İktisat Araştırmaları Dergisi • Journal of Research in Economics • Cilt: 3 / Issue • Sayı: 2 Ekim • October 2019 • ss/pp. 91-109
ISSN: 2636-8307 • DOI: 10.35333/JORE.2019.50

ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

PUBLIC DEBT AND INCOME INEQUALITY IN TURKEY

TÜRKİYE'DE KAMU BORCU VE GELİR DAĞILIMI

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Abstract

Public debt can affect the income distribution in different directions, depending on how the debt is used. The interest payments by public sector can also have impacts on income distribution. Public domestic borrowing in Turkey decreased since 2000s. This study informs about the public debt in Turkey in 2000s. The developments related to income distribution are analysed using income decomposition method and the related data. It is found that decreasing borrowing demand of public sector and decreasing real interest rate occurred simultaneously with decreasing financial income of households and this can have an improving effect on income distribution.

Keywords: Income distribution, public investment, public debt

JEL Classification: D31, H54, H63

Öz

Kamu borçlanması, ülke içinde gelir dağılımını çeşitli mekanizmalar yoluyla etkilemektedir. Kamuya borçlanma yoluyla sağlanan kaynağın harcandığı mecra ve kamu borcuna karşılık ödenen faiz gelir dağılımı üzerinde farklı yönlerde etki yapabilir. Türkiye'de kamu iç borçlanması 2000'li yıllar boyunca azalmıştır. Bu çalışma, öncelikle, Türkiye'de kamu borçlanmasının 2000'li yıllardaki seyri hakkında bilgi vermektedir. Ayrıca, Türkiye'de gelir eşitsizliğinin ne yönde ilerlediği ve hangi faktörlerin etkisinin azalıp arttığı, gelir dekompozisyonu yöntemi ve ilgili veriler kullanılarak incelenmektedir. Kamu sektörünün borçlanma talebindeki ve reel faiz oranındaki azalma ile hanehalklarının gelirinde finansal gelirin payının azalması aynı anda gerçekleşmiştir. Bu nedenle kamu borçlarındaki bir azalmanın gelir dağılımı iyileştirdiği söylenebilir.

Anahtar Kelimeler: Gelir dağılımı, kamu yatırımı, kamu borcu

JEL Sınıflandırması: D31, H54, H63

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Makale Gönderim Tarihi: 16.09.2019
Yayına Kabul Tarihi: 01.10.2019

1. Introduction

Income inequality has a tendency to rise in recent years. Alvaredo et al. (2017) claim that income inequality increased in North America, Asia and Europe and became stabilized in Middle East, albeit in high levels, since 1980. According to the Gini coefficient values calculated by Hein (2015), Gini coefficients in 15 most developed countries, based on before-tax income, increased in the first ten years of 2000s except for Netherlands. Income inequality can be attributed to several reasons, including political preferences of policy makers, the side effects of economic policies and business cycles as well as structural changes such as financial developments, technological progress or bargaining power of trade unions.

Income inequality in Turkey measured by Gini coefficient decreased in recent years according to Sefil-Tansever (2017). The calculations of income inequality in Turkey are based on Survey on Income and Living Conditions (SILC) data gathered by Turkish Statistical Institute (TURKSTAT, 2018b). According to inequality decomposition used by Sefil-Tansever (2017), inequality in income distribution mainly comes from labour and entrepreneurship earnings for the period between 2006 and 2014 (SILC data started to be collected in 2006). The weight of labour earnings in income inequality increased since 2006, while the weight of entrepreneurship declined.

Government policies can positively or negatively affect the income distribution even when these policies do not aim at income inequality. The role of public sector in economy has distributive impact, whereas taxation policy and transfer expenditures to the society lead to redistributive impacts. However, the relationship between public debt and income inequality is analysed in a very limited number of sources. Public debt can affect the income distribution of a country according to its two main aspects: from whom the money is borrowed and what the money is used for.

Salti (2015) uses a cross-country panel data about the lender to public sector to design an econometric analysis about the determinants of inequality and the role of public debt and debt composition. The results indicate two important findings: first, the level of public debt was significantly and positively related with income inequality and second, the share of domestically-held debt in total public debt was significantly and positively related with income inequality. The composition of public debt is one of the factors to be dealt with in the present chapter.

The present paper aims at illustrating the trends of Turkish economy in 2000s, regarding the budget balance and public borrowing. Then, the signs of relationship between these two groups of indicators are interpreted. There are two channels through which public borrowing is expected to affect the income distribution: through the interest payments for domestic public debt and via social transfers. Data used for analysis in this study is obtained from two main sources: One is the budget and financing data from Undersecretariat of Treasury of Turkish government and the other is the data of Survey of Income and Living Conditions, conducted by TURKSTAT. In addition, the data on ownership of bank deposits from BRSA (Banking Regulation and Supervision Agency) and data on fixed capital formation from Ministry of Development is used.

Başlevent (2014), who also uses SILC data, underlines that evaluation of the redistributive impact of social transfers on income inequality in Turkey is difficult, mainly due to the lack of detailed data. Başlevent argues that the data is limited to evaluate the effect of social transfers on income inequality because some payments to individuals and households are lumped together. This is one of the problems confronted during this study, too; and will be explained in detail.

The remaining part of this paper is organized as follows: In Section 2, data on Turkish public sector after 2000s is analysed under two headings: tax collecting, social transfer payments and investment by public sector are analysed in Subsection 2.1 whereas the magnitude of revenues and expenditures, the debt position and interest payment position of public sector are examined in Subsection 2.2. In Section 3 income distribution in Turkey is demonstrated by means of a detailed examination of SILC data. The focus is on the effect of different types of income on income inequality. The role of public sector on this effect is discussed. Section 4 concludes.

2. Public Sector in Turkey

Cyclical policies of public sector can affect the income distribution in different ways. The aim of the present chapter is to reveal some hints on the relationship between the cyclical public sector policies and income distribution. Therefore, an analysis of tax collection, social transfer and investment activities and debt position of the public sector is given in the following subsections.

2.1. Public Sector Activities

The Central Government Budget Balance and Financing Data of Turkey announced by Undersecretariat of Treasury demonstrates the central government budget revenues, central government budget expenditures and budget financing of Turkish government for the years between 2006 and 2017, on a monthly and annual basis (Undersecretariat of Treasury, 2018). Data is also available for general government budget; but central government budget data is more extensive than general budget government, because general budget data includes "public administrations within the scope of general budget", according to the Public Financial Management and Control Law No. 5018, where central government budget covers special budget administrations and regulatory and supervisory agencies in addition to the institutions within the scope of general budget. Both budgets exclude social security institutions.

Data is also available for the period between 1994 and 2005, under the heading of "Consolidated Budget Balance and Financing". This data covers general and annexed budget administration. The data for this period is less detailed than the data released after 2006. It includes amount of total revenues and total expenditures, interest payments (both domestic and foreign), net borrowing (both domestic and foreign), taxes within total revenues (both direct and indirect), but does not include the sub-items of expenditures. The budget data released after 2006 includes social transfers and transfers to households, which is meaningful for the purposes of this study; but for the years before 2005, data does not include these details.

The data about public budget and finance released by Undersecretariat of Treasury (2018) is given in million TL units. Due to inflation concerns, the amounts will not be used as numerical quantities. Every quantity will be expressed as a ratio to some other quantities (i.e. total revenues, total expenditures, or GDP) in order to avoid misleading results.

When the sub-items of revenues are analysed, it is seen that the revenues are grouped as tax revenues, other budget revenues, revenues of special budget industries and revenues of regulatory and supervisory institutions. For the purposes of this study, the rate of tax revenues to the central budget revenues on annual basis are composed and given in the following Table 1. As seen in the table, the share of tax revenues within the central government budget revenues increased almost continuously during the given period (2000-2017).

Treasury data includes budget expenditures under two headings: primary expenditures and interest payments. In the data belonging to 2006-2017 period, primary expenditures are detailed and the subheadings include "social transfers" and "other transfers to households", which are useful for this study [2]. The share of social transfers, other transfers to households and sum of the two items in total central government budget expenditures are calculated and given in Table 2 below. The data illustrates that the share of social transfers in total expenditures increased in time.

Table 1: Share of tax revenues in central government budget revenues (%) (2000-2017)

	Tax Revenues/Central Government Budget Revenues
2000	79.26
2001	77.09
2002	78.89
2003	84.11
2004	81.35
2005	77.50
2006	79.25
2007	80.29
2008	80.21
2009	80.03
2010	82.81
2011	85.51
2012	83.85
2013	83.70
2014	82.87
2015	84.47
2016	82.83
2017	85.04

Source: Undersecretariat of Treasury (2018) (own calculations)

2 As mentioned above, the central and general budgets do not include social security institutions. Therefore the social transfers demonstrated here do not contain pensions, survivor, unemployment, sickness and disability benefits, which are paid by Social Security Institution in Turkey.

Table 2: Share of social transfers and other transfers to households in central government budget expenditures (%) (2006-2017)

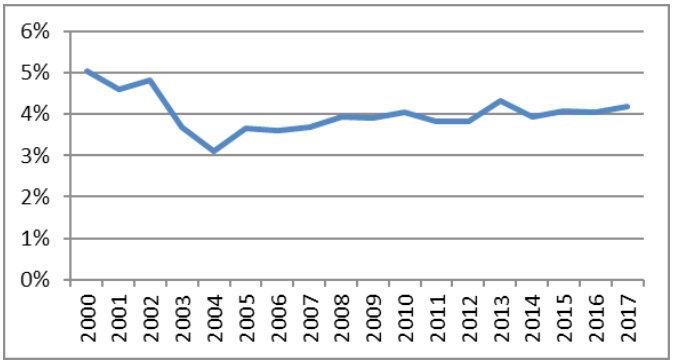
	Social Transfers / General Government Budget Expenditures	Other Transfers to Households / Central Government Budget Expenditures	(Social Transfers + Other Transfers to Households) / Central Government Budget Expenditures
2006	0.01	0.19	0.21
2007	0.03	0.30	0.34
2008	0.19	0.39	0.58
2009	0.38	0.38	0.77
2010	0.55	0.29	0.84
2011	0.81	0.36	1.18
2012	0.81	1.50	2.30
2013	1.79	0.99	2.78
2014	1.72	0.64	2.36
2015	1.80	1.13	2.93
2016	1.85	1.23	3.08
2017	1.81	1.50	3.31

Source: Undersecretariat of Treasury (2018) (own calculations)

According to the public sector general balance data released by the Ministry of Development (2018), the ratio of net fixed capital investment by public sector to the GDP fluctuated since 2000. The data is shown in following Figure 1. The data illustrates that the share of net fixed capital investment in GDP decreased in the first years of 2000s, started to increase in 2004 and stayed near 4% since 2008.

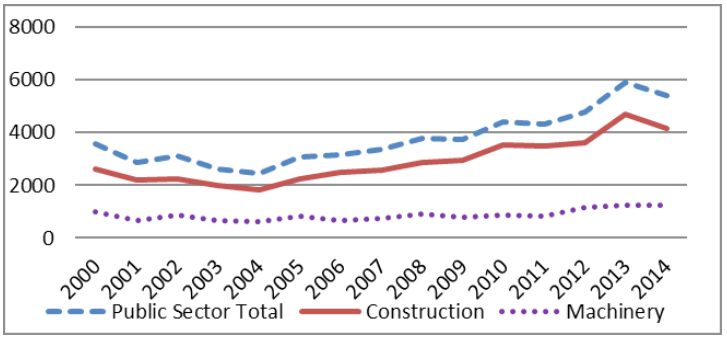
The composition of government fixed capital investment on fixed capital is given for the period 2000-2014 in constant prices (1998=100) (Ministry of Development, 2018). Total investment is divided in to machinery investment and construction investment. The data is illustrated in Figure 2 below. Public sector investment in constant prices decreased in the first years of 2000, similar the share of net investment to GDP. The increase after 2004 is more significant. It is obvious that the level of machinery investment stayed stable and the rise in public sector investment stemmed from the rise in construction investment.

Figure 1: Net fixed capital investment by public sector to GDP ratio (2000-2017)



Source: Ministry of Development (2018)

Figure 2: Gross fixed capital investment by public sector (machinery and construction shares) (2000-2017)



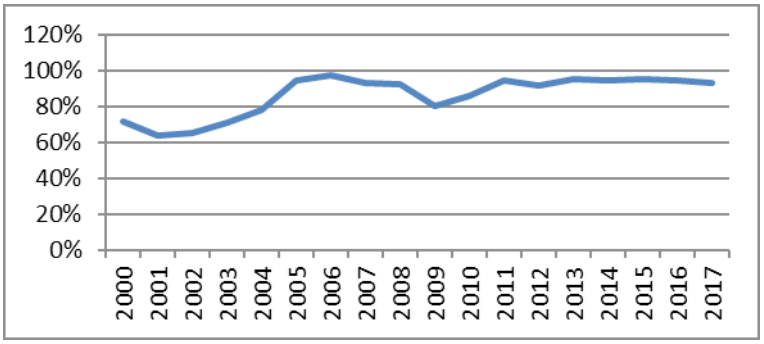
Source: Ministry of Development (2018)

2.2. Public Sector Debt Position

Although domestic public debt is an important issue for majority of countries, it is not explored adequately because concerns about the foreign debt dominate the literature (D'Erasmo & Mendoza, 2016). During European fiscal crisis in the recent past, governments' domestic debt ratios were very high. Domestic debt of government is also high in Turkey; but it is not considered as a hot issue as the foreign debt.

Turkey is a deficit country. Although the country gives a primary surplus, when interest payments are included, the position turns to deficit. During the period covered by this study, Turkish government continued to borrow in order to finance its budget deficit. The ability of revenues to cover the expenditures was low in the beginning of 2000s, but then this ratio improved, with the exception of 2009. Nevertheless, Turkish central government budget did not experience a surplus since 2000s. The ratio of total revenues to total expenditures is given in the following Figure 3.

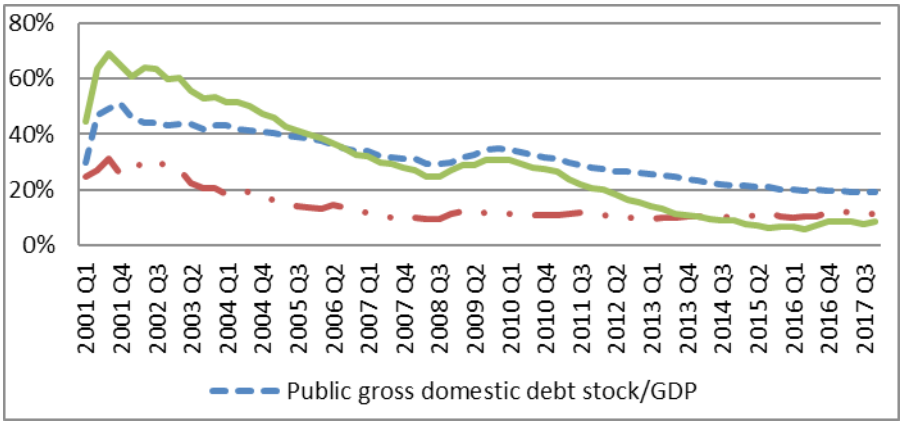
Figure 3: Total revenues/total expenditures ratio for Turkey (2000-2017)



Source: Undersecretariat of Treasury (2018) (own calculations)

When the available data on the debt structure of Turkish government is analysed, it is seen that data on total debt stock, interest payments, annual net borrowing and cost of borrowing, holders of debt, for both domestic and external debt, can be reached. In order to be compatible with purposes of this study the focus is on domestic debt of the government. In order to understand the debt position of Turkey, first, the gross and net debt stock are analysed. Undersecretariat of Treasury data contains the necessary data under the heading of "Public Net Debt Stock Statistics". The quarterly gross domestic and external debt amounts are given in Turkish liras; net debt stock is calculated by subtracting the Central Bank net assets, public sector assets and unemployment insurance fund net assets from gross debt stock; and then, the amount is divided by GDP. The ratios of gross domestic and external debt to GDP are calculated, using the values given for GDP. The obtained results of calculations are shown in the Figure 4 below. Domestic and foreign gross debt stocks are given separately.

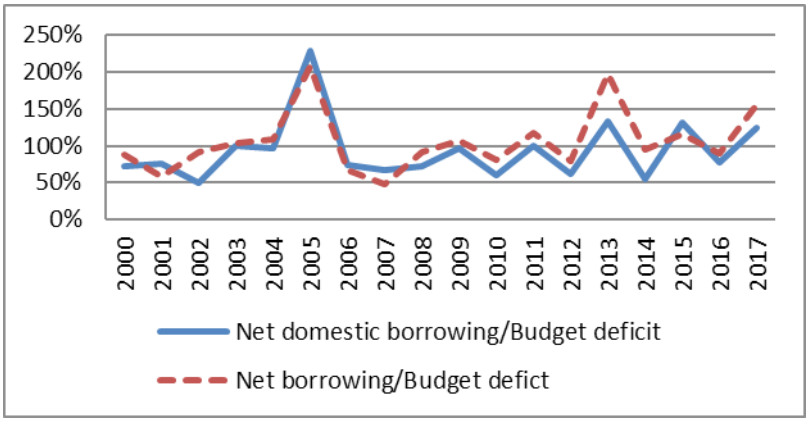
Figure 4: Ratio of gross domestic, gross external and net public debt to GDP (2001-2017)



Source: Undersecretariat of Treasury (2018) (own calculations added to original calculations)

The amount of net domestic and external debt is also given in Treasury data (Undersecretariat of Treasury, 2018). The net borrowing of the government sometimes exceeds the budget deficit, and sometimes it is below the budget deficit when the rest of the deficit is financed by privatization revenues or cash money. The ratio of net borrowing to budgetary cash deficit (which is negative for each year in the period of interest of this study) is very volatile. This volatility is shown in Figure 5.

Figure 5: The ratio of net borrowing and net domestic borrowing to budget financing (2000-2017)



Source: Undersecretariat of Treasury (2018) (own calculations)

The interest payments are also important for this analysis. As mentioned, Turkish government continues to borrow every year; the finance account is always negative. However, the amount of interest payment does not change in time; so, the ratio of interest payments to total expenditures decreases in time. This can be seen in Figure 6.

The ratio of domestic and foreign borrowing to GDP for the public sector indicates that public debt decreased in terms of its ratio to GDP (Ministry of Development, 2018).

Table 3: Net borrowing to GDP ratio (%) (2000-2017)

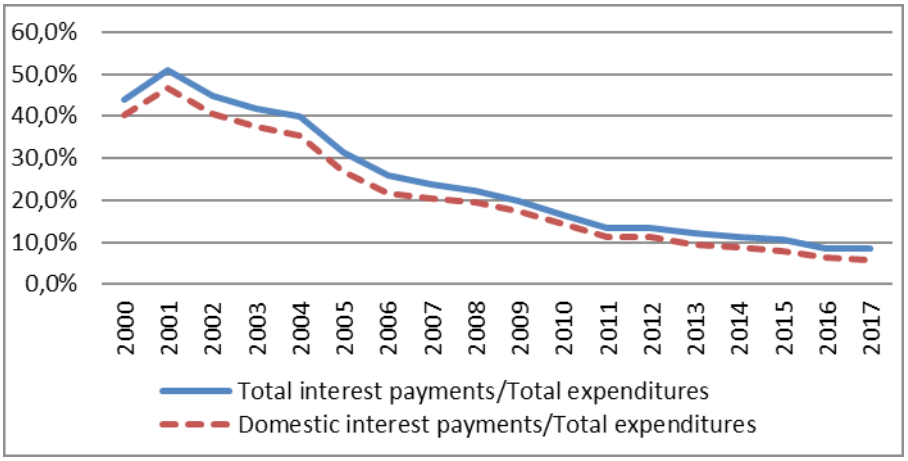
	Net Foreign Borrowing/GDP	Net Domestic Borrowing /GDP	Total Net Borrowing/GDP
2006	2.58	6.76	9.34
2007	-1.58	14.35	12.78
2008	4.84	5.38	10.22
2009	0.50	6.91	7.41
2010	0.78	3.35	4.13
2011	-0.12	0.51	0.39
2012	-0.07	-1.62	-1.69
2013	-0.18	0.46	0.28
2014	0.37	0.74	1.11
2015	0.43	4.15	4.59
2016	0.59	1.87	2.46
2017	0.03	0.23	0.26

Source: Undersecretariat of Treasury (2018) (own calculations)

Average cost of domestic borrowing is calculated using data from Treasury (Undersecretariat of Treasury, 2018). The data in Treasury website includes the monthly interest rate on zero coupon, fixed interest and cash borrowing activities of Treasury and their cumulative annual compound costs. The annual compound costs are taken; average annual compound of the three interest rates

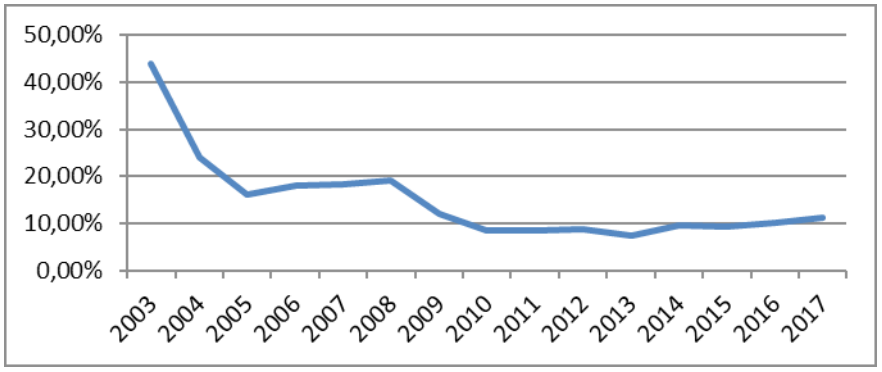
are calculated simply by adding them together and dividing by 3. The resulting annual compound cost of domestic borrowing is shown in following Figure 7.

Figure 6: Ratio of interest payments to total central government expenditures (2000-2017)



Source: Undersecretariat of Treasury (2018) (own calculations)

Figure 7: Average cost of domestic borrowing (cumulative cost, annual compound) (average of zero coupon, fixed interest and cash borrowing) (2003-2017)



Source: Undersecretariat of Treasury (2018) (own calculations)

Undersecretariat of Treasury (2018) releases the data on the composition of debt stock by holders, under the statistics named "Central Government Debt Statistics". The information on holders of debt securities issued by the Undersecretariat of Treasury and sold in domestic markets is given in the Table 4 below.

Table 4: Composition of domestic debt stock by holders (%) (2006-2017)

	Banking Sector	Non-Banking Sector			CBRT	Non-Residents
		Retail Investors	Corporate Investors	Mutual Funds		
2004	44.9	14.4	19	6.9	7.6	7.1
2005	47	10.5	17.3	8	6.8	10.3
2006	49.1	8.8	18.1	3.5	6.9	13.6
2007	51.7	5.9	18.5	4.5	6	13.4
2008	55	5.5	19.9	4.8	4.6	10.3
2009	63.4	2.9	18.5	4.2	2.3	8.6
2010	63	1.5	16.9	4	2	12.4
2011	56.7	1.6	18.7	3.8	2	17.3
2012	50.5	0.7	19.8	3.9	1.9	23.2
2013	50.1	0.9	20.6	4.7	2.1	21.5
2014	47.7	0.4	23.2	5.1	2	21.5
2015	48.9	0.3	25.3	6.2	2	17.3
2016	47.6	0.2	25.8	6.4	2.8	17.3
2017	47.1	0.2	24.9	5.8	2.5	19.4

Source: Undersecretariat of Treasury (2018)

The "non-residents" are defined as "investors of debt securities who are residing out of Turkey and the foreign branches of domestic banks"(Undersecretariat of Treasury, 2018). As seen in Table 4, the share of retail holders and CBRT decreased substantially in the given period, whereas share of corporate holders and non-residents increased. The decrease in retail investors' share means a decrease in the share of households.

3. Analysis of Income Distribution in Turkey

In this section, income distribution in Turkey is analysed using SILC data. The methods used during the calculations are explained in detail. The results are interpreted with respect to the information given in previous sections. The Survey on Income and Living Conditions is conducted by TURKSTAT since 2006. The data for the years 2006-2016 are released so far. The data is annual. Individuals and households are asked for their living conditions and the income they earned in the previous year. Therefore, each year's data covers the information for the previous year and the available data belong to the years between 2005 and 2015. In order to focus on the subject of interest of this study, questions about living conditions and corresponding answers are not considered. Instead, answers to the questions about income types are analysed. The survey consists of two questionnaires; one for individuals and one for households. Data about income is collected via both questionnaires. The individuals are numbered with respect to the household they belong to; the incomes of each individual in a household are summed up to the income obtained by the household as a whole, and then, the total income of a given household is calculated and weighted with respect to its representative power the household size. These manipulations are done in *STATA* program.

One problem with the data is that, the questions about income changed during the period. Some new items are added and some items are deleted. The income items in individual questionnaire, their codes and the years they are obtained are as follows:

- FG010 – Total annual net employee cash or near cash income (2006-2016)
- FG020 – Total annual net employee income in kind (2006-2016)
- FG030 – Total annual net self-employment income in cash (2006-2016)
- FG040 – Total annual net self-employment income in kind (2006-2016)
- FG050 – Value of agricultural products produced and used by household (2006-2007)
- FG070 – Unemployment benefits (2006-2016)
- FG080 – Old-age benefits (2006-2016)
- FG085 – Retirement grants (2008-2016)
- FG090 – Survivors' benefits (2006-2016)
- FG100 – Sickness benefits (2006-2016)
- FG110 – Disability benefits (including ghazi and honour pensions) (2006-2016)
- FG120 – Education-related allowances (2006-2016)
- FG125 – Other incomes (2006-2008)

The income items in household questionnaire, their codes and the years they are obtained are as follows:

- HG010 – Annual rental value of the dwelling (2006-2016)
- HG020 – Income received by household members under the age of 15 (2006-2016)
- HG030N, HGH030A – Children-related allowances (2006-2016)
- HG040 – Housing allowances (2006-2016)
- HG050N, HG050A – Other social allowances (2006-2016)
- HG060N, HG060A – Regular allowances from other households (2006-2016)
- HG065N – Alimonies received (2008-2016)
- HG070 – Rental income (2006-2016)
- HG080 – Property income (2006-2016)
- HG085 – Value of agricultural products produced and used by household (2008-2016)
- HG105 – Imputed annual income for individuals not responded (2006-2016)

The income sources are grouped in 8 groups and each of the group includes the following items in SILC data:

1. Labour Income: FG010, FG020

2. Entrepreneur Income: FG030, FG040
3. Rental Income: HG070
4. Financial Income: HG080
5. Social Transfers:
    - Pension and Survivor Benefits: FG080, FG085 (2008-2016), FG090
    - Unemployment and Sickness benefits: FG070, FG100
    - Other Social Transfers: FG110, FG120, HG030N, HG030A, HG040, HG050N, HG050A
6. Inter-household Transfers: HG060N, HG060A
7. Other Income: FG050 (for 2006-2007), FG125 (for 2006-2008), HG010, HG020, HG065N (for 2008-2016), HG085 (for 2008-2016), HG105

The pensions and survivor benefits and unemployment and sickness benefits are social transfers. However they are distributed to people on condition that people are registered workers and they have been working for a given period of time. As mentioned in Subsection 3.2.1, they are paid by Social Security Institution and they are not included in the social transfer figures that are given in Subsection 3.2.1. Therefore they are included under separate headings.

The disposable household income is included in the household data of SILC, with the code HG110. In data manipulations process, the different groups of income of individuals (starting with the letter *F*) belonging to the same household are summed together via a *STATA* code. Then, the household types of income (starting with the letter *H*) are added for each household. Thus, a sum of household income is calculated for each household. In the following calculations, both the total income calculated this way and the disposable income of the household already calculated and reported in surveys are used.

The next step is incorporating the size of household into the calculations. The size of household is important, because economies of scale are assumed. Deaton (1997) defines "public goods" in a household, which are offered to each member without decreasing the welfare of others. Therefore, the per capita income is not found by dividing the total income by total number of household members. Different equivalence scales are used in researches. OECD (2018c) defines in an annotation that three most commonly used equivalence scales are OECD scale (Oxford), modified OECD scale and square root scale. OECD scale and modified OECD scale assign decreasing coefficients for each additional member of the household and each child. In the present study, the square root scale is chosen. The household size is extracted from the data under individual register files for each year; all types of income and the total income as well as disposable income are divided by the square root of the household size.

In all these calculations households are weighted with respect to a weight parameter. It is important to weight the households with respect to a weight parameter because in surveys, each

household represents a different number of households in the total population (Deaton, 1997). This is due to the fact that selection probabilities differ across the groups of countries. Some households can refuse to answer the questions, or reaching some households can be more costly. Household weight parameter is necessary to prevent overrepresentation of some households and underrepresentation of other. The household weight parameter is included in the SILC data with the code HB040 and used in the calculations of the present study. With this data, four groups of calculations are completed for each year: calculation of Gini coefficient, calculation of shares of each income factor in total income, calculation of factor decomposition for income inequality and calculation of disposable income, social transfer income and financial income shares of population quantiles. Gini coefficient is calculated using the disposable income given in surveys. The disposable income formula is given in the results as the sum of individual and household incomes minus transfers to other households (and alimonies paid for the years after 2008). The disposable income of each household is divided by the square root of the number of people The *FASTGINI* command in *STATA* is used. The Gini coefficients are given in Table 5 below. As can be seen in Table 5, the income inequality in Turkey calculated with respect to SILC data tends to decrease since 2006. Inequality increased in 2009, following the crisis of 2007-2008. In 2014 and 2015, income inequality tends to increase again.

Table 5: Gini coefficient in Turkey (2005-2015)

	Gini Coefficient
2005	0.416
2006	0.399
2007	0.392
2008	0.402
2009	0.389
2010	0.391
2011	0.388
2012	0.388
2013	0.378
2014	0.385
2015	0.395

Source: TURKSTAT (2018b) (Own calculations)

Bükey and Çetin (2017) examine the factors of income inequality in Turkey, using time-series data covering the period 1980 and 2014. According to the results, growth and tax burden are not significant factors on Gini coefficient. Current account surplus is found to be positively related with Gini coefficient; thus increases the income inequality. A slight positive impact is seen between inflation rate and Gini coefficient. Lastly, the interest rate on deposits with 1-year maturity is found to have a slight positive impact on Gini coefficient.

Before analyzing the contribution of different sources of income to income inequality, the weights of different sources of income in total income of households and the change of these weights in

years should be analysed. For this aim, the shares of different sources of income in total income of households covered in the SILC survey, weighted with respect to the weight variable, are calculated for the years 2005-2015 and the results are given in the following Table 6. According to the shares of income components given in Table 6, labour earnings' share in total income increased, whereas share of entrepreneurship income decreased. Share of rental income remained around 2-3%. As explained in the previous chapter, with the decrease in real interest rates, the share of financial income decreased. Another explanation for the decrease in households' financial income is related to the composition of domestic debt stock with respect to holders. In 2000s, the share of retail investors in total domestic debt stock by government decreased and the share of banking sector and corporate investors increased significantly (Table 4).

An explanation for the increase in the share of labour income in total income is the decrease in unregistered labour in Turkish labour market since 2000s. The share of unregistered labour was more than 50% in total employment in the beginning of 2000s. In 2003, the ratio reached 56%. Then, it began to decrease steadily. In 2005, it became less than 50% and since 2012 the ratio is less than 40%. In 2017, the unregistered labour constituted 34% of total employment (TURKSTAT, 2018a). The rise in the ratio of registered labour also explains the increase in the share of pensions' and survivors' benefits, unemployment and sickness benefits in total income. As these kinds of social transfers are provided to registered workers and their relatives, it is expected that more people deserve the right to get these benefits when the share of registered labour is high.

The share of social transfers excluding pensions, survivor, unemployment and sickness benefits in total income increased until 2008, but fluctuated near 2% after 2008. As mentioned in Subsection 3.2.1., the ratio of social transfers excluding pensions and survivor, unemployment and disability benefits to total expenditures of the central government increased steadily in that period. Table 6 indicates that the increasing share of social transfers in government budget is not reflected in household budget.

In order to measure the contribution of each source of income to income inequality, *STATA* command *INEQFAC* is used. This command is based on the seminal work of Shorrocks (1982). Shorrocks (1982) develops a method to measure the contribution of each factor of income to income inequality. In this method, the researcher measures proportionate contribution of any factor to total inequality.

Table 6: Share of different sources of income in total income of households (%) (2005-2015)

	Labour Earnings	Entrepreneur Income	Rental Income	Financial Income	Social Transfers			Inter-household Transfers	Other Incomes
					Pensions and Survivor Benefits	Unemployment and Sickness Benefits	Other Social Transfer		
2005	39.46	17.63	2.02	4.21	16.38	0.12	1.45	4.33	14.40
2006	36.85	16.49	2.41	4.99	16.60	0.15	1.35	3.68	17.48
2007	40.76	16.40	2.70	2.92	17.41	0.20	1.45	4.39	13.77
2008	39.86	15.08	2.80	3.67	17.68	0.23	1.94	4.54	14.20
2009	39.66	15.63	2.52	3.13	17.87	0.59	2.20	4.20	14.20
2010	41.42	15.71	2.36	2.61	17.55	0.35	1.89	4.11	14.00
2011	42.57	15.12	2.05	2.20	18.31	0.35	2.10	3.85	13.46
2012	44.54	14.68	2.00	2.34	19.14	0.35	1.84	3.57	11.54
2013	44.14	13.62	2.08	2.20	20.31	0.39	1.86	3.73	11.67
2014	44.13	13.13	2.05	1.89	20.52	0.41	2.02	3.60	12.25
2015	44.68	13.24	2.01	1.61	20.90	0.49	1.99	3.57	11.50

Source: TURKSTAT (2018b) (Own calculations)

According to the method of Shorrocks (1982), the contribution of an income component to the overall income inequality is calculated by aggregating different components of income over different individuals. If different components of income are denoted by *k* and individuals are denoted by *i*, aggregating a specific income component over individuals yields the following overall level for the income component *k* as follows:

$$Y^k = \sum_{i=1}^{n} Y_i^k$$

Aggregating all income components yields total income as follows:

$$Y = \sum_{k=1}^{K} Y^k$$

Given the definitions above, the contribution of each source of income is found by dividing the covariance of each income component with the total income by the variance of total income, as shown in the following equation:

$$s_k^* = \frac{\text{cov}(Y^k, Y)}{\sigma_Y^2}$$

The contributions of different sources of income to income inequality calculated in *STATA* according to this formula are given in Table 7.

Findings summarized in Table 7 show that the main source of inequality in income distribution is the inequality of labour earnings and entrepreneur income. In the period covered by the data, the contribution of labour earnings and entrepreneur income to the overall inequality increased considerably. In 2006, 54% of income inequality was explained by labour earning and entrepreneur income, whereas in 2016, this ratio increased to 74%.

Table 7: Contribution of different sources of income to income inequality in Turkey (%) (2005-2015)

					Social Transfers				
	Labour Earnings	Entrepreneur Income	Rental Income	Financial Income	Pensions and Survivor Benefits	Unemployment and Sickness Benefits	Other Social Transfers	Inter-household Transfers	Other Incomes
2005	33.10	21.23	6.60	12.28	13.05	0.0014	0.06	1.69	11.99
2006	30.33	21.88	10.45	13.61	10.03	0.02	0.05	1.91	11.71
2007	29.38	32.30	6.99	10.13	13.71	0.07	-0.05	1.27	6.21
2008	32.91	24.38	11.03	12.24	12.08	0.03	-0.02	1.04	6.32
2009	27.98	27.25	12.93	9.99	15.47	0.1	-0.14	1.19	5.23
2010	35.34	24.79	9.61	11.97	11.38	0.17	-0.04	1.41	5.36
2011	37.86	20.11	10.46	11.58	13.14	0.14	-0.09	1.24	5.57
2012	36.12	27.51	10.89	7.92	10.97	0.34	-0.18	1.26	5.16
2013	40.42	25.58	8.65	6.82	13.43	0.11	-0.24	2.16	6.06
2014	45.65	21.27	6.82	5.57	12.77	0.19	-0.23	1.98	5.99
2015	35.43	38.20	4.29	7.5	8.37	0.15	-0.14	1.46	4.73

Source: TURKSTAT (2018b) (Own calculations)

The contribution of rental income and financial income to overall income inequality are higher than the shares of these income groups in total income. It is expectable, since the sources of financial income and rental income concentrate in the hands of high-income households. The data of banking accounts indicates that the banking deposits are also highly concentrated in Turkey. Banking deposits data are released by Banking Regulation and Supervision Agency (BRSA). According to the recent data (April 2018), 0.15% of residents who had deposits in banks in Turkey had a deposit of more than one million of Turkish Liras; and 97% of residents who had banking deposits had a deposit of less than ten thousand Turkish Liras. When the total amounts of banking deposits are examined, it is seen that the top 0.16% of the deposit holders, resident in Turkey, owned 54% of deposits whereas 97% of the deposit holders resident in Turkey owned only 3% of total deposits (BRSA, 2018). In a cross-country study of capital income and its impact on income inequality, Fräßdorf et al. (2011), analysed the micro-data belonging to UK, US and Germany, using decomposition method of Shorrocks (1982). The findings of the study are similar to the present study: household capital income has a higher contribution to income inequality than its share in total income, and its contribution to the overall inequality is related to the share it has in total income.

The contribution of rental income and financial income to income inequality decreased within the given period. This result is not surprising because the shares of financial income and rental income in total household income also declined. As mentioned in Subsection 3.2.2, the government debt, both domestic and external, decreased in the period after 2001. This implies that interest revenue from public bonds decreased within the period. The financial income of households, defined by the related variable (HG080) in SILC data, includes property return from all financial assets, not only from the government bonds. Unfortunately, the participants are not asked about the details of the financial assets they hold. Therefore, the decrease in the contribution of the financial income to the overall inequality and decrease in government debt and interest payments, and in real interest rates, occurred simultaneously.

The pensions and survivor benefits, unemployment and sickness benefits contribute to the income inequality positively. Although they are expected to decrease the income inequality but it is not the case. This can be attributed to the fact that only registered workers and their relative gain right for pensions and survivor benefits and the unemployment benefits and sickness benefits are paid to unemployed or sick workers only if they are (or were) registered to the social security system for a given period of time. In addition, unemployment benefits are paid for a limited time, determined by the period of registered work of the related worker. In such an environment, unregistered workers, or part-time, seasonal workers etc. who already constitute the more fragile portion of the workers cannot benefit from these kinds of social transfers. Social transfers excluding the pensions and benefits improved the income distribution, very slightly, in the majority of years within the covered period. The improving effect of social transfers increased in recent years, except 2015. As demonstrated above, Gini coefficient also increased in 2015.

The SILC data includes total household disposable income, already calculated in the data released by TURKSTAT. Disposable income includes the types of income listed above and a few types of expenditures (some taxes, transfers to other households, alimonies paid etc.) are subtracted from income. In order to analyse the financial income and social transfer income of people belonging to different percentile groups of income, the *STATA* command *PSHARE* is used. The total number of households is separated into 10% quantiles, and their share in total financial income and social transfers are calculated. In Table 8 below, results of three selected years (2005-2010-2015) are shown.

The distribution of capital income and social transfers among income groups implies that the financial income is distributed more disproportionately than the disposable income. The financial income is earned by high-income groups. Another result implied by this distribution is that social transfers in Turkey are not well-designed to improve the income inequality. The high-income groups obtain social transfers in high proportions with respect to their high incomes.

Table 8: Distribution of disposable income, financial income and social transfers with respect to disposable income quantiles (%) (2005, 2011, 2015)

	2005			2010			2015		
	Disposable Income	Financial Income	Other Social Transfers*	Disposable Income	Financial Income	Other Social Transfers*	Disposable Income	Financial Income	Other Social Transfers*
0-10%	1.98	0.58	16.49	2.40	0.81	15.74	2.54	1.05	23.29
10-20%	3.42	1.36	13.40	3.87	1.57	12.58	3.96	1.47	16.95
20-30%	4.57	2.28	8.46	4.92	2.14	9.06	4.96	1.70	9.65
30-40%	5.65	2.74	9.17	5.93	3.35	7.73	5.86	2.84	8.39
40-50%	6.83	4.12	5.53	7.02	4.39	8.72	6.88	3.36	9.00
50-60%	8.17	5.84	6.86	8.29	5.88	12.45	8.06	4.68	6.90
60-70%	9.79	7.98	10.01	9.78	6.94	9.07	9.53	5.32	6.99
70-80%	12.01	10.51	7.42	11.84	11.19	8.61	11.58	8.88	6.72
80-90%	15.73	13.76	9.81	15.38	14.36	8.78	15.16	12.58	6.22
90-100%	31.85	50.84	12.85	30.57	49.37	7.25	31.46	52.13	5.89

Source: TURKSTAT (2018b) (Own calculations)

Note: (*) Social transfers excluding pensions and survivor benefits, unemployment benefits and sickness benefits.

4. Conclusion

Since 2000s, debt stock and net borrowing of public sector in Turkey decreased in terms of their ratios to GDP. The decrease is observed both in the domestic debt and in the foreign debt of the public sector. The decrease in borrowing demand by the public sector results in decrease in the cost of borrowing. Since public sector's borrowing demand is an important determinant of real interest rate, the cost of borrowing would decrease for the whole economy due to the crowding out effect. Although the public sector debt stock and new borrowing declined in 2000s (both in total revenues and with respect to GDP), the fixed capital investment by the government increased since 2004. This public investment is not debt-financed type of investment. On the other hand, the share of taxes in central government budget increased. Finance of public investment can stem from this increase. It is hard to classify the social transfers by public sector, because social benefits are mainly entitled to those in formal labour market for a long period of time. The social transfers by central government, apart from transfer payments managed by Social Security Institution, increase steadily, but they constitute a very small part of total expenditures. As indicated in this chapter, the contribution of this kind of social transfers to improvement of income distribution is very limited. While the share of social transfers increased in the total expenditures of central government budget increased, the share of interest payments in total expenditures decreased. It can be concluded that reducing the burden of interest payments on the budget can allow for government policies to improve the income distribution. The decreasing borrowing demand of public sector and decreasing real interest rate are reflected in the decreasing financial income of households. Financial income is concentrated in the hands of highest income groups. Therefore high borrowing demand and high amounts of interest payment by the public sector contributes

to that concentration. Decreasing share of financial income led to decreasing contribution of financial income to the income inequality. Therefore it can be concluded that less borrowing demand by the public sector as a cyclical policy has the potential to improve the income distribution.

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