T.R
YILDIZ TECHNICAL UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCE
DEPARTMENT OF ECONOMICS

PhD DISSERTATION

THREE ESSAYS ON INCOME DISTRIBUTON AND THE GLOBAL FINANCIAL CRISIS

SİNEM SEFİL
10710202

ADVISOR
PROF.ENSAR YILMAZ

ISTANBUL
2016

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ABSTRACT

THREE ESSAYS ON INCOME DISTRIBUTION AND THE GLOBAL FINANCIAL CRISIS

Sinem Sefil

May, 2016

Although the possible causes and consequences of the global financial crisis have been reviewed by a great number of studies from different strands of economics, one the most discussed and debated issues is that of income distribution which comprises two measures: personal income distribution which refers to the distribution of national income among individuals or households and the functional income distribution which examines how the national income is shared by the two main factors of production, namely labor and capital. Turkey was hit severely both in terms of export sector revenues and foreign capital inflows due to the financial crisis of 2008-2009, resulting in an increasing current account deficit. Therefore, the personal and functional income distribution consequences of the crisis need careful examination. Aiming to formulate a broad frame of distributional issues, this dissertation consists of three essays where the main focus is income distribution. The first essay illustrates the role of income distribution and inequality as both a cause and a consequence of the financial crises, with a special focus on the subprime crisis and its transformation to a global financial crisis in 2008 by conducting an extensive literature review. The second essay examines the mechanism responsible for the behavior of the income and earning inequality in Turkey during the global financial crisis by using micro survey data compiled by TURKSTAT. The third essay investigates the effects of the global financial crisis on the functional income distribution in Turkey by conducting a

comparative analysis of various labor share measures using both aggregate and micro data sources provided by TURKSTAT. Aiming to provide a comprehensive examination of the distributional causes and consequences of the global financial crisis for Turkey, this study is the first attempt to employ the static decomposition analysis of Theil-t index and to examine the functional income distribution by using Turkish micro survey data.

Keywords: Global financial crisis, personal income distribution, functional income distribution

ÖZ

GELİR DAĞILIMI VE GLOBAL FİNANSAL KRİZ ÜZERİNE ÜÇ DENEME

Sinem Sefil

Mayıs, 2016

Olası sebep ve sonuçları iktisadın farklı kollarına ait pek çok çalışma tarafından işlenen global finansal kriz kapsamında, en çok araştırılan ve tartışılan faktörlerden biri gelir dağılımıdır. Gelir dağılımı ifadesi, ulusal gelirin bireyler arasındaki paylaşımını ifade eden bireysel gelir dağılımı ve ulusal gelirin iki ana üretim faktörü olan emek ve sermaye arasındaki bölüşümünü ifade eden fonksiyonel gelir dağılımı olmak üzere iki farklı ölçüm düzeyini kapsamaktadır. 2008-2009 global finansal krizi tarafından, dış ticaret açığında artışla sonuçlanan ihracat gelirleri ve yabancı sermaye akımlarındaki sert düşüş kanallarıyla ağır bir şekilde etkilenen Türkiye'de, krizin bireysel ve fonksiyonel gelir dağılımı üzerindeki etkilerine dair özenli bir çalışma gereksinimi doğmuştur. Dağılımsal sorunlara dair geniş bir çerçeve çizmeyi amaçlayan bu tez, ana konuları gelir dağılımı olan üç makaleden oluşmaktadır.

İlk makale, eşitsizlik ve gelir dağılımının finansal krizlerin sebebi ve sonucu olarak rolünü, 2008'de yaşanan global finansal kriz üzerine yoğunlaşarak, geniş bir literatür taraması ile incelemektedir. İkinci makale, global finansal kriz esnasında Türkiye'de gelir ve kazanç dağılımını etkileyen faktorleri, Türkiye İstatistik Kurumu tarafından derlenen mikro araştırma verilerini kullanarak araştırmaktadır. Üçüncü makale, global finansal krizin Türkiye'de fonksiyonel gelir dağılımı üzerindeki etkilerini, Türkiye İstatistik Kurumu'nun temin ettiği mikro ve ulusal düzey veriler ile emek payına dair farklı ölçekleri hesaplamak yoluyla karşılaştırmalı olarak analiz etmektedir.

Global finansal krizin Türkiye için dağılımsal sebep ve sonuçlarına dair kapsamlı bir araştırma sunmayı amaçlayan bu tez, Theil-t indeksini statik ayrışma analizine tabi tutan ve fonksiyonel gelir dağılımını mikro araştırma verisiyle analiz eden Türkiye ekonomisine dair ilk çalışmadır.

Anahtar kelimeler: Global finansal kriz, bireysel gelir dağılımı, fonksiyonel gelir dağılımı

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1. PARADIGMATIC PERSPECTIVES ON INCOME DISTRIBUTION AND FINANCIAL CRISES

1.1. Introduction

Although the roots and impacts of the financial crises have been extensively studied in the economics literature, income distribution and inequality have been among the issues which have always been a matter of discussion. The role of the inequality among individuals and factors of production on the occurrence of financial crises has long been a controversial issue and the stance of the economists on this debate is mainly rooted in their different views on the distributional mechanism in the economic system. Although the effects of income redistribution among households and the main factors of production on the economic system was a conspicuous subject in the discussions of the 19th century classical economists, in particular Marx, Smith, Ricardo and Keynes, the dominance of the neoclassical economics which does not consider inequality a destabilizing factor, threw inequality out of focus in the last quarter of the 20th century. However, economists from heterodox tradition, particularly Marxists and post-Keynesians have continued to examine the impacts of the changes in income distribution on the economic system (Goda, 2013). Crises have also been theorized predominantly by heterodox economists, since the neoclassical or mainstream economists see the economy as a stable system and crises as exogenous shocks, while economists from heterodox tradition agree that capitalist economies are inherently unstable and prone to crises due to their endogenous forces. The eruption of the global financial crisis in 2008 stimulated interest in the relationship between income inequality, credit booms, and financial crises (Bordo and Meissner, 2012). High levels of economic inequality and the increasing top income prior to the occurrence of the subprime crisis have been discussed and examined by an increasing number of economists from different strands of economics. Such discussions have revealed that many of the individual explanations

of financial crises in different economic traditions do not offer a complete overview of the subprime crisis and its transformation to the global financial crisis itself.

Apart from the large number of theoretical discussions among various economic strands on the role of inequality and income redistribution in the occurrence of financial crises, another line of research has focused on the distributional consequences of financial crises. From a theoretical point of view, the distributional effects of financial crises are ambiguous (De Beer, 2012) and have overlapping transmission mechanisms, which make it difficult to generalize the distributional consequences of financial crisis in a theoretical scheme.

Financial crises and policy responses to them have varying effects on different groups of people in a society. The magnitude and direction of these effects are not the same on the rich and on the poor; on the farmers and manufacturing workers or on people possessing assets in the form of real estates, US dollars and local currencies. While some groups gains, others lose a lot or lose less. Even though poor people do not consistently lose more than the other income segments do, this is an uncertain issue which varies by each case of financial crisis and county (Ferreira et al, 1999).

By conducting an extensive literature review, this paper attempts to illustrate the role of income distribution and inequality as both a cause and a consequence of the financial crises, with a special focus on the subprime crisis and its transformation to a global financial crisis. Considering the fact that different strands of economics have diverging theoretical interpretations as to why financial crises occur, it is necessary to begin initially with a comprehensive explanation of different theories of financial crises and the role of income distribution in these theories before the role income distribution in the occurrence of the global financial crisis a can be fully comprehended. For the sake of simplicity, this review will be limited to three heterodox schools of economics whose theories of financial instability are widely used to explain the global financial crisis—Marxism, post-Keynesianism, and the Austrian school—and to the two dominant schools of economics at the present time—neoclassical and new-Keynesian economics—which will be referred to as

mainstream economics. The distributional transmission channels of financial crises will also be reviewed in a non-theoretical framework prior to the examination of the distributional consequences of the global financial crisis.

This paper is organized as follows: Section 1.2 discusses the theoretical arguments of the heterodox and mainstream crisis theories on the role of income distribution as a cause of the financial crises and their further explanations in the frame of global financial crisis. Section 1.3 reviews the distributional channels of the financial crises before explaining distributional effects of global financial crisis. Finally Section 1.4 provides a conclusion.

1.2. Income Distribution as a Cause of Financial Crisis

The role of income distribution in the occurrence of the financial crises has been argued by various economists from different economic strands. Since the explanations offered by the different schools of economic though on this controversial issue are shaped by their own theoretical origins, an initial survey on the crisis theories of the different economic strands is essential to comprehend the theoretical explanations on the role of the income distribution as a cause of the global financial crisis, as it is indicated above.

1.2.1. Heterodox Crisis Theories and Income Distribution

Heterodox economics is an umbrella term covering various approaches, methodologies, schools, or traditions of economics that are considered outside of mainstream economics due to their rejection of the stylized notions of conventional economics (Lawson, 2015). One of the common denominators on which different heterodox strands of economics agree is that capitalist economies are inherently unstable and tend to have instability due to their endogenous contradictions. The tendency of the economic system to have instability has been discussed by a number of heterodox theories, which mostly belong to Marxist, post-Keynesian, and Austrian schools in particular. However, there are diverging ideas on the relationship between

income distribution and the occurrence of crises not just among these strands, but also within each strand.

Marxian economics puts the inequality and redistribution at the heart of the economic analysis relying on its main mechanism, which focuses on the class struggle between workers and capitalists. Based on the fundamental notion that capitalist economy is an inherently unstable system with fundamental self-contradictions that ultimately cause an economic downturn, All Marxian crisis theories see the fall in the profit rates stemming from internal inconsistencies in the capitalist system as the trigger of the crisis. Marxian economists' disagreement on the main reason for the fall in the profit rates brought on the development of different Marxian crisis theories. This variety of crisis theories in Marxian economics mostly arose from the absence of an integrated crisis theory in Marx's own discussions. Marx explained the fall in the rate of profits as related to the tendencies of under-consumption, over-production, over-accumulation, and disproportionality with respect to labor, without prioritizing any of them (Clarke, 1994). On that note of Marx's text, three main Marxian theories emerged to explain capitalist crises. In spite of the fact that none of the original versions of these theories are related to the financial markets and credit booms in principle, they have all been reinterpreted by the heterodox economists to explain the global financial crisis. One of these three approaches is the "under-consumption/over-production" theory of crises, which explains a crisis as a result of the fall in the rate of profits derived from under-consumption, i.e., lack of effective demand that is necessary for the consumption of the commodities overproduced by capitalists. The second approach is the "profit squeeze" theory that claims that either the scarcity "variable capital (labor)" or/and "constant capital" (e.g., raw material, machines) eventually result in a squeeze in capitalist' profits with higher costs. The last one is the theory of the "tendency for the rate of profit to fall" that emphasizes the role of increasing ratio of constant capital to variable capital in crisis as a consequence of the inner contradiction of the capitalist process (Wright, 1975; Shaikh, 1978; Weisskopf, 1978; Fine and Harris, 1979; Clarke, 1994; Evans, 2004; Kotz, 2011; Maniatis, 2012; Goda, 2013).

According to Marx's theory, surplus value, which is the source of capitalists' profit, is obtained by the exploitation of variable capital. Output is composed of two components, which are the output paid as wages to workers and the output received by capitalists; the smaller the first component, the higher the surplus value created by labor. So other things being equal, the surplus value increases with a decreasing real wage and increasing working time and/or output. On the other hand, the main success indicator of capitalists is the profitability of their investments in variable and constant capital. Thus, they prefer to use less labor per unit produced to reduce unit costs (Goda, 2013). In addition, Marxian theory accepts unemployment as inherent in a capitalist economy and gives it significant importance for the comprehension of income and wealth distribution.

According to the supporters of the under-consumption/over-production theory of crises, unequally distributed income among classes and/or individuals is the main underlying reason behind capitalist crises Going back to the discussions of Thomas Malthus in the 1820s, the under-consumptionist tradition includes various interpretations. A fundamental argument of all the different strands of this theory is that a capitalist economy tends to create an excessive production capacity, and the lack of effective demand for consuming the output results in an absolute economic downturn (Baran and Sweezy, 1966; Stanfield, 1977; Devine, 1983; Clarke 1994; Webber, 1996; Magdoff et al, 2002; Goldstein and Hillard, 2009; Maniatis, 2012; Ticktin, 2012; Goda, 2013; Howard and King, 2014; Fuchs, 2014). Since capitalists always self-preserve by profit maximization, they aim to increase their output and reduce employment and salaries. On the other hand, since the goods produced by capitalists need to be sold, the success of the capitalists' strategy is ultimately bounded by the purchasing power of the working class. When the production reaches a point where it cannot be absorbed by effective demand, capitalists' rate of profit subsequently falls. Eventually, a widening income gap, i.e., increasing income inequality between classes, results in a crisis.

The profit squeeze theory, on the other hand, claims that reduced income inequality between workers and capitalists causes a fall in the rate of the profit, which results in a crisis. According to this theory, being in search of more profit, capitalists

perpetually expand their scale of operation, which leads to a reduction in the unemployment rate (i.e., a reduction in the reserve army of the unemployed). As a consequence, workers' and unions' bargaining power increases, resulting in an increase in real wages and squeezing profits (Weisskopf 1979, Glyn and Sutcliffe 1972; Goldstein, 1985; Wood, 1987; Clarke, 1994; Moseley, 1997; Hein, 2006; Goda, 2013; Baronian, 2013). This theorem indicates that a change in the income distribution in favor of workers is the main cause of capitalist economic crises.

According to the third Marxist theory, the "tendency for the profit rate to fall," income redistribution among classes is not a source of capitalist crises, but it is one of the consequences of capitalist accumulation. Being under the pressure of increasing productivity and expanding production with a high level of competition, capitalists tend to replace the variable capital with constant capital, i.e., replacing the labor force with more machinery. The rate of profit starts to fall at a point where the increase in the constant capital is greater than the increase in the level of exploitation as a result of the high level of mechanization in the production process; then, the economic downturn begins. (Christiansen, 1976; Lebowitz, 1976; Shaikh, 1978; Weeks, 1982; Kuhn and O'Lincoln, 1989; Reuten, 1991; Laibman, 1992; Webber, 1996; Bell and Cleaver, 2002; Evans, 2004; Giacché, 2011; Goda, 2013; Dasgupta, 2013). Consequently, the increasing mechanization in production process, which is the main reason for capitalist crises, is not derived from the increasing bargaining power of workers or the high level of real wages; rather, it is caused by the capitalists' pursuit of more profit.

Building upon a radical interpretation of The General Theory of John Maynard Keynes and welcoming the contributions of a wide range of fields of study such as political science, sociology, anthropology, history, and psychology, post-Keynesian economics is a heterogeneous theory consisting of various strands which all meet at some common features, such as their emphasis on institutional and social factors, non-neutrality of money, critical realism, uncertainty of economic processes, and accepting the effective aggregate demand as the determinant of the economy (Lavoie, 2006; Goda, 2013). As such in the Marxian economics, the conflict between capitalists, workers, and rentiers and the redistribution of income and wealth among

them are at center of the post-Keynesian analysis (Arestis, 1996). The theorizing of financial crises in post-Keynesian tradition is mostly shaped by the financial instability hypothesis of Minsky (1982), the stock-flow-consistent model of Godley (1999) and financialization theory.

Forming a link between real and financial sectors, Minsky's (1982, 1986) financial instability hypothesis emphasizes the dynamics debt structure of the non-government sector as the key element that causes crises which are inherently unavoidable due to the functioning of the financial markets in the economic system. Minsky identified three types of borrowing positions for firms: hedge financing, speculative financing, and Ponzi financing. While the first one is based on making future payments by a certain income and including a minor risk for the creditor, the second is based on making future payments by a combination of cash (for covering interest due) and debt (re-borrowing for the principal payments) and including a moderate level of risk for the creditor. The third one, on the other hand, relies on making future payments by only re-borrowing, and thus contains the highest level of risk for the creditor. The higher the risk incurred by the creditor, the higher the risk premium incurred by the borrower. In a capitalist economy, firms tend to incur debt for financing their future investments with high return expectations. With the increasing investment demand, profits will also increase, and this economic loop results in an economic boom. Inevitably, when the rise in the investment supply falls behind the drastic rise in the investment demand, short-run interest rates increase rapidly with a domino effect that induces increased medium and long-run rates. As a result of the continuously decreasing rate of profits, firms become unable to fulfill their financial commitments and turn to more speculative and Ponzi financing options. Consequently, the financial system collapses (Minsky, 1982, 1986; Taylor and O'Connell, 1985; Gatti and Gallegati, 1990; Keen, 1995; Argitis, 2003). Minsky's financial instability hypothesis offers a comprehensive explanation for the financial disturbances in post-war periods. However, being limited to firms only and their pursuit of higher rates of profit, its theoretical framework is mainly based on the expectations and effective demand and lacks an examination of the relation between income distribution and financial stability (Jarsulic, 1988; Ezuho, 2011). On the other hand, there have been

some efforts to extend this hypothesis with an inequality perspective, which will be discussed further.

Another post-Keynesian effort that focuses on the dynamics of the private sector's debt accumulation causing a crisis is the stock-flow consistent approach, mostly formed by Godley (1999) and Godley and Lavoie (2001, 2007). The main principle of this approach is dividing the economy into sectors and examining the flows between them based on the notion that every money flow comes from somewhere and goes somewhere. Developing the model of Godley (1999), Lavoie and Godley (2001) and Godley and Lavoie (2001, 2007) proposed a more elaborated model in which the production decisions of private sector (firms) are financed by money created by banks; they claimed that the main reason the capitalist economy is pushed toward a crisis is the unsustainable imbalances in inter-sectoral flows. Without setting an assumption on different social classes' propensity to consume, a reduction in real wages caused by an increase in the costing margin has a distorting effect on output and the labor market due to the higher inflation rates linked to a greater struggle over the distribution of income arising from the increases in prices (Lavoie, 2008; Bezemer, 2009; Le Heron, 2009, 2011; Michell and Toporowski, (2012; Keen, 2015). On the other hand, this approach has lack capturing the income distribution among individuals in a macroeconomic sector or dividing households into rentiers and households (Michell, 2014b).

Post-Keynesian economists have been discussing the distorting effects of "financialization" on the economy within the context of the struggle of the different classes over income distribution. The increasing influence and significance of the financial motives, financial institutions, and financial actors in the functioning of the global economic system have been widely defined as financialization in the literature (Stockhammer 2004, 2005, 2008; Epstein, 2005; Hein, 2009; van Treeck, 2009a, 2009b). In comparison with the mainstream models that ignore the effective demand and the struggle between social classes and associate the increasing role of financial intermediation with increasing growth in the long run, post-Keynesian effective demand-based models have been heavily pessimistic about the effects of financialization on the income distribution and growth process (Hein, 2009). While

the early post-Keynesian business cycle models do not include the interaction between financial markets, inequality, and economic stability, post-Keynesian studies examining this issue and interpreting the post-Keynesian business cycle theories with a synthesis of financialization began to show an increase in the 90s, in parallel with the increasing in the degree of financialization and economic instability.

Resulting in an income redistribution in favor of rentiers, financialization affects the aggregate investment level, negatively increasing shareholder value orientation, i.e., ensuring high share prices by paying high dividends to shareholders and buying them back instead of using retained profit to boost the capital. As a result, non-financial firms that have difficulties financing their investments and their debt accumulation become unstainable. Therefore, in finance-dominated capitalist economies, capital accumulation tends to decline (Stockhammer, 2004, 2005, 2008; Orhangazi, 2008; van Treeck, 2009a; Hein, 2012; Sen and DasGupta, 2015) and when the fall in the investment activities cannot be compensated by household consumption, a crisis erupts. Moreover, financialization may trigger a crisis if it causes an unstainable debt accumulation in the household sector due to the decreasing wage share, which leads an increase in the income inequality, which will be discussed further.

Another heterodox strand of economics whose arguments on financial instability have been used widely to explain the global financial crisis is the Austrian school of economic thought. Unlike the Marxian school with its belief that the free market economy is self-destructive and the post-Keynesian school with its skepticism on free markets, the Austrian school puts great emphasis on the free market for the sustainability of the economic system, similar to neoclassical economics, and defines the free ownership of the production factors and the mechanism of price as the most efficient way to allocate income among individuals (Eren, 1987, 1992; Malinen, 2012). In other words, Austrian economics see income inequality as a natural consequence of economic agents' productive contributions. According to the Austrian theory, an intervention involving income redistribution would damage the economy instead of stimulating it. For instance, a tax increase causes the destruction of wealth or the confiscation of property that would otherwise have been invested (Maier and Koumparoulis, 2012). The explanation of Austrian economics as to why

financial instability occurs is offered by the Austrian Business Cycle Theory, which claims that crises occur due to the artificial and unsustainable credit-induced booms deriving from the state institutions' intervention in the credit market. Low interest rates induced in the market by central banks tend to increase borrowing from the banking system. The resulting excessive credit creation and a mismatch between savings and investment eventually cause instability in the financial markets, leading to a recession (Lin, 2006; Sy, 2012; Maier and Koumparoulis, 2012; Tiganas and Peptine, 2013). Unlike the other crisis theories, the Austrian Business Cycle Theory sees a crisis as a healing time that must be experienced by the economy to recover (Roberts, 2010).

1.2.2. Mainstream Crisis Theories and Income Distribution

Orthodox/mainstream economists see crises as exceptional deviations from the routine mechanism of a self-regulating economic system instead of being inherent or internally generated in a capitalist economy, as the heterodox tradition supports. In an economic environment where there is no asymmetrical information, all the economic agents are rational and behave homogenously with the motive of utility maximization, full employment always prevails, and financial markets are fully efficient in a world of perfect certainty where the neutrality of money holds. Relying on these strong assumptions, an efficient market hypothesis asserts that asset prices always reflect all relevant information; thus it is impossible to cheat the financial market and obtain excessive profits by purchasing undervalued assets or selling overvalued assets (Fama, 1970; Nesvetailova, 2007; Goda, 2013). In neoclassical theory, supply and demand mechanisms always make certain of a tendency toward an equilibrium state by accommodating the most efficient economic outcome possible. Thus, crises can only outbreak as a consequence of external shocks that disturb the equilibrium impermanently, or internal disturbances, which can interrupt the market equilibrium (Clarke, 1994). In other words, crises are considered a self-adjustment mechanism of the economy to overcome the disturbance resulting from both external and internal shocks.

On the other hand, studies conducted by mainstream economists on financial crises in developing countries have revealed that this orthodox explanation of crises does not offer a plausible ground for economic downturns. As a new-Keynesian economist, Krugman (1979) offered a model on financial crises known as the "first-generation model." This model is one of the first mainstream explanations of crises that sees the weakness of economic fundamentals to the balance of payment imbalances as the main source of financial crises (Tularam and Subramanian, 2013). Following the increasing frequency of financial crises in emerging countries in the 90s, the first-generation model pioneered its successor models, which are the second-, third-, and fourth-generation models of financial crises (Munoz, 2011). After the collapse of the European Exchange Rate Mechanism (ERM) in 1992–1993, Obstfeld (1994) proposed the second-generation model to explain this incident, which the first-generation model was unable to explain given the absence of the weakness of economic fundamentals. This type of model explains the crises as a result of the exchange rate regime's changing expectations on the government's policy choice by making a trade-off between credibility in the long-run and flexibility in macroeconomic activities in the short-run (Alves et all, 201).

Following the eruption of the Asian crises of the late 1990s, the third-generation crisis model emerged that investigates how quickly worsening in balance sheets can lead to a crisis by inducing fluctuating asset prices and exchange rates. This generation of models focuses on the self-fulfilling structure of crises and vulnerabilities in corporate and financial sectors arising from the balance sheet deterioration that can cause financial crises. In particular, the banking sector with large debts and over-borrowing is likely to trigger a crisis if a sudden change in expectations causes a run on the bank (McKinnon and Pill, 1996; Krugman, 1999, Chang and Velasco, 2000; Claessens and Kose, 2013).

The fourth-generation crises model differs from the previous ones that can be identified as a currency crisis model. It is mainly a general financial crisis model that examines the other asset prices as the major sources of financial crises (Krugman, 2001). Extending the earlier literature by introducing the institutional issues associated with macroeconomic vulnerabilities, which cause problems in the

banking sector, fourth-generation models also focus on the political indicators in anticipating financial crises (Tularam and Subramanian, 2013). When the banks and macroeconomic indicators are fragile enough, a sudden change in expectations can trigger a financial crisis.

A more effective new-Keynesian opposition to the orthodox explanation of crises assuming that there is no asymmetric information in efficient and endogenously stable markets is the asymmetric and imperfect information theory proposed by Akerlof (1970) and Stiglitz and Rothschild (1976). This theory implies that economic transactions include participants with different degrees to access to information and a market participant with a better degree to access information to take advantage of it for gaining more profit. Despite the existence of financial intermediaries for minimizing the information and transaction costs, the resulting inefficiency can create market disequilibrium endogenously. Therefore, a serious crisis may outbreak due to the internal imbalances and external shocks as well as a sudden change in expectations (Stiglitz, 1992; Basu, 2001; Claus and Grimes, 2003; Rosser, 2003; Crawford et al., 2015).

The asymmetric information theory gave rise to another opposition to the inherent stability notion of market, which is known as the behavioral finance theory (Akerlof, 2002, 411). Being introduced by Kahneman and Tversky (1979) and developed by Shefrin and Statman (1994), Shiller (1995, 2000), Shleifer (2000), and Akerlof and Shiller (2009), the field of behavioral finance sees financial crises and bubbles as the result of the emotional and cognitive biases of the market participants.

However, stochastic general equilibrium (DSGE) modeling, which is the most widespread mainstream method of recent times used by both policymakers and academics, asserts that the economy will always tend to achieve equilibrium. Essentially a short-run model, this approach establishes fully structural models and facilitates the analysis of policies by setting strong assumptions about the markets, variables, and functional forms. Under the assumptions of utility maximizing and rational consumers' expectations, profit maximizing producers, and the existence of representative agents with rational expectations, the market structure may be

disrupted, but market clearance will occur by a dynamic adjustment process in a few quarters (Dullien, 2009; Garcia, 2011; Fagiolo and Roventini, 2012). On the other hand, because of their disadvantages and failure in predicting the 2008 global financial crisis, the practicability and extensive usage of DSGE models have been criticized by mainstream economists such as Buiter (2009), Spaventa (2009) Stiglitz (2011), and Krugman (2011).

As it can be understood from the previous discussion, changes in income distribution do not have a significant role in the mainstream explanation of crises. From the orthodox economics point of view, crises are not inherent to the economy, and an instability that can only arise from exogenous shocks will be cleared by the forces of supply and demand. However, the first-, second-, third-, and fourth-generation mainstream models see crises as inherent to the economy due to the weaknesses of economic fundamentals. This weaknesses are derived from the sudden changes in expectations and the income redistribution, which may occur through several channels, such as the slowdown in economic activities, changes in relative prices, and fiscal contraction, is just one of the outcomes of crises.

Furthermore, behavioral theories of finance do not discuss the changes in individuals' inequality levels as the source of the changes in their behaviors (Goda, 2013). Likewise, As Stiglitz (2011) stated, DGSE models that mainly rely on the representative agent with rational expectations have no room for distributive issues. For instance, changes in interest rates and wages may have serious distributive effects in general, but the structure of DGSE models lets the workers compensate for their loss in wage with their profit income gained as "owners."

However, the inability of these mainstream models and approaches to predict and explain the 2008 global financial crisis has motivated mainstream economists to re-assess their basic assumptions and re-evaluate the role of income distribution and inequality in their explanation of crises. These discussions will be examined in detail further.

1.2.3. The Role of Income Distribution in The Heterodox Explanations of The Global Financial Crisis

The orthodox explanations of crises' failure to anticipate and estimate the eruption of the U.S. economy's subprime crisis in 2008 and its transformation to a global financial crisis that rapidly spread to other economies gave a rise to interest in Heterodox tradition in economics.

Within this context, Marxian explanations of crises have been revisited and reinterpreted by heterodox political economists, particularly from the Post-Keynesian strand. These interpretations of recent crisis can be roughly grouped in two classes: explanations that see the decreasing profit rates in the real sector as the main cause of the subprime crisis (Harman, 2009; Brenner and Jeong, 2009; Choonara, 2009; Freeman, 2010; Potts, 2011; Kliman, 2012) and explanations that see the increasing inequality and intervention to the under-consumption through increasing debt of households as the cause of subprime crisis (Smith, 2008; Tabb, 2010; Onaran, 2010a, 2010b; Maniatis, 2012; Russo, 2012; Navarro, 2014). However, particularly with the effect of Post-Keynesians' contributions to the reinterpretation of both theories to explain the subprime crisis, the effect of financialization on the emergence of the crisis is not just embedded in both groups' explanations, but it is also examined as an independent factor within the context of the Marxian tradition.

Heterodox economists who explain the subprime crisis on the basis of the Marxian falling rate of profit theory define financialization as a result of the falling rate of profits in the real sector. With the increase in the ratio of constant capital to variable capital in the post-1970 era, the surplus value obtained from capital investment decreased, which led to fewer investment activities in the real sector. As a consequence of the investors' searches for new and more profitable investment opportunities, the importance and variety of the financial investment instruments and financial markets significantly increased (Harman, 2009). The contribution of the financial sector to the overall profit in the economy increased from 10% to 40% from the early 1980s to 2007. While the ratio of financial assets to aggregate output was about 4 to 1 in the 1970s, it was approximately 10 to 1 in 2007. In the global

economy, the ratio of the global financial assets to global production increased to 356% from 119% between 1980 and 2007 (Smith, 2008). Consequently, this financialization phenomenon gave rise to more speculative assets and led to the subprime crisis. According to this line of thought, income inequality stemming from diminishing real wages and limited social benefits accelerated the subprime crisis by increasing the demand for speculative assets. On the other hand, it is just another result of the falling rate of profits along with the dominance of financial markets i.e. financialization, speculation, and securitization (Goda, 2013).

The explanation of the subprime crisis regarding the low rate of profit as the main trigger has been challenged by some heterodox economists whose arguments rely on the recovery of the profit rates beginning in the 1980s, thanks to the stagnant real wages and increasing exploitation of labor (Moseley, 2008; Evans, 2010, Shaikh, 2011). Further, decreasing debt-to-profit ratios of non-financial corporate businesses protected most of these corporations from bankruptcy. On the other hand, this recovery of the profit rates did not stimulate investment due to capitalists' decision to increase their own salaries and dividends (Moseley, 2008; Lysandrou, 2009, 2011).

On the other hand, the main argument of the heterodox economists who interpret the U.S. subprime crisis on the basis of the "under-consumption/over-production theory" is that, along with the other structural complications such as low interest rates, financial deregulation, speculative investment, and financial innovation, one of the fundamental causes of the crisis was the increasing indebtedness of the lower-income group who suffered from under-consumption due to the declining real wages in the U.S. economy (Smith, 2008; Tabb, 2010; Onaran, 2010a, 2010b; Maniatis, 2012; Russo, 2012; Navarro, 2014). After the post-1970 era, a significant increase in the corporate profits and top management salaries resulted in a growing capital surplus, which needed to be absorbed by the aggregate demand. On the other hand, the purchasing power of average households was not sufficient to provide the required aggregate demand level due to their decreasing real wages. Accordingly, the spending capacity of these households was increased with indebtedness, which was an outcome of the financialization process. While the workers with declining or stagnating real wages were encouraged to create effective demand by getting into

more debt, financialization in the economy maintained even more debt instruments to them. After the point when the debt accumulation of the household sector became unsustainable, the financial sector collapsed, having a domino effect on the rest of the U.S. economy and the global financial markets.

As it indicated before, Post-Keynesian interpretations regarding the source of the subprime crisis are predominantly grouped into three categories: Minskian instability, financialization and stock-flow consistent models.

Being proposed in an era with a primitive financial sector and being limited to firms and their search for higher profit only, Minsky's original hypothesis of financial instability naturally does not consider the household sector and their risky debt structure. However, the applicability of its main framework to current problems made it very predominant in heterodox literature on the subprime crisis. Specifically, some economists from heterodox traditions, such as Moseley (2008), O'Hara (2009), and Bellofiore (2011), have argued that the subprime crisis had predominantly Minskian characteristics instead of having traditional Marxian features. Even the leading mainstream economists, such as Stiglitz (2009a), Yellen (2009), and Krugman (2012), admitted that, after the global financial crisis, a shift in interest toward Minsky's financial instability occurred and it is well worth attention (Nowicki, 2013). The emphasis of Minsky's hypothesis on the institutions, deregulation, securitization, and financial innovation in financial markets makes it very convenient to explain the subprime crisis since the unsustainable bubble in housing prices and the emergence of toxic mortgage products in the subprime market were derived from the deregulation and innovation in financial markets that created speculative and Ponzi financing options for households (Kregel, 2007; Kaboub et al, 2010; Vercelli, 2010; Tavasci and Toporowski, 2010; Wray, 2011; McDaniel, 2012; Keen, 2013, 2015). As such in the original version of Minsky's financial instability hypothesis, income distribution and inequality do not play an important role in the emergence of the crisis in most of the contemporary versions of this hypothesis. Although there have been a few efforts (Dimsky 2010, Kebaup et al.,2010; Ezuho, 2011; Morset, 2013) to embed the inequality in the analysis, Minsky's financial

instability has been criticized by the proponents of the financialization theory because of its lack of aggregate demand and income distribution (Goda, 2013).

As it discussed in Section 3.2, the financialization theory placed inequality, income distribution, and aggregate demand in the center of the analysis regarding the crises. Financialization has been having distorting effects on household and functional income distribution through the rising income in financial rentiers and top management salaries at the expense of regular workers' wages and the weakening bargaining power of labor and labor unions. Weakening aggregate demand, which was the natural consequence of increasing income inequality, was overcome with debt-financed consumption accompanied by a reduction in household savings and private housing investment in the U.S. While the top 1% of households rapidly increased their share in the national income, poor and middle income households tried to sustain their livelihood while increasing their debt level. In addition, the deregulation in the finance sector made borrowing easier for individuals who tried to sustain a lifestyle and a consumption level they could not afford with their actual earnings. With the innovation in the finance sector that created more speculative and Ponzi scheme debt instruments, these households became over-indebted, and when their debt accumulation could no longer be sustained, the subprime crisis erupted (Palley, 2007, 2010; Stockhammer, 2008, 2012, 2015; Onaran , 2011; Hein, 2009, 2011; Zalewski and Whalen, 2010; McDaniel, 2012; Van Treeck and Sturn, 2012; Onaran and Galanis, 2012; van Treeck, 2013; Sinapi, 2014; Michell, 2014a; Caverzasi, 2014). The opponents of the financialization theory explain the subprime crisis using Minskian instability and a strong emphasis on inequality.

Another approach that post-Keynesians have employed to explain the causes of the subprime crisis are the stock-flow consistent models, which are basically accounting models based on the balance sheets of the sectors of an economy and the money flows among them. The inability of the mainstream general equilibrium models to anticipate the subprime crisis increased the interest of heterodox economists in stock-flow consistent models established to estimate financial crises and recessions. In particular, adding households as a sector along with firms and government sectors made it possible to observe the wealth and debt levels of society and imbalances in

cross-sectoral flows (Keen, 2015; Bezemer, 2009, 2011; Bellofiore and Passarella, 2010; Heron, 2011; Caverzasi and Godin, 2013). On the other hand, this approach cannot fully capture the income redistribution between individuals in a macroeconomic sector or divide households into rentiers and households (Michell, 2014b). This issue was overcome by a new approach relying on a combination of stock-flow consistent modeling and agent-based modeling (Kinsella et al, 2011; Caiani et al, 2015). Kinsella et al.'s (2011) model, which specifically relies on income distribution among households, shows the increase in inequality resulting from competition in a model consisting of firms, government, banks, and households. Although the literature regarding models that are combinations of stock-flow consistent models and agent-based models remains limited, it is a promising new line of research on the relationship between income distribution and crises in an inter-sectoral basis.

A common ground of the Austrian school economists' analyses regarding the subprime crisis was their emphasis on the inappropriate monetary policy adopted by the Federal Reserve as the main cause of the credit boom (Murphy, 2008a, 2008b; O'Driscoll, 2010; Boettke and Coyne, 2011; Barron 2011a, 2011b; Eren, 2016). Their explanation, which was based on the Austrian Business Cycle Theory, asserted that the credit boom was artificially created via setting interest rates at a level below the natural rate, which resulted in malinvestment (Morgan and Negru, 2012). As a result of the banks' interest in increasing their returns, the leverage of the debt instrument increased. Banks' behavior of taking excessive risks to obtain excessive returns stimulated by the Federal Reserve's regulation through the credit rating agencies allowed the banks to invest in securities that were profitable only under the condition that housing prices continued to increase (Fett, 2011). Nonetheless, the interest rates stabilized at their natural level and prices in the housing sector started to decrease. The resulting housing bubble caused the subprime crisis, which transformed into a global financial crisis later. Therefore, the Federal Reserve's optimistic assumption regarding their power of intervening in the economy at any time was not proven to be right (Maier and Koumparoulis, 2012). On the other hand, due to Austrian School's rejection of the econometric and statistical analyses, their literature on the global

financial crisis is purely theoretical and not supported by empirical findings that can prove the significance of their arguments (Fett, 2011).

1.2.4 The Role of Income Distribution in The Mainstream Explanations of The Global Financial Crisis

The eruption of the subprime and the following global financial crisis put forward several possible factors that might have caused the crisis among mainstream economists. Within this framework, some of the most discussed main causes of the crisis are the lack of regulation (Brummer, 2009; Davies, 2010; Whelan, 2010 Claessens et al., 2010) innovation in financial markets (Kolb, 2010; Reinhart and Rogoff 2008), and global imbalances accompanied by misguided monetary policy on the basis of setting very low interest rates (Obstfeld and Rogoff, 2009; Borio and Disyatat, 2011; Caballero and Krishnamurthy, 2009; Blanchard and Milesi-Ferretti. 2010; Nier and Merrouche, 2010; Astley et al., 2010). On the other hand, apart from its possible facilitating role, increasing income inequality is considered a root cause of the crisis in the mainstream economists' discussions of the subprime crisis (Goda, 2013).

Nonetheless, the idea of the absence of the link between rising inequality and the subprime crisis has been challenged by increasing numbers of mainstream economists. One of the first and most influential arguments suggesting a relationship between increasing income inequality and the subprime crisis was put forward by Rajan (2010). According to Rajan (2010), the main reason for the subprime crisis was the government's failure to deal with the increasing income inequality beginning in the late 1970s, which was mainly derived from the poor education system that could not provide the high-skilled workers required to perpetuate the skill-biased technological changes in the U.S. economy. Instead of developing policies that provide permanent solutions for educational and distributive problems, the government chose to promote de-regulation in the finance sector, which provided mortgage loans and other debt instruments for the low-income segment, to expand consumption levels. The resulting credit expansion in the U.S. economy caused a boom in consumption levels and the unsustainable debt accumulation of households.

When housing prices started to decrease in 2007, the fragile financial and banking system collapsed. Accordingly, Kumhof and Ranciere (2010) and Kumhoff et al. (2013) tested Rajan's arguments (2010) by employing a DSGE model and presented that increasing inequality and stagnant wages at the bottom of the income distribution led workers to become over-indebted to maintain their standard of living and living conditions. When an external shock hit the economy, the financial crisis erupted due to the fragility of these people and the financial system.

However, a number of opposing studies to Rajan's (2010) framework emerged. In contrast to Rajan, Bordo and Meissner (2012) found little evidence linking the global financial crisis to rising inequality and referred to economic expansion and low interest rates as the two main causes of the crisis. Then, Atkinson and Morelli (2011) stated that the causality of the rising inequality is not easy to establish and evidence on the increasing inequality following the financial crisis is stronger. Roháč (2011) also expressed that there is no convincing link between high levels of inequality and the global financial crisis.

On the other hand, a number of mainstream economists, such as Reich (2010), Milanovic (2010), Fitoussi and Saraceno (2010), Piketty (2011), Acemoglu (2011), Atkinson et al. (2011), Krugman (2010), and Stiglitz (2009b, 2010, 2012a, 2012b) also opposed the orthodox explanation of crises that assumes there is no link between increasing economic inequality and economic downturns. Supporting Rajan's (2010) argument, Milanovic (2010) asserted that the underlying cause of the crisis was the a credit-fueled system created by the compatible interests of the financial sector, which was searching for further lending opportunities, and the politicians who were eager to find a quick solution for the stagnant income of the middle class. Therefore, middle- and lower-class people used all the borrowing opportunities offered by this credit-fueled system that were bending their budget constraints to sustain a lifestyle that they otherwise would not have been able to afford. Similar to Milanovic (2010), Stiglitz (2009b, 2010, 2012a, 2012a, 2012b) also emphasized the ambition of the middle and lower classes to live beyond their means as the fueling force of the consumption boom created by the housing and stock market bubbles. These bubbles were the results of the easy monetary policy that was used to overcome the

insufficient aggregate demand in the U.S. and in the global economy after 2001. According to Stiglitz, the root cause of all these macroeconomic failures is the imperfect and asymmetric information phenomenon, which was theorized by himself and Rothschilds in 1976 along with the Akerlof (1970). The political power of the top income earners increased at the expense of the power of the working class due to the weakening labor unions, deregulations, and globalization. In addition, the financialization and skill-biased technological change increased the degree of income polarization. In line with Stiglitz, Krugman (2010) emphasized the role of the increasing top income share in the global financial crisis and stated that the increasing inequality before the two big crises in American history was not a coincidence and extreme inequality prompted the overconsumption of the lower- and middle- income classes, which led to the subprime crisis. Acemoglu (2011) stated the increasing top income share and lack of regulation of the financial sector was the possible driving force behind the global financial crisis. Likewise, Atkinson et al. (2011) and Piketty (2011) claimed that the increasing top income was an important cause of the global financial crisis. Atkinson et al. (2011) also showed that the rising inequality due to the share of the top income class is driven by high salaries much more than high returns to capital.

1.3. Distributional Effects of Financial Crisis and Channels of Transmission

From a theoretical perspective, the effects of financial crises on income distribution and inequality are not straightforward and depend on various factors. Traditionally, crises are expected to increase income inequality. Nonetheless, the decomposition of income inequality analyses present that the direction and magnitude of crises' impacts on income inequality and income distribution are ambiguous (Vašková, 2013). First, when it comes to wage dispersion, there might be conflicting effects due to the changes in the workforce composition driven by employers' cost-minimizing decisions and the downward shift in wages. Conventionally, low-skilled employees, who also generally receive lower wages, tend to be more negatively affected by financial crises than high-skilled ones. If a crisis affects the wage income of low-skilled workers more adversely than those of high-skilled employees, the wage gap

will widen. On the other hand, a reduction in the wage gap may occur if the number of low-skilled workers decreases more than that of high-skilled ones. Therefore, if a crisis affects employment instead of wages, it reduces the earning inequality. From the perspective of total income distribution, the effects of financial crises are also not clear cut. When the rate of unemployment increases due to a reduction in the number of workers with a low income, the income distribution becomes more unequal. On the other hand, a crisis might have an opposite effect on the incomes of people who were already unemployed prior to the crisis. The social benefits of the changes in the income structure generally adjust slowly since benefit levels are generally adjusted on an annual or biannual basis. Therefore, if workers' real incomes are reduced as a result of a recession when benefits do not change due to adjustment lags, this may cause a short-term delay in a radical income distribution change. But when the social benefits eventually decrease due to the economic downturn, inequality will increase (De Beer, 2012). These multifaceted and overlapping transmission mechanisms make it difficult to theorize and generalize the distributional consequences of financial crises.

There are several studies that have identified the channels and mechanisms through which crises affect income distribution (e.g., Manuelyan and Walton, 1998; Ferreira et al., 1999; Knowles et al., 1999; Baldacci et al., 2002; Halac and Schmukler, 2004; Lustig and Walton, 2009; Lumina, 2011). These papers bring to light the four main channels, which are changes in labor demand, inflation and relative price changes, changes in asset prices and capital returns, and public spending cuts and fiscal consolidation.

1.3.1. Changes in the Labor Demand

Financial crises typically interrupt economic activity and accordingly, lead to a reduction in labor demand. This derives from the contractionary economic policies that disrupt the aggregate demand for goods and services. The asymmetric shocks of a crisis can affect labor demand through quantities—layoffs; increases in unemployment and informal self-employment; reductions in working hours—or through prices: decreasing wages for wage earners and decreasing earnings for

employers and self-employed people as a result of less demand for their products. These adverse shocks have varying impacts on workers with varying skills and varying job security levels (Ferreira et al., 1999). As indicated above, poor people tend to be more vulnerable to asymmetric employment and income shocks since they do not possess the wealth to preserve themselves. They cannot hedge themselves against such adverse shocks due to their lack of assets and cannot benefit from the credit markets to compensate for their losses. In addition, poor people, who are typically unskilled workers, are generally the first to lose jobs in a layoff situation, as firms and employers tend to hoard their high-skilled workers. Since unskilled workers are more likely to lose their jobs in the formal sector, they are more likely to enter the informal sector, where wages tend to decrease more than those in the formal sector. Furthermore, due to their lack of skills and education, poor people are inclined to be less mobile, and therefore are generally unable to make use of new job opportunities (Halac and Schmukler, 2004).

The results emerging from the empirical literature on past financial crises verify the strong adverse effects of financial crises on the labor market that lead to a substantial rise in unemployment (World Bank, 2008). Young, old, female, and unskilled workers are found to be more likely to suffer from job losses following financial crises (Bourguignon and Morrisson, 1992; OECD, 1998; World Bank, 2007). Sectoral and regional shifts of labor and movement into the informal sector as a consequence of financial crises are common in developing countries (Bourguignon and Morrisson, 1992; World Bank, 1995; Manuelyan and Walton, 1998; Neri and Thomas, 2000; Ananta, 2002; Choudhry et al., 2010; Warunsiri, 2011; Colombo et al., 2012). Furthermore, a significant number of researchers suggest that a rise in the unemployment rate caused by a crisis is likely to persist over time. Long job search durations make it more difficult to find jobs, and the hysteresis effect is very likely to increase the structural unemployment rate (Blanchard and Wolfers, 2000; Nickell et al., 2005; Bassanini and Duval, 2006).

1.3.2. Inflation and Relative price changes

Low-income households and poor households are more likely to be severely affected by the high inflation rates financial crises usually cause. Poor people have almost no ability to hedge themselves against inflation since they hold a major part of their wealth in cash (Calvo, 2014). Inflation also generates a reduction in real wages due to the general absence of the strong link between nominal wages and the price index. The poor suffer more from this than others since they lack capital income, as their labor earnings comprise a significant share of their total income (Halac and Schmukler, 2004). Inflation not only causes compression in real income, but also severely shrinks the real value of household savings along with a stock market crash. Thus, the adverse impacts of inflation spread over a broad range of populations beyond the unemployed or poor workers (Knowles et al., 1999).

In times of financial crises, exogenous shocks, such as currency depreciation or sudden price changes in commodities, and policy changes, such as adjustments in tax and/or subsidy, trade reforms, and price increases in the public sector, tend to affect relative prices. These price changes have strong effects on all relative wages, sectoral levels of employment, and sector profitabilities. The changes in the relative prices of consumer goods have additional impacts on real incomes. A real devaluation, such as one resulting from a fiscal contraction, increases the price of tradable goods relative to non-tradable ones, which causes a wage reduction in the nontrade sector (Ferreira et al, 1999). On the other hand, a possible rise in the export demand may induce an increase in employment, and wages in the sectors of exportable goods may therefore balance some of the losses resulting from the deterioration in economic activity (Baldacci et al., 2002). In the late 1980s, a significant number of the poor people in the rural areas of Sub-Saharan Africa who were producing exportable goods benefited from real devaluations (Sahn et al., 1997). Another distorting impact of price changes occurs through exchange rate fluctuations that are likely to affect the prices of imported foods. The resulting rise in the domestic food price negatively impacts households, particularly poor ones (Baldacci et al., 2002). In East Asia, exchange rate devaluations led to a significant increase in imported good prices. These increases had a negative effect on households, particularly poor people and

poor farmers in urban areas whose food stocks and food production were already damaged due to the El Nino drought (Ferreira et al., 1999). Reynard (2012) presented that common high inflation consequences of financial crises are caused by the evolution of broad monetary aggregates following those crises. Reinhart and Rogoff (2008) showed that deterioration in inflation and in the exchange rate has been experienced together in a majority of the past financial crises. In addition, a number of studies have demonstrated the severe impacts of crises on poor people through rising food prices, particularly in developing countries (e.g., Von Braun, 2008; Swinnen, and Van Herck, 2009; Dev, 2009; Songwe, 2011).

1.3.3. Changes in Asset Prices and Capital Returns

Changes in capital returns and asset values are generally drastic in a financial crisis. Dramatic changes in the bond prices and interest rates, reductions in real estate prices, and the collapse of stock markets all cause direct changes in the incomes of people owning these different types of assets as well as in the incomes of those who suffer from the large amount of transfer to financial sectors within the context of bailout programs. Therefore, both the poor and the wealthy are adversely impacted by changes in asset prices. While the sudden changes in the relative returns to stocks versus bonds may cause an income redistribution only among the non-poor (Ferreira et al., 1999), the overall loss in the financial sector may lead to a recovery in income inequality due to the concentration of overall wealth in the top income groups and financialization.

On the other hand, there is evidence that financial crises generally severely affect individuals who are not included in the financial system. Following a financial crisis, crisis resolution programs and bailouts involve significant transfers from non-participants to participants in the financial system. Furthermore, these transfers are not received equally by all the agents in the financial sector, and a significant reallocation of income also takes place within the financial sector. Prior crises that took place in Uruguay, Argentina, and Ecuador imply that the participants of financial markets with large funds and deposits, including foreign participants and those who can access to foreign-based financial instruments, cover their losses or

even obtain capital gains, while small participants generally experience capital losses. Moreover, previous South American financial crises showed that the significant financial market participants with connections with banks took advantage of crises and crises resolution programs. Therefore, financial redistributions resulting from the financial crises were advantageous to the rich (Halac and Schmukler, 2004). Acevedo and Salinas (2000) and Cunningham and Maloney (2000) showed that during the financial crisis in Mexico, the top ten percent of the income distribution suffered from income losses, and there was a drop in inequality despite the fact that poverty increases afterwards a financial crisis. Acevedo and Salinas (2000) also presented that the income of the top decile is mostly concentrated in the financial sector, which makes it easier to recover the loss following a crisis. The financial income-based consequences of financial crises for the different income groups and different sectors have been extensively documented after the global financial crisis, which will be discussed further.

1.3.4. Public Spending Cuts and Fiscal Consolidation

In most countries, financial crises are followed by government actions, such as public expenditure cuts and fiscal consolidation, which are likely to have a significant distributional impact by reducing the labor demand, diminishing social spending and transfers to households and in kind services. These measures taken by the government severely affect those who rely on state benefits in cash and in kind for sustaining their lives, particularly the poor. Empirical evidence from OECD countries and other developing and developed economies imply that measures of fiscal consolidation generally cause an increase in income inequality together with an increase in long-term unemployment and a reduction in the labor share (Mulas-Granados, 2005; Agnello and Sousa, 2012; Woo et al., 2013; Ball et al., 2013). Woo et al. (2013) showed that social spending reductions are associated with a rise in income inequality, while Lewis and Verhoeven (2010) claimed that countries with the lowest income levels are more likely to reduce their social spending in times of financial crises.

Another controversial issue of debate has been the success and the distributional consequences of the special stabilization programs, such as those designed by International Monetary Fund (IMF) for developing countries. Garuda (2000) found evidence of worsening income distributions and decreasing incomes of the poor in the countries implementing IMF-backed stabilization programs relative to those without such interventions when external imbalance was severe prior to the stabilization programs. In cases where pre-program external imbalance is not very high, countries following the IMF-supported programs make relative progress in distributional indicators. Pastor (1987) also showed that stabilization programs designed by IMF cause a significant and persistent decrease in the labor share of income.

1.3.5. Distributional Consequences of Global Financial Crisis

In the post-1980 era of financial globalization, a significant rise in the frequency and severity of financial crises has been observed, particularly in low- and middle-income countries. Therefore, most of the empirical evidence on the adverse distributional effects of financial crises has been obtained from these countries' crisis experiences. As the subprime crisis in the U.S. economy and its transformation to a great recession and global financial crisis severely affected advanced economies as well as developing ones, it enabled economists to extend the literature on the distributional effects of financial crises with the evidence from advanced economies.

The distributional effects of the global financial crisis were severe on the U.S. economy, which had already been experiencing a decline and stagnation in wages and increases in income and wealth inequality for the last three decades (Piketty and Saez, 2006; Duménil and Lévy 2011; Mishel and Gee 2012; Mishel 2012). Hurd and Rohwedder (2010) found that almost 40% of U.S. households suffered from either job loss, mortgage payment arrears, foreclosure, or negative home equity. Many people who were approaching retirement suffered from the erosion of their retirement accounts, while a significant number of people retired early due to unemployment. Dufour and Orhangazi (2014) dempstrated that the polarization of

the workforce in the U.S. economy during the crisis resulted in a structural change in the labor market. Although a significant amount of the job loss took place in mid-wage occupations, employment opportunities offered since then have mainly been lower-wage jobs. A study by the National Employment Law Project (2012) showed that during the recession, 21% of the employment losses were in lower-wage occupations, while 58% of job opportunities offered during the recovery were in lower-wage occupations. The labor share also declined as well as the rate of unionization due to the crisis. The share of capital in the national income was more well recovered relative to the share of labor. Despite several adverse effects of the crisis, inequality measures showed a slight reduction in inequality immediately following the crisis in the U.S. This improvement most likely stemmed from the severe reduction in the financial assets' market values and the corresponding reduction in their revenue streams considering the concentration of the financial income to the top income groups in the income distribution. Nevertheless, shortly after, income inequality began to rise again, revealing the final effect of the crisis to be increasing income inequality. Mishel and Finio (2013) presented that the wage inequality in the U.S., which grew dramatically between 1979 and 2007, showed a reduction between 2007 and 2009 during the great recession, but began to increase again in 2009. Considering the substantial recovery in the stock market and wage growth at the top of the income distribution, the total income of the top 1%—which consists of wages, returns on financial assets, and capital gains—increased significantly and resulted in a rise in income inequality. Examining the evolution of top incomes in the U.S., Saez (2015) came to the same conclusion. According to his results, the financial crisis has only damaged the top income shares temporarily and this short-term reduction did not prevent any of the substantial rise in top income shares that has occurred for three decades. From 2007 to 2009, the income of the top 1% decreased dramatically by 36.3% due to the stock market crash, which caused a dramatic decline in capital gains. However, the incomes of the bottom 99% decreased by 11.6% within the same period. Therefore, the top 1% absorbed 49% of the losses in the financial crisis. On the other hand, although the average real income per household only increased by 8.4% from 2009 to 2014, the gains of different

income groups were not even. From 2009 to 2014, the income of the top 1% increased by 27.1, while the increase in the incomes of the bottom 99% was only 4.3%.

A surprising distributional consequence of the global financial crisis in the U.S. economy was the increased government spending, consisting of disability payments, unemployment and retirement benefits, welfare, and social services payments. Although this upward trend has reversed, it is still above its pre-crisis level. This trend differed from prior crisis experiences of developing countries. This difference stems from the structure of the U.S. economic system, where unemployment benefits are much more established and the automatic stabilizers step in case of recessions (Dufour and Orhangazi, 2014).

The global financial crisis and the following great recession had diverse distributional consequences worldwide, including high-, middle-, and low-income countries. Jenkins et al. (2013) analyzed the income distribution changes in 21 wealthy OECD countries. The results indicated that, despite the increases in unemployment rates, real incomes did not increase due to the falling inflation rates and the changes in income distribution were not severe (except for the U.S. economy) due to the government supports through tax and benefit programs, which are designed to support low-income households significantly hit by unemployment. However, they emphasized the possible adverse effects of the fiscal consolidation measures on inequality in the near future. Agnello and Sousa (2012), Ball et al. (2013), and Woo et al. (2013) also highlighted a strong link between the degree of transfers and benefits to the poor and the recovery from the adverse distributional effect of the global financial crisis in advanced countries. Jovanovic (2014) argued that the rising inflation was another factor that stabilized the increases in inequality by examining the changes in the inequality following the global financial crisis in 42 countries. According the Jovanovic (2014), the main reason underlying this pattern was the fact that countries that experienced increasing inflation also experienced an increase in minimum wages during this period. While the rise in minimum wages was protecting the poor's real income from higher inflation, the real income of the wealthy was eroded by it, which prevented severe increases in income inequality.

Jovanovic (2014) also claimed that the reduction in the income of the top decile was severe in countries with smaller recovery stock markets, low degrees of corruption, higher participation in the labor market, and higher inflation. De Beer (2012) showed that in a small majority of the European Union (EU) countries, inequality dropped following the global financial crisis, contrary to expectations; therefore, no uniform pattern has been found. Another finding of this study is that, in general, the response of the real wages was not strong due to the reduced working hours in a majority of EU countries and temporary work arrangements in some cases. A recent OECD (2015) report presented the income inequality behavior of the OECD countries following the recession period and found that the global financial crisis distorted the top income share only temporarily. Although the share of the top income group could not exceed its records over the past three decades, the real income of the lower 90% of the population was stagnating, while that of the top 1% had risen by 4%, as of 2010. Furthermore, in many countries, income inequality has been increasing since high-income households have recovered better than both middle- and low-income households.

The experiences of other regions and countries related to the global financial crisis and great recession beyond the OECD and EU have been also diverse. In their review of 17 countries in Latin America, Cord et al. (2014) presented that the improvement in inequality in Mexico, Brazil, and other Latin America countries over the first decade of the 2000s was disrupted by the global financial crisis, which caused a stagnation in the regional inequality reduction. According to Cord et al. (2014), the underlying cause of this stagnation was the fact that the reduction in inequality was largely rooted in the absence of the improvement in the top income distribution rather than the increasing income level of the poor. In addition, the decreasing ability of labor markets to create jobs and wage increases for the low-skilled workers, which comprise most of the workforce of the region, and the decreasing ability of the governments to sustain their spending on public transfers were indicated as the factors leading to the deterioration of the income distribution improvement in the region.

The global financial crisis also led to a temporary deterioration in the downward trend of income inequality in Turkey, according to the data provided by the Turkish Statistical Institute (TURKSTAT). Although the increase in income inequality has been recovered and is now lower than its pre-crisis level, the income gap between the top 20% quantile and bottom 20% quantile has been widening, and the ratio of the bottom 80% to the top 20% has been decreasing in the post-crisis period.

As Otker-Robe and Podpiera (2013) presented, the income distribution also sharply worsened after the crisis in several developing and low-income countries in Central Asia and Sub-Saharan Africa, with accompanying worsening socio-economic conditions. The impact of the crisis on the poor was more severe in these regions due to the food crisis in 2008 caused by the increasing food prices. The living conditions of many African, Eastern Asian, and Middle Eastern households, who had already been below the international poverty line, became even worse with the increasing food prices (Brinkman et al., 2010; Arieff et al., 2011).

1.4. Conclusion

The role of income distribution as a cause of financial crises has been a controversial issue that has been theorized by different strands of economics based on their views on the role of income distribution and inequality in the economic system.All Marxian crisis theories are based on the notion that class struggles over income distribution and crises are inherent to capitalist economies. While the Marxian theories of profit squeeze, tendency of the profit to fall and under-consumption/overproduction theory has been widely used in the explanations regarding the occurrence of global financial crisis, only the latter claims that increasing income inequality is the main cause of crises. In line with the Marxian economists, most post-Keynesian economists claim that crises and class struggles over income distribution are endogenous in capitalist economies Among the three theories of financial instability that became prominent in post-Keynesian literature—the Minskian instability hypothesis, stock-flows consistent models, and financialization—again, only the latter puts inequality in the center of the analysis and sees income inequality as the main cause of financial

crises. In contrast to most of the other heterodox traditions, the Austrian school of economics sees the income inequality as the natural cause of the economic mechanism and claims that following policies that force an income redistribution disrupts the economic system. On the other hand, most mainstream economists accept the endogenous stability of the economy as the norm and see exogenous shocks as responsible for short-term economic instability. According to mainstream economists, the forces of supply and demand always clear the market, and income redistribution is not the root of the crises. However, after the global financial crisis, mainstream economics started to experience a paradigm shift by questioning the role of inequality in the occurrence of the crises. Following the study of Rajan (2010), a number of mainstream economists claimed that the increasing income inequality was a root cause of the subprime crisis, and rejected the orthodox explanation of the financial imbalances. Nevertheless, a considerable number of mainstream economists have focused on the role of the top income share and deregulations in financial sectors within the context of their discussion on the subprime crisis.

Although there are fundamental differences between heterodox and mainstream strands of economics, they have some common grounds in their explanations regarding the emergence of the subprime crisis. The increasing income share and power of those in the top 1% of the income distribution, deregulation in financial markets, increasing importance of financial motives, and the role of the monetary policy in the creation of the debt-led consumption boom are the predominantly discussed factors among both heterodox and mainstream economists.

The literature on financial crises' effects on income distribution and inequality does not have a theoretical framework due to the overlapping and a-priori nature of the distributional transmission channels of financial crises, which make it difficult to theorize the possible consequences from the perspective of a particular school of economic though. Financial crises and policy responses to them have diverging effects on people with different levels of income and wealth, and in most cases, the parties who gain and who lose due to a particular crisis are situation specific. Although there are several channels of financial crises that may affect income distribution, four main channels—changes in labor demand, inflation and relative

price changes, changes in asset prices and capital returns, and public spending cuts and fiscal consolidation—have been widely discussed in the literature.

Although the recent global financial crisis and the following great recession had diverse distributional consequences worldwide, an important conclusion emerged from the crisis experiences of several countries: The public spending on social transfers during the recession has played a crucial role in reversing the adverse effect of the crisis. In the economies that offer benefits through social transfer programs to low-income households where unemployment hits severely, poor- and low-income households are more likely to recover. The significant role of the top income share within the context of the global financial crisis gave rise to another question regarding whether an income redistribution at the expense of the top income earners occurred. Since the top income share is more fragile in financial crises due to the amount of the returns on financial assets and capital gains in their income structure, one can assume that a reduction in income inequality might have occurred following the recent global financial crisis. However, the evidence does not support this hypothesis. Although the top income groups' shares decreased sharply when the crisis hit, they have been better at recovering their losses than low- and middle-income groups. Another important issue the global financial crisis gave rise to is the severe impact of food price increases on low-income countries in which most of the population is under the international poverty line.

2. THE IMPACTS OF THE GLOBAL FINANCIAL CRISIS IN 2008 ON THE PERSONAL INCOME INEQUALITY IN TURKEY

2.1. Introduction

Although the economic consequences of the global financial crisis can be assessed from several perspectives, one of the most discussed issues is that of income distribution of households. However the literature concerning the quantitative levels and asymmetric effects (describing the fact that different groups can be affected differently) of income distribution costs created by financial crises in developing countries is very limited. In particular, the number of detailed, multi-faceted and comprehensive studies taking into account the specific conditions of individual countries and the changes in welfare of all the agents in the economic system following a financial crisis, is highly limited.

Income inequality has long been a crucial issue for Turkey. Although, Turkey's income inequality has been slightly lower relative to those of in the same class of the per capita income level with Turkey (such as Mexico, China, Brazil) in the middle-high income group, Turkey has been ranked among the top three countries in the Organization for Economic Cooperation and Development (OECD) region in terms of income inequality and ratio of top %10 decile to bottom %10 decile[1].

Despite the economic boom of the Turkish economy from 2002 to 2008, which witnessed relatively low inflation and high growth, the economy has more recently been severely affected by the global financial crisis in 2008 and 2009 due to its large current account deficit, strong dependency on construction activity, and consumer

[1] For detailed information on international comparison, see "Appendix II: International Comparisons"

demand. Therefore, the household and personal income distribution consequences of the crisis need careful examination.

The direction of the causal relationship between financial crisis and household income inequality has been a matter in question. Conventionally, the aftermath of financial crises have been associated to widening income inequality. On the other hand, it could be argued that crises led to improvements in inequality reflecting the drastic capital losses of the top decile as a result of the financial crisis in that their income was affected severely relative to income of those at the bottom decile. The aim of this study is investigating the determining factors of income distribution in terms of income and earning inequality in Turkey during the global financial crisis by i) decomposing the Gini index by source of income in order to present the contribution of the several source of incomes to the changes in income inequality in terms of their gross and marginal contributions ii) examining the contributions of specific variables (education, position in occupation, economic sector) to the interpretation of labor earnings inequality in terms of their gross and marginal contribution through static decomposition of Theil T index.

Section 2.2 briefly reviews the literature in this field, while section 2.3 summarizes the data and methodology used in the study. Section 2.4 provides the findings and section 2.5 presents brief conclusions.

2.2. Literature Survey

The literature on the decomposition of the Gini coefficient by sources of income was established by Rao (1969), Fei et al. (1978), Pyatt et al. (1980) and Sharrocks (1982). Developing the Sharrocks' (1982) decomposition, Lerman and Yitzhaki (1985) proposed a decomposition of Gini coefficient by income source. Based on Lerman and Yitzhaki's (1985) approach, Stark et al (1986) showed the derivation of the effect of a marginal change in an source of income on the total inequality. Other methodologies of Gini decomposition by income source such as Silber (1993), Podder and Chatterjee (2002), Araar (2006), Araar and Duclos (2008) proposed also have been used in literature.

There are only a limited number of studies addressing impact of various income sources to inequality in Turkey. Silber and Özmucur (2000) examined the impact of various income sources to total income inequality by using Silber's (1993) decomposition and they found that; in 1994, contribution of income from a primary job to total inequality is relatively higher in urban areas while contribution of income from secondary job is higher in rural areas in Turkey. Başlevent (2010) investigated the contribution of labor market earnings, non-wage income and imputed rents to total income inequality using the Jenkin's (1995) extension to Sharrocks's (1982) decomposition with 1994 Household Income Distribution Survey (HIDS) and the 2003 and 2008 Household Budget Surveys (HBS) provided by the Turkish Statistical Institute. He found that, female earnings have a decreasing impact on household inequality and contribution of non-labor income inequality decreases from 1994 to 2008. Çetin and Gül (2013) employed Sharrocks's (1982) decomposition method to Household Budget Survey data of Turkish Statistical Institute between 2002–2009 and they showed that, interest income has the relatively highest contribution to income inequality and contributions of the profit, rent and interest incomes to income inequality are significantly higher than the contributions of transfer and wage incomes. Arslan (2014) showed that, although earning income is responsible for an important share in total inequality; by time, share of earnings income decreases in inequality in favor of non-earnings income as an income source by employing Gini decomposition of Lerman and Yitzhaki (1985) with Household Budget Surveys data of 2002 and 2011.

Interpretation of the Theil-T index decomposition in terms of gross and marginal contributions of different groups to total inequality has been subjected to some studies such as Psacharopoulos et al. (1993) Lopez-Acevedo and Salinas (2000), Neri and Camargo (2002) which all pointed the significant marginal and gross contribution of education to inequality.

By using the Static decomposition of Theil-T index, Psacharopoulos *et al*. (1993) found that gross contribution of education has a relatively higher gross contribution to inequality in Latin America and the Caribbean countries. Also, education has the largest marginal contribution to inequality among these countries except Bolivia and

Uruguay in 1986. By employing Gini decomposition of Lerman and Yitzhaki (1985) Lopez-Acevedo and Salinas (2000) showed that, in Mexico, labor earnings is a growing and significant source of income inequality. Also their results from the static decomposition analysis of Theil-T index show that, among the three variable set that consists of education, position in occupation and economic sector, education makes the greatest contribution to earning inequality both in terms of marginal and gross level. They also presented that, after the financial crisis Mexico experienced in 1995, the gross and marginal contribution of education decreased significantly. Using Mexican data between 1976 and 1997, Neri and Camargo (2002) found that working classes and years of schooling explains most of the total inequality with and increasing trend in terms of their gross contributions while marginal contribution of years schooling has the largest impact on the inequality.

In Turkey case, although there are studies that used decomposition of Theil-T index into between and within components, none of them expressed this analysis with gross and marginal contribution elements. Elveren and Galbraith (2009) examined the pay inequality in Turkish manufacturing sector between 1980 and 2001. Using Annual Manufacturing Industry Statistics (AMIS) collected by the Turkish Statistical Institute, they decomposed the Theil-T statistic by sub-sector, province, East-West distinction and geographic region for public and private sectors. They found that while pay inequality between regions does not change, in the late 1980s, pay inequality increases in the private sector between East and West, between provinces, and between sub-sectors. Şenergin (2010) decomposed Theil-T index into between and within components by using Turkish Household Budget Survey data of 2008 and showed that the disturbing effect on income distribution is at the highest level in primary school. Taştan and Akar (2013) examined the pay inequality in Turkey using Theil's T statistic calculated from employment and wage data of Turkish Statistical Institute for the 1992-2010. By focusing on regions and sector subgroups, they found that, pay inequality between sectors rises during recession and crisis periods (1994, 2001 and 2008).

2.3. Data and Methodology

The analysis in this study is based on data from the 2006 to 2011 Income and Living Conditions Survey (SILC) of the Turkey which have been collected annually by the Turkish Statistical Institute (TurkStat) since 2006. Data has been collected using a survey formed by panel survey method with the aim of supplying comparable measurements on household and personal income distribution, standard of living, poverty and social exclusion as part of the studies regarding adaptation to European Union (EU). The topics of education, housing, ownership of assets, economic situation, health status, income status, labor status, demography and social exclusion are covered in the survey to calculate indicators for income, living conditions, poverty and social exclusion. Sample unit is determined as the household. Although sample size is determined as approximately 13000 household at the beginning, it varies from year to year since the survey is a panel application[2].

In order to estimate the contribution of the several source of incomes on income inequality, Gini index decomposition by income sources is employed to present the contribution of the several source of incomes. By following Lerman and Yitzhaki (I985), Gini index (G) for the overall income distribution can be expressed as a function of the covariance between income and its cumulative distribution, that is,

$$G=\frac{(2\ \mathrm{cov}\ [Y, F(Y)\ ])}{\mu}, \qquad (1)$$

where Y is the per capita income distribution ($Y=(y_1,\ldots\ldots y_n)$ where y_n denotes the individual i's level of per capital income ($i=1,\ldots n$)), μ is the mean of capita income, $F(Y)$ is the cumulative distribution of overall per capita income in the sample i.e $F(Y) = [f(y_1),\ldots\ldots f(y_n)]$ where $f(y_i)$ corresponds to rank of y_i divided by the number of observations (n)[3]. (Lopez-Acevedo, Salinas, 2000, 23).

Utilizing the properties of the covariance, equation (1) can be represented as an expression that captures the each K income components' contribution to income inequality.

[2] For detailed information on data structure and demographic profile of subjects, see "Appendix I:Data Structure"

[3] Cumulative distribution and covariance are calculated by using the household weights.

$$G = \sum_{k=1}^{K} \left[\frac{\mu_k}{\mu} * \frac{(2cov[y_k, F(Y)])}{\mu_k} * \frac{cov[y_k, F(Y)]}{cov[y_k, F(Y_k]} \right] = \sum_{k=1}^{K} S_k G_k R_k \qquad (2)$$

where S_k is the income source k's share of total group income ($S_k = \mu_k/\mu$); G_k is the Gini coefficient of income source k within the group, R_k is the Gini correlation of income from component k with total income distribution[4] (Stark at all, 1986).

The larger the product of S_k, G_k and R_k, the greater the contribution of income component k to overall income inequality. Nevertheless, it must be pointed that while R_k is defined on the interval (–1,1], G_k and S_k are always less than one and positive. When R_k falls below zero, income component k is negatively correlated with overall income and therefore lowers the Gini coefficient (Leibbrandt et al, 2000).

Using this formulation, the effect of a minor percentage change in any income source on Gini coefficient, i.e. the impact of various income components on income inequality can be calculated. Under the assumption of there is an exogenous increase in overall income stemming from income component j, by a factor σ_j ($(y_{ij}(\sigma_j)=(1+ \sigma_j)\ y_{ij})$ for i=1,….n)) income distribution of component j becomes $Y_j=((1+ \sigma_j)\ y_{ij},...(1+ \sigma_j)y_{nj})$. As Stark et al. (1986) showed, the derivative of the Gini index with respect to a change in income component j is:

$$\frac{\partial G}{\partial \sigma_j} = S_j(R_j\, G_j - G) \qquad (3)$$

In case of this derivative is negative, income inequality will decrease by the marginal increase in income component j. This will occur when income from source j has zero or negative correlation with total income ($-1 \leq R_j \leq 0$) or when there is a positive correlation between income from component j and total income (($R_j > 0$) and $R_j G_j < G$).

Dividing equation (4) by G, it is obtained that:

[4] R_k is the correlation coefficient between Y and Y_k, i.e. $R_k = \frac{\text{cov}\,[Y_k\, F(Y)]}{\text{cov}\,[Y_k, F(Y_k)]}$

$$\frac{\partial G}{\partial \sigma_j}\frac{1}{G} = \frac{S_j R_j G_j}{G} - S_j \qquad (4)$$

Equation (4) implies that the marginal percentage change in income inequality (as calculated through the Gini coefficient) stemming from a small percentage change in income from source j is equal to source j's share in total inequality minus source j's share in total income.

To put it another way, this percentage change can be stated as $N_j = R_j G_j / G$ which is the Gini elasticity.

$$\frac{\partial G}{\partial \sigma_j}\frac{1}{G} = S_j (N_j - 1) \qquad (5)$$

Therefore, a percentage increase in the income from income component j with an elasticity of Gini N_j larger (smaller) than one will increase (decrease) the inequality. The lower the Gini elasticity implies larger the re-distributive impact (Lopez-Acevedo, Salinas, 2000).

In order to investigate the factors and mechanisms driving inequality, static decomposition of Theil T index which is sensitive to changes at the top and bottom tail of the income distribution is employed. Theil T index belongs to the family of generalized entropy inequality measures whose general formula is given by:

$$GE(\alpha)\frac{1}{\alpha(\alpha-1)}\left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{Y_i}{\overline{Y}}\right)^{\alpha} - 1\right] \qquad (6)$$

Where $\overline{Y}$ is the average income and Yi is the ith individual's income, α is the sensitivity parameter which represents the weight given to distances between incomes at different parts of the income distribution. A more positive (negative) sensitivity parameter implies a GE measure that is more sensitive to income differences at the top (bottom) of the distribution.

A widely used form of the generalized entropy class index is the GE (0) which is called as "the mean logarithmic deviation":

$$\mathrm{GE}(0) = -\frac{1}{n}\sum_{i} ln\left(\frac{Y_i}{\overline{Y}}\right) \tag{7}$$

The GE (1) is the Theil T index which applies equal weights across the distribution of income. Theil T index is expressed as follows:

$$\mathrm{GE}(1) = \mathrm{T} = \left(\frac{1}{\mathrm{n}}\right)\sum_{\mathrm{i}=1}^{\mathrm{n}}\left(\frac{\mathrm{Y_i}}{\overline{\mathrm{Y}}}\right)\ln\left(\frac{\mathrm{Y_i}}{\overline{\mathrm{Y}}}\right) \tag{8}$$

where n is the population size. Assuming n is divided into G groups with ng observations, equation (8) can be expressed as

$$\mathrm{T} = \sum_{\mathrm{g}=1}^{\mathrm{G}}\left(\frac{1}{\mathrm{n}}\right)\sum_{\mathrm{i}=1}^{\mathrm{n_g}}\left(\frac{\mathrm{Y_{ig}}}{\overline{\mathrm{Y}}}\right)\ln\left(\frac{\mathrm{Y_{ig}}}{\overline{\mathrm{Y}}}\right) \tag{9}$$

where Y_{ig} is the income of the ith individual in the gth subgroup of the population. Defining

$$\beta_g = {}^{n_g}\!/_{n} \text{ and } \quad Z_g = {}^{\overline{Y}_g}\!/_{k}$$

where k is a reference income and $\overline{Y}_g$ is the average income of the gth group, ,T can be written as

$$\mathrm{T} = \left(\frac{1}{\mathrm{k}}\right)\sum_{\mathrm{g}=1}^{\mathrm{G}} \mathrm{B_g}\,\mathrm{Z_g}\ln\mathrm{Z_g} - \ln\mathrm{k} + \left(\frac{1}{\mathrm{k}}\right)\sum_{\mathrm{g}=1}^{\mathrm{G}} \beta_g \mathrm{Z_g}\,\mathrm{T_g} \tag{10}$$

Where T_g is the Theil T index of the g_{it} subgroup and $k= \sum \beta_g Z_g$. The first two terms on the right hand side of equation (10) stand for between group inequality while the

third term denotes within group inequality. Assigning the mean income as the reference income ($Z_g = \alpha_g = \bar{Y}_g / \bar{Y}$), equation (10) can be defined as,

$$T = \sum_{g=1}^{G} \alpha_g \beta_g \ln \alpha_g + \sum_{g=1}^{G} \alpha_g \beta_g T_g \qquad (11)$$

where first term is between group inequality and the second term is within group inequality. Decomposing the Theil T index into between and within group components by using subgroups is defined as "static decomposition of Theil T index".

2.4. Findings

The general results regarding the evolution of income inequality in Turkey can be seen in Table 2.1. Gini coefficient and generalized entropy (GE) indexes cover the period of 2006 to 2011. Four values of generalized entropy sensitivity parameters (-1, 0, 1, 2) were employed in the calculations. Disposable income was adjusted using the national equivalence scale based on a parameter equivalence scale form.[5]

All inequality measures exhibit a decrease from 2006 to 2011. The bottom-sensitive GE(-1) exhibits a17.3% decrease, while the top-sensitive GE(2), the "Theil T index," which is GE(1), "the mean logarithmic deviation," which is GE(0), and the Gini coefficient show 5.22%, 9.52%, 11.83%, and 4.56% decreases, respectively.

However, it can be seen that this overall decrease in income inequality was interrupted by the global financial crisis period. The top-sensitive GE (2) indices begin to increase by 2009, and then decreases in 2011. All the other GE indices and Gini coefficients increase by 2008, then show a slight decrease by 2010. Bottom-sensitive GE (-1) indices increased by almost 5% from 2008 to 2009. Following these fluctuations, all inequality measures decreased below their 2007 level in 2011.

[5] For more information on the equivalence scale used, see "Appendix III: Equivalence Scale"

Table 2.1: Economic Inequality Measures By Years

Inequality Measure*	2006	2007	2008	2009	2010	2011
GE(-1)	0.476	0.389	0.392	0.438	0.390	0.394
GE(0)	0.338	0.302	0.297	0.313	0.297	0.298
GE(1)	0.357	0.337	0.324	0.340	0.331	0.323
GE(2)	0.575	0.605	0.555	0.582	0.647	0.545
Gini	0.439	0.418	0.415	0.424	0.415	0.415

Source: Own calculations based on SILC Data *Based on total income equalized by National Equivalence Scale (2002).

In order to investigate the effects of the crisis period on different income shares, Lorenz curves for total equalized income were estimated (see Table 2.2). It can be seen that, over the analysis period of 2006 to 2011, the richest 10% of the country lost 1.6 percentage points of their income share, while the poorest 20% and middle 40% increased theirs by 1.2 and 0.8 percentage points, respectively. Therefore, despite of the decrease in income inequality, income transfer to both the bottom and middle classes was not significant. Between 2008 and 2009, there was a slight decrease in the income shares of the bottom, middle, and middle-high income groups. After a slight increase in 2010, the bottom and middle-high income groups sustained their income levels, while the middle income group lost 0.2 percentage points of their income share. On the other hand, the income share of top 10% and the top 2% income groups followed a different pattern during the crisis and afterward.

Following a 1.9 percentage point decrease in 2008, the top 10% income group increased its share by 1.1 percentage points in 2009. After this small recovery, the income share of this group worsened by a 0.8 decrease in 2010, which was followed by a minor increase in 2011.Therefore, while low, middle, and middle-high income groups received income shares higher than their pre-crisis levels in 2011, richest stratum could not reach its pre-crisis income share level.

In order to investigate the impact of various income components on income inequality, Gini index decomposition by source of income (introduced by Lerman

and Yitzhaki (1985) was employed. In Table 2.3, the results of the Gini decomposition analysis are displayed.[6]

Table2.2: Lorenz Curves for Total Equalized Income*
(accumulated income share)

Accumulated Share	2006	2007	2008	2009	2010	2011
10	1.80	2.12	2.16	2.05	2.17	2.16
	(0.009)	*(0.011)*	*(0.009)*	*(0.009)*	*(0.009)*	*(0.008)*
20	4.97	5.61	5.68	5.48	5.75	5.77
	(0.009)	*(0.011)*	*(0.009)*	*(0.009)*	*(0.009)*	*(0.008)*
30	9.23	10.19	10.28	10.03	10.45	10.44
	(0.009)	*(0.010)*	*(0.009)*	*(0.009)*	*(0.009)*	*(0.007)*
40	14.59	15.80	15.96	15.66	16.21	16.13
	(0.008)	*(0.010)*	*(0.009)*	*(0.008)*	*(0.009)*	*(0.007)*
50	21.12	22.49	22.76	22.40	23.07	22.91
	(0.008)	*(0.010)*	*(0.008)*	*(0.008)*	*(0.009)*	*(0.007)*
60	29.02	30.39	30.87	30.38	31.12	30.96
	(0.008)	*(0.010)*	*(0.008)*	*(0.008)*	*(0.008)*	*(0.007)*
70	38.59	39.82	40.60	39.89	40.80	40.55
	(0.007)	*(0.009)*	*(0.008)*	*(0.007)*	*(0.008)*	*(0.007)*
80	50.53	51.33	52.67	51.55	52.57	52.29
	(0.007)	*(0.009)*	*(0.007)*	*(0.007)*	*(0.008)*	*(0.006)*
90	66.40	66.54	68.41	67.29	68.11	67.96
	(0.006)	*(0.008)*	*(0.006)*	*(0.006)*	*(0.007)*	*(0.005)*
92	70.46	70.34	72.33	71.26	71.99	71.91
	(0.007)	*(0.010)*	*(0.008)*	*(0.008)*	*(0.008)*	*(0.007)*
94	75.15	74.67	76.74	75.76	76.32	76.32
	(0.007)	*(0.009)*	*(0.007)*	*(0.007)*	*(0.008)*	*(0.006)*
96	80.59	79.81	81.72	81.02	81.35	81.41
	(0.006)	*(0.009)*	*(0.007)*	*0.007*	*0.008*	*0.006*
98	87.56	86.62	88.00	87.64	87.68	87.83
	(0.005)	*(0.007)*	*(0.006)*	*(0.006)*	*(0.007)*	*(0.005)*
100	100.00	100.00	100.00	100.00	100.00	100.00
Bottom 20 %	5	5,6	5,7	5,5	5,8	5,8
Middle 40 %	24	24,8	25,2	24,9	25,4	25,2
Middle high 30 %	37.4	36,2	37,5	36,9	37	37
Top 10 %	33.6	33,5	31,6	32,7	31,9	32

Source: Own calculations based on SILC Data *Based on National Equivalence Scale (2002). * Standard errors are in the brackets

[6] For the detailed results of the Gini decomposition and bootstrapped standard errors see "Appendix IV: Decomposition of Gini by Income Source"

Table 2.3: Decomposition of Gini By Income Source, Share In Overall Gini

	Total Labor Earning	Entrepreneur income	Financial Income	Rental income	Social transfer	Pensions and survivors' benefits	Inter-household transfer	Other Incomes	Total Income
				2006					
$S_kG_kR_k$	0.0987	0.1385	0.0347	0.0532	0.0011	0.0335	0.0001	0.0259	0.3856
S_k	25.6	22.7	8.6	14.2	0.4	17.7	0.9	10	100
				2007					
$S_kG_kR_k$	0.1165	0.0911	0.0529	0.0729	-0.0004	0.0344	-0.0002	0.028	0.3952
S_k	26.5	17	11.9	15.8	0.4	17	0.9	10.6	100
				2008					
$S_kG_kR_k$	0.1036	0.1463	0.0261	0.063	0.0027	0.0242	-0.001	0.0159	0.3808
S_k	24.2	24.8	7.2	15.3	0.8	17.9	1	8.8	100
				2009					
$S_kG_kR_k$	0.126	0.1318	0.0431	0.0721	0.0009	0.03	0.0004	0.0181	0.4224
S_k	25.2	21.1	10	15.2	0.6	18.3	1	8.6	100
				2010					
$S_kG_kR_k$	0.1493	0.1227	0.039	0.0526	-0.0007	0.0237	-0.0004	0.0174	0.4036
S_k	29.9	19.3	9	13.2	0.5	18.3	0.7	9.1	100
				2011					
$S_kG_kR_k$	0.1322	0.1499	0.0282	0.0591	0.0011	0.023	0.0001	0.0148	0.4082
S_k	27.7	23.4	7.4	13.3	0.7	18	0.9	8.6	100
Note: For bootstrapped standard errors, see " Appendix IV-Table AIV.1-AIV.6"									

Source: Own calculations based on SILC Data

The results show that total labor earnings make up the largest share of total income in each year save for 2008. Total labor earnings, entrepreneur income, and pensions and survivor benefits together constitute more than 60% of total income. Rental income follows these as the forth-largest component.

The decomposition results show total labor earnings and entrepreneur income to be the most significant sources of income inequality. After a significant decrease in 2007, the contribution of entrepreneur income to inequality increased by 37.7% in 2008, decreased gradually from 2008 to 2010, and then increased again in 2011. The contribution of total labor earnings to inequality moved in the opposite direction over the period of analysis, increasing gradually from 2008 to 2010, and then showing a slight decrease in 2011.

Rental income increased its contribution to inequality in 2007 by 27%, slightly decreased in 2008, recovered its contribution level in 2009, and then decreased to its

2006 level in 2010. In 2007 and 2010, social transfers contributed negatively to income inequality in a similar manner to inter-household transfers in 2007, 2008, and 2010.

Table 2.4 shows the impact of a marginal percentage change in income source on total income inequality. Social transfer, pensions and survivors' benefits, inter-household transfers, and other income sources can be seen to have had a redistributive effect on inequality during the period of analysis. A one percentage change in total labor earnings, which had a redistributive effect in 2006, began to

Table 2.4: Gini Elasticity (Nj) and The Percent Change in Gini Per 1 Percent Change In Income Source (%)

		Total Labor Earning	Entrepreneur income	Financial Income	Rental income	Social transfer	Pensions and survivors' benefits	Inter-household transfer	Other Incomes
2006	Nj	0.998	1.582	1.051	0.972	0.784	0.492	0.022	0.670
	%	-0.0004	0.1321	0.0044	-0.004	-0.0008	-0.0898	-0.0085	-0.033
2007	Nj	1.112	1.359	1.129	1.169	-0.241	0.513	-0.057	0.668
	%	0.0297	0.0609	0.0153	0.0267	-0.0053	-0.0826	-0.0093	-0.0353
2008	Nj	1.125	1.547	0.947	1.081	0.924	0.356	-0.270	0.473
	%	0.0302	0.1359	-0.0039	0.0123	-0.0006	-0.1150	-0.0123	-0.0465
2009	Nj	1.183	1.478	1.025	1.126	0.318	0.388	0.097	0.501
	%	0.0461	0.1008	0.0025	0.0190	-0.0043	-0.1121	-0.0093	-0.0427
2010	Nj	1.236	1.573	1.078	0.992	-0.311	0.321	-0.148	0.473
	%	0.0706	0.1107	0.0070	-0.001	-0.0068	-0.1243	-0.0080	-0.0481
2011	Nj	1.171	1.567	0.929	1.092	0.374	0.313	0.013	0.422
	%	0.0471	0.1328	-0.0053	0.0122	-0.0044	-0.1234	-0.0092	-0.0498
Note: For bootstrapped standard errors, see " Appendix IV-Table AIV.7-AIV.12"									

Source: Own calculations based on SILC Data

stimulate inequality in 2007. Furthermore, during the global financial crisis of 2008-2009, Gini elasticity (Nj) increased gradually. Gini elasticity values of entrepreneur income presents that, it has an inequality-increasing effect on inequality with a not as clear cut pattern through the years. The effect of one percentage change fluctuates over years with an increase in 2008 followed by a decrease in 2009. On the other hand, a marginal increase in rental income has a re-distributive effect in 2006 and 2010. In 2008, its contribution to inequality decreased by 0.014 percentage point, then showed a slight increase in 2009.

In order to assess the contribution of several variables to the level of earning inequality, the static decomposition of the Theil-T index was employed. "Education" related to human capital, "position in occupation," and "economic sector" related to physical capital accumulation were the chosen set of variables for explaining earning inequality among the economically active labor force in Turkey[7]. As presented in equation (9) of the methodology section, the Theil T index is decomposed between and within the group components using the selected variables as subgroups. Appendix V. offers the categories of variables and general results for the static decomposition analysis of the Theil-T index.

Table 2.5 presents the gross contribution of each selected variable to income inequality, which is defined as the relative importance of between group component in overall income inequality.

Table 2.5: Gross Contribution To The Explanation Of Labor Earning Inequality (%)

Variables	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Education	14.6	14.7	15.9	18.1	20.1	18.2
Pos. in Occupation	19.4	19.3	19.0	16.7	15.3	16.2
Economic Sector	7.3	7.1	8.3	9.0	10.1	6.9

Source: Own calculations based on SILC Data

From 2006 to 2008, position in occupation represents the relatively largest contribution to earning inequality in terms of its gross contribution. However, in 2009 education became the leading contributor to earning inequality. Education increased its gross contribution to earning inequality gradually from 14.6% to 20.1% between 2006 and 2010, and then decreased to 18.2% in 2011. On the other hand, the gross contribution of position in occupation moved in the opposite direction from entrepreneur income during the analysis period, decreasing gradually from 19.4% to 15.3% between 2006 and 2010, then slightly increasing to 16.2% in 2011. The gross contribution of the economic sector to income inequality increased from 8.3% to 10.1% between 2008 and 2010, and then decreased to 6.9%, which represents its lowest value over the period of analysis.

[7] Education, position in occupation and economic sector are chosen due to their high explanatory power of the earning inequality.

When (G_j) is defined as the variable j's gross contribution to overall earning inequality, (G_{jk}) can be defined as the joint contribution of variable k and j, which represents the inequality between the K and J groups related to the two variables. Finally, (M_{kj}) can be defined as the marginal contribution of variable k given variable j, which can be calculated by subtracting the gross contribution of variable j from the joint contributions of k and j:

$$M_{kj} = G_{jk} - G_j \tag{10}$$

When n variables are included in the decomposition, marginal contributions from order 1 to order n-1 can be calculated (Psacharopoulos et al., 1997).

To put it more generally, as explained by Lopez-Acevedo and Salinas (2000), when an additional variable is included in a model that already contains certain variables, the marginal contribution of the added variable represents the difference between the gross contribution of these two models.

Table 2.6 presents the results with regard to the marginal contribution of education, position in occupation, and economic sector in explaining earning inequality. It can be seen that marginal contribution of position in occupation and marginal contribution of education increased gradually from 2009 to 2011 after a slight decrease in 2008.

Table 2.6: Marginal Contribution to the Explanation of Labor Earning Inequality (%)

Variables	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Education	9.7	10.5	10.1	11.0	11.8	12.4
Pos. in Occupation	17.2	18.8	17.7	15.6	13.9	14.9
Economic Sector	5.6	6.5	7.0	7.1	6.0	5.8

Source: Own calculations based on SILC Data

However, position in occupation decreased steadily from 2007 to 2010 followed by a 1% increase in 2011. The contribution of economic sector increased between 2006 and 2009, yet decreased in 2010 and 2011.

The results of the static decomposition analysis show that, while the significance of education has increased over time in relation to income inequality, position in

occupation has decreased in terms of both its marginal and gross contribution to earning inequality. Economic sector appeared to be relatively less important.

2.5. Conclusion

The analysis showed that the downward trend in income inequality between 2006 and 2011 has been distorted by the global financial crisis in 2008and 2009. The slight income transfer to both bottom 10% and middle 40% income classes from top 10 % and middle high 30%. The results of the Lorenz curve analysis also show that the low, middle, and middle-high income groups were not only hit relatively lately by the financial crisis, but that they also received higher income shares than their pre-crisis levels in 2011. On the other hand, the richest stratum could not maintain its pre-crisis income share by the end of the crisis period.

Results from the Gini decomposition by income source indicate that total labor earnings and entrepreneur income which were the most significant income components by their share in total income, were also the most significant income components that contributed to income inequality. Over the period of global financial crisis in 2008 and 2009 financial crisis, contribution of total labor earnings and entrepreneur income to inequality moved in the opposite direction from each other. From 2008 to 2010, the contribution of total labor earnings to inequality increased while the contribution of entrepreneur income to inequality decreased. Social transfers which contributed negatively to income inequality in 2007 and 2010 had a slight positive contribution to inequality in 2008 and 2009. Examining the effect of one percentage change in income source to total inequality, i.e. Gini elasticity, it is found that, social transfer, pensions and survivors' benefits and inter-household transfers had a redistributive effect on inequality.

Decomposition of Theil T analysis showed that during the global financial crisis, the importance of the education increased while position in occupation lost its significance in terms of both their gross and marginal contribution to earning inequality.

3. FUNCTIONAL INCOME DISTRIBUTION CONSEQUENCES OF THE GLOBAL FINANCIAL CRISIS IN 2008 IN TURKEY

3.1. 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. 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).

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 3.2 provides a framework on factor shares and the financial crises in Turkey in the post-1980s era. Section 3.3 explains the conceptual issues and different approaches in measuring functional income distribution. Section 3.4 presents a summary of the literature on the effects of the financial crises on the distribution of functional income. Section 3.5 presents the data and methodology, and Section 3.6 presents the results. Finally, Section 3.7 provides a summary and conclusion.

3.2. 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 3.1, 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%.

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.

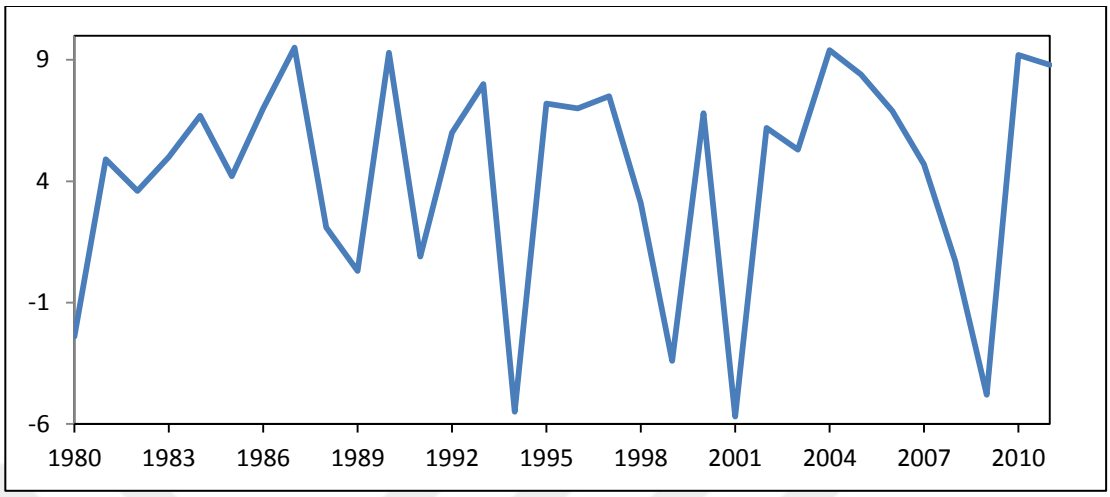


Figure 3.1: Growth Rate in Turkey

Source: OECD Database

Figure 3.2 presents the share of employees' compensation in the gross value added for the period between 1995 and 2009. 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

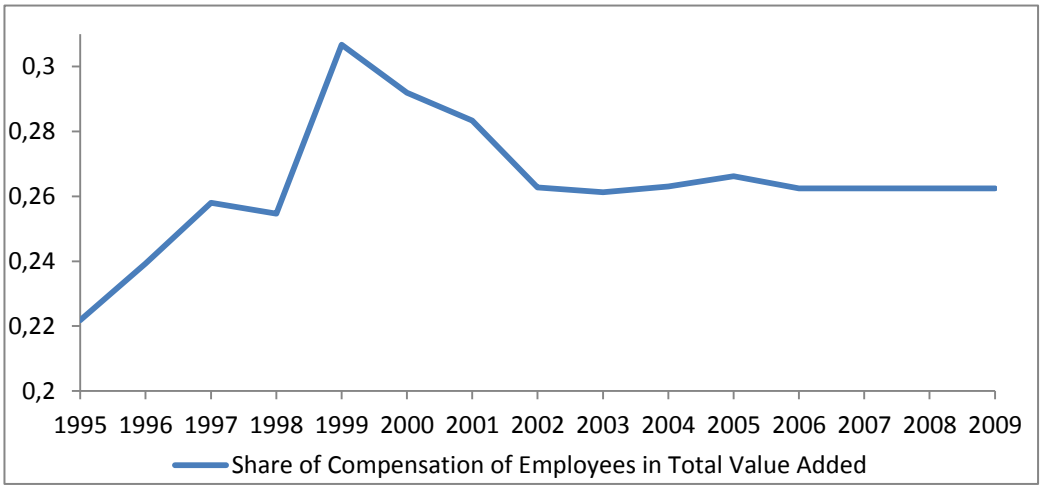


Figure 3.2: Share of Compensation of Employees in Gross Value Added

Source: Own calculations using data from WIOD's SEA

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 3.3 indicates the shares of labor compensation and capital compensation in the gross value added in Turkey[8] 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%).

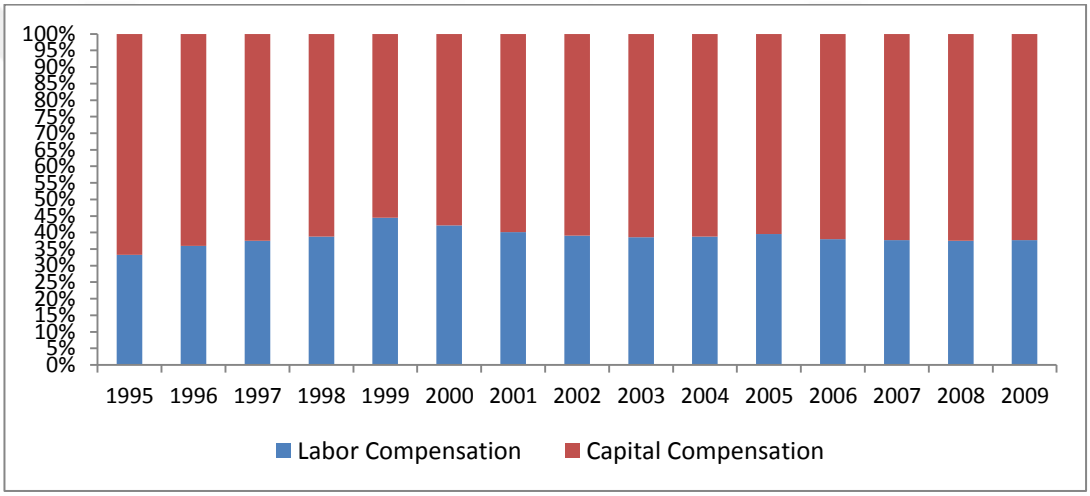


Figure 3.3: Labor Compensation and Capital Compensation in Turkey

Source: WIOD's SEA

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%).

[8] 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).

Figure 3.4 presents the skill distribution of labor compensation in Turkey[9] 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.

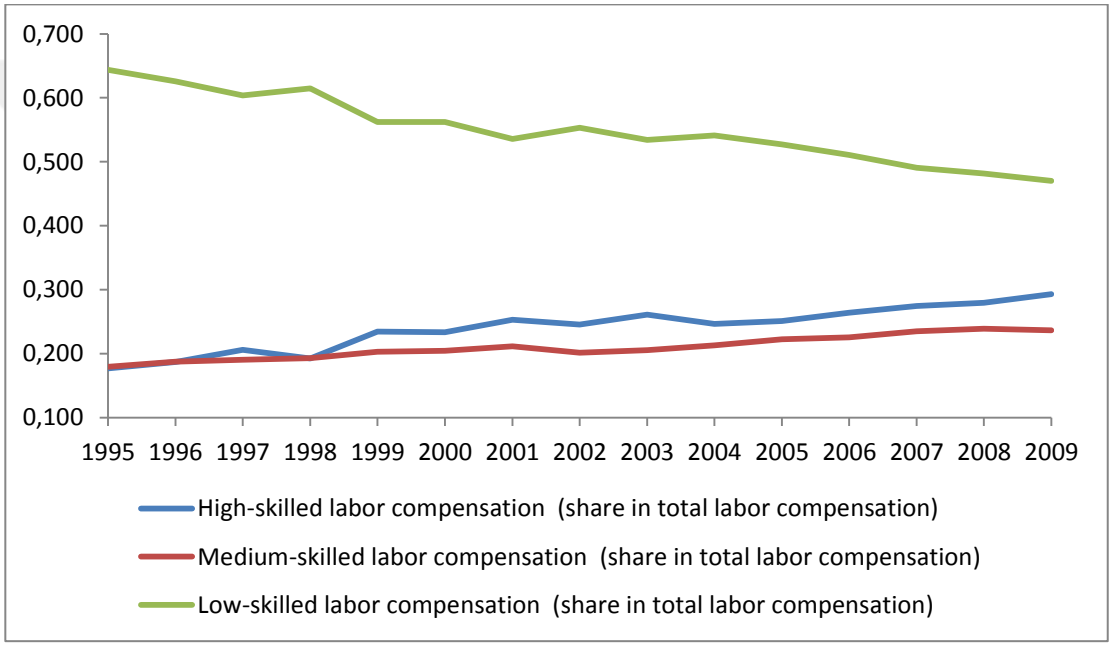


Figure 3.4: Skill Distribution of Labor Compensation in Turkey

Source: WIOD's SEA

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

[9] 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)

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.

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

3.3.1. 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 accounts[10]. In the 18th and 19th centuries, in defining factors of production, classical scholars focused on physical resources, examining them in terms of their 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 built up in the context of accumulation and distribution which are main concerns of the classical economics (Kraemer 2010).

[10] Gross National Product was first released in the U.S. in 1935 and in the U.K. in 1941.

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 (1983) 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).

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).

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.

3.3.2. 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 denominator and numerator. First of all, a few transformations are required for the computation of aggregated income as the denominator 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).

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[11] 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). 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). 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”

[11] 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.

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 country[12] (Guerriero 2012). 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 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

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

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[13]; 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 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 that 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

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

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.

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). 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.

3.4. Functional Income Distribution 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 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 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—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.

3.5. 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 data[14]. 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 incomes[15]. 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[16]. 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

[14] 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).

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

[16] "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.

(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 3.5 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 income[17].

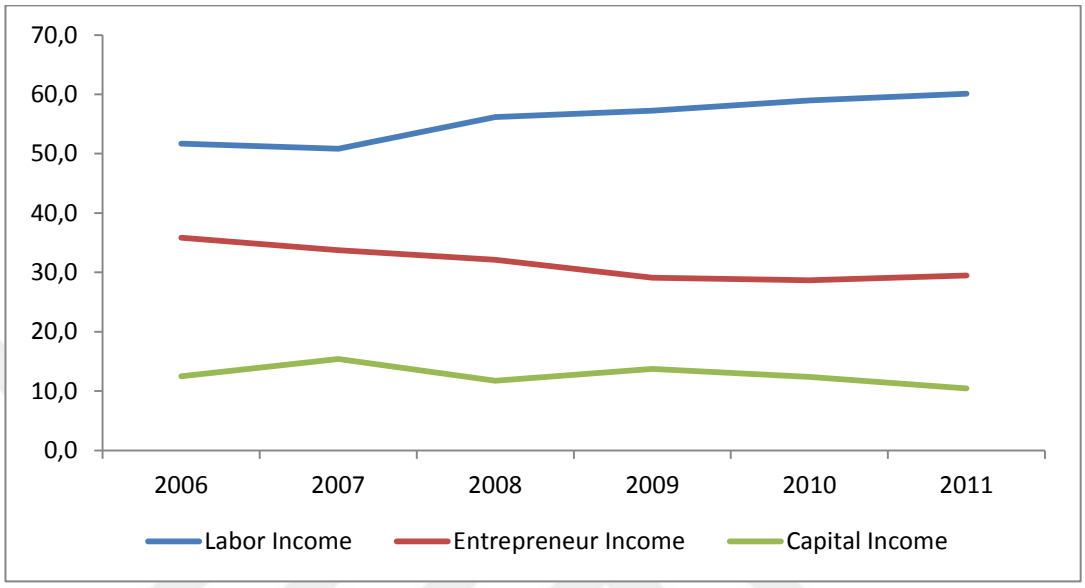


Figure 3.5: Share of Labor Income, Entrepreneur Income and Capital Income in Total Market Income

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.[18] Since entrepreneur income is gained by both employers and self-employed people by

[17] For summary statistics on income categories, see "Appendix VI: Summary Statistics on Income Categories"

18 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.

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 3.6.

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%, respectively[19].

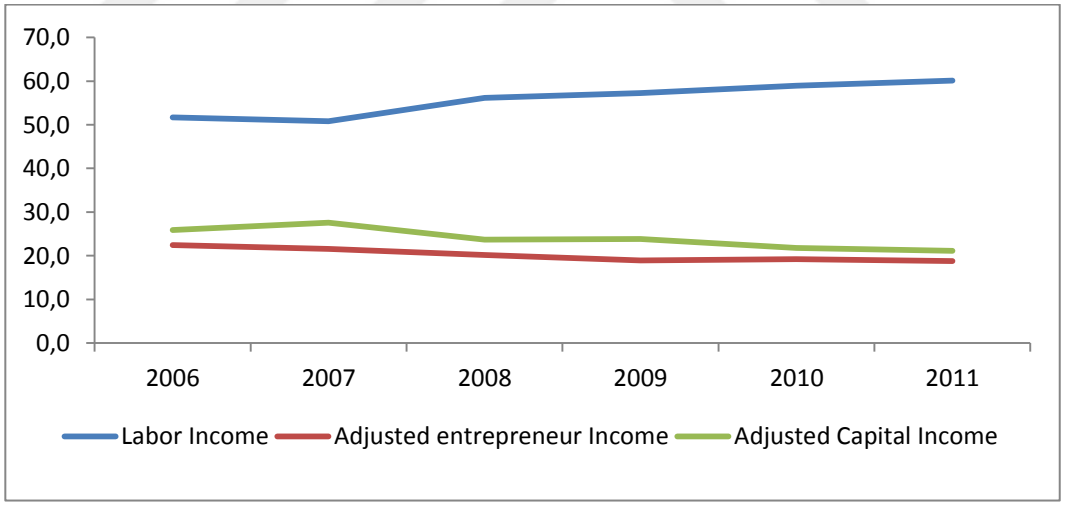


Figure 3.6: Share of Labor Income, Adjusted Entrepreneur Income and Adjusted Capital Income in Total Market Income

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

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.

[19] For summary statistics on adjusted entrepreneur income, see "Appendix VII. Summary Statistics for Adjusted Entrepreneur Income."

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

$$\mathrm{LS}_1 = \frac{\text{Total Labor Income}}{\text{Total Market Income}}$$

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

$$\mathrm{LS}_2 = \frac{\text{Total Labor Income} + \frac{2}{3}\text{Entrepreneur Income}_{\text{adjusted}}}{\text{Total Market Income}}$$

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

$$\mathrm{LS}_3 = \frac{\text{Total Labor Income} + \text{Entrepreneur Income}_{\text{adjusted}}}{\text{Total Market Income}}$$

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:

$$\mathrm{LS}_4 = \frac{\text{Total Labor Income}}{\text{Total Market Income} - \text{Entrepreneur Income}}$$

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:

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

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

3.6. Analysis

The results of the calculations of the labor shares using LS_1, LS_2, LS_3, and LS_4 are shown in Table 3.1. 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, LS_3, having the largest average labor income share, overstates the labor share by ignoring the capital income component of entrepreneur income.

Table 3.1: Labor Share Measures

	LS_1			LS_2			LS_3			LS_4		
	Level	Δ%	∑Δ	Level	Δ%	∑Δ	Level	Δ%	∑Δ	Level	Δ%	∑Δ
2006	51.7			66.7			74.1			66.7		
2007	50.8	-1.77		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

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

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 3.7. Almost overlapping lines of LS_4 and LS_2 lie between the upper line of LS_3 and the lower line of LS_1.

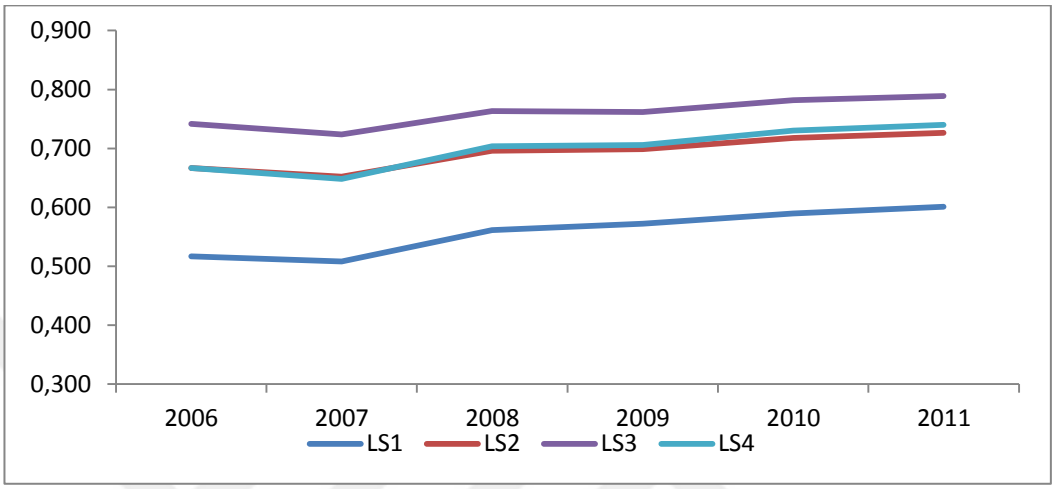


Figure 3.7: Labor Share Measures

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

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 obtainthe 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 3.2 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 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.

Table 3.2: Labor Share Measures (Between 45th and 55th Percentile)

	LS_1			LS_2			LS_3			LS_4		
	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	-0.94		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.
∑Δ: Cumulative percentage changes.
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

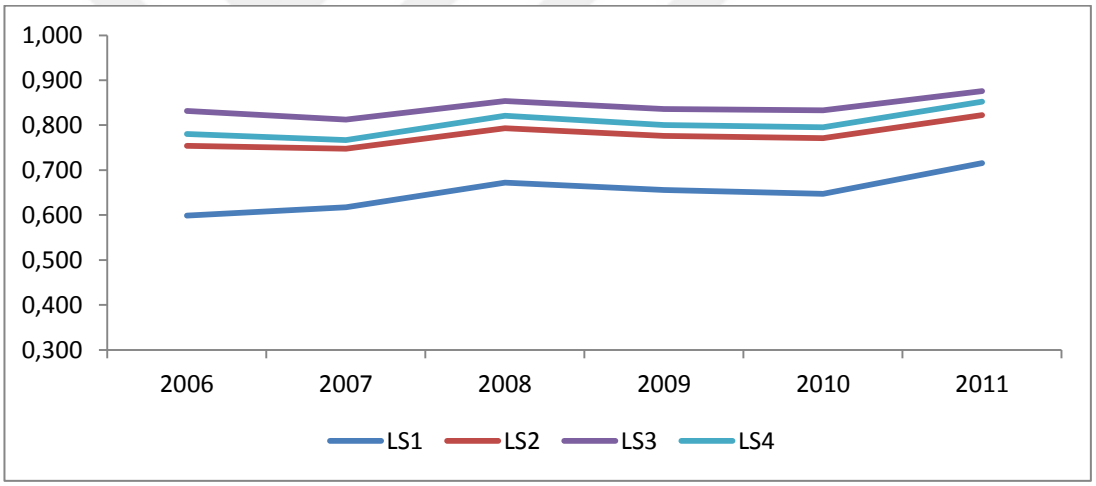


Figure 3.8: Labor Share Measures (Between 45th and 55th Percentile)

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

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 3.8, 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 perfective. Within this context, the skill distribution in the labor income based on educational level is examined. As shown in Figure 3.9, 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.

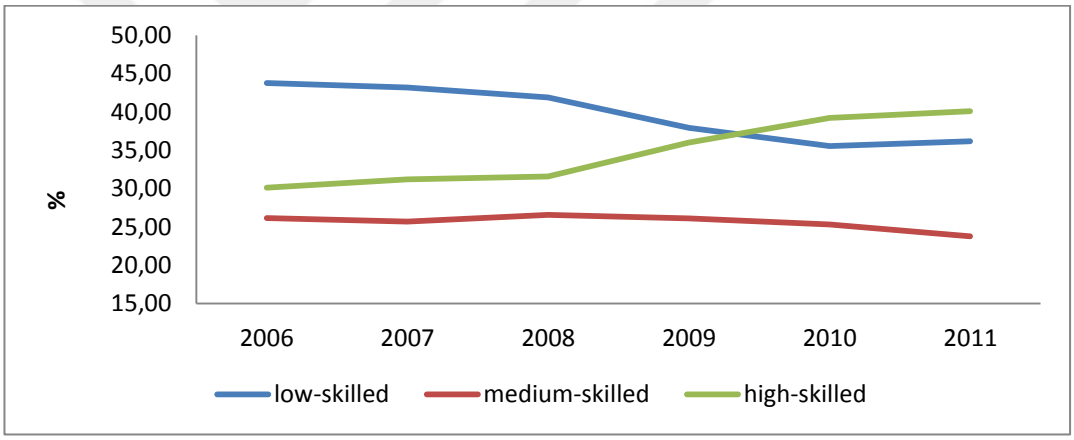


Figure 3.9: Educational Skill Distribution in Labor Income

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 3.10., 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 year[20]. These educational skill-based changes at the time of the financial crisis simply indicate the labor-hoarding phenomenon in the

[20] For detailed information on the status in employment by the educational skill distribution, see "Appendix VIII. Status in Employment by the Educational Skill Distribution."

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[21].

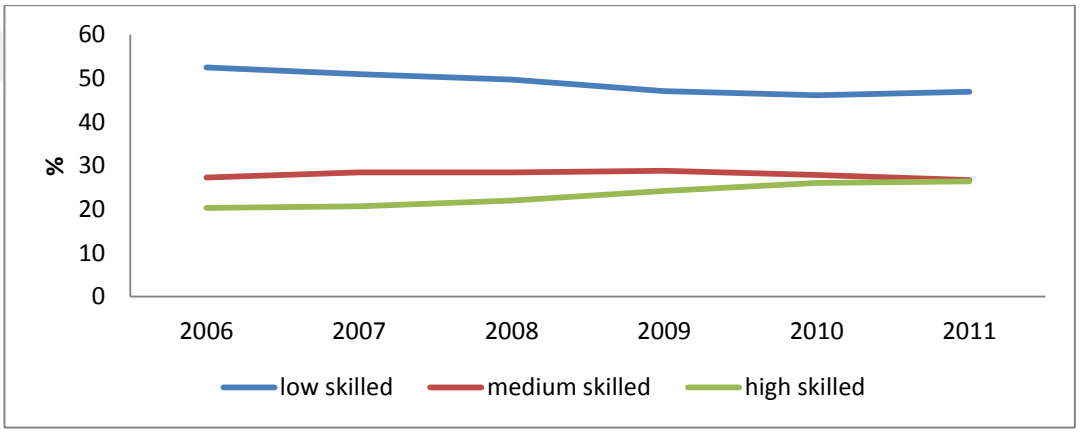


Figure 3.10: Educational Skill Distribution Among Regular Employees

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

The calculations of the labor share with aggregate data with LSm_6 and LSm_7 are presented in Table 3.3. 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 3.11, 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

[21] For detailed information on the summary statistics of labor income by the educational skill distribution, see "Appendix.IX. Summary Statistics of Labor Income by the Educational Skill Distribution."

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 3.3: 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

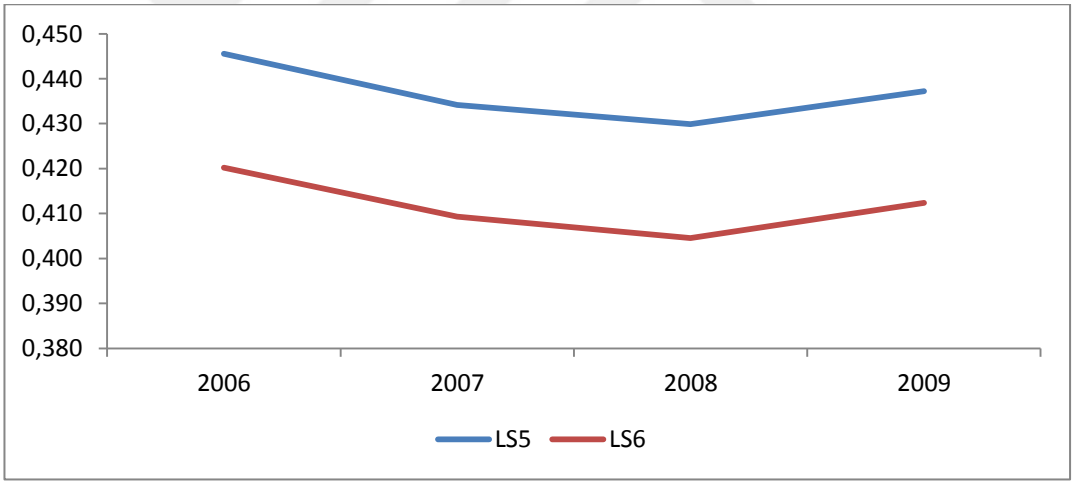


Figure 3.11: Labor Share Measures With Aggregate Data

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

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). 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%.[22] Moreover, the average rate of regular employees (salaried workers) unregistered to social security institutions (i.e., informally employed) between 2006 and 2011 was 20%[23]. The average magnitude of the informal sector in the Turkish economy between the same period was calculated as 28.8% by Schneider (2013)[24]. 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 3.4 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.

[22] For detailed information on status in employment, see "Appendix X. Employment Status in Labor Force."
[23] For detailed information on registration status to social security institutions, see "Appendix XI. Registration Status to Social Security Institutions in the Main Job by Status in Employment."
[24] For detailed information on the size of the informal economy of Turkey, see "Appendix XII. Size of the Informal Economy of Turkey and 27 European Countries (Average) (in % of off. GDP).

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 3.4: 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)

3.7. 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.

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APPENDIX

Appendix I. Data Structure

The SILC aims to produce cross-sectional and panel data for Turkey at the national, rural, and urban levels. In accordance with the rotational design methodology which is employed in the survey, while one part of the household stays in the sample from one year to another, the new households get involved in the sample instead of the rest of the sample frame. In this context, %75 of the sample size has been determined to stay in the sample. The basic sampling which represents the target population is selected as the 13 years and older individuals who are monitored throughout 4 years with the aim of determining the evolution of the target population to the basic sampling. Table A1.1 shows the number of households and number of individuals by years.

Table AI.1: Sample Size by Year

Year	Number of households	Number of individuals
2006	10,920	30,186
2007	10,796	30,263
2008	11,228	31,141
2009	11,870	32,539
2010	12,106	32,875
2011	15,025	40,679

Source: Own calculations based on SILC Survey

The topics of education, housing, ownership of assets, economic situation, health status, income status, labor status, demography and social exclusion are covered in the survey to calculate indicators as income, living conditions, poverty and social exclusion indicators.

Category Selection

Within the context of analysis, classifications for educational level, position in occupation and economic sector are used in the following categories:

1-Educational Level

1-Illiterate
2-Literate but not a graduate
3- Primary school
4- Secondary, vocational secondary or primary education school
5- High school
6- Vocational or technical high school
7- Faculty/university, college or higher education level

2-Position in Occupation

1- Regular employee
2- Casual employee
3- Employer
4- Self-employed

3-Economic Sector

a) For years 2006, 2007, 2008 and 2009

1- Agriculture, forestry, hunting and fishing
2- Mining and quarrying
3- Manufacturing
4- Electricity, gas and water supply
5- Construction
6- Wholesale and retail trade; repair of motor vehicles, motorcycles and personnel and household goods
7- Hotels and restaurants
8- Transport, communication and storage
9- Financial intermediation
10- Real estate, renting and business activities
11- Public administration and defense; compulsory social security, excluding armed forces
12- Education
13- Health and social work
14- Other social, community and personal service activities

b) For years 2010 and 2011

1- Agriculture, forestry, and fishing
2- Mining and quarrying
3- Manufacturing
4- Electricity, gas, steam, water supply, sewerage etc.
5- Construction
6- Whole-sale and retail trade
7- Transportation and storage
8- Accommodation and food service activities
9- Information and communication
10- Financial and insurance activities
11- Real estate activities
12- Professional, scientific and technical activities
13- Administrative and support service activities
14- Public administration and defense
15- Education
16- Human health and social work activities
17- Arts, entertainment and recreation
18- Other social, community and personal service activities

Group Selection

The labor force consists of persons who are working as regular employee, casual employee, employer or self-employed and above 15 years old. Following tables shows the number of individuals that belong to the labor force and sample size by variable and year respectively.

Table AI.2 Sample Size For The Labor Force

Year	Number of persons	% of the total sample
2006	10,826	35.9
2007	11,048	36.5
2008	11,711	37.6
2009	11,965	36.8
2010	12,288	37.4
2011	28,230	69.4

Source: Own calculations based on SILC Survey

Table AI.3 Sample Size By Variable and Year

Variable	2006	2007	2008	2009	2010	2011
Educational Level						
Illiterate	626	531	527	488	435	1,081
Literate but not a graduate	587	586	607	617	575	1,359
Primary school	4,761	4,722	4,809	4,682	4,707	10,68
Secondary, vocational secondary or primary educ. school	1,427	1,535	1,679	1,719	1,793	4,107
High school	1,086	1,195	1,342	1,333	1,360	3,194
Vocational or technical high school	1,001	1,059	1,133	1,275	1,318	3,044
Faculty/university, college or higher educ. level	1,338	1,420	1,614	1,851	2,100	4,762
Position in Occupation						
Regular employee	5,633	5,884	6,457	6,683	7,086	16,40
Casual employee	1,298	1,441	1,537	1,393	1,395	3,101
Employer	706	634	621	608	607	1,431
Self-employed	3,189	3,089	3,096	3,281	3,200	7,290
Total	10.836	11,048	11,711	11,965	12,288	28,230

Source: Own calculations based on SILC 2011 Survey

Table AI.4 Employment Share Within Economic Sector By Level of Education, 2011

	Illiterate	Literate but not a graduate	Primary school	Secondary, vocational secondary or primary education school	High school	Vocational or technical high school	Faculty/ university, college or higher educ. level	Total
Agriculture, forestry, and fishing	14.03	12.01	60.11	7.41	2.85	2.48	1.11	100
Mining and quarrying	0.47	0.47	50.23	23.94	7.51	9.86	7.51	100
Manufacturing	1.34	3.83	40.7	20.05	10.93	14.8	8.34	100
Electricity, gas, steam, water supply, sewerage	3.41	2.93	28.78	8.78	13.17	28.29	14.63	100
Construction	2.23	6.51	49.79	19.54	7.91	7.72	6.28	100
Wholesale and retail trade	1.51	3.31	32.02	20	19	14	11	100
Transportation and storage	0.6	3.14	46.33	18.29	12.55	10.95	8.14	100
Accommodation and food service activities	0.59	3.66	42.84	21.52	13.93	9.88	7.59	100
Information and communication	0	0	6.72	7.84	22.01	11.94	51.49	100
Financial and insurance activities	0.28	1.56	15.01	8.92	16.86	15.16	42.21	100
Real estate activities	0.97	1.62	19.61	9.4	18.8	15.24	34.36	100
Professional, scientific and technical activities	0	0.23	5.23	4.43	9.2	9.66	71.25	100
Administrative and support service activities	2.08	2.78	28.77	11.01	16.27	18.06	21.03	100
Public administration and defense	3.49	3.05	24.19	10.03	14.73	12.44	32.06	100
Education	0.08	0.25	4.55	2.69	5.89	4.71	81.82	100
Human health and social work activities	5.34	1.92	15.34	5.07	12.6	18.63	41.1	100
Arts, entertainment and recreation	0.73	0.73	27.74	16.79	21.17	16.79	16.06	100
Other social, community personal ser. activities	4.58	4.7	42.33	21.29	7.55	9.03	10.52	100
Total	3.83	4.81	37.84	14.55	11.31	10.78	16.87	100

Source: Own calculations based on SILC 2011 Survey

Table AI.5 Employment Share Within Level of Education By Economic Sector, 2011

	Illiterate	Literate but not a graduate	Primary school	Secondary, vocational secondary or primary education school	High school	Vocational or technical high school	Faculty/ university, college or higher educ. level	Total
Agriculture, forestry, and fishing	65.49	44.59	28.39	9.11	4.51	4.11	1.18	17.87
Mining and quarrying	0.09	0.07	1	1.24	0.5	0.69	0.34	0.75
Manufacturing	6.57	14.94	20.18	25.86	18.13	25.76	9.28	18.76
Electricity, gas, steam, water supply, sewerage	0.65	0.44	0.55	0.44	0.85	1.91	0.63	0.73
Construction	4.44	10.3	10.02	10.23	5.32	5.45	2.83	7.61
Wholesale and retail trade	6.11	10.67	13.11	21.06	26.11	19.42	9.95	15.5
Transportation and storage	0.83	3.46	6.5	6.67	5.89	5.39	2.56	5.31
Accommodation and food service activities	0.83	4.12	6.13	8.01	6.67	4.96	2.44	5.42
Information and communication	0	0	0.17	0.51	1.85	1.05	2.9	0.95
Financial and insurance activities	0.19	0.81	0.99	1.53	3.73	3.52	6.26	2.5
Real estate activities	0.56	0.74	1.13	1.41	3.63	3.09	4.45	2.19
Professional, scientific and technical activities	0	0.15	0.43	0.95	2.54	2.79	13.17	3.12
Administrative and support service activities	1.94	2.06	2.71	2.7	5.13	5.98	4.45	3.57
Public administration and defense	5.09	3.53	3.57	3.85	7.26	6.44	10.6	5.58
Education	0.09	0.22	0.51	0.78	2.19	1.84	20.41	4.21
Human health and social work activities	3.61	1.03	1.05	0.9	2.88	4.47	6.3	2.59
Arts, entertainment and recreation	0.09	0.07	0.36	0.56	0.91	0.76	0.46	0.49
Other social, community personal ser. activities	3.42	2.8	3.2	4.19	1.91	2.4	1.78	2.86
Total	100	100	100	100	100	100	100	100

Source: Own calculations based on SILC 2011 Survey

Table AI.6 Employment share within level of education by position in occupation, 2011

	Regular employee	Casual employee	Employer	Self-employed	Total
Illiterate	16.37	23.31	2.04	58.28	100
Literate but not a graduate	29.14	20.82	3.02	47.02	100
Primary school	41.2	14.91	4.79	39.1	100
Secondary, vocational secondary or primary education school	62.99	14.44	4.82	17.75	100
High school	71.54	6.48	6.98	15	100
Vocational or technical high school	78.19	4.37	5.39	12.06	100
Faculty/university, college or higher education level	87.82	0.84	5.69	5.65	100
Total	58.12	10.98	5.07	25.82	100

Source: Own calculations based on SILC 2011 Survey

Table AI.7 Employment share within position in occupation by level of education, 2011

	Regular employee	Casual employee	Employer	Self-employed	Total
Illiterate	1.08	8.13	1.54	8.64	3.83
Literate but not a graduate	2.41	9.13	2.87	8.77	4.81
Primary school	26.82	51.37	35.78	57.3	37.84
Secondary, vocational secondary or primary education school	15.77	19.12	13.84	10	14.55
High school	13.93	6.68	15.58	6.57	11.31
Vocational or technical high school	14.51	4.29	11.46	5.03	10.78
Faculty/university ,college or higher education level	25.49	1.29	18.94	3.69	16.87
Total	100	100	100	100	100

Source: Own calculations based on SILC 2011 Survey

Table AI.8: Share of educational level by income decile within income group, 2011

Income Decile	Illiterate	Literate but not a graduate	Primary school	Secondary, vocational secondary or primary education school	High school	Vocational or technical high school	Faculty/ university, college or higher educ. level	Total
I	13.96	11.17	38.58	19.16	7.16	5.24	4.74	100
II	8.15	8.63	45.93	17.38	8.89	6.09	4.93	100
III	5.68	7.12	47.66	16.56	10.22	7.12	5.64	100
IV	2.69	5.52	45.12	18.27	11.42	11.57	5.41	100
V	2.83	4.3	44.04	16.78	13.72	11.37	6.95	100
VI	1.83	3.55	44.94	14.77	12.32	14.11	8.48	100
VII	1.59	2.97	40.71	13.27	12.75	14.46	14.24	100
VIII	0.81	1.8	31.91	9.16	13.32	14.1	28.89	100
IX	0.59	1.66	23.19	7.51	10.31	12.11	44.64	100
X	0.41	1.1	22.53	7.18	11.19	10.97	46.61	100

Source: Own estimates based on SILC 2011 Survey

Table AI.9: Share of educational level by income decile within educational level, 2011

Income Decile	Illiterate	Literate but not a graduate	Primary school	Secondary, vocational secondary or primary education school	High school	Vocational or technical high school	Faculty/ university, college or higher educ. level
I	36.76	23.75	10.21	13.93	6.55	4.98	2.83
II	20.76	17.76	11.77	12.22	7.87	5.6	2.85
III	14.67	14.83	12.37	11.8	9.16	6.63	3.3
IV	6.95	11.53	11.73	13.03	10.25	10.79	3.17
V	7.33	8.99	11.46	11.98	12.34	10.62	4.08
VI	4.76	7.46	11.77	10.61	11.15	13.26	5.01
VII	4.1	6.15	10.51	9.41	11.38	13.4	8.29
VIII	2.1	3.77	8.3	6.54	11.97	13.16	16.95
IX	1.52	3.46	6.03	5.36	9.26	11.31	26.19
X	1.05	2.31	5.86	5.12	10.06	10.24	27.33
Total	100	100	100	100	100	100	100

Source: Own estimates based on SILC 2011 Survey

Appendix II: International Comparisons

Table AII.1: Upper Middle Income Countries-Gini Index

Country Name	2005	2006	2007	2008	2009	2010	2011	2012
Albania	31.70	-	-	29.98	-	-	-	28.96
Argentina	49.27	48.26	47.37	46.27	45.27	44.50	43.57	-
Bulgaria	-	-	28.14	33.57	-	35.78	34.28	-
Belarus	27.39	28.17	28.78	27.22	27.69	27.72	26.46	-
Brazil	56.65	55.93	55.23	54.37	53.87	-	53.09	52.67
China	42.48	-	-	42.63	-	42.06	37.01	-
Colombia	55.06	58.66	58.88	56.05	55.92	55.51	54.18	53.53
Costa Rica	47.77	49.31	49.49	49.14	50.97	48.10	48.60	48.61
Dominican Republic	49.96	51.90	48.69	49.00	48.86	47.20	47.40	45.68
Ecuador	54.12	53.20	54.33	50.61	49.28	49.26	46.21	46.57
Hungary	30.19	28.30	-	27.53	-	29.37	28.94	-
Jordan	-	33.89	-	32.63	-	33.69	-	-
Kazakhstan	26.83	29.98	29.59	29.07	-	28.56	-	-
Mexico	51.11	48.11	-	48.28	-	47.16	-	48.07
Macedonia, FYR	39.13	42.78	-	44.20	-	-	-	-
Montenegro	30.14	29.39	30.82	30.01	30.27	28.60	30.63	-
Panama	53.99	55.06	52.97	52.63	52.03	51.91	51.83	51.90
Peru	49.28	49.07	49.62	46.89	46.24	44.92	45.67	45.33
Romania	29.82	30.61	30.35	29.53	28.34	28.16	27.21	27.33
Serbia	33.43	29.67	29.43	28.18	28.67	29.65	-	-
Thailand	-	42.35	-	40.51	-	39.37	-	-
Turkey	41.73	39.65	38.44	38.28	38.97	38.79	40.04	-
South Africa	-	67.40	-	-	63.14	-	65.02	-

Source: World Bank Estimates-World Development Indicators

Table AII.2: Upper Middle Income Countries-Income Share Held By Lowest %10

Country Name	2005	2006	2007	2008	2009	2010	2011	2012
Albania	3.37	-		3.73	-	-	-	3.66
Argentina	1.06	1.1	1.22	1.26	1.24	1.46	1.57	-
Bulgaria	-	-	3.26	2.42	-	2.07	2.07	-
Belarus	3.66	3.63	3.59	3.79	3.71	3.76	3.88	-
Brazil	0.93	0.96	0.9	0.99	0.98	-	0.98	1.04
China	1.79	-	-	1.77	-	1.69	-	-
Colombia	1.13	0.68	0.79	0.91	0.97	1.05	1.11	1.07
Costa Rica	1.3	1.24	1.46	1.41	1.21	1.57	1.49	1.47
Dominican Republic	1.5	1.45	1.61	1.7	1.69	1.81	1.78	1.89
Ecuador	0.93	1.17	1.01	1.15	1.25	1.35	1.44	1.41
Hungary	3.44	3.44	-	3.55	-	3.28	3.19	-
Jordan	-	3.51	-	3.73	-	3.62	-	-
Kazakhstan	4.04	3.74	3.82	3.98	-	4.03	-	-
Mexico	1.18	1.96	-	1.81	-	1.99	-	1.85
Macedonia, FYR	2.32	2.09	-	2.23	-	-	-	-
Montenegro	3.52	3.55	3.27	3.5	3.3	3.64	3.36	-
Panama	0.84	0.74	0.97	1.04	1.25	1.1	1.05	0.99
Peru	1.46	1.44	1.32	1.46	1.56	1.66	1.49	1.44
Romania	3.4	3.34	3.38	3.45	3.59	3.52	3.66	3.66
Serbia	2.88	3.4	3.44	3.76	3.55	3.37	-	-
Thailand	-	2.5	-	2.79	-	2.8	-	-
Turkey	1.95	2.08	2.15	2.13	2.21	2.21	2.16	-
South Africa	-	1.07	-	-	1.17	-	1.05	-

Source: World Bank Estimates-World Development Indicators

Table AII.3: Upper Middle Income Countries-Income Share Held by Highest %10

Country Name	2005	2006	2007	2008	2009	2010	2011	2012
Albania	25	-	-	24.5	-	-	-	22.9
Argentina	36.3	35.4	34.9	33.7	32.6	32.4	31.8	-
Bulgaria	-	-	22.2	25.7	-	27	26	-
Belarus	21.7	22.3	23	22	22.6	22.3	21.5	-
Brazil	45.2	44.5	43.6	42.9	42.5	-	41.9	41.7
China	32	-	-	31.1	-	30	-	-
Colombia	44.3	47.2	47.8	44.4	44.6	44.3	43.1	42
Costa Rica	36	38	38.9	38.2	39.7	37.1	37	37.1
Dominican Republic	39.1	41.2	38.4	38.8	38.7	36.5	37.3	35.8
Ecuador	42.6	42.5	43.3	39.4	38.2	38.4	34.8	35.4
Hungary	23.9	22.8	-	22.1	-	23.1	23.1	-
Jordan	-	27.7	-	26.8	-	27.6	-	-
Kazakhstan	21.7	24.7	24.2	24.2	-	23.7	-	-
Mexico	40.2	38.3	-	38.7	-	37.5	-	38.9
Macedonia, FYR	28.9	32.7	-	34.5	-	-	-	-
Montenegro	23.9	23	23.9	24.1	24.2	22.5	24.5	-
Panama	40.5	41.8	40.2	40.6	40.5	40.1	40	39.9
Peru	38.1	37.7	37.8	35.4	35	34.1	34.3	33.8
Romania	23.5	24.1	24	23.2	22.3	21.9	21.4	21.5
Serbia	26.2	23.5	23.5	22.7	22.8	23.2	-	-
Thailand	-	33.3	-	31.8	-	31	-	-
Turkey	31.7	29.6	28.2	28.6	29.2	29.3	30.5	-
South Africa	-	57.5	-	-	51.7	-	53.8	-

Source: World Bank Estimates-World Development Indicators

Table AII.4: Gini for Turkey

Years	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gini	41.4	42.2	41.3	41.7	39.7	38.4	38.3	39	38.8	40.04

Source: World Bank Estimates-World Development Indicators

Table AII.5: Gini Coefficient*-OECD countries

Year	2006	2007	2008	2009	2010	2011
Country						
Australia	..	..	0.33594	..	0.33374	..
Austria	0.26760	0.26886	0.26240	0.26905	0.26902	0.28175
Belgium	0.26493	0.27692	0.26535	0.26925	0.26434	..
Canada	0.31703	0.31793	0.32054	0.31997	0.31940	0.31558
Chile	0.51100	..	..	0.51000	..	0.50300
Czech Republic	0.26091	0.25679	0.26010	0.25803	0.25823	0.25607
Denmark	0.23890	0.24600	0.24160	0.23750	0.25210	0.25270
Estonia	0.33736	0.31166	0.31314	0.30937	0.31697	0.32259
Finland	0.26841	0.27045	0.26576	0.26017	0.26499	0.26542
France	0.29300	0.29200	0.29300	0.29300	0.30300	0.30900
Germany	0.29036	0.29543	0.28711	0.28808	0.28568	0.29309
Greece	0.34102	0.33462	0.33101	0.33151	0.33779	0.33538
Hungary	..	0.27210	..	0.27190	..	..
Iceland	0.28988	0.28293	0.30447	0.26560	0.24573	0.25061
Ireland	0.31516	0.30281	0.29489	0.31209	0.31322	0.30174
Israel	..	..	0.37114	0.37274	0.37612	0.37740
Italy	..	..	0.31666	0.31461	0.32132	0.32141
Japan	0.32926	..	..	0.33575	..	..
Korea	0.30600	0.31200	0.31400	0.31400	0.31000	0.31100
Luxembourg	0.27363	0.27561	0.28885	0.27814	0.27099	0.27613
Mexico	..	..	0.47461	..	0.46603	..
Netherlands	0.28000	0.29500	0.28600	0.28300	0.28300	..
New Zealand	..	..	0.33000	0.32400	..	0.32300
Norway	..	..	0.25010	0.24490	0.24864	0.24960
Poland	0.31724	0.31722	0.30910	0.30547	0.30656	0.30387
Portugal	0.36945	0.36368	0.35806	0.34037	0.34480	0.34136
Slovak Republic	0.24751	0.24563	0.25686	0.26565	0.26343	0.26147
Slovenia	0.24229	0.24136	0.23586	0.24723	0.24640	0.24502
Spain	0.31475	0.30625	0.31506	0.32858	0.33410	0.34393
Sweden	..	..	0.25933	0.26906	0.26906	0.27342
Switzerland	..	..	..	0.29817	..	0.28895
Turkey	..	0.40900	..	0.41110	0.41700	0.41200
United Kingdom	0.33938	0.34134	0.34236	0.34461	0.34105	0.34439
United States	0.38355	0.37614	0.37824	0.37867	0.38025	0.38934

Sources: OECD.Stats, *Gini (at disposable income, post taxes and transfers)

Table AII.6: Ratio of top %10 decile to bottom %10 decile -OECD countries*

Year	2006	2007	2008	2009	2010	2011
Country						
Australia	..	..	4.5	..	4.5	..
Austria	3.3	3.3	3.2	3.3	3.2	3.5
Belgium	3.4	3.3	3.3	3.4	3.3	..
Canada	4.1	4	4.1	4.2	4.1	4.1
Chile	9.4	..	..	8.7	..	8.5
Czech Republic	3.1	3	2.9	3	3.1	3
Denmark	2.8	2.8	2.8	2.8	2.9	2.9
Estonia	4.5	4.4	4.2	4.1	4.4	4.4
Finland	3.2	3.2	3.2	3.1	3.2	3.2
France	..	..	3.4	3.5	3.6	3.6
Germany	..	..	3.5	3.6	3.6	3.6
Greece	4.7	4.4	4.4	4.3	4.6	4.8
Hungary	..	3.1	..	3.4	..	..
Iceland	3.2	3.2	3.2	3.1	2.8	2.8
Ireland	4	3.7	3.7	3.8	3.8	3.8
Israel	..	..	6.2	6.2	6.4	6.2
Italy	..	..	4.2	4.1	4.3	4.2
Japan	5	..	..	5.2	..	..
Korea	4.5	4.7	4.8	4.8	4.8	4.8
Luxembourg	3.4	3.3	3.4	3.5	3.4	3.4
Mexico	..	..	9.6	..	9.5	..
Netherlands	3.2	3.3	3.3	3.3	3.3	..
New Zealand	..	..	4.2	4.2	..	4.2
Norway	..	..	3	2.9	2.9	3
Poland	4.2	4	4	4	4	4
Portugal	5.3	5	4.9	4.8	4.6	4.7
Slovak Republic	2.9	3	3.1	3.2	3.2	3.3
Slovenia	3.1	3.1	3	3.2	3.2	3.2
Spain	4.4	4.3	4.5	4.9	5.1	5.4
Sweden	..	..	3.2	3.3	3.3	3.4
Switzerland	..	..	..	3.6	..	3.7
Turkey	..	6.2	..	6.3	6.5	6.3
United Kingdom	4.2	4.3	4.3	4.2	4.1	4
United States	..	..	5.9	5.9	6.1	6.1

*The data for certain countries includes one or more breaks in series. The reasons for these breaks are varied and include the switch to a different survey (e.g. Belgium, Italy or UK), different methodology (switch from tax units to households in Sweden) or population coverage (Germany). The set of characteristics of a series over a given period without break is referred to in IDD as a 'Definition'.

*The P90/P10 ratio is the ratio of the upper bound value of the ninth decile (i.e. the 10% of people with highest income) to that of the upper bound value of the first decile.

*Data for 2004 are from the Household Income and Consumption Survey. From 2007 on, the data source is the Household Income and Living Condition Survey.

Appendix III. Equivalence Scale

Equivalence scales are the tools that convert household level incomes into individual income levels by transferring the nominal incomes of heterogeneous households to equivalent incomes that can be compared across individuals.

A parametric equivalence scale typically functions with explicit parameters that vary depending on household characteristics, such as size and age structure. Thus, they enable us to compare the welfare levels of households with different compositions. This information can be shown as follows:

$$Y_E = \frac{Y_U}{E_i} \quad (1)$$

where Y_E is equivalent income, Y_U is the sum of individual incomes in the household (i.e., unadjusted household income), and E_i is the equivalence scale.

Buhmann et al. (1988) introduced a widely used functional form with one parameter:

$$E_i = N^{\theta}, \quad 0 \leq \theta \leq 1 \quad (2)$$

where N denotes the number of individuals in the household and θ is the parameter of equivalence elasticity representing the economies of scale in the household. If Θ=1, Y_E equals per capita income, which indicates an absence of economies of scale. θ=0 corresponds to perfect economies of scale where all commodities are public, and no adjustment of size is needed for the household income.

An extended version of Equation 2, which distinguishes between adults and children, is the following:

$$E_i = (A + \alpha C)^{\theta}, \quad 0 \leq \theta \leq 1, \quad 0 < \alpha \leq 1 \quad (3)$$

where A is the number of adults in the household, C is the number of children in the household, α is the weighting parameter for number of children relative to number

of adults, and Θ is the parameter of economies of scale. This modified version of Equation 2 has been extended by Cutler and Katz (1992) and used in several studies. Parametric equivalence scales can also be developed as a function of the relative age based requirements of the household members. Following this method, The OECD employs the following equivalence scale form for income adjustment purposes:

$$E_i = 1 + \alpha(A - 1) + \beta C \quad (4)$$

where A and C are the number of adults aged 14 and over and children less than age 14 respectively and 1 is the value attached to the household head. Turkish Statistical Institute has been using "modified OECD scale" in which α =0.5 and β=0.3 in equation 4 for Income and Living Condition Survey. Although Modified OECD scale is a widely used form which allows researchers to make better statistical comparisons among OECD countries, its limitations by means of inability of capturing country-specific family-size distributions and economies of scales. Therefore, in this study, a country-specific equivalence scale i.e "National Equivalence Scale" developed by Turkish Statistical Institute by using Household Budget Survey of 2002 is used for adjusting incomes of the heterogeneous households. National Equivalence Scale is identified with equation 3 in which α=0.6 and θ=0.9.

Appendix IV. Decomposition of Gini By Income Source

Table AIV.1: General Results for Decomposition of Gini by Income Source

Year	Source	Sk	Gk	Rk	Share	% Change
2006	Total Labor Earning	25.6%	0.7186	0.5357	0.0987	-0.0004
	Entrepreneur income	22.7%	0.8450	0.7220	0.1385	0.1321
	Financial Income	8.6%	0.6235	0.6501	0.0347	0.0044
	Rental income	14.2%	0.5564	0.6737	0.1379	-0.0040
	Social transfer	0.4%	0.9795	0.3087	0.0011	-0.0008
	Pensions and survivors' benefits	17.7%	0.5877	0.3225	0.0335	-0.0898
	Inter-household transfers	0.9%	0.9640	0.0087	0.0001	-0.0085
	Other Incomes	10.0%	0.4823	0.5359	0.0259	-0.0330
	Total Income		0.3856			
2007	Total Labor Earning	26.5%	0.7042	0.6242	0.2948	0.0297
	Entrepreneur income	17.0%	0.8483	0.6332	0.2305	0.0609
	Financial Income	11.9%	0.6823	0.6541	0.134	0.0153
	Rental income	15.8%	0.6282	0.7356	0.1844	0.0267
	Social transfer	0.4%	0.946	-0.1008	-0.001	-0.0053
	Pensions and survivors' benefits	17.0%	0.5776	0.3511	0.087	-0.0826
	Inter-household transfers	0.9%	0.9509	-0.0236	-0.0005	-0.0093
	Other Incomes	10.6%	0.4262	0.6193	0.0709	-0.0353
	Total Income		0.3953			
2008	Total Labor Earning	24.2%	0.729	0.5875	0.272	0.0302
	Entrepreneur income	24.8%	0.8172	0.7209	0.3842	0.1359
	Financial Income	7.2%	0.6357	0.5669	0.0684	-0.0039
	Rental income	15.3%	0.6031	0.6821	0.1655	0.0123
	Social transfer	0.8%	0.9721	0.3618	0.0071	-0.0006
	Pensions and survivors' benefits	17.9%	0.5162	0.2627	0.0636	-0.115
	Inter-household transfers	1.0%	0.9469	-0.1086	-0.0026	-0.0123
	Other Incomes	8.8%	0.3973	0.4531	0.0417	-0.0465
	Total Income		0.3807			
2009	Total Labor Earning	25.2%	0.7525	0.6638	0.2984	0.0461
	Entrepreneur income	21.1%	0.8617	0.7241	0.312	0.1008
	Financial Income	10.0%	0.6641	0.6516	0.1021	0.0025
	Rental income	15.2%	0.6427	0.7396	0.1707	0.019
	Social transfer	0.6%	0.9656	0.1389	0.002	-0.0043
	Pensions and survivors' benefits	18.3%	0.523	0.3132	0.071	-0.1121
	Inter-household transfers	1.0%	0.9486	0.0434	0.001	-0.0093
	Other Incomes	8.6%	0.4261	0.4961	0.0428	-0.0427
	Total Income		0.4223			
2010	Total Labor Earning	29.9%	0.7237	0.6892	0.3699	0.0706
	Entrepreneur income	19.3%	0.8654	0.7337	0.304	0.1107
	Financial Income	9.0%	0.6878	0.6328	0.0965	0.007
	Rental income	13.2%	0.5934	0.6745	0.1304	-0.0011
	Social transfer	0.5%	0.9469	-0.1325	-0.0016	-0.0068
	Pensions and survivors' benefits	18.3%	0.5222	0.2481	0.0587	-0.1243
	Inter-household transfers	0.7%	0.9536	-0.0628	-0.001	-0.008
	Other Incomes	9.1%	0.4189	0.4554	0.0431	-0.0481
	Total Income		0.4036			
2011	Total Labor Earning	27.7%	0.7381	0.6474	0.3237	0.0471
	Entrepreneur income	23.4%	0.8514	0.7513	0.3671	0.1328
	Financial Income	7.4%	0.6689	0.5667	0.0691	-0.0053
	Rental income	13.3%	0.617	0.7226	0.1448	0.0122
	Social transfer	0.7%	0.9647	0.1581	0.0026	-0.0044
	Pensions and survivors' benefits	18.0%	0.533	0.2398	0.0562	-0.1234
	Inter-household transfers	0.9%	0.9514	0.0057	0.0001	-0.0092
	Other Incomes	8.6%	0.3944	0.4365	0.0363	-0.0498
	Total Income		0.4082			

Source: Own calculations based on SILC Data

Table AIV.2: Bootstrapped Standard Errors for Decomposition of Gini by Income Source- Share in Overall Gini,-Year 2006

Bootstrap statistics-year 2006 GK gini of k						
Variable	**Observed**	**Bias**	**Std. Err.**	**[95% Conf.**	**Interval]**	
Total Labor Earning	0.718574	-0.0023	0.013153	0.6921422	0.745007	(N)
				0.693764	0.739653	(P)
				0.6985697	0.741523	(BC)
Entrepreneur income	0.844985	-0.00097	0.011972	0.8209266	0.869044	(N)
				0.8149127	0.85694	(P)
				0.8138831	0.855845	(BC)
Financial Income	0.623473	-0.00106	0.015012	0.5933058	0.65364	(N)
				0.5895725	0.649875	(P)
				0.5895725	0.650541	(BC)
Rental Income	0.5564	0.000751	0.01873	0.5187608	0.594038	(N)
				0.5153946	0.58879	(P)
				0.4982815	0.585585	(BC)
Social transfer	0.979453	-0.00221	0.005779	0.9678389	0.991067	(N)
				0.9635156	0.985198	(P)
				0.9676437	0.987167	(BC)
Pensions and	0.587727	-0.00279	0.015044	0.5574948	0.617959	(N)
survivors' benefits				0.5592645	0.613004	(P)
				0.5592645	0.623425	(BC)
Inter- household	0.963989	-0.00036	0.005318	0.9533026	0.974675	(N)
transfer				0.9542212	0.972161	(P)
				0.9541603	0.972161	(BC)
Other Incomes	0.482325	-0.00237	0.010143	0.4619422	0.502707	(N)
				0.4571553	0.499719	(P)
				0.4632951	0.502877	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation =708, Replications =50						

Source: Own calculations based on SILC Data

Table AIV.3: Bootstrapped Standard Errors for Decomposition of Gini by Income Source- Share in Overall Gini,-Year 2007

Bootstrap statistics-year 2007						
Variable	**Observed**	**Bias**	**Std. Err.**	**[95% Conf.**	**Interval]**	
Total Labor Earning	0.704218	-0.0013	0.016278	0.671506	0.736929	(N)
				0.673106	0.742609	(P)
				0.679612	0.747499	(BC)
Entrepreneur income	0.848278	-0.00179	0.009794	0.828597	0.867959	(N)
				0.826678	0.865549	(P)
				0.826678	0.870794	(BC)
Financial Income	0.682303	-0.00053	0.024941	0.632182	0.732424	(N)
				0.636364	0.743045	(P)
				0.638521	0.745951	(BC)
Rental Income	0.628199	-0.00156	0.024666	0.57863	0.677768	(N)
				0.586382	0.678519	(P)
				0.586382	0.683018	(BC)
Social transfer	0.946022	-0.00109	0.005989	0.933986	0.958058	(N)
				0.93425	0.954542	(P)
				0.93425	0.954747	(BC)
Pensions and	0.577603	-0.00067	0.013992	0.549484	0.605722	(N)
survivors' benefits				0.553176	0.607622	(P)
				0.553176	0.613129	(BC)
Inter- household	0.9509	-0.00044	0.004539	0.941779	0.960021	(N)
transfer				0.941354	0.9577	(P)
				0.941354	0.958074	(BC)
Other Incomes	0.426236	0.001016	0.009316	0.407514	0.444958	(N)
				0.410865	0.443046	(P)
				0.40917	0.443046	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation =708, Replications =50						

Source: Own calculations based on SILC Data

Table AIV.4: Bootstrapped Standard Errors for Decomposition of Gini by Income Source- Share in Overall Gini,-Year 2008

Bootstrap statistics-year 2008						
Variable	**Observed**	**Bias**	**Std. Err.**	**[95% Conf.**	**Interval]**	
Total Labor Earning	0.728998	-0.00224	0.016898	0.69504	0.762956	(N)
				0.701087	0.762922	(P)
				0.70622	0.764807	(BC)
Entrepreneur income	0.817152	-0.00033	0.011585	0.793872	0.840432	(N)
				0.793254	0.83371	(P)
				0.789463	0.83371	(BC)
Financial Income	0.635718	-0.00188	0.014325	0.606932	0.664505	(N)
				0.605842	0.665314	(P)
				0.605842	0.669192	(BC)
Rental Income	0.603064	-0.00099	0.019652	0.563572	0.642557	(N)
				0.57197	0.637169	(P)
				0.57197	0.637899	(BC)
Social transfer	0.97212	-0.00091	0.006889	0.958276	0.985964	(N)
				0.953974	0.980329	(P)
				0.952886	0.980077	(BC)
Pensions and	0.516237	-0.00203	0.013409	0.489291	0.543183	(N)
survivors' benefits				0.48684	0.541713	(P)
				0.491493	0.552616	(BC)
Inter- household	0.946926	-0.0006	0.005441	0.935992	0.957861	(N)
transfer				0.931821	0.954748	(P)
				0.931407	0.954748	(BC)
Other Incomes	0.39734	-0.00131	0.008922	0.379411	0.415269	(N)
				0.378509	0.412909	(P)
				0.381099	0.416575	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=708, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.5: Bootstrapped Standard Errors for Decomposition of Gini by Income Source- Share in Overall Gini,-Year 2009

Bootstrap statistics-year 2009						
Variable	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Total Labor Earning	0.752546	0.000645	0.014489	0.72343	0.781663	(N)
				0.728103	0.778193	(P)
				0.716514	0.778193	(BC)
Entrepreneur income	0.861664	-0.00036	0.008113	0.845361	0.877967	(N)
				0.848483	0.876095	(P)
				0.846029	0.876095	(BC)
Financial Income	0.664113	-0.00435	0.025227	0.613417	0.714809	(N)
				0.615875	0.718155	(P)
				0.619202	0.718203	(BC)
Rental Income	0.642663	-0.00279	0.023234	0.595972	0.689353	(N)
				0.597848	0.689215	(P)
				0.597848	0.700333	(BC)
Social transfer	0.965558	-0.00202	0.00731	0.950869	0.980247	(N)
				0.950927	0.973671	(P)
				0.952501	0.974212	(BC)
Pensions and	0.523033	-0.00131	0.009704	0.503532	0.542535	(N)
survivors' benefits				0.498676	0.542474	(P)
				0.498676	0.551797	(BC)
Inter- household	0.948632	-0.00068	0.00611	0.936353	0.960911	(N)
transfer				0.934834	0.957926	(P)
				0.934834	0.957926	(BC)
Other Incomes	0.426117	-0.00269	0.009386	0.407255	0.44498	(N)
				0.40696	0.440658	(P)
				0.410366	0.444621	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=708, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.6: Bootstrapped Standard Errors for Decomposition of Gini by Income Source- Share in Overall Gini,-Year 2010

Bootstrap statistics-year 2010						
Variable	**Observed**	**Bias**	**Std. Err.**	**[95% Conf.**	**Interval]**	
Total Labor Earning	0.723688	-5.4E-05	0.010278	0.703033	0.744343	(N)
				0.705987	0.744113	(P)
				0.701259	0.744113	(BC)
Entrepreneur income	0.865363	-0.00226	0.007997	0.849293	0.881433	(N)
				0.846568	0.875864	(P)
				0.848327	0.87985	(BC)
Financial Income	0.687753	-0.01022	0.033324	0.620785	0.754721	(N)
				0.614522	0.730347	(P)
				0.626637	0.732546	(BC)
Rental Income	0.593398	-0.00252	0.016033	0.561178	0.625619	(N)
				0.557897	0.616279	(P)
				0.557897	0.629099	(BC)
Social transfer	0.946907	-0.00083	0.005927	0.934997	0.958818	(N)
				0.936309	0.958233	(P)
				0.936309	0.960277	(BC)
Pensions and	0.522189	0.000393	0.010956	0.500172	0.544207	(N)
survivors' benefits				0.501669	0.542065	(P)
				0.495455	0.542065	(BC)
Inter- household	0.953571	-0.00021	0.004385	0.944759	0.962382	(N)
transfer				0.944065	0.961832	(P)
				0.944065	0.962308	(BC)
Other Incomes	0.418905	-0.00134	0.008768	0.401284	0.436526	(N)
				0.399062	0.433824	(P)
				0.399062	0.436686	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=708, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.7: Bootstrapped Standard Errors for Decomposition of Gini by Income Source- Share in Overall Gini,-Year 2011

Bootstrap statistics-year 2011						
Variable	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Total Labor Earning	0.738101	-0.00311	0.009575	0.718859	0.757342	(N)
				0.716709	0.754005	(P)
				0.72352	0.755792	(BC)
Entrepreneur income	0.851368	-0.00031	0.009528	0.83222	0.870516	(N)
				0.832243	0.863831	(P)
				0.818954	0.863831	(BC)
Financial Income	0.668865	-0.00517	0.017309	0.634082	0.703648	(N)
				0.635648	0.695015	(P)
				0.637877	0.695187	(BC)
Rental Income	0.617047	-0.00256	0.01806	0.580754	0.653339	(N)
				0.584412	0.64457	(P)
				0.584412	0.649023	(BC)
Social transfer	0.964734	-0.0022	0.00572	0.953239	0.976229	(N)
				0.950104	0.974027	(P)
				0.956933	0.976062	(BC)
Pensions and	0.532962	0.000851	0.013316	0.506203	0.55972	(N)
survivors' benefits				0.505014	0.560602	(P)
				0.505014	0.561663	(BC)
Inter- household	0.951422	-0.00125	0.004544	0.942291	0.960553	(N)
transfer				0.941334	0.958146	(P)
				0.943205	0.960216	(BC)
Other Incomes	0.394406	-0.00063	0.007736	0.37886	0.409951	(N)
				0.379427	0.407886	(P)
				0.379836	0.414689	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=708, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.8: Bootstrapped Standard Errors for Decomposition of Gini by Income Source-Marginal Effects,- Year 2006

Bootstrap statistics-year 2006						
Variable	**Observed**	**Bias**	**Std. Err.**	**[95% Conf.**	**Interval]**	
Total Labor Earnings	-0.00044	0.001944	0.019501	-0.03963	0.038747	(N)
Marginal effect				-0.02995	0.036938	(P)
				-0.0389	0.036938	(BC)
Entrepreneur income	0.132147	-0.00243	0.022365	0.087202	0.177091	(N)
Marginal effect				0.0922	0.171323	(P)
				0.093799	0.174776	(BC)
Financial Income	0.004377	0.000158	0.006091	-0.00786	0.016617	(N)
Marginal effect				-0.00454	0.013936	(P)
				-0.00454	0.022337	(BC)
Rental Income	-0.00396	0.000573	0.007621	-0.01927	0.01136	(N)
Marginal effect				-0.02094	0.009411	(P)
				-0.02313	0.006757	(BC)
Social transfer	-0.00077	-0.00015	0.001294	-0.00337	0.001835	(N)
Marginal effect				-0.00284	0.001929	(P)
				-0.00268	0.00254	(BC)
Pensions and	-0.0898	-0.00045	0.009835	-0.10956	-0.07004	(N)
survivors' benefits				-0.10581	-0.06983	(P)
Marginal effect				-0.10455	-0.06279	(BC)
Inter- household	-0.00853	-6.8E-05	0.001771	-0.01209	-0.00497	(N)
transfer				-0.01141	-0.00455	(P)
Marginal effect				-0.01141	-0.00319	(BC)
Other Incomes	-0.03303	0.000421	0.004362	-0.0418	-0.02427	(N)
Marginal effect				-0.04394	-0.02548	(P)
				-0.04449	-0.02548	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=708, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.9: Bootstrapped Standard Errors for Decomposition of Gini by Income Source - Marginal Effects,-Year 2007

Bootstrap statistics-year 2007						
Variable	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Total Labor Earnings	0.029688	0.001735	0.019095	-0.00869	0.06806	(N)
Marginal effect				0.002979	0.075034	(P)
				0.002979	0.08417	(BC)
Entrepreneur income	0.06086	-0.0037	0.014911	0.030895	0.090824	(N)
Marginal effect				0.022905	0.08693	(P)
				0.028119	0.088537	(BC)
Financial Income	0.015309	0.000633	0.010196	-0.00518	0.035798	(N)
Marginal effect				-0.00253	0.035093	(P)
				-0.00601	0.030797	(BC)
Rental Income	0.02666	0.000122	0.010539	0.005481	0.047838	(N)
Marginal effect				0.009505	0.047678	(P)
				0.01099	0.050332	(BC)
Social transfer	-0.00533	1.95E-05	0.001266	-0.00788	-0.00279	(N)
Marginal effect				-0.00802	-0.00326	(P)
				-0.00802	-0.00301	(BC)
Pensions and	-0.08262	0.000286	0.008382	-0.09946	-0.06577	(N)
survivors' benefits				-0.09414	-0.06666	(P)
Marginal effect				-0.09414	-0.05779	(BC)
Inter- household	-0.00931	9.98E-05	0.001908	-0.01314	-0.00548	(N)
transfer				-0.01207	-0.0056	(P)
Marginal effect				-0.01224	-0.0056	(BC)
Other Incomes	-0.03526	0.000805	0.003712	-0.04272	-0.0278	(N)
Marginal effect				-0.04067	-0.0271	(P)
				-0.04097	-0.02954	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=708, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.10: Bootstrapped Standard Errors for Decomposition of Gini by Income Source - Marginal Effects,-Year 2008

Bootstrap statistics-year 2008						
Variable	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Total Labor Earnings	0.030174	-0.00106	0.021132	-0.01229	0.07264	(N)
Marginal effect				-0.01771	0.060203	(P)
				-0.02054	0.060203	(BC)
Entrepreneur income	0.13587	0.001371	0.021383	0.092899	0.178842	(N)
Marginal effect				0.107436	0.175299	(P)
				0.107436	0.194975	(BC)
Financial Income	-0.00387	0.001137	0.004523	-0.01296	0.005223	(N)
Marginal effect				-0.01105	0.005502	(P)
				-0.01203	0.004304	(BC)
Rental Income	0.012304	0.000483	0.012022	-0.01186	0.036464	(N)
Marginal effect				-0.00743	0.036009	(P)
				-0.00743	0.036009	(BC)
Social transfer	-0.00059	0.00016	0.002977	-0.00657	0.005392	(N)
Marginal effect				-0.00477	0.005918	(P)
				-0.00428	0.008899	(BC)
Pensions and	-0.11504	-0.00153	0.007702	-0.13052	-0.09956	(N)
survivors' benefits				-0.1332	-0.10089	(P)
Marginal effect				-0.12604	-0.09947	(BC)
Inter- household	-0.01232	-3.2E-05	0.001943	-0.01623	-0.00842	(N)
transfer				-0.01669	-0.0093	(P)
Marginal effect				-0.01787	-0.0093	(BC)
Other Incomes	-0.04653	-0.00054	0.002405	-0.05136	-0.04169	(N)
Marginal effect				-0.05141	-0.04255	(P)
				-0.0514	-0.04113	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=890, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.11: Bootstrapped Standard Errors for Decomposition of Gini by Income Source - Marginal Effects,-Year 2009

Bootstrap statistics-year 2009						
Variable	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Total Labor Earnings	0.046122	0.001227	0.017802	0.010347	0.081898	(N)
Marginal effect				0.014768	0.077234	(P)
				0.014768	0.082673	(BC)
Entrepreneur income	0.100804	0.001725	0.015481	0.069694	0.131915	(N)
Marginal effect				0.072971	0.129771	(P)
				0.068775	0.125705	(BC)
Financial income	0.002452	-0.00114	0.009468	-0.01658	0.021479	(N)
Marginal effect				-0.01551	0.022473	(P)
				-0.01204	0.028222	(BC)
Rental Income	0.019024	-0.00078	0.011366	-0.00382	0.041865	(N)
Marginal effect				-0.00204	0.039564	(P)
				-0.00146	0.046435	(BC)
Social transfer	-0.00434	-6E-05	0.001889	-0.00814	-0.00055	(N)
Marginal effect				-0.00783	-0.00054	(P)
				-0.00732	0.000242	(BC)
Pensions and	-0.11209	-0.00051	0.006468	-0.12509	-0.09909	(N)
survivors' benefits				-0.1274	-0.10178	(P)
Marginal effect				-0.1274	-0.10178	(BC)
Inter- household	-0.00927	-0.00025	0.002117	-0.01352	-0.00501	(N)
transfer				-0.01395	-0.00566	(P)
Marginal effect				-0.01395	-0.00495	(BC)
Other Incomes	-0.0427	-0.00022	0.001934	-0.04659	-0.03882	(N)
Marginal effect				-0.04628	-0.03978	(P)
				-0.04558	-0.03884	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=1029, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.12: Bootstrapped Standard Errors for Decomposition of Gini by Income Source - Marginal Effects,-Year 2010

Bootstrap statistics-year 2010						
Variable	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Total Labor Earnings	0.07058	0.005347	0.019654	0.031083	0.110077	(N)
Marginal effect				0.043944	0.106413	(P)
				0.029418	0.101221	(BC)
Entrepreneur income	0.110738	-0.00252	0.018506	0.073549	0.147927	(N)
Marginal effect				0.06664	0.144077	(P)
				0.088883	0.161716	(BC)
Financial income	0.007009	-0.00266	0.012771	-0.01866	0.032674	(N)
Marginal effect				-0.01801	0.029762	(P)
				-0.01164	0.033189	(BC)
Rental Income	-0.0011	0.000237	0.008952	-0.01909	0.016889	(N)
Marginal effect				-0.0176	0.015105	(P)
				-0.02441	0.015105	(BC)
Social transfer	-0.00682	-0.00015	0.001173	-0.00918	-0.00446	(N)
Marginal effect				-0.00931	-0.00522	(P)
				-0.00931	-0.00513	(BC)
Pensions and	-0.12426	-0.00028	0.007168	-0.13866	-0.10985	(N)
survivors' benefits				-0.14046	-0.11097	(P)
Marginal effect				-0.14046	-0.11004	(BC)
Inter- household	-0.00802	0.000168	0.001397	-0.01083	-0.00522	(N)
transfer				-0.01099	-0.00539	(P)
Marginal effect				-0.01102	-0.00597	(BC)
Other Incomes	-0.04813	-0.00015	0.00257	-0.05329	-0.04296	(N)
Marginal effect				-0.05292	-0.04356	(P)
				-0.05292	-0.04356	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=1052, Replications=50						

Source: Own calculations based on SILC Data

Table AIV.13: Bootstrapped Standard Errors for Decomposition of Gini by Income Source - Marginal Effects,-Year 2011

Bootstrap statistics-year 2011						
Variable	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Total Labor Earnings	0.047139	0.002895	0.016998	0.012979	0.081299	(N)
Marginal effect				0.010744	0.077981	(P)
				0.00892	0.074504	(BC)
Entrepreneur income	0.132813	-0.0025	0.018217	0.096206	0.169421	(N)
Marginal effect				0.099591	0.165138	(P)
				0.099609	0.166895	(BC)
Financial income	-0.00532	-0.00113	0.004849	-0.01506	0.004427	(N)
Marginal effect				-0.01553	0.001828	(P)
				-0.01519	0.002689	(BC)
Rental Income	0.012223	0.001659	0.009148	-0.00616	0.030606	(N)
Marginal effect				-0.0059	0.032096	(P)
				-0.00603	0.027209	(BC)
Social transfer	-0.00435	-0.00048	0.001849	-0.00807	-0.00064	(N)
Marginal effect				-0.00746	-0.00046	(P)
				-0.00709	-0.00043	(BC)
Pensions and	-0.12344	-3.8E-05	0.007835	-0.13918	-0.10769	(N)
survivors' benefits				-0.14024	-0.11055	(P)
Marginal effect				-0.14381	-0.11211	(BC)
Inter- household	-0.00924	-0.00051	0.001511	-0.01228	-0.00621	(N)
transfer				-0.01268	-0.0069	(P)
Marginal effect				-0.01139	-0.00597	(BC)
Other Incomes	-0.04982	0.000108	0.002404	-0.05465	-0.04499	(N)
Marginal effect				-0.05427	-0.0459	(P)
				-0.05502	-0.04659	(BC)
Note: N = normal, P = percentile, BC = bias-corrected						
Number of observation=1067, Replications=50						

Source: Own calculations based on SILC Data

Appendix V. General Results For Static Decomposition Analysis

Table AV.1: General Results for Static Decomposition Analysis, (2006-2009)

	2006		2007		2008		2009	
	Between	Within	Between	Within	Between	Within	Between	Within
Education								
Illiterate	-0.02108	0.00956	-0.01746	0.00719	-0.01647	0.00627	-0.01464	0.00487
Literate but not a graduate	-0.01613	0.01409	-0.01568	0.01129	-0.01695	0.00928	-0.01694	0.00730
Primary school	-0.05866	0.12395	-0.05851	0.11411	-0.06027	0.10545	-0.05985	0.10352
Secondary, vocational secondary or primary education school	-0.01165	0.04169	-0.01717	0.04332	-0.01947	0.04083	-0.02485	0.04062
High school	0.01772	0.04098	0.01177	0.03883	0.02043	0.04772	0.01042	0.03528
Vocational or technical high school	0.01542	0.03012	0.01456	0.04049	0.01502	0.03371	0.01011	0.02992
Faculty/university college or higher education level	0.12896	0.05767	0.13664	0.05836	0.13492	0.05905	0.16029	0.07017
Total	0.05458	0.31806	0.05414	0.31358	0.05720	0.30232	0.06454	0.29168
Position in Occupation								
Regular employee	0.02053	0.13516	0.01087	0.13300	0.02388	0.13103	0.03849	0.14338
Casual employee	-0.04370	0.01271	-0.04512	0.01372	-0.04538	0.01570	-0.04060	0.01336
Employer	0.12727	0.05448	0.13216	0.06173	0.12205	0.06270	0.09866	0.05437
Self-employed	-0.03169	0.09787	-0.02706	0.08843	-0.03213	0.08167	-0.03723	0.08579
Total	0.07241	0.30023	0.07085	0.29688	0.06842	0.29110	0.05932	0.29690
Economic Sector								
Agriculture, forestry, hunting and fishing	-0.05008	0.08609	-0.05117	0.06602	-0.05042	0.05840	-0.05016	0.06104
Mining and quarrying	0.00115	0.00166	-0.00059	0.00147	0.00014	0.00209	-0.00103	0.00090
Manufacturing	-0.00268	0.07064	-0.00728	0.06693	-0.00550	0.07062	-0.00848	0.06025
Electricity, gas and water supply	0.00461	0.00105	0.00332	0.00098	0.00455	0.00146	0.00598	0.00342
Construction	-0.01720	0.02078	-0.01275	0.02785	-0.01505	0.02534	-0.00796	0.03797
Wholesale and retail trade; repair of motor vehicles, motorcycles, personnel - household goods	0.03328	0.07668	0.03508	0.08338	0.02899	0.07359	0.01538	0.06579
Hotels and restaurants	-0.00388	0.01005	-0.00402	0.01425	-0.00841	0.00867	-0.00837	0.00904
Transport, communication and storage	0.00520	0.01776	0.00505	0.01537	0.00452	0.01778	0.00411	0.01351
Financial intermediation	0.01360	0.00495	0.01247	0.00626	0.01037	0.00603	0.01110	0.00496
Real estate, renting and business activities	0.00866	0.01898	0.00379	0.01701	0.00443	0.02224	0.00516	0.02048
Public administration and defense; compulsory social security, excluding armed forces	0.02085	0.00910	0.02200	0.01031	0.02575	0.00924	0.03048	0.00801
Education	0.01081	0.00623	0.01466	0.00612	0.01954	0.00729	0.02168	0.00845
Health and social work	0.01431	0.00832	0.01508	0.00988	0.01935	0.01353	0.02597	0.01668
Other social, community and personal service activities	-0.01145	0.01316	-0.00971	0.01598	-0.00851	0.01347	-0.01187	0.01371
Total	0.02719	0.34545	0.02594	0.34183	0.02974	0.32978	0.03199	0.32422

Source: Own calculations based on SILC Data

Table AV.2: General Results for Static Decomposition Analysis (2010, 2011)

	2010		2011	
	Between	Within	Between	Within
Education				
Illiterate	-0.01292	0.00501	-0.01400	0.00573
Literate but not a graduate	-0.01557	0.00693	-0.01547	0.00822
Primary school	-0.06386	0.08539	-0.06007	0.09125
Secondary, vocational secondary or primary education school	-0.02985	0.03100	-0.02830	0.03511
High school	0.00302	0.03180	0.00328	0.03424
Vocational or technical high school	0.00931	0.02865	0.00948	0.02930
Faculty/university college or higher education level	0.17856	0.08371	0.16918	0.08339
Total	0.06870	0.27248	0.06410	0.28725
Position in Occupation				
Regular employee	0.03543	0.15343	0.02856	0.15172
Casual employee	-0.03890	0.01422	-0.03836	0.01316
Employer	0.08697	0.04535	0.09794	0.05124
Self-employed	-0.03133	0.07600	-0.03132	0.07841
Total	0.05217	0.28900	0.05682	0.29453
Economic Sector				
Agriculture, forestry, and fishing	-0.03920	0.05714	-0.03825	0.05843
Mining and quarrying	-0.00031	0.00144	-0.00017	0.00176
Manufacturing	-0.01884	0.05355	-0.01991	0.05256
Electricity, gas, steam, water supply, sewerage etc.	0.00153	0.00216	0.00197	0.00312
Construction	-0.01345	0.02364	-0.01290	0.02678
Whole-sale and retail trade	0.01078	0.05246	0.00958	0.05679
Transportation and storage	0.00699	0.01866	0.00237	0.01795
Accommodation and food service activities	-0.00943	0.01038	-0.00449	0.01368
Information and communication	0.00571	0.00329	0.00749	0.00393
Financial and insurance activities	0.01560	0.00625	0.01209	0.01483
Real estate activities	-0.00024	0.00053	0.00522	0.00268
Professional, scientific and technical activities	0.00787	0.00734	0.01237	0.00998
Administrative and support service activities	-0.00622	0.00679	-0.00077	0.01203
Public administration and defense	0.08450	0.04771	0.01581	0.01363
Education	--	--	0.02038	0.00959
Human health and social work activities	--	--	0.01817	0.01875
Arts, entertainment and recreation	0.00130	0.00382	0.00128	0.00279
Other social, community and personal service activities	-0.01207	0.01152	-0.00601	0.00786
Total	0.03451	0.30666	0.02422	0.32714

Source: Own calculations based on SILC Data

Table AV.3: Bootstrap Results for Theil-T Index Decomposition

2006				
Number of obs =10394				Replications = 100
Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]
0.372642	0.008968	41.55	0.000	.3550662 .3902182
2007				
Number of obs=10584				Replications = 100
Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]
0.36773	0.012571	29.25	0.000	.3430907 .3923694
2008				
Number of obs = 11236				Replications = 100
Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]
0.359527	0.012585	28.57	0.000	.334861 .3841922
2009				
Number of obs = 11477				Replications = 100
Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]
0.356215	0.011843	30.08	0.000	.3330026 .3794263
2010				
Number of obs=11787				Replications = 100
Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]
0.341173	0.009933	34.35	0.000	.3217035 .3606414
2011				
Number of obs= 27116				Replications = 100
Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]
0.351351	0.007384	47.58	0	.3368778 .3658234

Source: Own calculations based on SILC Data

Appendix VI. 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
	Total Market Income						99969431
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
	Total Market Income						119476416
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
	Total Market Income						134248660
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
	Total Market Income						153269065
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
	Total Market Income						166536484
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
	Total Market Income						230680939

Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations
Obs: Number of observations
Std. Dev.: Standard Deviation

Appendix VII. Summary Statistics for Adjusted Entrepreneur Income

Years	Obs	Mean	Std. Dev.	Min	Max	Value (TL)
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 VIII. Status In Employment by The Educational Skill Distribution (%)

Educational Skill type	Regular employee	Casual employee	Employer	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
Total	100	100	100	100	100	100
		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
Total	100	100	100	100	100	100
		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
Total	100	100	100	100	100	100
		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
Total	100	100	100	100	100	100
		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	19.1
high skilled	26.02	1.34	19.28	3.72	1.41	14.18
Total	100	100	100	100	100	100
		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
Total	100	100	100	100	100	100

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

Appendix IX. 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 X. Status in Employment (%)

Employment Status (%)	2006	2007	2008	2009	2010	2011
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

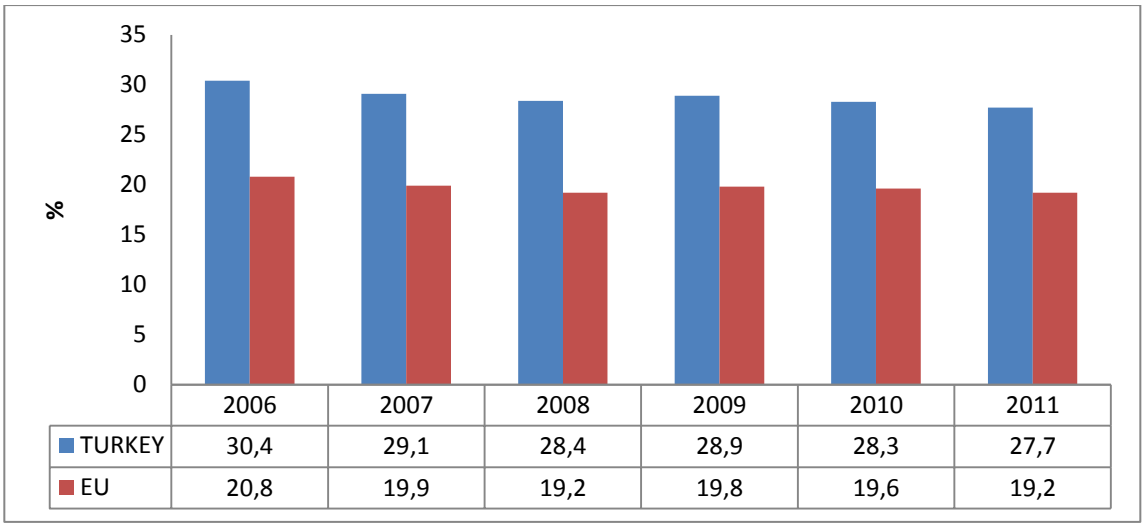
Source: Income and Living Conditions Survey, TURKSTAT, Own Calculations

Appendix XI. 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
	Registered	73.25	5.86	57.22	22.33	4.18	40.14
2006	Not registered	26.75	94.14	42.78	77.67	95.82	59.86
	Total	100	100	100	100	100	100
	Registered	77.18	8.81	63.72	25.83	5.95	43.31
2007	Not registered	22.82	91.19	36.28	74.17	94.05	56.69
	Total	100	100	100	100	100	100
	Registered	82	14.77	69.73	30.78	5.75	49
2008	Not registered	18	85	30.27	69	94	51
	Total	100	100	100	100	100	100
	Registered	80.57	9.36	68.09	26.88	4.23	46.66
2009	Not registered	19.43	90.64	31.91	73.12	95.77	53.34
	Total	100	100	100	100	100	100
	Registered	81.33	10.61	72.98	27.97	4.29	48.89
2010	Not registered	18.67	89.39	27.02	72.03	95.71	51.11
	Total	100	100	100	100	100	100
	Registered	83	11.86	74.65	30	5.64	53
2011	Not registered	17	88	25.35	70	94	47
	Total	100	100	100	100	100	100

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

Appendix XII. Size of The Informal Economy of Turkey and 27 European Union Countries (Average) (in % of off. gdp)



Source: Schneider (2013)

RESUME

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- **TUBITAK International Doctoral Research Fellowship** granded by the "The Scientific and Technological Research Council of Turkey (TUBITAK)" for doctoral research at LSE between 02/2014 and 08/2014.
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- **High Honor Degree** in the undergraduate education for graduation with the highest GPA of the class in 2006-2007 spring semester of the Istanbul Commerce University
- **B.Sc Full Scholarship** granded by OSYM (Student Selection and Placement Center) during the 4 year Bachelor in Science program at Istanbul Commerce University, Department of Statistics