

Functional Income Distribution Consequences of Financial Crisis in Turkey

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Abstract

The aim of this study is to examine the effects of the 2008 financial crisis on the functional income distribution in Turkey by conducting a comparative analysis of various labor share measures using different data sources. Four different labor share measures in the total market income were calculated using micro data from the 2006 -2011 Income and Living Conditions Survey of Turkey. The results of micro-data calculations indicated a substantial and permanent increase during the crisis due to the labor hoarding in the labor market, leading to an increase in skilled employees' labor income share at the expense of unskilled employees' labor income share. The results obtained from aggregate data-based labor share calculations with two different measures were relatively smaller than micro data-based labor shares, due to the large share of informal employment in Turkey. Further, the labor shares obtained from aggregate data decreased during the 2008 financial crisis, in contrast to the labor shares from micro data.

Key words: Functional Income Distribution, Turkish Labor Shares

JEL codes: E25, D33, D31, G01

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1. Introduction

In the post-1980s era, a significant increase in the degree of integration and interdependency of financial markets and world economies resulted in a rise in the frequency and intensity of financial crises around the globe, especially in developing countries. Many studies have examined the fiscal and monetary consequences of these financial crises. Others have focused on the effects of these financial crises on the functional and personal distribution of income. The 2007–2008 global financial crisis, which severely hit developed countries, as well as developing ones, provided an opportunity for researchers to extend the related literature to the experiences of high-income and middle-high income countries.

A financial crisis can affect the functional distribution of income, which deals with the distribution of output between the main factors of production (labor and capital), through several channels. For example, the distribution of functional income may change in favor of capital income due to decreasing labor demand and wages, with varying influences on different groups of workers with different skills. As explained by the labor-hoarding hypothesis, a decrease in labor demand has the greatest effect on unskilled labor because high turnover costs and low sustainability of trained labor motivate firms to “hoard” their skilled labor (Agenor 2001; Leitner and Stehrer 2012). Furthermore, the bargaining power of unskilled workers is very limited due to their lack of skills and education. With the diminishing power of labor and labor unions at times of financial crises, workers accept lower wages in order to keep their jobs. Also, financial crisis decreases the real value of money holdings. Since the poor’s earning structure is more fragile to inflation, they are more exposed to income erosion from inflation. The deterioration in labor share following financial crisis examined and verified by several empirical studies (Diwan 1999; Harrison 2002; Jayadev 2007; Onaran 2008, 2009; Charpe 2011; Dufour and Orhangazi, 2014). However, functional income redistribution in favor of labor share is also theoretically possible at times of financial crises, especially in labor-intensive sectors, where the labor share may rise in accordance with an increase in exchange rates, leading to increased exports.

Another line of the literature has been treating functional income distribution as a cause of financial crises (Stockhammer et al, 2009; Stockhammer and Ederer, 2008; Onaran et al, 2011; van Treeck and Sturn, 2012; Aiginder and Guger, 2012; van Treeck, 2012; Hein, 2013). Different schools of economic thought have different viewpoints on the casual relationship between financial crises and functional income distribution. All Marxian crisis theories put the class struggle between workers and capitalist in the heart of analysis, but only Marxian overproduction/under-consumption theory sees functional income redistribution as the main cause of a crisis by defining crisis as a consequence of insufficient consumer demand relative to the production amount. In addition, many post-Keynesians crisis theories accept the

changes in functional income distribution as one of the main roots of financial crises. On the other hand, orthodox crisis theories do not consider functional income redistribution a source of financial crises (Goda, 2013, 1).

Turkey has experienced three major crises in 1994, 2001, and 2008, all of which have had severe impacts on the Turkish economy. The first two of these crises can be characterized as twin crises, as they were a combination of currency and banking crises. Unlike the other financial crises experienced by the Turkish economy in the post-1980s era, the 2008 financial crisis was not an endogenous product of Turkey's internal dynamics. Although the crisis in 2008 was on a global scale and not of Turkey's own making, it had severe impacts on the country because of the vulnerabilities of Turkey's economic structure. Although its economy was booming from 2002 to 2008, a large current account deficit, together with strong dependency on foreign capital inflow and consumer demand, prevented sustainable growth during this period. When the contagion effects of the 2007–2008 global crisis hit the Turkish economy, capital inflows suddenly stopped. Thus, Turkey experienced a significant rise in unemployment and a drastic drop in GDP.

The aim of this paper is to examine the effects of this crisis on the functional distribution of income in Turkey via an analysis of factor shares (labor and capital). In such cases where aggregate labor income decreases, profits decline, and the resulting financial instability places pressure on incomes from property, a comprehensive analysis must be undertaken in order to investigate the changes in the factor shares. In the present study, repeated cross-sectional microdata were used, in addition to conventional national account statistics. The data were obtained from the Survey of Income and Living Conditions (SILC) in Turkey from 2006 to 2011, which contains detailed information on individual incomes by source. The analysis consisted of two steps. First, we calculated four measures of the labor income share of the working population obtained from microdata and investigated the changes in the labor income based on educational skill differences of individuals. Second, we calculated two measures of the labor income share by using of aggregate data obtained from World Input Output Database (WIOD)'s Socio Economics Accounts (SEA).

This paper is organized as follows: Section 2 provides a framework on factor shares and the financial crises in Turkey in the post-1980s era. Section 3 explains the conceptual issues and different approaches in measuring functional income distribution. Section 4 presents a summary of the literature on the effects of the financial crises on the distribution of functional income. Section 5 presents the data and methodology, and Section 6 presents the results. Finally, Section 7 provides a summary and conclusion.

2. Functional Income Distribution and Financial Crises in Turkey in the Post 1980 era.

1980 was a milestone year for the whole world as well as for Turkey, as it marked a conceptual change in the frame of economics. In the 1970s, the oil crisis hit the Turkish economy severely, as well as other developing countries. In addition, the economic embargo after the Cyprus Peace Operation in 1974 put serious pressure on the domestic economic stability of Turkey. To overcome this serious crisis, Turkey made a structural reform to its economic system, along with its usual responses to the crisis, including devaluation and an increase in the interest rate. With the economic measures taken on January 24, 1980, the import substitution policies were replaced with the neoliberal economic system by adopting trade and capital liberalization. Although the new economic program seemed to succeed in overcoming the crisis initially, rapid and full liberalization of capital accounts without proper regulations on fiscal and financial systems created deep vulnerabilities in the Turkish economy in the late 1980s.

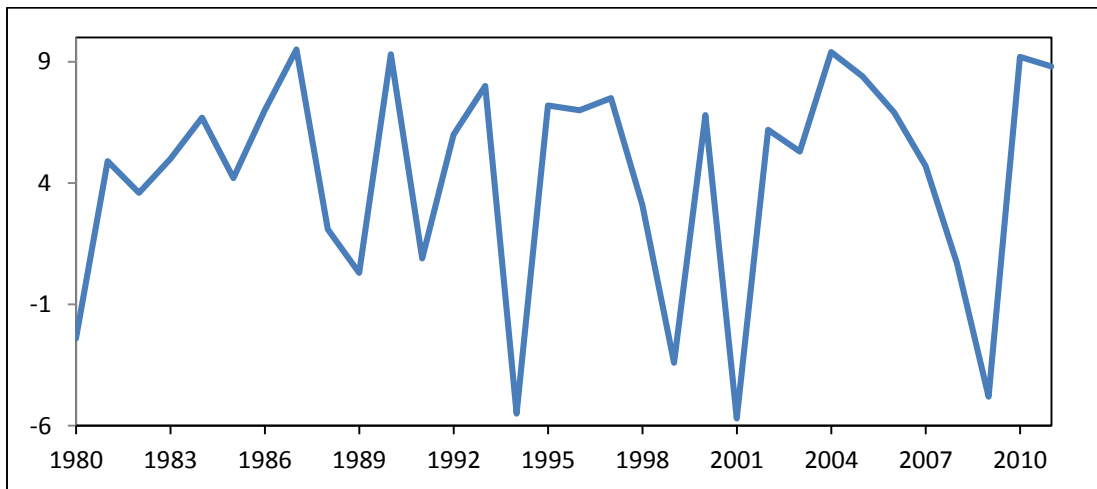
Following the liberalization of capital accounts, increased domestic interest rates resulted in a significant rise in capital inflows. Being more dependent on short-term capital inflows to finance the public deficit, the government kept the interest rate high to prevent capital outflows. As the cost of borrowing increased with high interest rates, the government only came up with temporary solutions to lessen the effects of the high costs of borrowing instead of making structural reforms to the Turkish economy. In the early 1990s, persistent economic instability became a characteristic of the Turkish economy with high unemployment, inflation, public deficits, and current account deficits. The macroeconomic fundamentals of the Turkish economy continued to weaken, finally causing a serious financial crisis in 1994.

The government's reaction to this severe crisis was to launch an IMF-supported stabilization program on April 5, 1994. Although the economic stabilization program ensured stability for a while, it was abandoned in favor of populist economic policies to gain support in the early general election held in December 1995. Implementing expansionary economic policies without any structural reforms once again had a negative impact on the Turkish economy. Therefore, the continuing lack of fiscal discipline created the need for a recovery plan, and another economic stabilization program designed by IMF was launched in December 1999. In this context, a foreign exchange anchor was employed to introduce disinflation and consequently reduce the public deficit. When the stabilization program started to provide economic recovery, the government ironically stopped implementing it properly once again, and with the deep deterioration in the economy, Turkey experienced a severe financial crisis in 2001. This time, the banking sector, which was very vulnerable under the exchange rate, interest rate, and liquidity risks, collapsed

with a domino effect on the real economy. After the crisis, a wide-ranging reform and policy measures were introduced as part of a new stabilization program assisted by the IMF. The Banking Regulation and Supervision Agency (BDDK) conducted a comprehensive regulation program for reconstructing and strengthening the banking sector. Along with the other institutional reform programs, the stabilization program succeeded in maintaining fiscal discipline and lowered the inflation rate. From 2002 to 2007, Turkey seemed to break the vicious cycle of a financial crisis, followed by discontinuation of the stabilization program. With the help of positive global economic conditions leading capital inflows to emerging financial markets, the Turkish economy experienced an economic booming period with relatively positive economic indicators. On the other hand, a large current account deficit, an over-dependency on foreign capital inflows, and consumer demand continued to create vulnerabilities in the background. When the Turkish economy was hit by the global crisis in 2008, a sudden stop of foreign capital inflows and international trade activities caused a sharp fall in the GDP and employment.

The economic instability in Turkey in the period of 1980–2011 is illustrated in Figure 1, showing the growth rates in Turkey. The 1994 and 2001 financial crises resulted in -5.5%, and -5.7% declines in the real GDP. Due to the global financial crisis, the real GDP increased only by 0.7% in 2008, followed by a 4.8% reduction in 2009. The average growth rate between 1980 and 2011 was 4.8%.

Figure 1. Growth Rate of GDP in Turkey

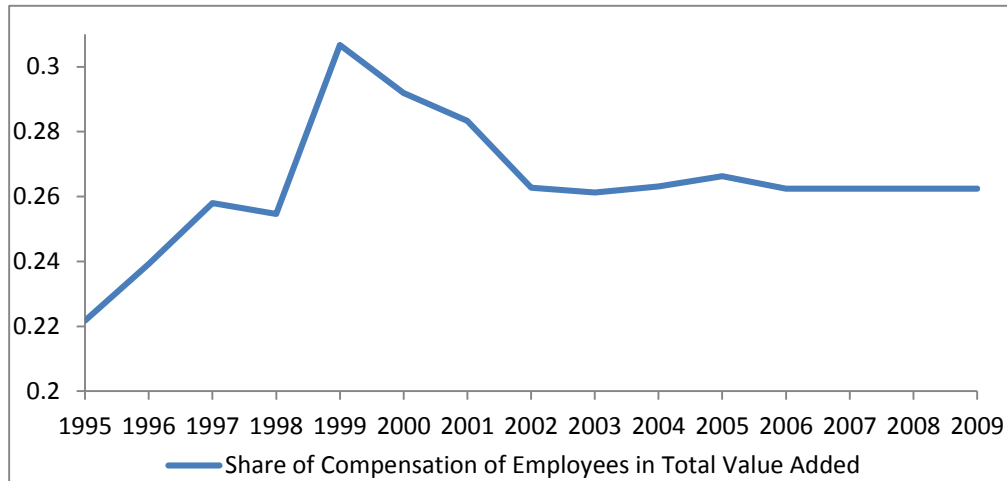


Data Source: OECD Database, <http://stats.oecd.org/>

A comprehensive and long-term investigation into the relationship between financial crises and functional income distribution in Turkey for the post-1980 era cannot be conducted due to the lack of available aggregate data. It is not possible to assess the behavior of the share of employees'

compensation, labor compensation, and capital compensation before and after the 1994 financial crisis due to the absence of data. Figure 2 presents the share of employees' compensation in the gross value added for the period between 1995 and 2009.

Figure 2. Share of Compensation of Employees in Gross Value Added



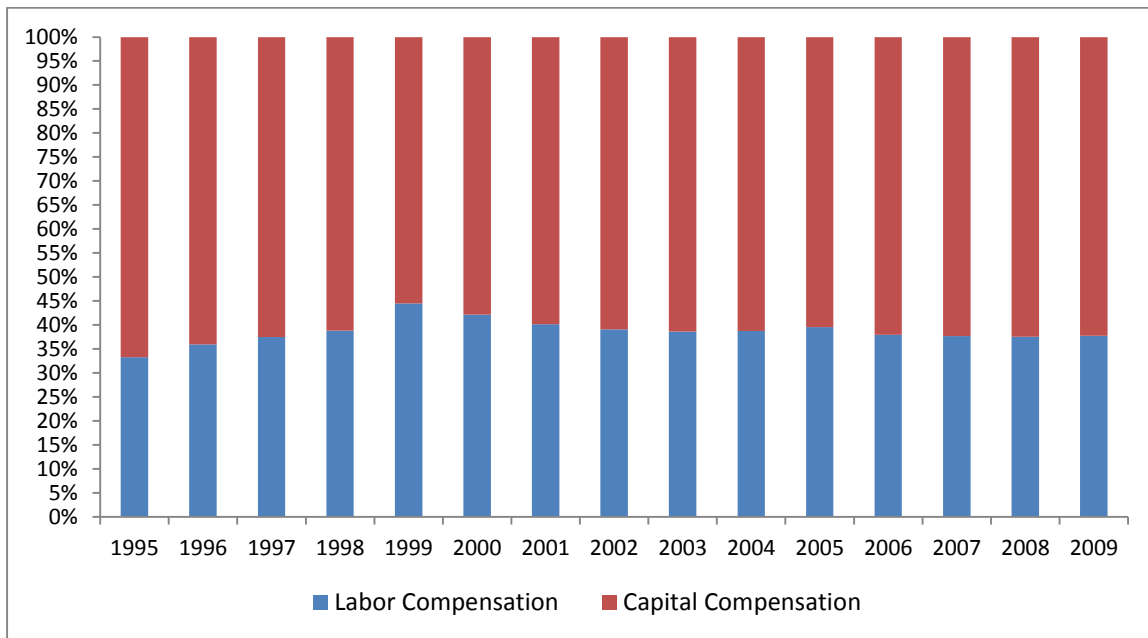
Data Source: Own calculations using data from WIOD's SEA, http://www.wiod.org/new_site/database/seas.htm

The share of employees' compensation started to fall in 2000, the year the IMF-backed stabilization program was abandoned, and continued to decrease during the 2001 financial crisis and 2002. When it stabilized in 2003, the total decrease in the share of employees' compensation in 3 years was about 15%. On the other hand, it remained stable before and after the 2007–2008 global crisis. The average rate of employees' compensation in the total value added between 1994 and 2009 is 26.4%.

Figure 3 indicates the shares of labor compensation and capital compensation in the gross value added in Turkey² between 1995 and 2009. From 1995 to 2000, the share of labor compensation in the gross value added increased from 33.3 % to 44.5 %, but it started to decrease in 2000 following the deviation from the IMF-supported stabilization program. The reduction in labor compensation continued from 2000 to 2003 (3.5%).

² In WIOD, labor compensation is computed by using the method proposed by Gollin (2002) (shown as LS₅ in this document). First, self-employed compensation is imputed by assuming self-employed individuals earn the same wage as employees. Then, labor compensation is defined as the total of imputed compensation and the compensation of employees. Capital compensation is obtained as a residual of labor compensation from the gross value added. It is the gross compensation of capital consisting of profits plus depreciation allowances. Along with the conventional fixed (reproducible) assets, such as buildings and machinery, it also includes unreproducible assets, including tangible assets (such as land, mineral resources), intangible assets (such as brand names, software, organizational capital, copyrights, patents, trademarks), and financial capital (Timmer et al. 2015).

Figure 3. Labor Compensation and Capital Compensation in Turkey



Data Source: WIOD's SEA, http://www.wiod.org/new_site/database/seas.htm

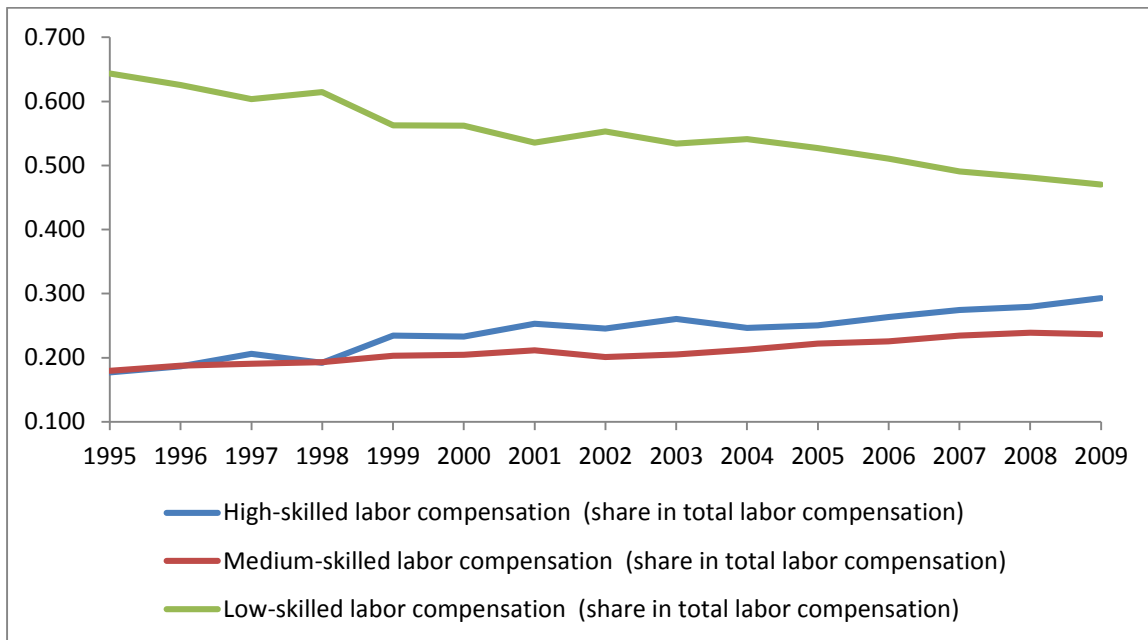
Unlike the share of employees' compensation, the share of labor compensation was affected by the 2007–2008 global crisis by a small percentage (0.5%). Figure 4 presents the skill distribution of labor compensation in Turkey³ between 1995 and 2009. The reduction in the low-skilled compensation share in the total labor compensation is compensated by an upward trend in high-skilled labor compensation and a slight upward trend in medium-skilled labor compensation through the period. In 2002, right after the 2001 financial crisis, a break was seen in the patterns of each category with an increase in low-skilled labor compensation and decreases in medium-skilled and high-skilled labor compensation.

³ Skill types are defined based on levels of education as follows:

- Low-skilled =Below high school (primary, secondary, illiterate, and others);
- Medium-skilled = High school and vocational high school;
- High-skilled =University and above.

The WIOD uses the skill distribution of employment information obtained from Turkish Statistical Institute (TURKSTAT) labor force survey (Erumban et al. 2012, 30)

Figure 4. Skill Distribution of Labor Compensation in Turkey



Data Source: WIOD's SEA, http://www.wiod.org/new_site/database/seas.htm

On the other hand, there was no apparent change in the trends of each skill type before and after the 2008 global crisis. From 1995 to 2009, the low-skilled labor compensation decreased by 17.3%, while the high-skilled and medium-skilled labor compensation increased by 11.6% and 5.7%. In addition, the gap between the low-skilled labor compensation and medium-skilled labor compensation began to widen in 1999.

3. Measuring the distribution of functional income: conceptual evolution and different approaches

3.1. Conceptual evolution

The distribution of output between factors of production has been interesting economists as a fundamental component of the economic analysis of employment, aggregate production, and relative prices. In this context, there are several theories on the distribution of functional income that correspond to diverse theoretical and ideological approaches to these main branches of economic analysis.

As Gollin (2008) stated, factor shares were observed initially at industry or firm level in the period before formalized national income and product accounts⁴. In the 18th and 19th centuries, in defining factors of production, classical scholars focused on physical resources, examining them in terms of their

⁴ Gross National Product was first released in the U.S. in 1935 and in the U.K. in 1941.

cost and value within the context of output growth. Classical economists, including Adam Smith, Thomas Malthus and David Ricardo examined the distribution of output among different classes, namely: workers, landlords and capitalists who received their revenues as wages, rents and profits respectively. Marx, on the other hand, focused on the distribution of output between two main classes: capitalists and workers.

In the classical economics framework, the distribution of functional income is ambiguous because it lacks a clear statement on the development of wage share. Thus, it can be identified only by the determination of productivity and wage growth, which are the major parameters that affect income distribution. An inference on development of factor shares cannot be made separately, but has to be build up in the context of accumulation and distribution which are main concerns of the classical economics (Kraemer 2010, p. 10).

At the end of the 19th century, the change in economic theory from classical to neoclassical economics brought the production function with two inputs (labor and capital), with rent included in capital, along with profits. As Atkinson (2009) stated, this changes in the production function mostly arose from the difficulty in measuring rents in company-occupied land, where it was practically impossible to distinguish returns from land from other components of profits.

In neoclassical economics, the production function is defined as an aggregated version of the microeconomic concept of a firm, expanded to include the entire economy. Under the assumption of perfect substitution between labor and capital, the economy is represented by an aggregated production function, which shows constant returns to scale. Factor shares are independent of changes in the prices of inputs and outputs in the case of elasticity of factor substitution is equal to one. Thus, a production function with constant returns to scale and a factor substitution of one i.e Cobb-Douglas production function denotes that the observed factor shares are constant over time (Dünhaupt 2013, pp. 7–8).

The stability of labor share as a production function was verified with data from the U.K. and U.S. as in the Cobb and Douglas (1928), Kalecki (1938) and Keynes (1939), which he defined this constancy as “one of the most surprised, yet best established, facts in the whole range of economic statistics” (Xiang 2008). Solow (1958) also employed aggregate production function but raised concerns about their use by characterizing the stability of factor shares as “partially a mirage”. Following the publication of the influential paper by Kaldor (1961), the constancy of factor shares with the given assumption of the Cobb-Douglas production function started to be noted as one of the stylized facts of growth theory. However, earlier and recent empirical evidence have been challenging the factor share stability hypothesis.

The existence of a long-term declining trend in labor share that has been widely documented in the economics literature (Blanchard 1997; Poterba 1999; Harrison 2002; Berthold et al. 2002; Acemoglu

2003; Guerriero and Sen 2012; Elsby et al. 2013, Karabarbounis and Neiman 2014), makes the distribution of functional income an interesting subject. There have been some leading factors responsible for the decline in the labor share and its deteriorating consequences on economy. Deregulation in labor market and declining trend in trade union, globalization and financialisation have been suggested as being responsible for this long term downward trend (Michell, 2014, 21).

Another reason for observed variability in the factor shares is the raising awareness of redefinition of labor share by taking the self-employment into consideration through the literature which will be discussed in the next section.

3.2. Definition and data Issues

The conventional measurement of functional income distribution is based on the calculation of labor share in national income. Since the labor share is a ratio, the accuracy of the measurement heavily depends on the choice of dominator and numerator. First of all, a few transformations are required for the computation of aggregated income as the dominator of the labor share ratio. First, indirect taxes (Taxes on Productions and Imports) must be subtracted from the Gross Value Added at basic prices for obtaining the factor costs as they can't be considered as return to capital or labor. Second, Consumption of Fixed Capital must be removed from the Gross Value Added where data is available, since it is not included in the standard definition of capital income (Guerriero, 2012, 6).

The choice of numerator for the ratio of labor share has been evolving. Early empirical studies of the functional income distribution relies on calculation of labor share based on the ratio of compensation of employees (payments to labor) to GDP at factor cost (Value added-indirect taxes-fixed capital) derived from national income and product accounts. In this "unadjusted labor share" calculation, capital share is simply obtained as a residual of this ratio. This method has been criticized as being a poor indicator of aggregate labor income since the compensation of employees does not include the labor income of people who are not classified as employees.

Income from self-employed activities⁵ includes both returns to labor service and returns to capital. As Gollin (2002) indicated, particularly in developing countries, self-employment which represents a very large fraction of the workforce, accounts for emerging entrepreneurship and business start-ups. Also it represents minor employment and hidden unemployment (Guerriero 2012, p. 5). Therefore, the use of the compensation of employees as an indicator of labor income may result in

⁵ In the literature, the self-employed are also termed as "entrepreneurs" or "proprietors", and their income as entrepreneur income" or "proprietor's income". In this study "self-employed income" and "entrepreneur income" are used interchangeably.

incorrect estimations of factor shares and biased cross-country comparisons. Using data from 35 countries, Kuznets (1959) was the first to verify this type of bias in an analysis of the relationship between the share of compensation of employees in GDP and per-capita income. In that study, the countries are grouped by their per capita income level, and the average share of compensation of employees across the groups is then compared. The study found that while the share is higher in developed countries, it is lower in less developed countries. Harrison (2002) and Jayadev (2007) also confirmed a clear pattern of the share of compensation of employees increasing by per-capita income.

In 1953, the United Nations Statistics Division released System of National Accounts (SNA) tables, which has been providing data on the compensation of employees, mixed income from self-employment, and operating surpluses (from rent and capital) for a large number of countries. Using these data, a few adjusted labor share measures have been produced (Guerrero 2012, p. 7). To distinguish self-employed labor income from mixed income, Johnson (1954) calculated the share of labor income as a sum of the 2/3 of the mixed income and compensation to employees in total value added at factor costs.

Kravis (1959) proposed four alternative calculations to decompose the mixed income. The first one which he identified as “labor-basis” approach calculates the labor component of self-employed income directly and regarded the capital income as residual. This is done by assuming that the labor income of a self-employed individual is equal to that of an employee. The second “economy wide basis” calculation method divides self-employed income for each period based on the current ratio between labor and capital income of the whole economy, excluding that of the self-employed sector. The third calculation divides mixed income into its labor and capital components in a 0.65:0.35 ratio, respectively, as Johnson (1954) did. The last one which he identified as “asset basis”, calculates capital income of the self-employed in national income by applying to the share of other property (the combined share of interest, corporate profits and rent) the ratio of the value of self-employed to other property and treats the residual component of self-employed income as the returns to labor of self-employed.

The important issue with the calculations of Johnson (1954) and Kravis (1959) is that they are based on mixed income. Unfortunately, the data of SNA on mixed income category are not available for every country⁶ (Guerrero 2012, p. 7). Furthermore, although all measures of labor share covered above have been widely used in the literature, each method has its own drawbacks. “Unadjusted labor share,” underestimates the actual value of the labor share, as it does not take into account the labor income component of entrepreneur (self-employment) income. Labor share measure of Johnson (1954) is

⁶ For a summary of SNA data compiled for each country, see Guerrero (2012).

criticized for ignoring the possible changes in shares of labor and capital income over time by fixing the ratio in advance. “Labor-basis” measure of Kravis (1959) overstates the labor share by ignoring the capital income component of entrepreneur income. “Economy wide basis” measure ignores the scale differences of the private unincorporated businesses and large corporations and “asset basis” measure requires detailed information on the input and rate of return of each financial income component (the combined share of interest, corporate profits, and rent), which is usually not available.

Gollin (2002) was the first to propose to using data on the composition of the workforce for distinguishing the self-employment income into its labor and capital components. Relying on the assumption that the labor income of the self-employed workers earn the same as that of employees, he suggested to impute employee compensation for self-employed workers by using the composition of workforce information of the International Labor Organization (ILO) Yearbooks of Labor Statistics. In the method proposed by Gollin (2002), the average employee compensation is obtained by dividing the total compensation of employees by the total number of employees. The average employee compensation is then adjusted for the whole workforce by multiplying it by the number of people in the workforce. According to this calculation, capital income is the part of self-employed income that exceeds the mean wage sum. Using this method, Gollin (2002) obtained relatively stable labor shares in developing countries, and this approach has been widely used in the literature (Bernanke and Gürkaynak 2001⁷; Bentolila and Saint-Paul 2003; IMF 2007; EC 2007; Ellis and Smith 2007; Xiang 2008; Guerriero 2012).

Guerriero (2012) proposed a further adjustment to Gollin’s measure that excludes the income earned by “employers” from the compensation of employees to avoid the overestimation of labor share. This method uses the average wage of self-employed people who were not classified as employers. Guerriero and Sen (2012) used the same methodology to decompose the self-employed income into its labor and capital income components.

As noted earlier in Section 3.1, the calculation of labor share within the context of the distribution of functional income has been traditionally utilizing aggregate national account data. However, another line of research has been growing that focuses on calculating factor shares using micro-level survey data (Ryan 1996; García-Verdú 2005; Wolff and Zacharias 2007; Adler and Schmid 2012; Steffen 2013; Schlenker and Schmid 2013). Atkinson (2009) defined factor shares as an important starting point in establishing links between national accounts and household experience. He pointed out that the assumption that increases in national GDP signifies proportional rises in household incomes does not always hold true. In an economic environment that

⁷ They used an earlier version version of the methodology applied by Gollin (2002).

identifying labor receiving wages, landlords receiving rents and capitalists receiving profits is no longer possible, an individual's total income may consist of all three categories of income. Therefore, using aggregate data for examining each income category in terms of functional income distribution gives rise to different issues. For instance, using the compensation of employees as an indicator of labor's receipt may result in overestimation of the wage share because the compensation of employees comprises a number of components, which are not included in the wage packets of workers. These include employers' payments for private pensions and social security, health care, and other benefits. In addition, interest payments on national saving certificates, which are a capital income source for households, have no equivalent in national accounts (Atkinson 2009, pp. 6–7). The use of micro-survey data for examining factor shares enables us to make a link between the aggregate and household dynamics of factor distribution.

Two types of household or individual income are used to estimate factor shares in the literature: i) market income, which is the sum of labor-related income (i.e., income from full-time, part-time, or self-employed work), and capital income, which is the sum before taxes and public benefits, and ii) disposable income (i.e., the income minus taxes and benefits). Market income refers to the sum of incomes from production factors. As such, it is similar to factor shares in aggregate national income and is more suitable for analyses of the distribution of functional income. Disposable income, which is a standard income measure in the economic inequality literature, can be defined as the sum of factor incomes only under the assumption that direct tax payments equals to cash benefit receipts (Ryan, 1996 p. 111). In this study, market income share was used as the denominator of the factor share ratio obtained from the microdata, as we are interested in the distribution of income derived from an individuals' interaction with the economy.

Before presenting the methodology and data sources of the analysis, the literature on the functional income distribution and financial crisis will be presented in the next section.

4. Literature on Functional Income Distribution and Financial Crisis

Although there have been a large number of studies examining the long-run trend of factor shares, only a few have investigated the effects of financial crises on factor shares.

Diwan (1999) examined the labor share in the GDP with the United Nations data of 135 countries varying from 1975 to the mid-1990s. Using the ratio of the compensation of employees/GDP, he found that the labor share usually dropped drastically after a financial crisis and could not make a full recovery in the following years. He reported 5 cases in which the labor share increased following a financial crisis: Israel 1976–86, Sri-Lanka, 1978, Indonesia 1979 and 1983, and Greece 1981. Detailed examination showed that for Indonesia, the issue is simply related to timing, considering the fact that the ratio collapsed in 1984. In other examples, the rise in the labor share is not one of timing. In Israel and Greece, the increase in the

labor share is possibly a result of receiving large-scale international subventions from Europe and the U.S. to promote their economic stabilization policies.

Harrison (2002) analyzed the share of employees' compensation in GDP of over 100 countries using SNA data with varying periods between 1950s and 1990s and found a negative effect of financial crises on the labor share. After dividing countries into two groups based on their GDP per capita in 1985, she showed that only the labor share of poorer countries was affected negatively by a financial crisis. When the sum of employees' compensation and self-employed income was used as an alternative measure of labor income, the sample was reduced to less than one-third of the original sample and became primarily weighted toward developed countries and several eastern European countries due to the limited number of countries reporting self-employment income. In this case, no significant effect of financial crises on the labor share was found.

Jayadev (2007) defined the labor share of national income as the ratio of employees' compensation to the GDP from cross-country panel data obtained from the SNA database. According to the results, the occurrence of a financial crisis resulted in a 0.5 percent reduction in the labor share, on average. Making an adjustment in the labor share, as in "economy wide basis" approach of Kravis (1959), caused a reduction in the sample one-sixth of its original size. An analysis of this new sample, mostly consisting of higher-income countries, showed that the effect of financial crises on the labor share disappeared.

Onaran (2008) suggested that labor share data from the manufacturing industry is more solid and provides a larger time series for a wide range of countries and thus used the share of manufacturing wages in manufacturing value added as an indicator of the labor share. Manufacturing labor share data for Korea, Mexico, and Turkey were obtained from the OECD Industrial Structural Analysis Database (STAN) Database and national accounts. For Chile, Thailand, the Philippines, and Brazil, manufacturing data from the World Development Indicators (WDI) database of World Bank were combined with SNA data, and for Indonesia, Malaysia, and Argentina, WDI data were combined with data from the Economist Intelligence Unit (EIU) database. The analysis showed that the crises caused a long-lasting decrease in the wage share in all countries.

Onaran (2009) first analyzed the manufacturing wage share for three developing countries—Mexico, Turkey, and Korea—with the data from the OECD (STAN) Database (for Mexico and Korea) and the national accounts data (for Turkey) varying from 1994 to 2004. In all countries, despite the quick recovery period at the year after the crisis, the wage share generally continued to decrease for about two or three years. Then, data from the manufacturing industry in six more Latin American and South-East

countries with a financial crisis history were included in the analysis. For labor share calculations for the Philippines, Brazil, and Thailand, the SNA manufacturing data were combined with the data from the WDI database, and for Indonesia, Argentina, and Malaysia, the WDI data were combined with the EIU data. The results showed that the crises also caused a strong reduction in the wage share in all these countries.

Charpe (2011) analyzed employees' compensation in comparison to the GDP of 119 countries using data from OECD, SNA, and from national statistical agencies (for Brazil and China) and found negative effects of financial crises on the ratio of employees' compensation to the GDP for Eastern European and Latin American countries.

Dufour and Orhangazi (2014) investigated the behavior of the labor share of income measured as the ratio of the compensation of labor to the GDP in the U.S. economy after the 2007–2008 financial crisis. Their results indicated that a slight increase in the labor share of income took place in 2008 and then it started to decrease. The same behavior in the labor share was observed in the corporate sector as well, with a reduction in employees' compensation as a share of corporate gross value added after the financial crisis.

It is clear that the existing literature on the effect of financial crises on functional income distribution is mostly based on the unadjusted labor share in the GDP (compensation of employees/GDP), and there has been no effort to measure the factor shares using micro data. This study includes an analysis of both micro data and aggregate data to offer an extensive comparative analysis on the functional income distribution in Turkey.

5. Data and Methodology

The analysis in this study is based on individual and household level micro data from the Turkish SILC for the period between 2006 and 2011 and aggregate data from the WIOD's SEA for the period between 2006 and 2009. The SILC has been conducted annually by TURKSTAT since 2006 with the aim of providing comparable data with European Union countries. Within this scope, both household and individual-level datasets have been generated to offer measurements on personal and household income distribution, poverty, social exclusion, and the standard of living as part of the process of adaptation to the EU. Stratified, two-staggered, clustered sampling is employed as the sampling method and the final sampling unit is determined as the household. The sample size is specified as approximately 13,000 households, but it varies from year to year since the survey is a panel application.

Since 2007, TURKSTAT has not released the GDP by cost components i.e., GDP by income approach (the compensation of employees plus the gross operating surplus/mixed income plus taxes on production and

imports minus subsidies on products and production). Therefore, for Turkey, calculating the net value added by the sum of the factor components (labor and capital) is not possible using values of GDP by income approach for the period after 2006. Also, mixed income as a distinct account is not available in Turkey's national account statistics. Thus, by following the Penn World Table (PWT) database (Version 8.1) that employed the WIOD's SEA data to calculate the share of labor compensation in the GDP, we use the gross value added (representing the income of labor and capital) and the compensation of employees data from the WIOD's SEA for the labor share calculations at the macro level. The WIOD includes annual time series of factor requirements and input-output tables of 40 countries from 1995 to 2011. It is constructed by merging the national input-output tables with national accounts and international trade data⁸. The WIOD's SEA includes annual data on 35 countries on value added (at current and constant prices), industry output, employment, and wages by skill types and investment and capital stocks. The sum value added of all industries (gross value added) represents the sum of the all labor and capital incomes⁹. Employment status information is also obtained from TURKSTAT.

The calculation of the labor share with micro SILC data is carried out by adopting unadjusted labor share, measure of Johnson (1954), "labor basis" and "economy wide basis" measures of Kravis (1959) as LS_1 , LS_2 , LS_3 , and LS_4

to micro data¹⁰. The compensation of employees data in national accounts corresponds to the "salary, wage, per diem incomes (labor income)" category in SILC data, representing the income in cash or in kind that is received by working as an employee. Income related to working overtime, bonuses for job-hazards and business risks, capital bonuses, and premiums is also included in this category. Mixed income in national accounts corresponds to the "entrepreneur income (self-employment income)" category in the SILC data, defined as the income obtained by working as an entrepreneur (employment status is self-employed (own account workers or employer) net of all expenditures related to the workplace, social insurance cuts, taxes etc. Capital income is obtained by summing up the rental income (income obtained by renting real estate like apartments, stores, shops, or other properties like fields and gardens, the net of all expenditures such as maintenance, taxes, insurance, and renewals) and property income (income

⁸ The construction of the database was carried out by the cooperation of 12 research institutes with the funding of European Commission, Research Directorate General as part of the 7th Framework Program, Theme 8: Socio-Economic Sciences and Humanities. For detailed information on WIOD, see Timmer et al. (2015).

⁹ For more information on the construction of WIOD's SEA, see Erumban et al. (2012).

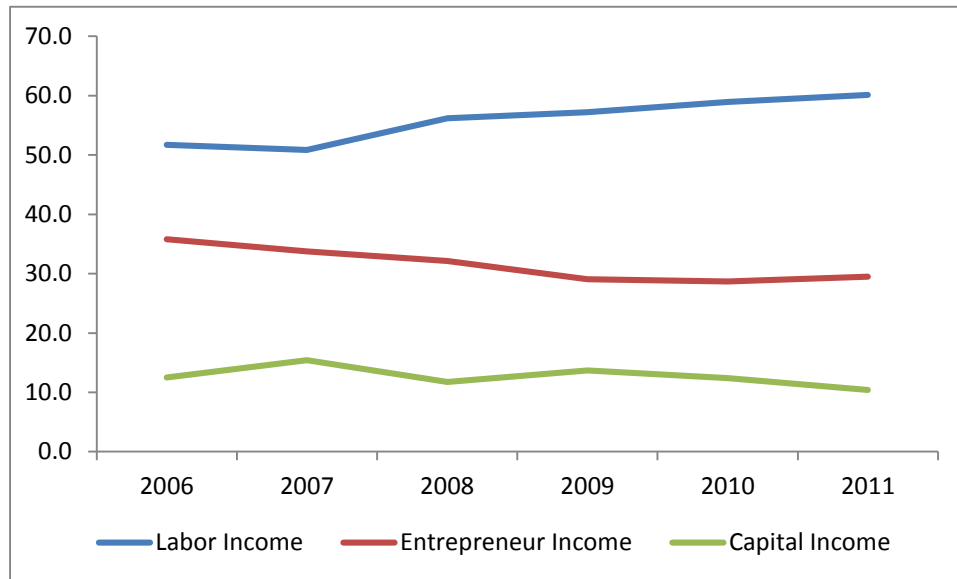
¹⁰ "Asset basis" measure of Kravis (1959) could not be adopted since its formulation requires detailed information on the return to interest, rent, and corporate profits.

obtained as the share of profits from a company or financial institution, dividend, the interest of bank account etc., net of taxes). As the micro-level equivalent of the sum of factor shares in national income, individual market income (income before the payment of taxes and the receipt of public benefits), which is the definitional sum of factor shares, is used. Individual market income is approximated by the sum of labor income, capital income, and entrepreneur income. Since the rental and property income variables are only available at household level, capital income is obtained from household-level data while the sum of labor income and entrepreneur income variables are obtained from individual-level data.

Figure 5 presents the shares of labor income, entrepreneur income, and capital income in the total market income by year. In all years, labor income has the largest share of the total market income. The average rate of labor income of the total market income was 55.8% between 2006 and 2011. From 2007 to 2008, the labor income share increased from 50.8% to 56.2% and then showed a gradual increase until 2011. Entrepreneur income has the second-largest share of the total market income with an average rate of 31.5% between 2006 and 2011. It gradually decreased from 35.8% to 29.1% between 2006 and 2009 and then stabilized. Capital income has the smallest share in the total market income with an average rate of 12.7% between 2006 and 2011. From 2006 to 2007, the capital income share in the total market income increased from 12.5% to 15.4%, but it dropped sharply to 11.7% in 2008. After a small recovery in 2009, it decreased gradually until 2011. From these figures, it is seen that the global financial crisis in 2008 resulted in an increase in the labor income share of the total market income, mostly at the expense of the share of financial income¹¹.

¹¹ For summary statistics on income categories, see "Appendix 1: Summary Statistics on Income Categories"

Figure 5. Share of Labor Income, Entrepreneurial Income and Capital Income in Total Market Income



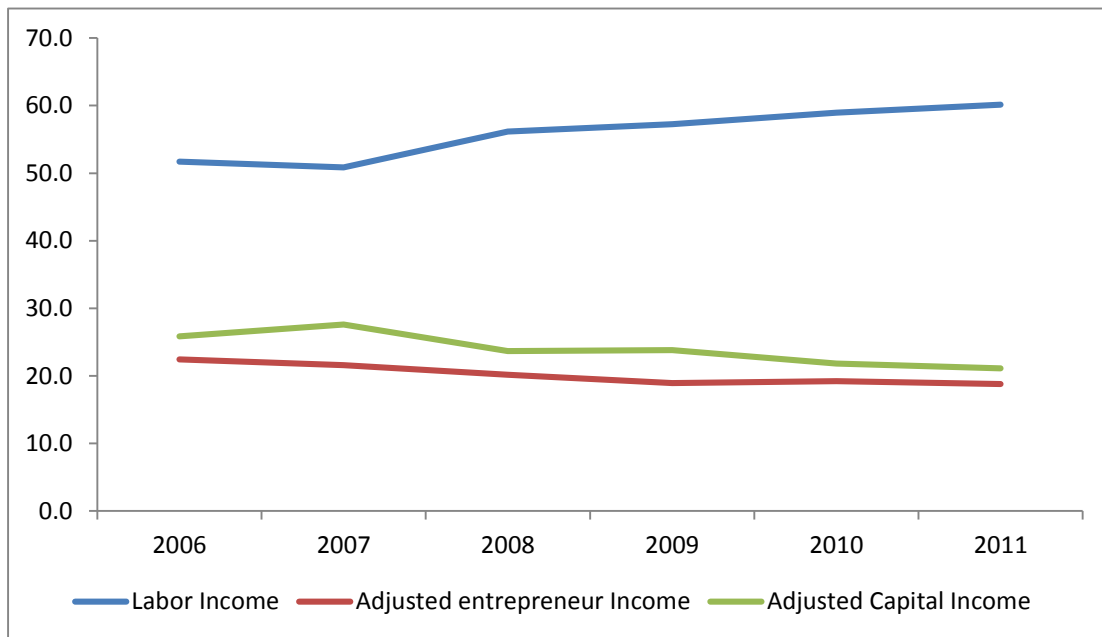
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

Entrepreneur income is a combination of both capital and labor income components like the mixed income, i.e., self-employed income in national accounts. The main issue in labor share calculations at the micro level is how to divide the entrepreneur income into its capital and labor components, as in the case of self-employed income at the macro-level calculations of the labor share. A good example of this issue is the case of a small-sized grocery store that has no employees apart from its owner, whose employment status is “self-employed.” The sales revenue of this grocery store net of all expenditures (entrepreneur income) contains both the labor income and the capital income of the self-employed shop owner. Determining the proportions of labor and capital income in this kind of situation is a key issue, especially for the economies with a high share of small-sized enterprises in total enterprises.¹²

Since entrepreneur income is gained by both employers and self-employed people by definition, its unambiguous capital income component must be dropped from entrepreneur income by subtracting the amount of entrepreneur income that is gained by individuals whose employment status is “employer” before imputing it to labor income. Therefore, we only imputed the entrepreneur income gained by people whose employment status is “self-employed.” After imputing the unambiguous capital income component of entrepreneur income to capital income, the shares of adjusted capital and adjusted entrepreneur income in the total market income are presented in Figure 6.

¹² In Turkish economy, the share of small-sized enterprises with 0–9 employees in total enterprises is 93.6 % as of the 2013 statistics from TURKSTAT.

Figure 6. Share of Labor Income, Adjusted Entrepreneurial Income and Adjusted Capital Income in Total Market Income



Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

After imputing the entrepreneur income of employers to capital income, the adjusted share of capital income is the second-largest share in market income, following the share of labor income. The average rates of the adjusted entrepreneur income and adjusted capital income between 2006 and 2011 are 20.2% and 24%, respectively¹³.

Adopting unadjusted labor share, measure of Johnson (1954), “labor basis” and “economy wide basis” measures of Kravis (1959) for the SILC data at the micro level, the LS_1 , LS_2 , LS_3 , and LS_4 are derived, respectively.

The unadjusted labor share is obtained as the ratio of the total labor income to the total market income as follows:

$$LS_1 = \frac{\text{Total Labor Income}}{\text{Total Market Income}}$$

Following the common rule proposed by Johnson (1954), two-thirds of adjusted entrepreneur income is imputed to the total labor income as follows:

¹³ For summary statistics on adjusted entrepreneur income, see “Appendix 2. Summary Statistics for Adjusted Entrepreneur Income.”

$$LS_2 = \frac{\text{Total Labor Income} + \frac{2}{3}\text{Entrepreneur Income}_{adjusted}}{\text{Total Market Income}}$$

Based on the labor basis calculations of Kravis (1959), all entrepreneur income is imputed to labor income as follows:

$$LS_3 = \frac{\text{Total Labor Income} + \text{Entrepreneur Income}_{adjusted}}{\text{Total Market Income}}$$

The economy-wide bases approach of Kravis (1959) is adopted by considering the entrepreneur income as holding the same proportion of capital and labor components as the rest of the economy's income as follows:

$$LS_4 = \frac{\text{Total Labor Income}}{\text{Total Market Income} - \text{Entrepreneur Income}}$$

For the calculations of the labor share at the macro level, measures developed by Gollin (2002) and Guerriero (2012) are employed as LS_5 and LS_6 respectively by using employment status data from TURKSTAT and WOID' SEA data:

$$LS_5 = \frac{\frac{\text{Compensation of employees} * \text{Total workforce}}{\text{number of employees}}}{\text{Value Added} (-\text{fixed capital} - \text{indirect taxes})}$$

$$LS_6 = \frac{\frac{\text{Compensation of employees}}{\text{Number of employees}} (\text{Total workforce} - \text{employers})}{\text{Value Added} (-\text{fixed capital} - \text{indirect taxes})}$$

6. Analysis

The results of the calculations of the labor shares using LS_1 , LS_2 , LS_3 , and LS_4 are shown in Table 1. The average labor shares calculated with these measures between 2006 and 2011 are 55.83%, 69.30%, 76.02% and 69.92%, respectively. LS_1 , “unadjusted labor share,” has the lowest average share among other measures is that it underestimates the actual value of the labor share since it does not take into account the labor income component of entrepreneur (self-employment) income, as indicated above. In addition, the LS_3 , having the largest average labor income share, overstates the labor share by ignoring the capital income component of entrepreneur income.

Table 1. Labor Share Measures

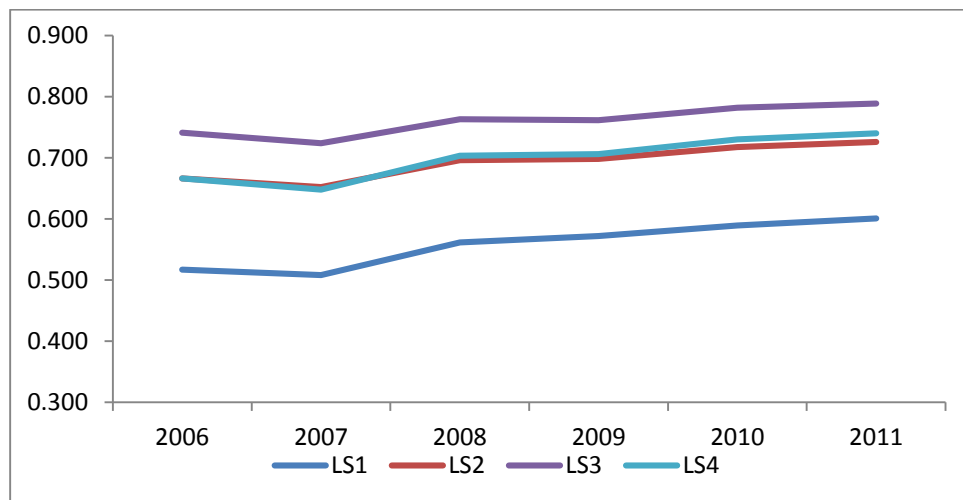
	LS_1			LS_2			LS_3			LS_4		
	Level	$\Delta\%$	$\Sigma \Delta$	Level	$\Delta\%$	$\Sigma \Delta$	Level	$\Delta\%$	$\Sigma \Delta$	Level	$\Delta\%$	$\Sigma \Delta$
2006	51.7			66.7			74.1			66.7		
2007	50.8	-1.77		65.2	-1.99		72.4	-2.35		64.8	-2.93	
2008	56.2	10.63	8.86	69.6	6.75	4.76	76.3	5.39	3.04	70.4	8.64	5.71
2009	57.2	1.78	10.64	69.9	0.43	5.19	76.2	-0.13	2.91	70.6	0.28	5.99
2010	59	3.15	13.79	71.8	2.73	7.92	78.2	2.62	5.53	73	3.4	9.39
2011	60.1	1.86	15.65	72.6	1.11	9.03	78.9	0.9	6.43	74	1.37	10.76

$\Delta\%$: Year-on-year percentage changes.

$\Sigma \Delta$: Cumulative percentage changes.

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

Figure 7. Labor Share Measures



On the other hand, the LS_4 and LS_2 values are quite similar to each other throughout the analysis period. Following a decrease in 2007, a relatively significant increase is observed in 2008 in each measure

of the labor share. Then, all labor shares increase gradually until 2011, with the exception of LS_3 decreasing by 0.13% in 2009. Similar trends for each measure can also be seen in Figure 7. Almost overlapping lines of LS_4 and LS_2 lie between the upper line of LS_3 and the lower line of LS_1 .

Before examining the causes for the labor share increase during the financial crisis in detail, LS_1 , LS_2 , LS_3 , and LS_4 are also calculated using a set of individuals and households between the 45th and 55th percentiles of the income distribution to obtain labor share values that are not affected by the extreme observations located in the lower and upper tails of the income distribution. In this way, it is possible to obtain the labor share of those located in the middle of the income distribution that is not affected by the extreme observations, particularly by the ones that declared zero income. Table 2 presents the labor share measures for those located between the 45th and 55th percentiles of income distribution.

Table 2. Labor Share Measures (Between 45th and 55th Percentile)

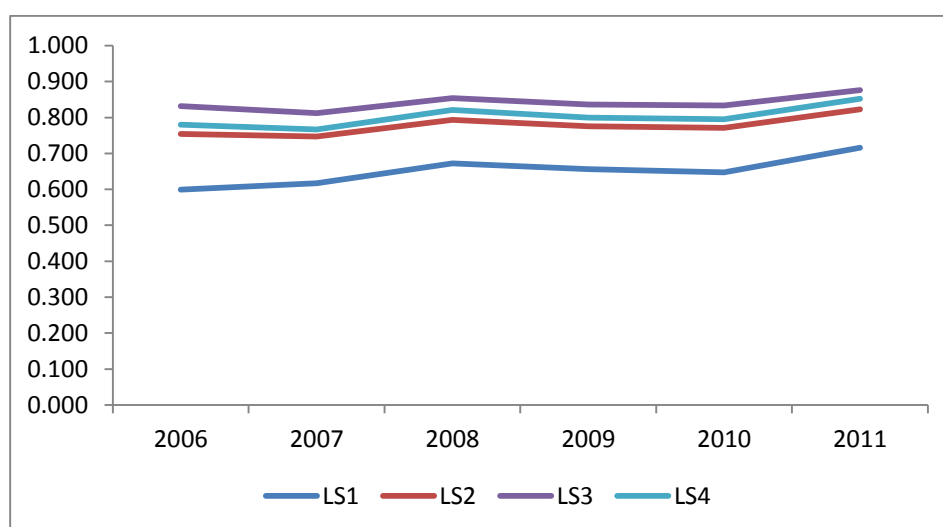
	LS ₁			LS ₂			LS ₃			LS ₄		
	Level	Δ%	Σ Δ	Level	Δ%	Σ Δ	Level	Δ%	Σ Δ	Level	Δ%	Σ Δ
2006	59.9			75.4			83.1			78		
2007	61.7	3.01		74.7	-0.94		81.2	-2.34		76.7	-1.69	
2008	67.2	8.91	11.92	79.3	6.16	5.22	85.4	5.17	2.83	82.1	7.04	5.35
2009	65.6	-2.44	9.48	77.6	-2.19	3.97	83.6	-2.15	0.68	80	-2.63	2.72
2010	64.7	-1.39	8.09	77.1	-0.65	3.32	83.3	-0.36	0.32	79.5	-0.63	2.09
2011	71.6	10.66	18.75	82.2	6.61	9.93	87.6	5.16	5.48	85.2	7.17	9.26

Δ%: Year-on-year percentage changes.

ΣΔ: Cumulative percentage changes.

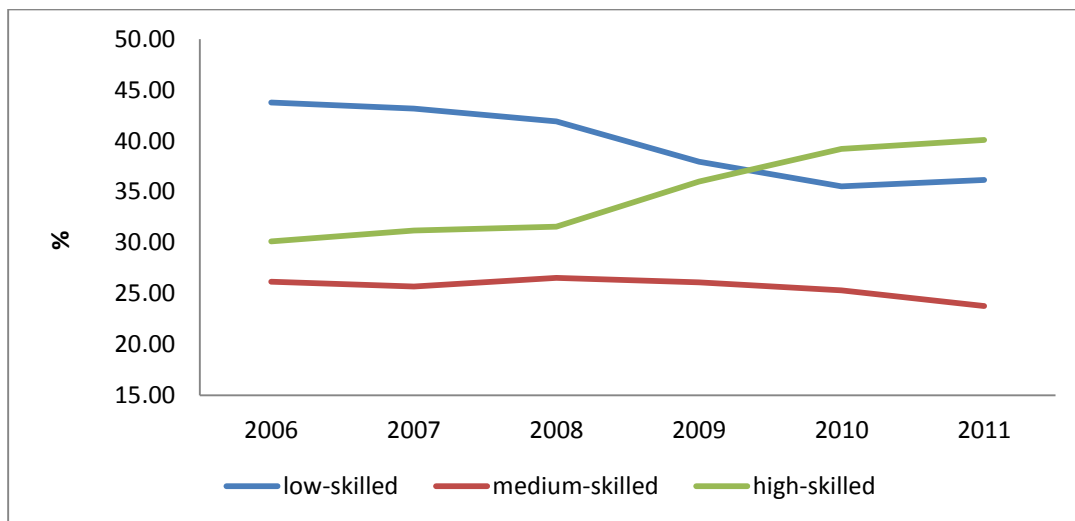
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

Figure 8. Labor Share Measures (Between 45th and 55th Percentile)



After this adjustment, the average labor shares between 2006 and 2011 for LS_1 , LS_2 , LS_3 , and LS_4 increased to 65.12%, 77.72%, 84.03%, and 80.25%, respectively. The trend of labor shares also changed. The increase in labor shares in 2008 still exists, but it is followed by subsequent decreases in 2009 and 2010 and an increase in 2011. As shown in Figure 8, the labor share calculations of the four measures do not just increase, they also converge with each other. In addition, over the analysis period, the labor shares are nearly stable, rather than exhibiting an upward trend. Despite the existence of a significant upward trend after 2008, the levels of the labor share measures are still higher than those prior to 2008. The increase in labor shares during the 2008 global crisis caused by the increase in labor income was accompanied by a decrease in financial income. Substantial capital losses due to the financial crisis are an expected result. In addition, the nominal wage rigidity due to the long-term contracts in the labor market was accompanied by a relatively stable inflation rate, which in the case in Turkey during the 2008 global crisis, may have prevented a labor income reduction in real terms. But in this case, a substantial increase in the labor share due to the crisis necessitates a detailed investigation of labor income from the human capital perspective. Within this context, the skill distribution in the labor income based on educational level is examined. As shown in Figure 9, the increase in the share of income gained from high-skilled employees in the labor income started in 2008, corresponding with a decrease in the share of income gained by low skilled employees in the labor income.

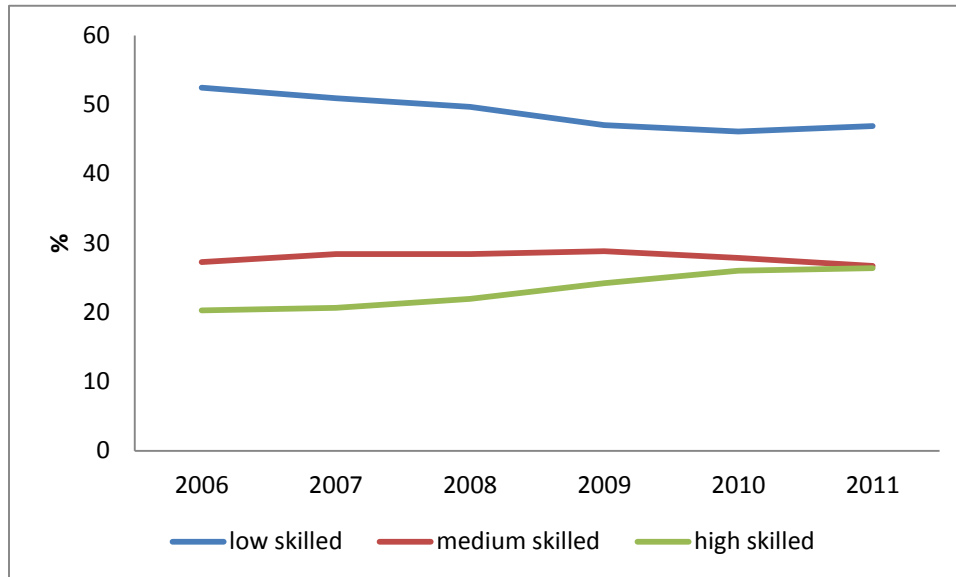
Figure 9. Educational Skill Distribution in Labor Income



Low-skilled =Below high school (primary, secondary, illiterate, and others)
Medium-skilled = High school and vocational high school
High-skilled =University and above.
 Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

The shares of the unskilled and high-skilled regular employees in relation to all regular employees also followed the same pattern as the labor incomes of those mentioned above. As illustrated in Figure 10, the number of high-skilled regular employees started to increase in 2008, while the number of low skilled employees started to decrease in the same year¹⁴.

Figure 10. Educational Skill Distribution Among Regular Employees



Low-skilled =Below high school (primary, secondary, illiterate, and others)

Medium-skilled = High school and vocational high school

High-skilled =University and above.

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

These educational skill-based changes at the time of the financial crisis simply indicate the labor-hoarding phenomenon in the Turkish labor market. As explained above, the labor-hoarding hypothesis suggests that during economic downturns, firms tend to “hoard” their skilled labor due to their low sustainability and high turnover costs, and a reduced labor demand affects unskilled labor severely due to their reduced bargaining power. Apparently, labor-hoarding reflected an important increase in the labor share in the market income since the magnitude of the average income of high-skilled employees is very large in comparison with the average income of low skilled workers¹⁵.

¹⁴ For detailed information on the status in employment by the educational skill distribution, see “Appendix 3. Status in Employment by the Educational Skill Distribution.”

¹⁵ For detailed information on the summary statistics of labor income by the educational skill distribution, see “Appendix 4. Summary Statistics of Labor Income by the Educational Skill Distribution.”

Calculations of the labor share with aggregate data with LSm_6 and LSm_7 are presented in Table 3. The average labor shares for 2006–2009 for LS_5 and LS_6 are 43.7% and 41.2%, respectively. As expected, LS_5 has greater labor share values than LS_6 since LS_5 tends to overstate the labor share, as indicated above. In addition, as can be seen more clearly in Figure 11, the labor shares from both measures have an almost U-shaped trend over the analysis period with the lowest point at 2008, the year of the global crisis. These results indicate that the labor shares calculated by LS_5 and LS_6 are not just relatively small in magnitude, but they also exhibit different behavior from the micro data-based measures during the crisis year.

Table 3. Labor Share Measures With Aggregate Data

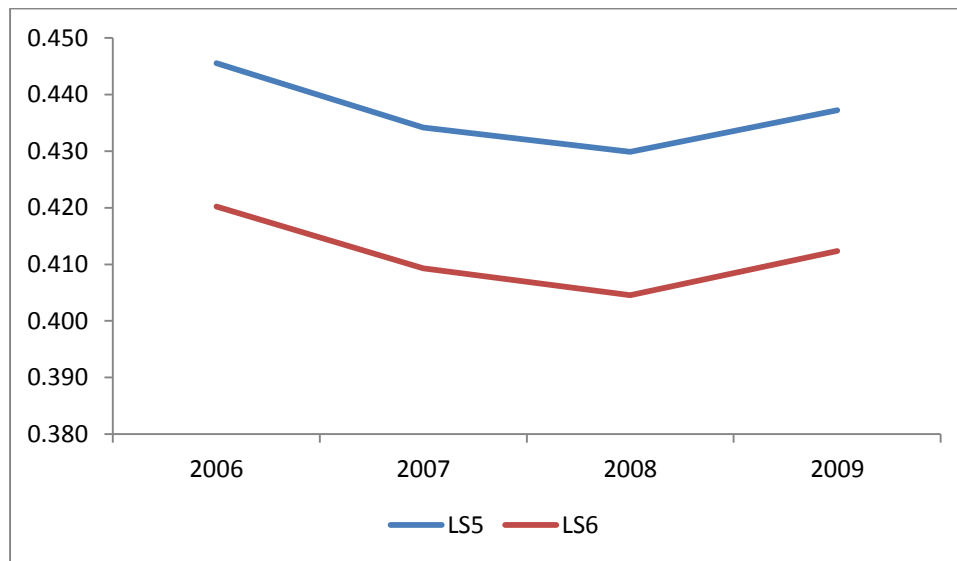
Measures	LS_5			LS_6		
	Level	$\Delta\%$	$\Sigma \Delta$	Level	$\Delta\%$	$\Sigma \Delta$
2006	44.6			42		
2007	43.4	-2.76		40.9	-2.69	
2008	43	-0.93	-3.69	40.5	-0.99	-1.7
2009	41.2	4.37	0.68	41.2	1.73	0.03

$\Delta\%$: Year-on-year percentage changes.

$\Sigma\Delta$: Cumulative percentage changes.

Source: WOID's Socio Economics Accounts and TURKSTAT's Employment Status Statistics of TURKSTAT Own Calculations

Figure 11. Labor Share Measures With Aggregate Data



In fact, before conducting a comparative assessment of the labor shares from micro and aggregate data, it is important to keep in mind that factor shares from aggregate data and micro data cannot be compared directly without taking into account the fundamental differences arising from their definitions. For

instance, the capital income share obtained from aggregate data contains measurement error derived from depreciation, etc. and some income components that cannot be described as capital income in the meaning of flows of capital income to households, such as undistributed corporate profits and central bank profits (Adler and Schmid, 2012, 5). In addition, employee compensation data from the national income contains some components that are not included in workers' wage packets (such as social security payments), and consequently are not reported by individuals in micro data, as indicated before. Therefore, the total market income of individuals cannot be aggregated implicitly to the gross value added of an economy (see, Ryan 1996, Adler and Schmid 2012).

In addition, it is well known that informal employment and self-employment in Turkey are widespread.

TURKSTAT reported that the average informal employment rate in the labor market between 2007 and 2011 was 43.62%. According to SILC data, the average rate of self-employed people in the labor force between 2006 and 2011 was 21.8%.¹⁶ Moreover, the average rate of regular employees (salaried workers) unregistered to social security institutions (i.e., informally employed) between 2006 and 2011 was 20%¹⁷. The average magnitude of the informal sector in the Turkish economy between the same period was calculated as 28.8% by Schneider (2013)¹⁸. In fact, as García-Verdu (2005) showed, a low labor share in the gross value added is also a common feature of Latin American countries with similar characteristics to Turkey. In light of such information, a lower labor share is expected in aggregate data than in micro data for Turkey.

Moreover, Turkey's LS_5 and LS_6 values are lower than the averages in a cross-country comparison. Table 4 presents the average LS_5 and LS_6 values by income classification, the level of development, and the region, calculated by Guerriero (2012). Guerriero (2012) computed the labor share measures by constructing a panel dataset of 141 countries from the 1990 to the 2000s. As an upper middle-income country, Turkey has LS_5 and LS_6 values lower than the averages of upper middle-income countries in both developed and developing countries.

¹⁶ For detailed information on status in employment, see "Appendix 5. Employment Status in Labor Force."

¹⁷ For detailed information on registration status to social security institutions, see "Appendix 6. Registration Status to Social Security Institutions in the Main Job by Status in Employment."

¹⁸ For detailed information on the size of the informal economy of Turkey, see "Appendix 7. Size of the Informal Economy of Turkey and 27 European Countries (Average) (in % of off. GDP)."

Table 4. Average LSm6 LSm7 Values by Income Classification, Level of Development and Region.

	LS ₅	LS ₆
<i><u>Income Classification</u></i>		
Low income	0.7635	0.7529
Lower-middle income	0.7752	0.7466
Upper-middle-income	0.6684	0.6331
High-income	0.7363	0.6883
<i><u>Level of Development</u></i>		
Developing country	0.7015	0.6672
Developed country	0.7363	0.6883
<i><u>Region</u></i>		
Africa	0.6482	0.5846
Americas	0.7131	0.6745
Asia	0.6586	0.6356
Europe	0.7662	0.7191
Oceania	0.7992	0.7646

Source: Guerriero (2012)

Although the labor share reduction during the crisis is compatible with the existing literature on the measurement of the labor share with aggregate data, the absence of the gross value added data calculated with an income approach for Turkey calls into question the accuracy of the results.

7. Conclusions

This study attempted to reveal the direction and magnitude of the effect of the 2008 global financial crisis on the functional income distribution in Turkey via the calculation of the labor share using both micro and aggregate data. The main issue with the labor share calculations is how to impute the entrepreneur income or self-employment income in a way that includes both labor and capital income components. Different labor share measures have been proposed to identify the proportions of these components for aggregate data calculations. For Turkey, the absence of the mixed income component that covers the self-employment income in national accounts makes it impossible to calculate a wide range of labor share measures. In addition, no study has attempted to calculate factor shares with micro data for Turkey. This study aimed to fill in this gap by adopting four different labor share measures to micro data, including those based on mixed income. Within this context, imputing the labor income component of entrepreneur income, the labor shares in the total market income were calculated using

the Turkish SILC data. Then, two measures of the labor share were calculated using aggregate data. The results obtained from the micro data calculations suggest that, although four measures of labor share have differences in their magnitudes, their trends and, more importantly, their behaviors during the 2008 global crisis, are the same. Contrary to the literature-based expectations, the labor shares calculated from micro data showed a substantial and permanent increase during the crisis. More surprisingly, a detailed examination of the labor income based on educational skill attributes of the working population showed that labor hoarding i.e., favoring skilled laborers due to their high replacement cost in the labor market, which should lead to a labor share reduction during the crisis, led to an increase in the labor share due to the very large average labor income of skilled employees relative to unskilled ones. The labor shares obtained from aggregate data are not just relatively smaller than those obtained from micro data, but they also exhibit the opposite behavior as the micro-based ones during the 2008 global crisis. Although a comparison of the factor shares obtained from micro data and aggregate data directly is not appropriate due to the differences arising from their definitions, it is not surprising that relatively smaller labor shares were obtained from aggregate data, considering the large magnitude of the informal employment and informal economy in Turkey. This characteristic of the Turkish economy is one potential reason for the relatively lower labor shares compared to the averages of other countries with the same attributes, such as income classification, region, and level of development. The labor share reduction in aggregate data due to the crisis is consistent with the existing literature, but requires a detailed examination using factor cost determination with different approaches, such as income-based GDP computation.

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APPENDIX 1. SUMMARY STATISTICS FOR INCOME CATEGORIES

Years	Variable	Obs	Mean	Std. Dev.	Min	Max	Value (TL)
2006	Labor Income	13531	3818.829	6420.415	0	144000	51672575
	Entrepreneur Income	13531	2646.287	7794.897	-32537	177931	35806909
	Capital Income	10920	1143.768	3306.552	0	79682.44	12489947
	<u>Total Market Income</u>						<u>99969431</u>
2007	Labor Income	13954	4352.349	6967.009	0	167837.2	60732678
	Entrepreneur Income	13954	2890.389	9622.116	-54626	276531	40332488
	Capital Income	10796	1705.377	6213.21	0	371849	18411250
	<u>Total Market Income</u>						<u>119476416</u>
2008	Labor Income	14424	5227.18	7774.451	0	160000	75396844
	Entrepreneur Income	14424	2988.916	10399.92	-879.07	372000	43112124
	Capital Income	11228	1401.825	4813.979	0	177275.6	15739691
	<u>Total Market Income</u>						<u>134248660</u>
2009	Labor Income	14847	5907.291	9085.195	0	254100	87705549
	Entrepreneur Income	14847	3001.59	10721.52	-50000	350000	44564607
	Capital Income	11870	1769.074	6974.255	0	330677	20998908
	<u>Total Market Income</u>						<u>153269065</u>
2010	Labor Income	15057	6521.068	9715.468	0	147778	98187721
	Entrepreneur Income	15057	3170.691	10502.02	-60000	250000	47741094
	Capital Income	12106	1702.269	6420.574	0	270500	20607669
	<u>Total Market Income</u>						<u>166536484</u>
2011	Labor Income	18513	7490.359	10592.5	0	173887	138669016
	Entrepreneur Income	18513	3671.707	12563.89	-19680	350000	67974312
	Capital Income	15025	1599.841	6664.813	0	420518.3	24037611
	<u>Total Market Income</u>						<u>230680939</u>

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

Obs: Number of observations

Std. Dev.: Standard Deviation

APPENDIX 2. SUMMARY STATISTICS FOR ADJUSTED ENTREPRENEUR INCOME

<u>Years</u>	<u>Obs</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Min</u>	<u>Max</u>	<u>Value (TL)</u>
2006	12825	1750.272	4875.341	-4409	78282	22447238.4
2007	13320	1934.276	5722.963	-40000	180500	25764556.3
2008	13803	1961.772	5849.526	-879.07	120500	27078338.9
2009	14239	2039.255	6526.606	-50000	248801.5	29036951.9
2010	14450	2217.075	6795.429	-9355	250000	32036733.8
2011	17791	2433.442	7352.78	-19680	257693.4	43293366.6

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

Obs: Number of observations

Std. Dev.: Standard Deviation

APPENDIX 3. STATUS IN EMPLOYMENT BY THE EDUCATIONAL SKILL DISTRIBUTION (%)

		Regular employee	Casual employee	Employee	Self employed	Unpaid family worker	Total
2006	low skilled	52.45	90.52	62.32	88.77	90.91	72.87
	medium skilled	27.25	8.86	21.53	8.94	7.73	16.97
	high skilled	20.29	0.62	16.15	2.29	1.37	10.16
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2007	low skilled	50.94	88.76	60.72	87.83	90.12	71.61
	medium skilled	28.41	10.34	21.13	9.68	8.6	17.95
	high skilled	20.65	0.9	18.14	2.49	1.27	10.44
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2008	low skilled	49.68	88.75	58.78	86.75	90.6	69.89
	medium skilled	28.39	10.41	24.8	10.6	8.51	18.76
	high skilled	21.95	0.85	16.43	2.65	0.88	11.36
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2009	low skilled	47.03	88.15	57.73	84.94	91.37	68.32
	medium skilled	28.8	10.56	25	11.72	7.52	19.02
	high skilled	24.18	1.28	17.27	3.35	1.11	12.66
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2010	low skilled	46.11	86.13	53.38	84.98	91.37	66.73
	medium skilled	27.87	12.52	27.35	11.3	7.21	19.14
	high skilled	26.02	1.34	19.28	3.72	1.41	14.18
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2011	low skilled	46.91	88.49	54.3	85.83	91.15	66.28
	medium skilled	26.7	9.9	24.65	10.54	7.38	18.58
	high skilled	26.39	1.61	21.05	3.64	1.47	15.14
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

APPENDIX 4. SUMMARY STATISTICS OF LABOR INCOME BY THE EDUCATIONAL SKILL DISTRIBUTION

Year	Variable	Obs	Mean	Std. Dev.	Min	Max	Value
2006	low skilled labor income	9860	2292.597	3898.045	0	83316	22605006
	medium skilled labor income	2296	5885.28	7024.812	0	139992	13512603
	high skilled labor income	1375	11312.7	11593.61	0	144000	15554963
	Total						51672572
2007	low skilled labor income	9993	2622.656	4307.812	0	133000	26208201
	medium skilled labor income	2504	6226.977	7110.011	0	96000	15592350
	high skilled labor income	1457	12993.91	12230.91	0	167837.2	18932127
	Total						60732679
2008	low skilled labor income	10080	3133.655	4976.66	0	150000	31587242
	medium skilled labor income	2706	7392.575	8272.81	0	122466.7	20004308
	high skilled labor income	1638	14533.15	12064.78	0	160000	23805300
	Total						75396850
2009	low skilled labor income	10139	3280.877	5266.621	0	150000	33264812
	medium skilled labor income	2825	8095.111	8383.301	0	124183	22868689
	high skilled labor income	1883	16766.89	15293.87	0	254100	31572054
	Total						87705554
2010	low skilled labor income	10040	3473.469	5328.184	0	99710	34873629
	medium skilled labor income	2878	8628.795	8509.612	0	86333.33	24833672
	high skilled labor income	2139	17989.91	15898.66	0	147778	38480417
	Total						98187718
2011	low skilled labor income	12265	4087.081	5931.981	0	102775	50128048
	medium skilled labor income	3443	9571.407	9179.787	0	96000	32954354
	high skilled labor income	2805	19816.98	16595.91	0	173887	55586629
	Total						138669032

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

Obs: Number of observations

Std. Dev.: Standard Deviation

APPENDIX 5. STATUS IN EMPLOYMENT (%)

<u>Employment Status (%)</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Regular employee	41.63	42.17	44.77	44.98	47	49.96
Casual employee	9.59	10.33	10.66	9.47	9.37	9.37
Employer	5.22	4.54	4.31	4.09	4.02	3.89
Self employed	23.57	22.14	21.46	22.07	21.23	20.32
Unpaid family worker	19.99	20.83	18.81	19.38	18.37	16.46
Total	100	100	100	100	100	100

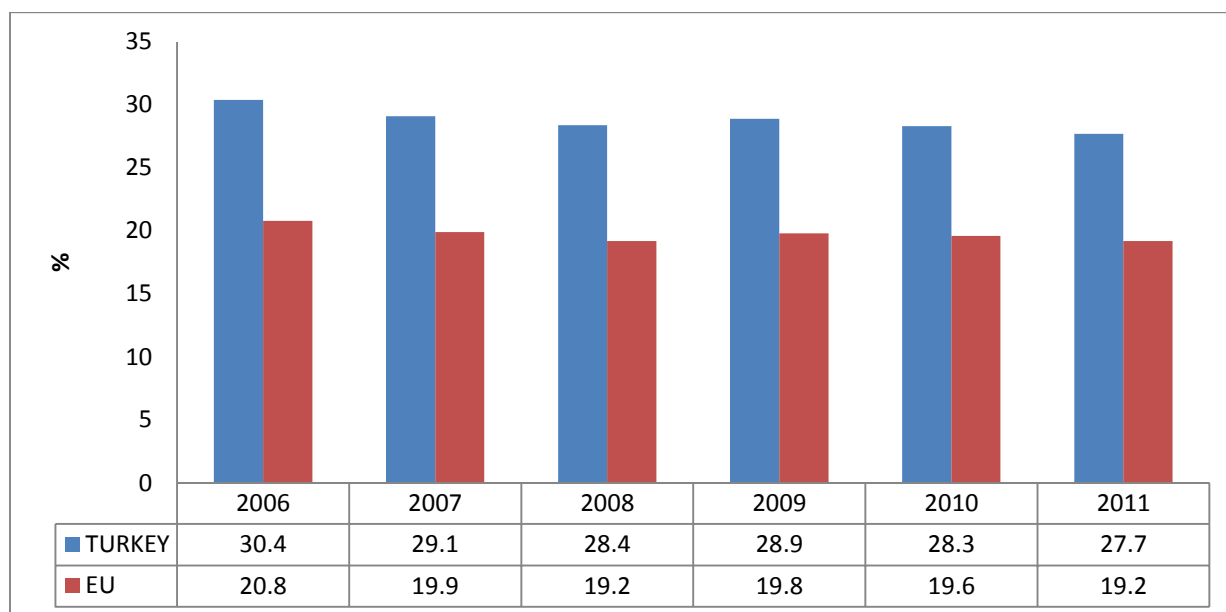
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

APPENDIX 6. REGISTRATION STATUS TO SOCIAL SECURITY INSTITUTIONS IN THE MAIN JOB BY STATUS IN EMPLOYMENT (%)

Years	Status	Regular employee	Casual employee	Employer	Self employed	Unpaid family worker	Total
2006	Registered	73.25	5.86	57.22	22.33	4.18	40.1
	Not registered	26.75	94.14	42.78	77.67	95.82	59.8
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2007	Registered	77.18	8.81	63.72	25.83	5.95	43.3
	Not registered	22.82	91.19	36.28	74.17	94.05	56.6
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2008	Registered	82	14.77	69.73	30.78	5.75	49
	Not registered	18	85	30.27	69	94	51
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2009	Registered	80.57	9.36	68.09	26.88	4.23	46.6
	Not registered	19.43	90.64	31.91	73.12	95.77	53.3
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2010	Registered	81.33	10.61	72.98	27.97	4.29	48.8
	Not registered	18.67	89.39	27.02	72.03	95.71	51.1
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2011	Registered	83	11.86	74.65	30	5.64	53
	Not registered	17	88	25.35	70	94	47
	<u>Total</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

**APPENDIX 7. SIZE OF THE INFORMAL ECONOMY OF TURKEY AND 27 EUROPEAN UNION COUNTRIES
 (AVERAGE) (IN % OF OFF. GDP)**



Source: Schneider (2013)