IJBESAR

International Journal of Business and Economic Sciences Applied Research

Labor Income Share Consequences of Global Financial Crisis: Evidence from Turkey

Sinem Sefil Tansever

pp. 73-84

Volume 10, Issue 2

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR

ijbesar.teiemt.gr

Labor Income Share Consequences of Global Financial Crisis: Evidence from Turkey*

Sinem Sefil Tansever[1]

[1] *Istanbul Commerce University,*

ARTICLE INFO

Article History

Received 4 March 2017;

Accepted 14 May 2017

JEL Classifications

E25, D33, D31

Keywords:
Factor Shares, Labor Share, Market income

ABSTRACT

Purpose:
The aim of this study is to examine the effects of the 2008 financial crisis on the labor share in Turkey, by conducting a comparative analysis of various labor share measures using both micro survey and aggregate data.

Design/Methodology/Approach:
By adopting aggregate data- based labor share measures to micro survey data, four different labor share measures in the total market income were calculated using micro data from the 2006 to 2014 Income and Living Conditions Survey of Turkey. Two additional labor share measures were calculated using aggregated data obtained from World Input Output Database's Socio Economics Accounts.

Findings:
The results of the 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 employee labor income share at the expense of unskilled employee 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.

Research limitations/implications –
Due to the lack of the applicable aggregated data, four labor share measures adopted to micro data could not be used for aggregated data-based labor share calculations. Therefore, a straightforward comparison between the micro and macro data based results of the labor share measures could not be made.

Originality/Value:
As the first attempt using micro survey data for calculation of Turkey's factor shares, this study reveals the labor market consequences of global financial crisis in Turkey in search of the evolution of labor share in the market income and provide a comparison between micro and macro data-based results.

©Eastern Macedonia and Thrace Institute of Technology

1. Introduction

In the post-1980's 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 crises. Others have focused on the effects of these financial crises on the personal distribution of income and functional distribution of income, which deals with the distribution of output between the main factors of production (labor and capital). 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 labor share 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 having 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

†Corresponding Author: Sinem Sefil Tansever
Email: ssefil@ticaret.edu.tr
DOI: 10.25103/ijbesar.102.07

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 low-income earning structure is more susceptible 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.

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.

A comprehensive and long-term investigation into the relationship between financial crises and labor share in Turkey for the post-1980 era cannot be conducted due to the lack of available data. Figure 1 indicates the shares of labor compensation and capital compensation in the gross value added in Turkey[1] 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 started to decrease in 2000 following the deviation from the IMF-supported stabilization program, right before the 2001 financial crisis. The reduction in labor compensation continued from 2000 to 2003 (3.5%).

Unlike the share of employee compensation, the share of labor compensation was affected by the 2007–2008 global crisis by a small percentage (0.5%).

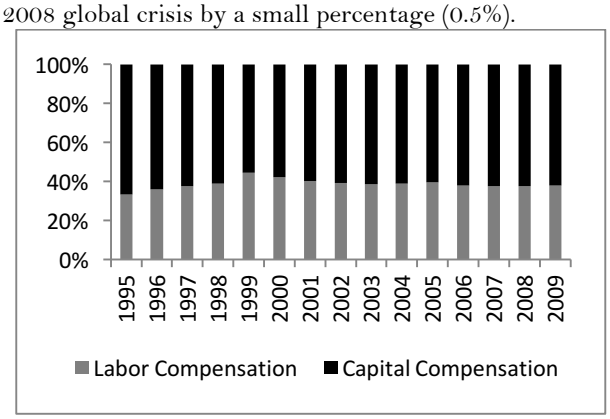

Figure1. Labor Compensation and Capital Compensation in Turkey
Data Source: WIOD's SEA

Figure 2 presents the skill distribution of labor compensation in Turkey[2] 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 throughout 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. 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

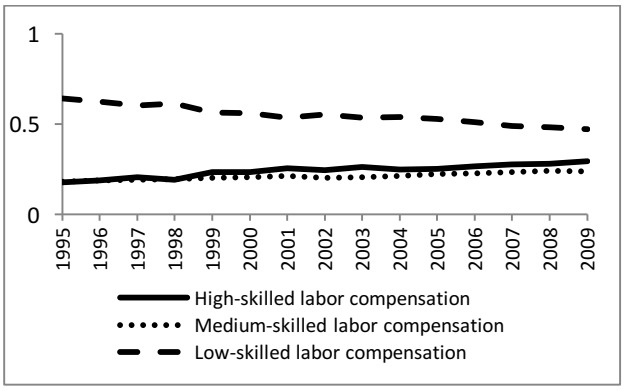

Figure 2. Skill Distribution of Labor Compensation in Turkey
Data Source: WIOD's SEA

[1] In WIOD, labor compensation is computed by using the method proposed by Gollin (2002) (shown as LS_5 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).

[2] 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, p.30)

compensation and medium-skilled labor compensation began to widen in 1999.

The aim of this paper is to examine the effects of this crisis on the labor income share 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, together with the conventional national account statistics. The data were obtained from the Survey of Income and Living Conditions (SILC) in Turkey for the years 2006 to 2014, 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) for comparison.

This paper is organized as follows: Section 2 explains the definition and data issues in measuring labor share. Section 3 presents a literature summary of the effects of the financial crises on labor share. Section 4 presents the data and methodology, and Section 5 presents the results. Finally, Section 6 provides a summary and conclusion.

1.1 Measuring the labor share: Definition and data Issues

Since the labor share is a ratio, the accuracy of the measurement heavily depends on the choice of denominator and numerator. Initially, a few transformations are required for the computation of aggregated income as the denominator of the labor share ratio. Firstly, 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. Secondly, 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, p.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 activities[3] 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 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 (Guerriero, 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 mixed-income SNA data is

[3] 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.

not available for every country[4] (Guerriero 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. Johnson's (1954) Labor Share measure is criticized for ignoring the possible changes in shares of labor and capital income over time by fixing the ratio in advance. The "Labor-basis" measure of Kravis (1959) overstates the labor share by ignoring the capital income component of entrepreneur income. The "Economy wide basis" measure ignores the scale differences of the private unincorporated businesses and large corporations and the "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 self-employed workers is 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, 2001[5]; 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.

The calculation of labor share within the context of the distribution of functional income has been traditionally undertaken via aggregate national account data. However, another line of growing research 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, 2014).

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 of laborers receiving wages, landlords receiving rents and capitalists receiving profits, 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 labor share gives rise to different issues. For instance, using the compensation of employees as an indicator of labor's receipt may result in an overestimation of the wage share because the compensation of employees comprises a number of components, that 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, p. 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.

In the literature, two types of household or individual income are used to estimate factor shares: 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 labor share and financial crisis will be presented in the next section.

1.2. Labor Share and Financial Crisis: The Literature

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 labor share in the GDP, using 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

[4] For a summary of SNA data compiled for each country, see Guerriero (2012).

[5] They used an earlier version version of the methodology applied by Gollin (2002).

increased following a financial crisis: Israel 1976–86, Sri-Lanka, 1978, Indonesia 1979 and 1983, and Greece 1981.

Harrison (2002) analyzed the share of employee compensation in GDP of over 100 countries using SNA data for various periods between 1950 and 1990, and found a negative effect of financial crises on the labor share. 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 an on average 0.5 % reduction in the labor share. 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) used the manufacturing labor share data for Korea, Mexico, and Turkey obtained from the OECD Industrial Structural Analysis Database (STAN) Database and national accounts. For Chile, Thailand, the Philippines, and Brazil, manufacturing data from the Word Development Indıcators (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—using data from the OECD (STAN) Database (for Mexico and Korea) and the national accounts data (for Turkey) from 1994 to 2004. In all countries, despite the quick recovery period in the year after the crisis, the wage share generally continued to decrease for two to three years. Then manufacturing industry data for 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 employee 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 employee 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 also observed in the corporate sector, 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 labor share in Turkey.

2. 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. 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 the 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 data[6] . 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

[6] 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).

incomes[7]. 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 (1959), "labor basis" and "economy wide basis" measures of Kravis (1959) as LS_1, LS_2, LS_3 and LS_4 to micro data[8]. 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 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 3 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 58.7% between 2006 and 2014. From 2007 to 2008, the labor income share increased from 50.8% to 56.2% and then showed a gradual increase until 2014. Entrepreneur income has the second-largest share of the total market income with an average rate of 30% between 2006 and 2014. It gradually decreased from 35.8% to 29.1% between 2006 and 2009 followed by a slight increase in 2011 to 29.5%. The share of the entrepreneur income gradually decreased to 25.9% in 2014. Capital income has the smallest share in the total market income with an average rate of 11.3% between 2006 and 2014. 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 2014. 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 income.

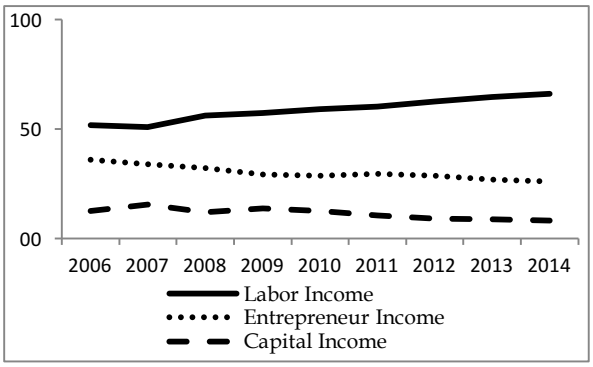

Figure 3. Share of Labor Income, Entrepreneur Income and Capital Income in Total Market Income
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

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[9].

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 4.

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

[8] "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.

[9] 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.

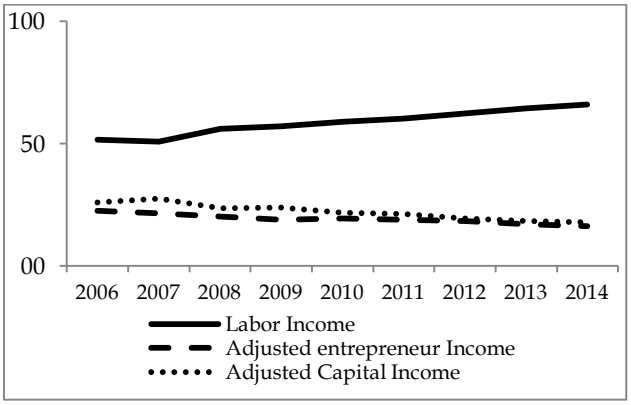

Figure 4. Share of Labor Income, Adjusted Entrepreneur Income and Adjusted Capital Income in Total Market Income

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 2014 are 19.2% and 22.2%, respectively.

Adopting unadjusted labor share, measure of Johnson (1959), "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:

$$LS_1 = \frac{\text{Total Labor Inc.}}{\text{Total Market Inc.}} \quad (1)$$

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

$$LS_2 = \frac{\text{Total Labor Inc.} + \frac{2}{3}\text{Entrepreneur Inc.}_{\text{adjusted}}}{\text{Total Market Inc.}} \quad (2)$$

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

$$LS_3 = \frac{\text{Total Labor Inc.} + \text{Entrepreneur Inc.}_{\text{adjusted}}}{\text{Total Market Inc.}} \quad (3)$$

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:

$$LS_4 = \frac{\text{Total Labor Inc.}}{\text{Total Market Inc.} - \text{Entrepreneur Inc.}} \quad (4)$$

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:

$$LS_5 = \frac{\frac{\text{Compensation of employees} * \text{Total workforce}}{\text{number of employees}}}{\text{Value Added } (-\text{fixed capital} - \text{indirect taxes})} \quad (5)$$

$$LS_6 = \frac{\frac{\text{Compensation of employees}}{\text{Number of employees}} (\text{Total workforce} - \text{employers})}{\text{Value Added } (-\text{fixed capital} - \text{indirect taxes})} \quad (6)$$

3. Results

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 2014 are 58.65%, 71.45%, 77.84% and 72.48%, 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.

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 2014, with the exception of LS_3 decreasing by 0.13% in 2009. Similar trends for each measure can also be seen in Figure 5. Almost overlapping lines of LS_4 and LS_2 lie between the upper line of LS_3 and the lower line of LS_1. On the other hand, the LS_4 and LS_2 values are quite similar to each other throughout the analysis period.

Table 1. Labor Share Measures

Measure	LS_1			LS_2			LS_3			LS_4		
Years	Level	Δ%	∑ Δ	Level	Δ%	∑ Δ	Level	Δ%	∑ Δ	Level	Δ%	∑ Δ
2006	51.7			66.7			74.1			66.7		
2007	50.8	-1.74		65.2	-2.25		72.4	-2.29		64.8	-2.85	
2008	56.2	10.63	8.89	69.6	6.75	4.5	76.3	5.39	3.1	70.4	8.64	5.79

2009	57.2	1.78	10.67	69.9	0.43	4.93	76.2	-0.13	2.97	70.6	0.28	6.07
2010	59	3.15	13.82	71.8	2.73	7.66	78.2	2.62	5.59	73	3.4	9.47
2011	60.1	1.86	15.68	72.6	1.11	8.77	78.9	0.9	6.49	74	1.37	10.84
2012	62.4	3.83	19.51	74.6	2.75	11.52	80.6	2.15	8.64	76.3	3.11	13.95
2013	64.5	3.4	22.88	75.9	1.74	13.26	81.6	1.24	9.88	77.8	1.97	15.92
2014	66.0	2.3	25.21	76.8	1.19	14.45	82.3	0.86	10.74	78.8	1.29	17.21

Δ%: Year-on-year percentage changes., ∑Δ: Cumulative percentage changes.
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

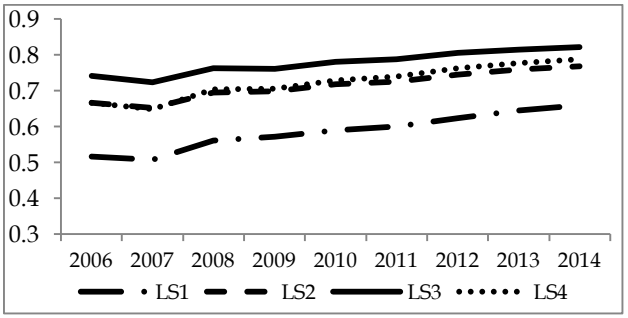

Figure 5. Labor Share Measures
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

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 2014, with the exception of LS_3 decreasing by 0.13% in 2009.

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. After this adjustment, the average labor shares between 2006 and 2014 for LS_1, LS_2, LS_3, and LS_4 increased to 69.40%, 80.67%, 86.30%, and 83.32%, respectivel

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

Measure	LS_1			LS_2			LS_3			LS_4		
Year	Level	Δ%	∑ Δ	Level	Δ%	∑ Δ	Level	Δ%	∑ Δ	Level	Δ%	∑ Δ
2006	59.9			75.4			83.1			78		
2007	61.7	3.01		74.7	-0.93		81.2	-2.29		76.7	-1.67	
2008	67.2	8.91	11.92	79.3	6.16	5.23	85.4	5.17	2.88	82.1	7.04	5.37
2009	65.6	-2.38	9.54	77.6	-2.14	3.09	83.6	-2.11	0.77	80	-2.56	2.81
2010	64.7	-1.37	8.17	77.1	-0.64	2.45	83.3	-0.36	0.41	79.5	-0.63	2.18
2011	71.6	10.66	18.83	82.2	6.61	9.06	87.6	5.16	5.57	85.2	7.17	9.35
2012	75.3	5.17	24	84.9	3.28	12.34	89.6	2.28	7.85	87.9	3.17	12.52
2013	78.6	4.38	28.38	86.6	2	14.34	90.6	1.12	8.97	89.3	1.59	14.11
2014	80.0	1.78	30.16	88.1	1.73	16.07	92.2	1.77	10.74	91.1	2.02	16.13

Δ%: Year-on-year percentage changes, ∑Δ: Cumulative percentage changes.
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

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. Then, they steadily increased between 2011 and 2014. As shown in Figure 6, the labor share calculations of the four measures do not only increase, they also converge with each other.

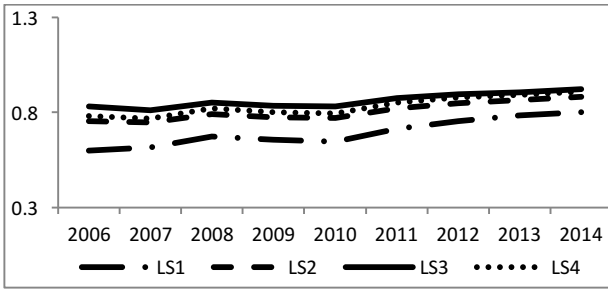

Figure 6. Labor Share Measures (Between 45th and 55th Percentile)

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

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 perfective. Within this context, the skill -distribution in the labor income based on educational level is examined. As shown in Figure 7, 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. 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 8, 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 year.

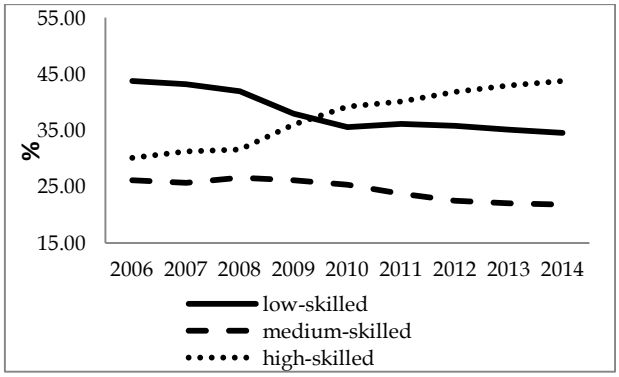

Figure 7. Educational Skill Distribution in Labor Income

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

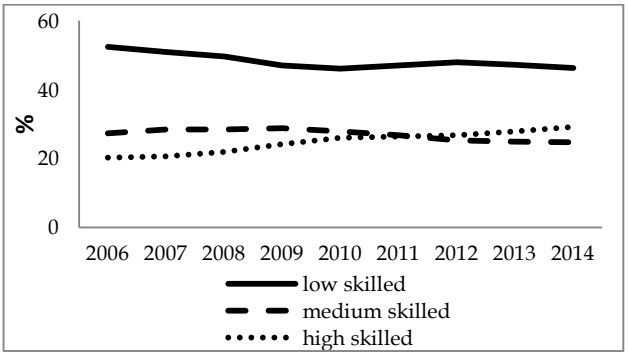

Figure 8. Educational Skill Distribution Among Regular Employees

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 the 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 workers .

The calculations of the labor share with aggregate data with LS_5 and LS_6 are presented in Table 3.

Table 3. Labor Share Measures With Aggregate Data

Measures	LS_5			LS_6		
Years	Level	Δ%	∑ Δ	Level	Δ%	∑ Δ
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

Δ%: Year-on-year percentage changes.

∑Δ: Cumulative percentage changes.

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

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 9, 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.

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,

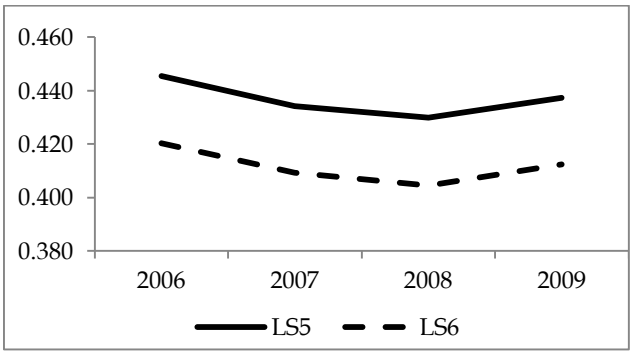

Figure 9. Labor Share Measures With Aggregate Data

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

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, p.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 2015 was 40.29%. According to SILC data, the average rate of self-employed people in the labor force between 2006 and 2014 was 20.8%. Moreover, the average rate of regular employees (salaried workers) unregistered in social security institutions (i.e., informally employed) between 2006 and 2014 was 18.8%. Schneider (2015) calculated the average magnitude of the informal sector in the Turkish economy in 2015 as 28.15% which was 10 percentage point higher than European Union average. 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 for the years; 1990 to 2000. 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.

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.

Table 4. Average LS_5 and LS_6 Values by Income Classification, Level of Development and Region.

	LS_5	LS_6
Income Classification		
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
Level of Development		
Developing country	0.7015	0.6672
Developed country	0.7363	0.6883
Region		
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)

7. Conclusion

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.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence

References

Adler, M. and Schmid, K.D., 2012, "Factor shares and income inequality - Empirical evidence from Germany 2002 – 2008", *University of Tubingen Working Papers in Economics and Finance 34*, University of Tuebingen, Faculty of Economics and Social Sciences.

Agenor, P.R., 2001, "Business Cycles, Economic Crises, and the Poor: Testing for Asymmetric Effects", *World Bank Policy Research Working Paper No: 2700*. Available at SSRN:http://ssrn.com/abstract=632769

Atkinson, A. B., 2009, "Factor shares: The principal problem of political economy?", *Oxford Review of Economic Policy*, 25, 1, pp. 3-16.

Bentolila, S. and Saint-Paul, G., 2003, "Explaining Movements in the Labor Share", *Contributions to Macroeconomics*, 3, 1, pp. 1–31.

Bernanke, B. S. and Gürkaynak, R. S., 2001, "Is Growth Exogenous?", *Taking Mankiw, Romer, and Weil Seriously. NBER Macroeconomics Annual, 16.*

Charpe, M., 2011, "The labour share of income: Determinants and potential contribution to exiting the financial crisis", *World of Work Report 2011*, 1, pp. 55-74.

Diwan, I., 1999, "Labor shares and financial crises", *World Bank, Washington*, DC. Mimeo.

Dufour, M. and Orhangazi, Ö., 2014, "Capitalism, Crisis, and Class: The United States Economy after the 2008 Financial Crisis", *Review of Radical Political Economics*, 46, 4, pp. 461-472.

EC., 2007, "The Labour Income Share in the European Union", Employment in Europe 2007, Directorate-General for Employment Social Affairs and Equal Opportunities, Brussels.

Ellis, L. and Smith, K., 2007, "The global upward trend in the profit share", *BIS Working Papers*, n. 231.

Erumban, A., Gouma, R., de Vries, G., de Vries, K., Timmer, M., 2012, WIOD Socio-Economic Accounts (SEA): Sources and Methods. Groningen, April.

García-Verdú, R., 2005, "Factor Shares from Household Survey Data", *Working Paper, 2005-05: Banco de México.*

Gollin, D., 2002, "Getting income shares right. Journal of political Economy",110, 2, pp. 458-474.

Guerriero, M., 2012, "The Labour Share of Income around the World. Evidence from a Panel Dataset", Institute for Development Policy and Management (IDPM). Development Economics and Public Policy Working Paper Series WP No:32/2012

Guerriero, M. and Sen, K., 2012, "What Determines the Share of Labour in National Income? A Cross-Country Analysis" *IZA Discussion Paper Series*, Discussion Paper No. 6643.

Harrison, A. E., 2002, "Has globalization eroded labor's share? Some cross-country evidence" *Mimeo, University of California, Berkeley, and National Bureau of Economic Research*, Cambridge, MA.

Harrison, A., 2005, "Has globalization eroded labour's share? Some cross country evidence" MPRA Paper No. 39649.

IMF, 2007, "The Globalization of Labor. In W. E. a. F. Surveys (Ed.), World Economic Outlook. Spillovers and Cycles in the Global Economy", Washington D.C

Jayadev, A., 2007. "Capital account openness and the labour share of income", *Cambridge Journal of Economics*, 31, 3, pp. 423-43.

Johnson, D. G., 1954, "The Functional Distribution of Income in the United States, 1850-1952", *The Review of Economics and Statistics*, 36, pp. 175-182.

Kuznets, S., 1959, "Quantitative aspects of the economic growth of nations: IV. Distribution of national income by factor shares", *Economic Development and Cultural Change*, 7,3, pp. 1-100.

Leitner, S. M. and. Stehrer, R., 2012, "Labour Hoarding during the Crisis: Evidence for selected New Member States from the Financial Crisis Survey", *The Vienna Institute for International Economic Studies*. Working Paper:84

Onaran, Ö., 2008, "Life after crisis for labor and capital" in Neoliberal Globalization as New Imperialism: Case Studies on Reconstruction of the Periphery, eds. Yeldan, E., Kose, A. and Senses, F., Nova Scientific Publishers, New York, pp. 171-195

Onaran, Ö., 2009, "From the Crisis of Distribution to the Distribution of the Costs of the Crisis: What Can We Learn from Previous Crises about the Effects of the Financial Crisis on Labor Share?", *PERI Working Papers*, 161.

Ryan, P., 1996, "Factor Shares and Inequality in the UK", *Oxford Review of Economic Policy*, 12, pp. 106-126.

Schlenker, E. and Schmid. K.D., 2013, "Capital income shares and income inequality in the European Union", No. 80-2013. FZID Discussion Paper.

Schneider, F., 2015, "Size and Development of the Shadow Economy of 31 European and 5 Other OECD Countries from 2003 to 2014: Different Developments?", *Journal of Self-Governance and Management Economics* 3 4, pp. 7-29.

Steffen, P. E., 2013, "The Real Income Shares of Labor, Human and Physical Capital from Micro-and Macro-Data" *(No.*

9/2013). DEP (Socioeconomics) Discussion Papers, Macroeconomics and Finance Series.

Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R. de Vries, G. J., 2015, "An Illustrated User Guide to the World Input–Output Database: the Case of Global Automotive Production", *Review of International Economics*, 23, pp. 575–605

Wolff, E. N., and Zacharias, A. (2007). Class Structure and Economic Inequality. Working Paper 487: Levy Economics Institute.

Xiang, X., 2008, *Labor's Share of Income in a Cross-Section of Countries*. PhD Thesis, Graduate College of the University of Illionis at Chicago.