT on entertainment and vacation	0.0051	0.5474	0.1031	0.0004	-0.0013
VAT on individual expenditures	0.0067	0.4118	-0.0326	-0.0006	-0.0038
Petroleum excise on transportation	0.0020	0.2868	-0.1576	-0.0005	-0.0011
Other Indirect Taxes	0.0060	0.2939	-0.1505	-0.0013	-0.0038
In-kind Transfers					
All net in-kind transfers	0.1114	-0.0245	0.4688	0.0560	
Net health transfers	0.0539	0.0171	0.4273	0.0234	
Net education transfers	0.0574	-0.0634	0.5078	0.0288	
In-Kind education benefits: Primary	0.0251	-0.2450	0.6894	0.0179	
In-Kind education benefits: Secondary	0.0159	-0.1356	0.5799	0.0090	
In-Kind education benefits: Tertiary	0.0164	0.2835	0.1609	0.0013	

Source: Own estimates based on Turkey 2016 HBS.
Size: ratio between amount collected or spent and total market income plus pensions.
Inequality effect: change in Gini coefficient with/without each fiscal intervention.
Poverty effect: change in poverty headcount ratio at $5.5PPP line.
By construction, marginal contributions of individual interventions are not additive.