

**TC.
YILDIZ TECHNICAL UNIVERSITY
INSTITUTE OF SOCIAL SCIENCES
CHAIR OF ECONOMICS
M.A. ECONOMICS**

MASTER THESIS

**WHY INCOME INEQUALITY DECLINED IN
TURKEY: A THEORETICAL APPROACH**

**VOLKAN SÜLEYMAN GÜRGEN
12729101**

**INSTRUCTOR
ASST. PROF. BURAK UNVEREN**

**İSTANBUL
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I have read this thesis and found its content and scope adequate for a
Master's thesis in Economics at the Graduate School of Social
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İSTANBUL
January 2016

ÖZ

TÜRKİYEDE GELİR EŞİTSİZLİĞİ NEDEN DÜŞTÜ: TEORİK BİR YAKLAŞIM

Volkan Süleyman GÜRGEN

Ocak, 2016

Son 20 yılı aşkın süredir Türkiye'de, Gini katsayısı ve Palma rasyosu kademeli olarak düşmüştür. Açıkça görülüyor ki gelir eşitsizliğinin bu aşağı yönlü trendi Türk vergi sistemiyle ilişkili değildir. Bu yüzden, bu çalışmada gelir eşitsizliğinin diğer faktörleri ve bileşenleri analiz edildimiş arasındaki ilişkiler gösterilmiştir. Gelir eşitsizliğinin alt başlıkları olan bölüşüm ve yeniden bölüşüm faktörleri analiz edilmiştir. Ayrıca, emeğin milli gelirden aldığı pay, özel sektörün karlılık düzeyi, sermaye yoğun üretimin getirdiği üretim metodlarındaki değişim ve sermayenin getiri oranı da gelir eşitsizliği ve gelir eşitsizliğini nasıl etkilediği bağlamında çalışılmıştır. Türkiye'de gelir eşitsizliği üstüne gerek teorik gerekse ampirik çalışmalar yetersiz düzeydedir. Bu çalışmada, makro faktörler ve gelir eşitsizliği verileri birlikte çalışılmıştır. İkame esnekliği, sermaye yoğun üretim süreci, emeğin milli gelirden aldığı pay, arasındaki ilişki gösterilmiş ve Türkiye'de 1963'ten 2013'e, özellikle 2002-2013 arasında gelir eşitsizliğini nasıl etkilediği analiz edilmiştir. Palma rasyosunun gelir eşitsizliğinin ölçülmesinde, Gini katsayısına kıyasla daha iyi bir yöntem olduğu düşünüldüğünden Palma rasyosu da incelenmiş ve Palma rasyosundaki düşüşün Gini katsayısındaki düşüşten daha fazla olduğu tespit edilmiştir. Emeğin milli gelirden aldığı payın artmasıyla gelir eşitsizliğinin de azaldığı tespit edilmiştir. Zaman serisi analizi yapmak için yeterli veri olmamasına rağmen, teori ve ampirik analiz Türkiye'de gelir dağılımındaki düşüşün emeğin milli gelirden aldığı payın artmasıyla ilişkili olduğunu göstermektedir.

Anahtar Kelimeler: Faktör Gelirleri, Gelir eşitsizliği, İkame Esnekliği

ABSTRACT

WHY INCOME INEQUALITY DECLINED IN TURKEY: A THEORETICAL APPROACH

Volkan Süleyman GÜRGEN

January, 2016

Gini coefficient and Palma ratio in Turkey have gradually fallen over the last 20 years. Apparently, this downside trend is not related to the Turkish tax system. Thus other factors of income inequality are analyzed in this study. Distributive and redistributive factors of income inequality are analyzed. In particular, labor income share, markup, capital deepening, and rate of return on capital are analyzed with regard to the declining income inequality in Turkey. There is a paucity of theoretical and empirical analysis of income inequality in Turkey. In this study, macro factors and income inequality data are studied together. The relation between elasticity of substitution, capital deepening and labor income share is illustrated and analyzed how this relation affects income inequality in Turkey through 1963 to 2013, particularly 2002-2013. Palma ratio is deemed a better and deeper way of understanding income inequality. Despite Palma ratio and Gini coefficient are both tools for measurement of inequality, the decline in Palma ratio is more than the decline in Gini coefficient in Turkey. It is found that, increasing labor income share has an impact on declining income inequality. Despite the lack of data for time series analysis, theory and descriptive regression analyses show that declining income inequality in Turkey is related to the improvements in labor income share.

Keywords: Factor Shares, Income Inequality, and Elasticity of Substitution

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ABBREVIATIONS

TUIK	: Türkiye İstatistik Kurumu
WB	: World Bank
GDP	: Gross Domestic Product
LIS	: Labor Income Share
GİB	: Gelir İdaresi Başkanlığı
DPT	: Devlet Planlama Teşkilatı
IRS	: Internal Revenue Service
PWT	: Penn World Table

1 INTRODUCTION

As Thomas Piketty says ‘the distribution of wealth is too important an issue to be left to economists, sociologists, historians, and philosophers. It is of interest to everyone, and that is a good thing’ (Piketty, Capital in twenty-first century, 2014). Income distribution and income inequality is one of the most significant topics in social sciences. Even sustainable economic growth is related to income inequality and income distribution accordingly.

Inequality is perceived a longstanding problem among societies for centuries and causes even wars among societies or nations. Indeed inequality is not a problem if society perceives that resources distributed fairly among people. The inequality concept that has been argued among economists, sociologists, or politicians is the inequality, which is not fair. The following question is what is fair? So that, from this perspective inequality is an ethical problem rather than a mathematical issue. It is not the first and foremost question that ‘what if inequality affects growth negatively’. The question is ‘is it ethic that some people suffer from starvation or at least poverty while other minority can reach affluent resources and wealth’.

In Turkey, income inequality is still high in compare to OECD countries, in other word there is much more inequality relative to advanced economies. However, though earlier studies have some methodological defects, wide range of study shows that there is a decline through 1963 to 2013.

In this study the decline in income inequality in Turkey is analyzed with regard to macroeconomic factors. To illustrate graphs and the decline in income inequality Turkish National Statistics Institution data are used which is gathered from 2002 regularly. In addition, there are various study before 2002 in terms of measuring income inequality. These studies are also analyzed and used as well.

After presenting fundamental concepts of income inequality in chapter one, empirical dynamics of income inequality are studied in chapter two. In chapter three, theoretical side and concepts of income inequality is studied while showing relation

to income inequality. Factor share is studied to understand and show the relation to income inequality particularly. In chapter four the case of Turkey is analyzed with regard to chapter two and chapter three while combining theoretical and empirical side of the topic. Piketty's theory is also studied and illustrated regarding the case of Turkey in chapter four.

2 FUNDAMENTALS OF INCOME DISTRIBUTION

The economic theory provides certain tools to analyse the welfare of a society and the obstacles, which impede increasing welfare. GDP per capita is one of the most known indicators to measure welfare. However, what if all production is belong to just one person (e.g. a king)? In this case GDP per capita fails to give a reasonable measure of the welfare of such a society. This shows that economic thinking should incorporate how production is shared among citizens into the discussion. This tool is unquestionably significant no less then the amount of goods and services produced. Consequently, income distribution plays an outstanding role on welfare and must be measured to be cured. In this context, how ‘equal’ distributed income is the issue. Equality and the degree of equality is a significant term of income distribution and welfare as well. Even though perfect equality is not possible and not desirable either, more equal distributed income is always one of the outstanding goal of an economic theory.

Distribution of wealth (real assets, financial assets minus debt, etc.) is always more ‘unequal’ than income distribution in a society. Wealth distribution also affects income distribution theoretically and empirically. Since wealthy people have less marginal propensity to consume, wealth is accumulated as a matter of course. Furthermore, labor income is typically consumed without saving. This tells us that wealth should have a tendency to be concentrated in the hands of a minority. Indeed, in 2002 top %1 wealthy people has 35% and 20% percent of total wealth in, respectively, Switzerland and United States (Kopczuk, Saez, 2004). Since wealth generates income, understanding how assets, land and rental income distributed in a society is necessary to analyze the unequal opportunities or any kind of inequality.

2.1 Income Distribution

Income distribution is a mathematical concept and self-defined in comparison to income inequality. Accordingly, first income distribution should be clarified. Only then income inequality can be properly analyzed in various aspects. First of all, it is

obvious that income distribution requires a classification. This classification can be made up of people by quantity as a part of population or can be made up of qualification such as income as a function of rent, labor, or capital. Both methods are necessary to analyze how income is distributed in a society. There are four kind of widely used income distribution classification based on qualification or quantity. These are individual income distribution, functional income distribution, regional income distribution, and sectorial income distribution. Regional or sectorial income distribution is beyond the scope of the present study.

2.1.1 Individual Income Distribution

Individual income distribution is based on quantity, which takes each individual as a number regardless of how they earn income as a part of GDP. A simple way is to classify income to illustrate what percent of society receive a certain level of income. In this way frequency distribution tells what percent of society receive different amounts of income but more precisely size distribution is the way widely used in various analyses methods. Size distribution shows percentiles and deciles of population and the amount of income the percentile takes from gross domestic product (Perkins, Radalet, Lindauer, 2006). So it can be seen which decile takes how much income of total income. This method is also a frequency distribution even it is shown as percentile. Even a percentage represents millions of people for some countries with high population such as China or India. This distribution can be interpreted as twenty percent shares as widely used or as decimals or only five percent segments. Smaller percentage including analyses obviously provides clearer and more reliable results in comparison to roughly classified surveys.

Lorenz curve is a clearer way of looking surveys as a graph rather than numbers. Lorenz curve shows income as cumulative percentage on y axis and cumulative percentage of population on x axis named after Max Lorenz, a statistician who first wrote an article with this technique in 1905 (Perkins, Radalet, Lindauer, 2006). This method enables us to illustrate the graph of income distribution on population.

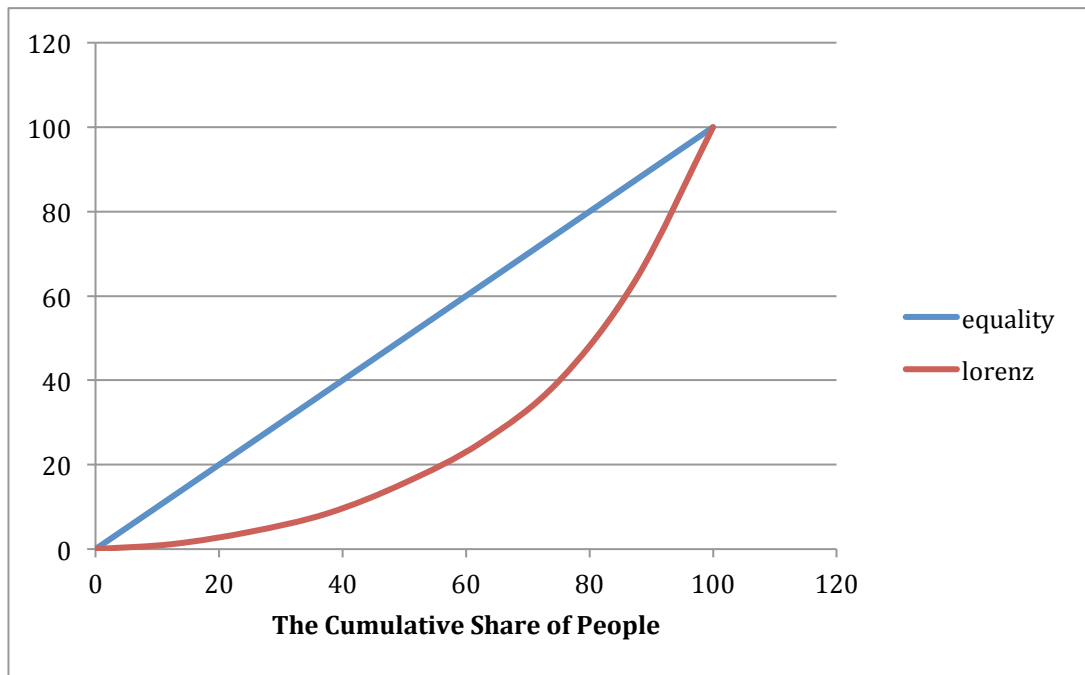


Figure 2. 1: Lorenz Curve

Source: Edited by the Author.

The 45-degree diagonal line on the graph represents the distribution of income where all individuals get equal income. The curve represents a less equal distribution on this graph. The more convex the curve the less equal is the distribution and vice versa. From the origin to upper right corner, all society shares complete production is produced in society.

Another widespread method is looking society through their function in production process and on a function based classification. One can wish to analyze how much income capital takes from total production. Of course, the same question can be asked about labor as well. In other words, we can analyze how much various factors of production are rewarded for their service in production process. Income distribution is also a function of production factors and how these factors are distributed among individuals, including labor and the role of these factors played in production. Even though all individuals theoretically can earn capital and labor income at the same time, as is widely known, capital and land ownership and the function of this ownership, rental income, are typically unequally distributed and concentrated within a small part of society. Evidently, this creates inequality. Conversely, higher minimum wages and wages in general for skilled and unskilled

workers lead more equal societies in comparison to countries which have less labor share of gross domestic product.

2.1.2 Functional Income Distribution

The functional income distribution makes the distinction between the shares of types of income used for different spending purposes, while the personal distribution of income is a measure of inequality of a specific type of income. The former is an indicator of how much of labor income there is to share, while the latter indicates how equally labor income is distributed among individuals (Giovannoni, 2010, 2). In this way, functional income distribution illustrates that how income shared among production factors.

Functional income distribution is both subject to macroeconomics and socioeconomics inherently. It stands very central role in income inequality and political economics as well.

Apart from how income is distributed among labor and capital, the movement in labor share is also significant in analyses regarding income distribution. Some macroeconomic production models such as Cobb-Douglas takes labor income share still while some empirical studies shows the contrast.

Therefore, it is possible to analyse how capital and labor income share benefits of income. In other words, to develop a perspective to income inequality, it is to be asked, what percent of production is paid as wage? To measure this income of individuals is required in gross domestic product.

The capital share can be shown as one minus the labor share,

$$\frac{W}{Y} + \frac{\pi}{Y} = 1 \quad (1)$$

Where W/Y and π/Y represent the labor and capital shares. More particularly labor income share is,

$$\frac{W}{Y} = \frac{wN}{PQ} = \frac{w}{P} / \frac{Q}{N} = \frac{w_R}{A_L} \quad (2)$$

where W is the wage, Y is national income, w the nominal (average) wage, N the level of employment, P the price level, Q is the output and the ratios w/P and Q/N are the real wage w_R and labor productivity A_L . Rates of change:

$$\left(\frac{W}{Y}\right) \cong \dot{w}_R - \dot{A}_L \quad (3)$$

Equation (3) states that the labor share of income goes up when real wages outpace labor productivity. In contrast when labor productivity increase is not passed on to workers, the wage share goes down and the capital share goes up. The cost of doing business goes up when real wages outpace workers' productivity accordingly (Giovanni, 2010, 3).

There can be written many equation or notation, which shows labor income share and capital share as a functional income distribution. It is to be noted that labor share does not uniquely depend on real wages and productivity. There can be factors affects labor share indirectly; those affect real wages or productivity (Giovanni, 2010, 3). An increase in minimum wages or wage policy of government or any other factors are possible to affect labor income share and functional income distribution accordingly.

Since the general notation is to show income as summation of labor income share and capital income share, when labor income share is given, capital share is equal to one minus labor share. In this way, it is safely concluded that if real wages increases while productivity stays still or declines, labor share increases accordingly and the way around; labor income share declines if productivity declines and real wages declines more than productivity or real wages declines while productivity stays still. Thus, labor income share tells the relationship between real wages and productivity. Since productivity hard to decrease because of technological improvements in economy, the general expectation is that real wages increases more in compare to productivity and labor income share increases in this way.

2.2 Redistribution

There are two possible ways of changing income distribution. Simply, changing while goods and services are produced or changing after produced. Redistribution is the way of changing income distribution after production of goods and services.

Redistribution is one of the most important figures in the topic of income inequality. Even factor distribution works not in favor of an equalized distribution, redistribution is a good way of equalizes income inequality mathematically. Redistribution is simply the role of Robin Hood for government. Especially a progressive income tax is the simplest method for a good income equality. Apart from these perspectives, sociologists such as David Grusky, say to perceive inequality, as a redistribution policy problem is not an efficacious perspective.

However without a sustainable redistributive policy, changes in functional distribution would be inefficient solely. Not surprisingly, countries, which have more income tax, such as Denmark or Nordic countries, have a better level of income inequality.

Within redistributive policies there are two main way which are tax and transfer payments. Especially progressive income tax is an efficient way of changing income distribution.

Theoretically income tax, as a percentage of income, even with a flat income tax rate, mathematically means taking more from wealthy people in comparison to poorer people. On the other hand, government is able to use this collected tax to create less income inequality by using tax income for public goods and services. Progressive income tax does this function effectively.

In contrast to income tax, especially value added tax is disrupting income inequality compared to income tax. Since people who live with low level of income, have higher propensity of consumption, inevitably, pay more consumption tax as a percentage of income. In this way, consumption tax works conversely to income tax. Countries, which have high level of income inequality, are expected to have higher level of consumption tax levels in compare to income tax, such as Turkey.

Some economists, such as David Grusky, believe that increasing income tax is not the solution because inequality arises from market failures more than redistributive

policies. However, another perspective is that increasing wealth tax or income tax could reduce income inequality that arises from increasing pre-tax inequality. These perspectives are disputable, whether inequality arises from production process which is relevant to functional income distribution or, relevant to redistributive policies. Admittedly, both factors are determinative on income inequality.

2.3 Income Distribution and Income Inequality

Inequality measurement is an attempt to give meaning to comparisons of income distributions in terms of criteria, which may be derived from ethical principles, appealing mathematical constructs or simple intuition. All can be derived in sense of income distribution.

It is obvious that decomposition of income as capital income and wage income has some difficulties in an economy. It is also possible that some individuals has both capital income and wage income at the same time. These factors make inequality obscure as an aspect of income. In this way individual income is used an ultimate data to measure income inequality in a clearer way to grasp aspects of income inequality. Admittedly, wage share and capital share are also significant variables to reveal how income shared and how inequality change in a society.

2.3.1 Why Inequality Matters

The percentage of US citizens who consider to decrease inequality between rich and poor is the responsibility of government is stands 52 percent (39 percent in 1985) and people who perceive large differences as normal and necessity for America also declined 24 percent in compared to 34 percent in 1987. (Grusky, Kricheli-Katz. 2012). According to Piketty (2014) physical reality of inequality is visible to the naked eye and naturally inspires sharp but contradictory political judgments.

Peasant and noble, worker and factory owner, waiter and banker: each has his or her own unique vantage point and sees important aspects of how other people live and what relations of power and domination exist between social groups, and these observations shape each person's judgment of what is and is not just (Piketty, 2014).

Obviously inequality is a subjective issue and there will always be arguments on. What is important is to lessen unfair opportunities and poverty in society. In this way

inequality can't be justified by mathematicians or policy makers inherently, there is always more to say of people.

On the other hand, increasing income inequality and inequality in a broad topic is more concerned among societies, politicians and social scientists. Income inequality perceived not just a social issue; it is more of an economic problem, which can be even an obstacle over growth.

2.3.2 Inequality Measures and Spread

Measuring inequality is crucial to grasp how deep inequality is, for policymakers, sociologists and economists. There are various methods using deciles of population or separate population into five parts as twenty percent from poor to richest but the widespread use is GINI coefficient which is named after Corrado Gini, an Italian statistician (Perkins, Radalet, Lindauer, 2006).

GINI coefficient is calculated by using Lorenz curve basically. The main idea is that the more curved line on Lorenz curve means more inequality. On basis of Lorenz curve, Gini is calculated by dividing the area between Lorenz curve and equality line to the area of the rectangular. In this way, inequality is measured roughly. It must be noted that Gini coefficient doesn't tell certain transfers among deciles. For instance, the transfer among middle class or upper class enables Gini coefficient decrease even there is some transfer from the bottom to middle class in the meanwhile.

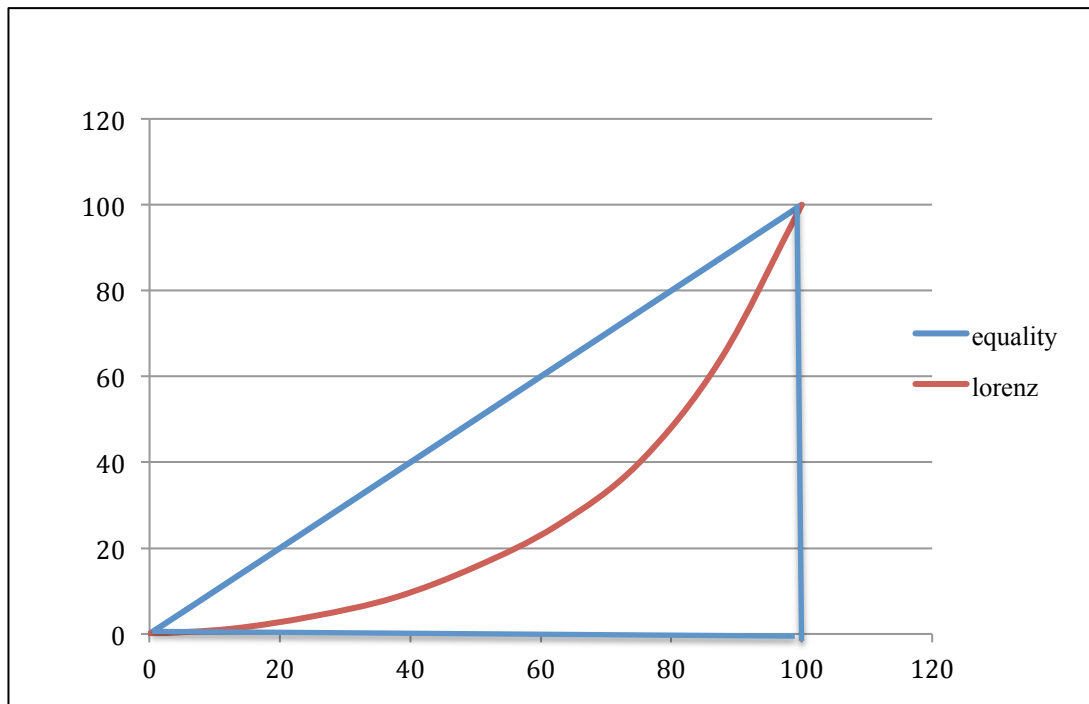


Figure 2. 2: Gini Coefficient Illustration

Source: Edited by the Author.

GINI coefficient is the ratio of the curved area to the area of rectangular. So that, it varies between zero to one. The more close to one is the more inequality and vice versa. Nations are divided into three categories of income inequality: low (with $Ginis < 0.40$), medium ($0.40-0.50$), high (> 0.50) (Perkins, Radalet, Lindauer, 2006, 197).

The problem with the GINI coefficient is that a recovery within middle class or upper class (from top decile to D9 or D8) can be perceived an improvement even if the bottom lose some. For instance, in China and Zimbabwe the lowest quintile receives about 4.6 percent of income but for China GINI 0.447 which is very much better than GINI coefficient 0.568 in Zimbabwe (Perkins, Radalet, Lindauer, 2006, 196). Despite that fact that GINI has some shortcomings, it is still used widespread among economists.

Jose Gabriel Palma (2011) noticed this weakness of GINI to illustrate inequality and developed another indicator named Palma ratio in his article. Recently Palma ratio is also a prominent measure of inequality. Since the aim of coefficients are to measure inequality rather than welfare, while GINI coefficient analyse whole population

Palma ratio focus on bottom four deciles (D1-D4) to top decile (D10) which creates inequality. Gabriel Palma (2011) studied 135 countries and reach results that middle 5 deciles are homogeneous among countries while (D10/D1-D4) is diversify widely. Before Gabriel Palma (2011)'s study, reports generally illustrate GINI coefficient or top decile and bottom decile such as WDI. Gabriel Palma recognized that middle five decile take about half of income not only poor countries but also more developed countries comparably. As he states he focuses 'rich' part of population which is top decile. As he named in his article 'It is all about the share of rich' according to Palma (2011). Palma (2011) emphasizes that even D9 is four times low in compare to D10 in his study.

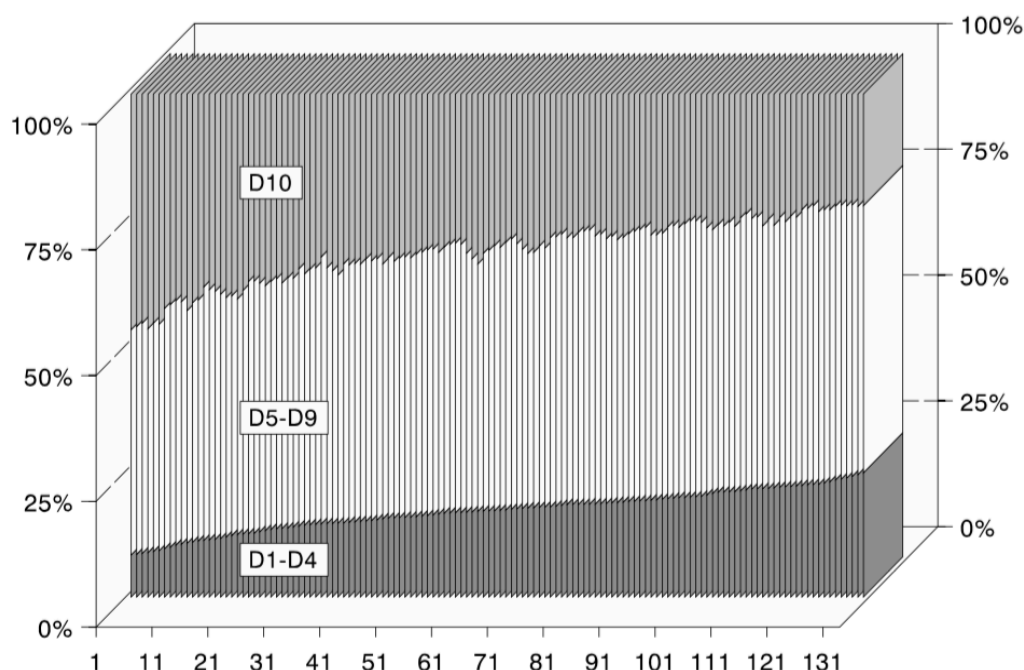


Figure 2. 3: Income Distribution of Countries in Palma's Study

Source: Palma, 2011.

In the figure it is clear from bottom to top, from less developed countries to more developed countries, D5-D9, in other words middle class takes about half of GDP while others share the rest of production. The left side shows worst income inequality while the right side illustrates better income inequality. On the right side the poorest forty percent takes about twenty percent while the figure in left side

shows that D1-4 takes roughly less than ten percent. But the astounding aspect of Palma is in almost all countries middle share is close to each other with half of GDP.

On the other hand, there is very top of income inequality that it is almost impossible to measure or determine, because of lack of stats regarding top rich people's income to rest of population. For example, there can be only five to ten rich families who own half of economy and classical income inequality measures consider them in top decile rather than top individuals. So that, top decile or even Palma ratio kind of measurement tools tells us lack of inequality and probably there is always more inequality than economic tools are able to measure.

Since wealth creates more income and wealthy people have less propensity of consumption, income inequality is inherently easy to increase rather than decrease. Despite the fact that with modern economy innovations and human capital are much more important and effective on wealth and income inequality, as Thomas Piketty (2011) noted inheritance is still more effective and determinative on income inequality.

2.3.3 Factor Shares and Inequality

Factor shares play a significant role in income inequality. In Europe, labor income share is high in comparison to US and developing countries and inequality is low accordingly. On the other hand though labor income share is high in Europe in comparison to developing countries or US, even in Europe labor income share is declining and inequality is rising. In 1977 GINI was 0.229 in UK while employment share of income is 79.7 and in 1991 GINI was 0.324 (Ryan, 1996, 118).

If it is analyzed that the components of income, income inequality can be analyzed comprehensively. In theory, it is possible that individuals have labor income and capital income or rental income at the same time. However, this case is an exception, as labor income share decreases, inequality increases accordingly all over the world in advanced countries (Stockhammer, 2012, 1). On the other hand self employed people who has average income also illustrated in capital income while high level income owners such as CEOs counts in labor income.

The main aim of factor shares is to illustrate labor income and capital income as two aspects of production and have an insight of the productivity level of economy. In

inequality perspective it is useful but has some shortcomings. While individual income shows that how unequal a society is mathematically, labor income share is just a good statistic to analyse reasons behind inequality.

Factor share is an important component of analyzing income inequality, however classification is not as clear as in 19th century. There is a huge amount of professionals earn more than capital holders such as CEOs or CFOs. As David Grusky remark, the extraordinary rise in CEO pay, as inequality rises, dates to the late 1970s. The acceleration in rise of CEOs and their income and role in companies, has been especially sharp since the mid-1990s. Because of the significant role of CEOs in companies, the gap between CEOs and average workers varies from year to year, but there is no mistaking the dramatic increase in recent decades (Grusky, [18.09.2015])

Factor shares are effected various factors within economy, such as employment, labor participation rate, minimum wages, technical change, very top income rates, capital income, inclination of society to have bonds or shares of firms. In this way to measure the effect of factor shares on income inequality is ambiguous in some aspects. However, empirically factor shares are correlated to income inequality. Not surprisingly, in Europe and in Turkey labor income share and income inequality has some common changes. In Europe, falling labor income share follows increasing income inequality and in Turkey, declining income inequality follows increasing labor income share in the meanwhile.

Though people who make a living on labor are able to have capital income, generally workers who sell labor don't have capital income, except some Arabic countries. In this way functional income distribution also tells about factor share are highly related to income inequality.

As some economists assert technical change is an important factor of labor share which cause labor income share declines in last three decades, technical change also related labor income share and income inequality accordingly.

Unemployment and labor force participation rate also very effective on labor income share. Through the increase in female labor participation rate, labor income share is expected to increase in Turkey. With less labor participation rate, labor income share

would stay low admittedly. As in Turkey female labor participation rate is around thirty percent and in this way labor participation rate is also low. Thus labor income share is constraint by labor participation rate.

Education and productivity of labor force is another significant factor of labor income share. Through increasing education level, labor productivity and labor income share is expected to increase.

2.3.4 Other factors of Inequality

There are various studies, which investigate factors and components of inequality. Since there are sociological, political and economic base of inequality, inequality is a wide and comprehensive field to study that is not just popular for decades or even centuries. Such as education, health services, demographic improvements in urbanization are all effective in inequality. In addition political approach of the country is a significant factor that affects inequality.

Inequality is generally a reason of unfair opportunities and less efficient labor. So that higher democracy level or free speech accordingly and open societies creates less inequality. Free trade and openness are also effective on inequality. As the Heckscher-Ohlin Theorem asserts, free trade affects labor and capital prices in this way effects inequality directly (Salvatore, 2013, 118). A widespread belief among economists is that economic development, including shifts from agriculture to industry and services and the adoption of new technologies initially benefits mainly a minority of the population. As the new methods of production become widespread, the benefits from economic development are shared more evenly, and higher per capita GDP tends to reduce inequality (Barro, 2008).

There are two main disputes admittedly among economist those are focused on explaining inequality. First one is that very top level incomes such as CEOs or CFOs getting higher and higher, in this way creates inequality. Especially researchers who study socioeconomics such as David Grusky focus on this part of inequality rather than income tax base inequality theories. The second widespread dispute is that declining labor income share creates inequality. Especially the case of downward in

labor income shares from 1980 in developed countries plays a main role in this dispute. Especially after Thomas Piketty's famous book, labor income share and functional income distribution again popular among economists who focus on income inequality.

Very top incomes also are possible to create inequality even labor income share declines. The share of very top incomes in labor share is possible to increase while labor income share declining.

Kuznets claims that growth is a cure of inequality eventually not even in the beginning but afterwards deepening inequality enables investment and growth and then inequality can be reduced. Inequality is expected to decline after a certain point of industrialization, democratization, and developing a welfare state; Kuznets believes that inequality has an inverted 'U' shape and though a rise at the beginning there would be a decline afterwards. In his study (1955) he praised growth and implies that inequality is a self-cure problem depends on growth, which fits perfectly 'growth is a rising tide that lifts all boats' view. This perspective is admittedly useful for politicians and popular when it has first raised. Today, inequality stands still and even worse increasing in OECD countries and in US as well. As Piketty states declining inequality between 1914-1945 is a result of world war and world war driven shocks which were especially effective

Wage differences also effects income distribution fundamentally. There are possible gender inequalities in wage policy of firms or inequalities as social convention. Social conventions or government policies are possible to effect wage differences and income inequality as well. On the other hand as profession diversify in a society wage differences lessen in compare to societies like Turkey. There is a huge amount of unemployed people who have no profession; in this way wage differences deepen accordingly. As countries like Germany, people have productive professions, this cause less wage differences among citizens. In Turkey or usually in developing countries not all citizens have opportunity to develop a profession and increase personal productivity and higher wage levels.

The structure of the market is another effective factor which deeply effective on income distribution and income inequality. The more competitive markets bring

higher wages and higher labor income share and in this way lessen income inequality. This side of inequality is possible to measure partially by using markup of market as a competition indicator.

Since landowners hold rental income for long rigidly, distribution of land is also very much effective on income distribution. Especially in countries like Turkey, which still have effects of feudalism, there are strong landowners who have a huge amount of rental income. In this way income inequality stands higher in compare to more developed countries.

Particularly in developing countries there are higher income inequality among regions. Development and growth in developing countries diffuse generally from a certain region such as Marmara in Turkey. This factor deteriorates income distribution and worsens income inequality. In developed regions there is more need for higher productivity in professionals and more need for labor force, so wages are higher in compare to other regions. In contrast to developed, high-industrialized regions, less developed regions have higher unemployment rate and less labor force. Through developing process all regions in a country equalize or at least converge developed regions and increase opportunities.

Inflation also deteriorates income distribution and cause income inequality. In particular, inflation affects people who have constant income. Household who have income as profit or rental income are able to adjust their income to inflation rate in contrast, inflation means who have constant income depreciation for labor who have wage as income.

3 EMPIRICAL DYNAMICS OF INCOME DISTRIBUTION IN TURKEY

In this chapter, empirical dynamics of income distribution in Turkey is documented and analyzed. Also income distribution in OECD countries is also analyzed and compared to Turkey. First of all income inequality measures are analyzed then the factors those affect income distribution and income inequality are documented and analyzed.

3.1 Gini and Palma Ratio in Turkey

There has been regular research on income distribution in Turkey since 2002. However there are various, exceptional studies on income distribution and income inequality as well. Research before 2002 are also used as an indicator but since methods vary in these studies and the samples, which were used, was not wide as it is today. So that studies, especially before 1987 are not reliable as much as recent ones.

The first of income distribution research has been carried out by government planning institution (DPT) in 1963. However, this study based on many assumptions and follow a deductive methodology rather than widespread questionnaires. Tax information, which has provided by citizens were used. After this first attempt, there has been several studies carried out not by just governmental institutions but also individual.

In 1968 Hacettepe University has carried out a study based on 256 location and 4505 household questionnaires. (Özmucur, 1995, 145). Until 1987, there are other studies those have been made in 1973, 1978, 1983, and 1986. However, in surveys those carried out before 1987 there are not wide questionnaires and methodological deficiencies (Çubukçu, 2002, 102). In this study, it is focused on recent studies, in particular years between 2000-2014. On the other hand to indicate the difference 1994 survey is also used frequently. In this way, long term Gini coefficient declines sharply until 1978 and afterward there is an upward movement. Until 1994, there are some upward and downward moves in Gini coefficient, however in long run there is

a regular decline including 2005. In 1963 while Gini is more than 0.5, with a regular decline Gini reached out 0.38 in 2005.

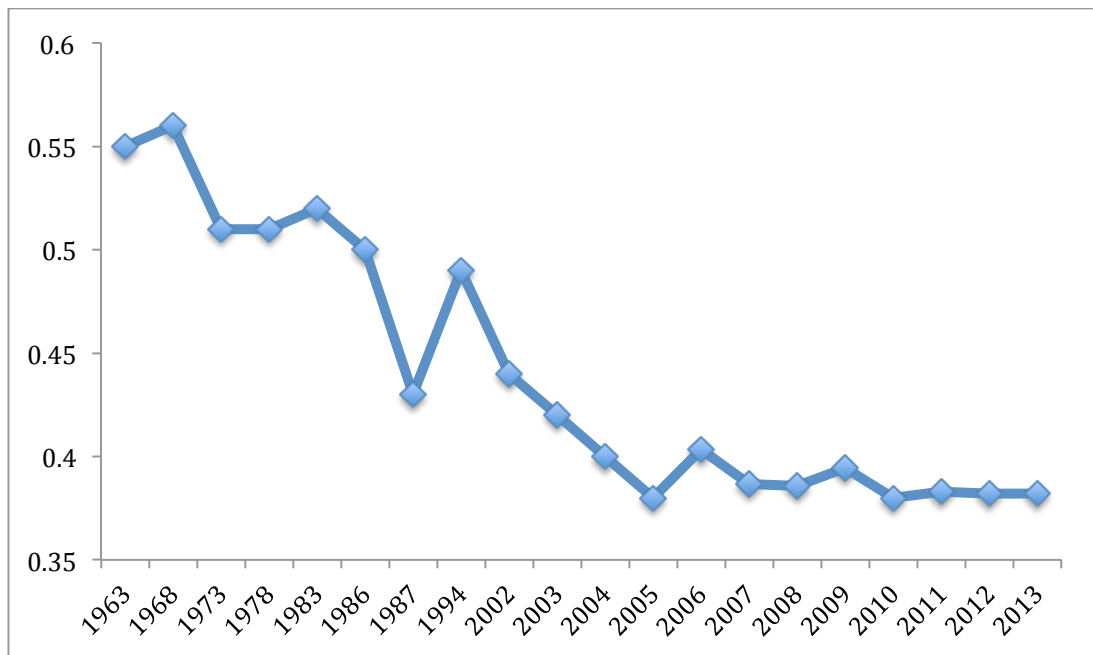


Figure 3. 1: Long Term Gini in Turkey

Source: Derived From Çalışkan, 2010. TUIK, 2015.

Even though there are insufficient studies, declining long term Gini coefficient is coherent with the data since 2001. On the other hand, developing countries, like Turkey from 1950 to 2013, it is expected that income inequality declined. In this regard, long term Gini chart is significant for descriptive analyses at least.

In 1994 National Statistics Institute has carried out a research and found out GINI as 0.49. So far, income inequality has declines about 0.38 regularly in Turkey.

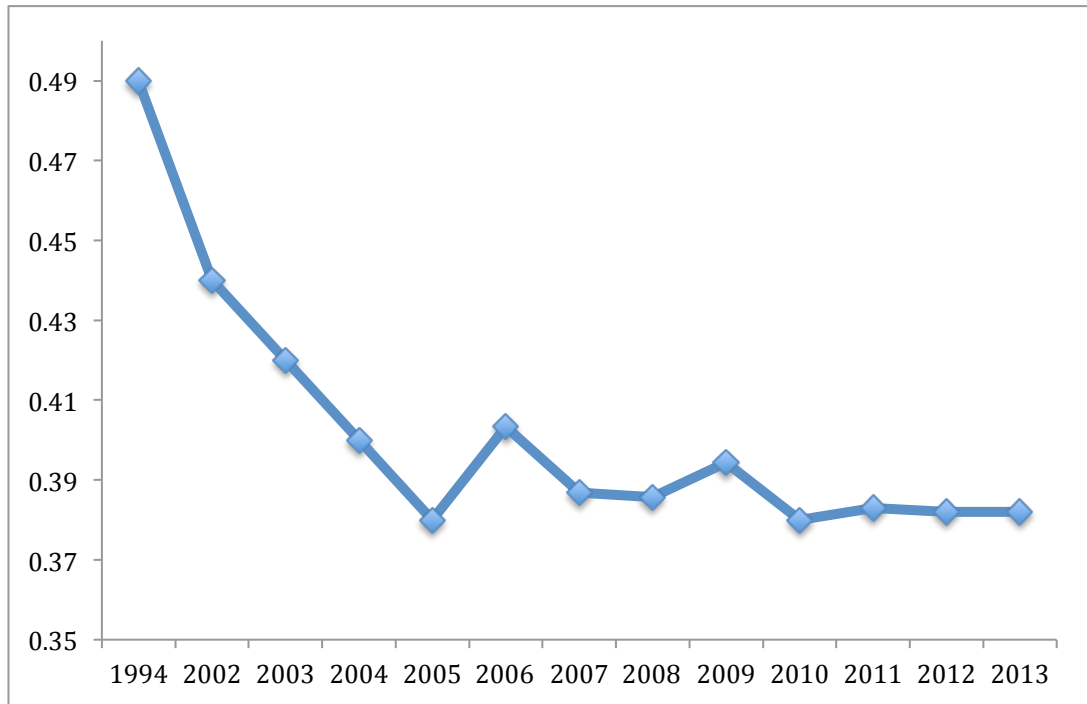


Figure 3. 2: Gini From 1994 to 2013

Source: Derived From TUIK, 2015.

Palma ratio is not widespread in Turkish official reports but since Palma ratio has developed a different perspective and has been being considerable among economists, it is also a significant statistic apart from Gini coefficient. Palma ratio is regularly declining in recent years, from 1994 to 2013, Palma ratio declined from 3 to 1.70, which can be concluded as a significant, dramatic change. The improvement in Palma ratio also demonstrates declining income inequality. The decline in Palma ratio is far more than Gini coefficient, which is about %44 from 1994 to 2005. In 2013 Palma ratio is 1.70 for Turkey, means top income decile takes 1.7 times of bottom four deciles. In another word, top decile has taken 6.8 times higher income per person. This illustrates a significant improvement in income inequality of d10 to d4 that was 9.16 times in 2002, and 12 times in 1994; almost two times more in compare to 2013 datum.

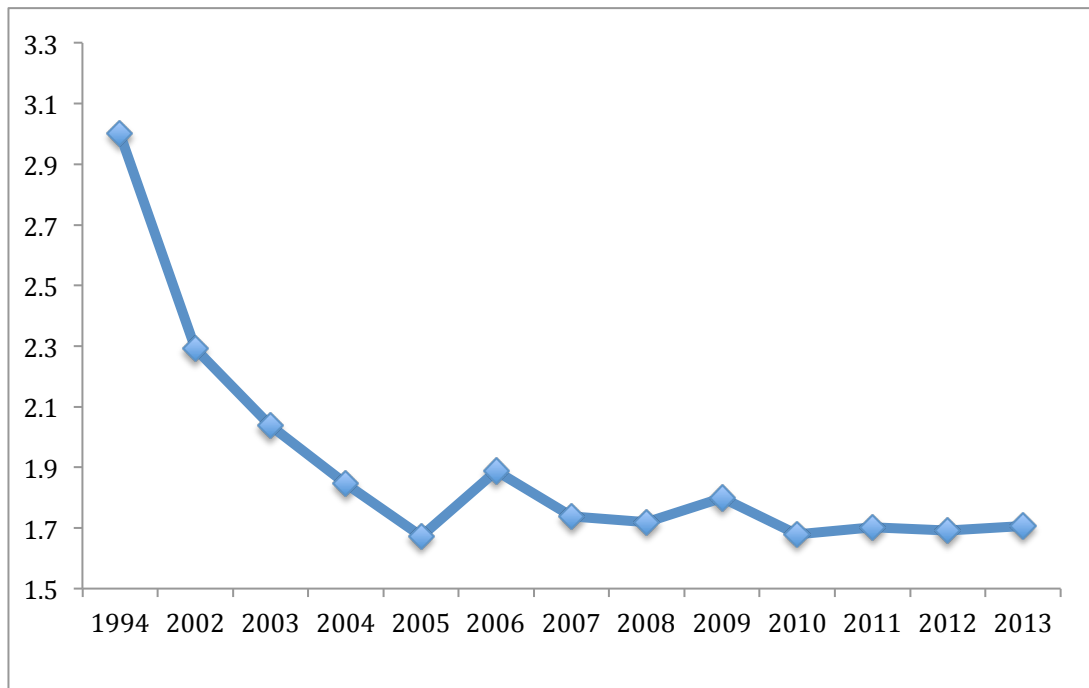


Figure 3. 3: Palma Ratio in Turkey

Source: Calculated by the Author Using TUIK 2015.

D9/D1 is one the significant indicator of income inequality. Since growth, shocks, or any recovery in transfer payments affects bottom and ceiling of society, D9/D1 indicator is more volatile in compare to Gini coefficient. In this way D9/D1 similar to Palma ratio and enables a broader income inequality analysis. As it is illustrated in figure 3.4, D9/D1 ratio falls from 22.5 to 11.8 in 1994 to 2013, which also shows declining income inequality in Turkey.

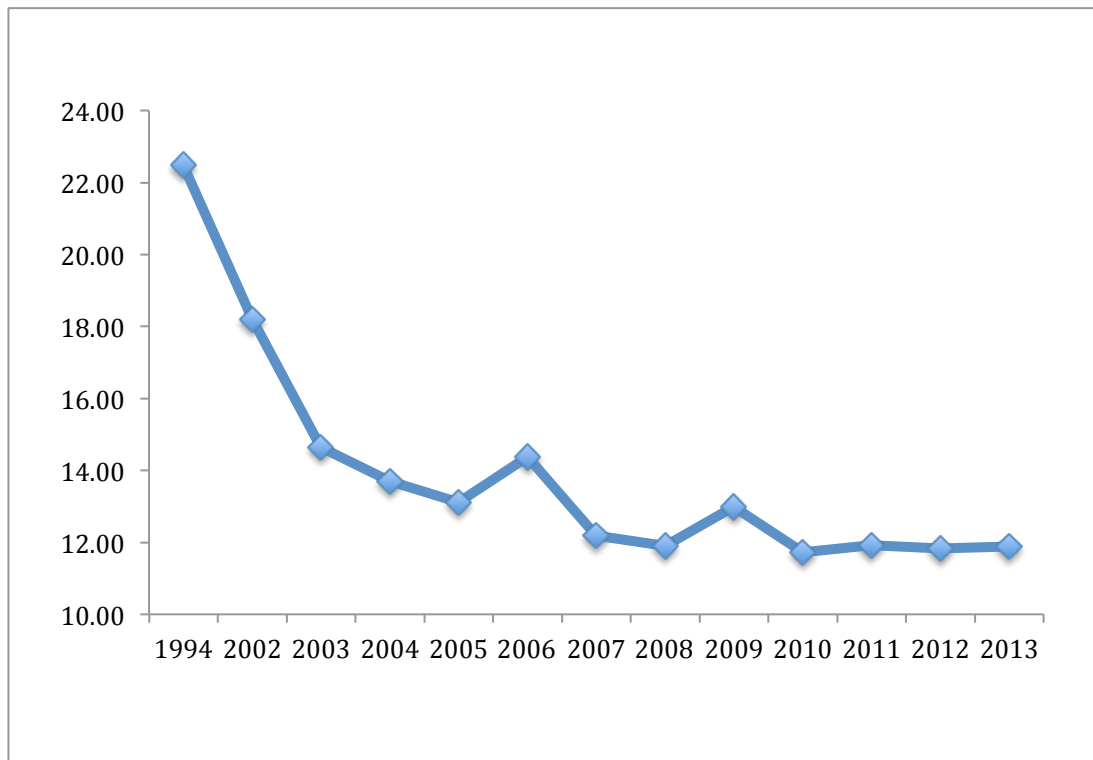


Figure 3. 4: D9/D1 in Turkey

Source: TUIK, 2015.

Poverty rate which is related the distribution of income is also an indicator which shows that how income is distributed among citizens, particularly at the bottom of population. There are several types of poverty rate based on different percentages. Poverty threshold is the line, which is formed by using certain ratio (50%, 60% or 40%) of equivalised individual median income. Most common use of these is the rate based on sixty percent below median income. This line is also declining in Turkey from 25 percent to 22 percent in 2006-2014 (Figure 3.5).

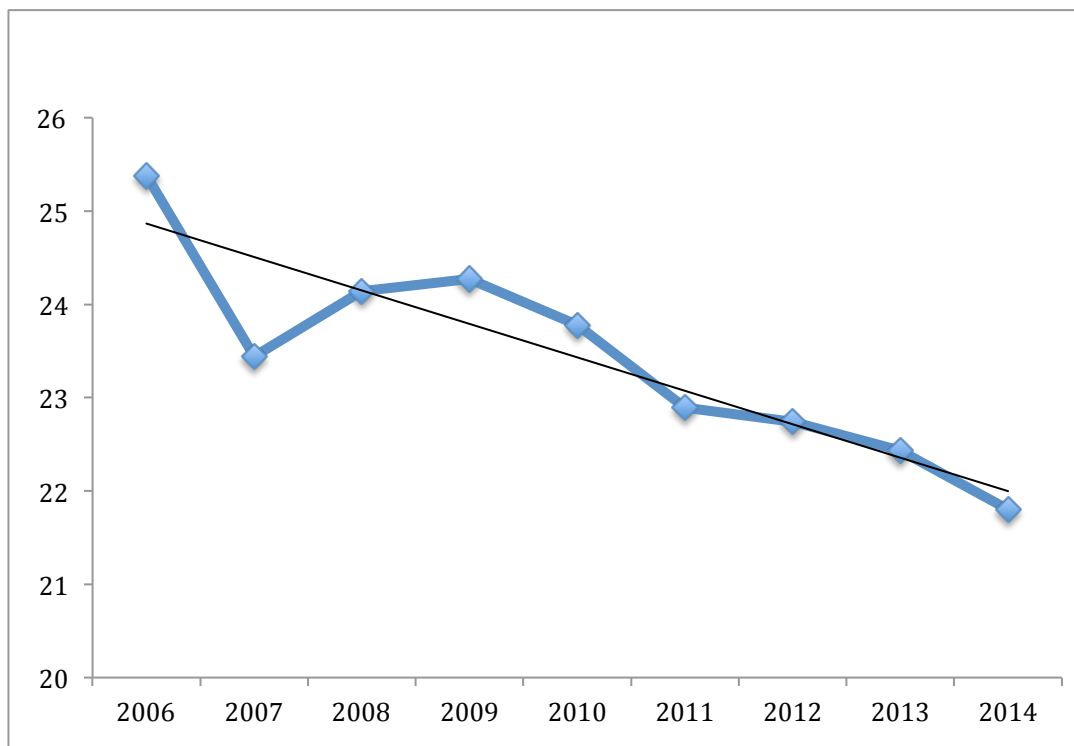


Figure 3. 5: Poverty Rate (%60)

Source: Derived From TUIK, 2015.

Poverty based on food and nonfood ratio also declined between 2002-2009 from %26.96 to %18.08 (Figure 3.6). Since survey methods have changed by ‘TUIK’ after 2009, there is no available data since 2009. This poverty line based on a consumption bundle, which consists of food and non-food consumption needs. Since complete poverty is a measure of people who below a certain line, it is not directly related to income inequality; however declining complete poverty is a sign of better transfer payments and declining inequality. In this regard, declining complete poverty rate is also notable to illustrate income inequality.

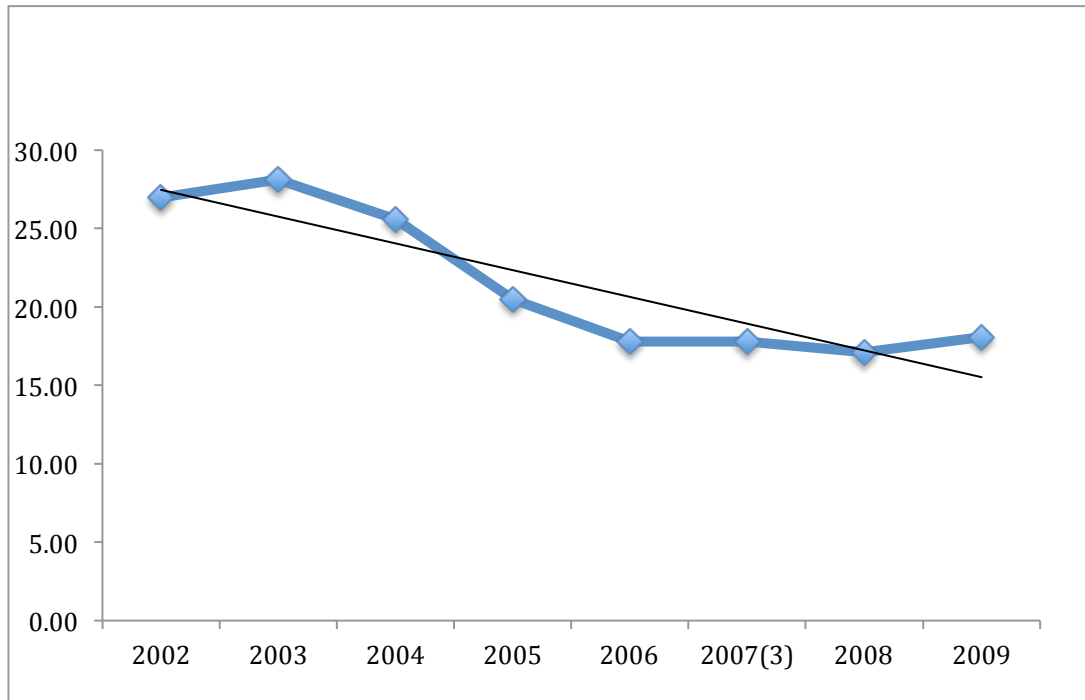


Figure 3. 6: Complete poverty (food+nonfood) (%)

Source: Derived From TUIK, 2015.

3.2 Labor Income Share

Since wage is a significant component of income distribution, labor income share is theoretically very much effective on income distribution. To grasp the level and structure of labor is highly necessary to analyze income inequality.

Labor income share is low in developing countries as a structural problem. The same situation exists for Turkey; LIS has always been low in Turkey relative to more developed countries. Despite the fact that shadow economy is higher in Turkey, labor income share is notably low. There are various reasons explaining low labor income shares in Turkey. Unemployment, low levels of labor participation rate, low labor productivity, low minimum wages, and the structure of economy, which requires less technology intensive production methods and unskilled workers, are leading reasons of low level of labor income share.

Admittedly, skilled labor force which supports and creates high-tech goods, which contains more surplus value, gets more income in compare to less skilled workers. On the other hand, it is a fact that only skilled labor supported economy creates high level

of GDP such as OECD countries or US. In this regard, transformation in Turkish economy and capital deepening production requires more skilled labor force. In this way, skilled labor force increase labor income share. Increasing income is affects income distribution positively. Apparently the rise from %36 to %48 in 2002-2013 is one of the main components of declining income inequality in Turkey (Figure 3.7). In 1994, labor income share was %28.3 and rose to %38.7 in 2002. It is possible that the number of people who participated in labor force caused this increase. On the other hand entrepreneurship income in GDP fell to %34.5 while it was %42.4 in 1994. Only service sector share in GDP increased between 1994-2002 apart from labor income share (Kustepeli, Halac, 2004,148).

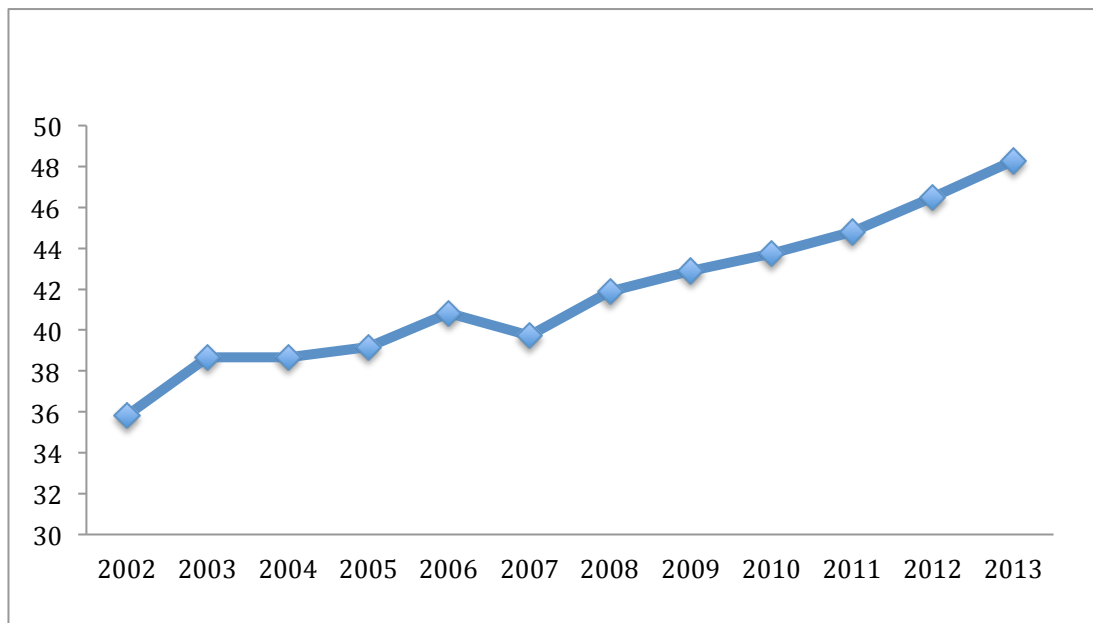


Figure 3. 7: Labor Share Income (%)

Source: Derived From TUIK, 2015.

3.3 Labor Structure

As it is usual for developing countries Turkey had a transformation in labor structure, thereby in also production methods. From agriculture-based economy to technology intensive, surplus value based economy is highly critical in developing process for Turkish economy and income inequality. Labor structure is highly related to labor income share. Labor productivity, labor distribution over sectors and skilled labor or

unskilled labor is also determinative on labor income share and income inequality accordingly.

Labor participation rate and unemployment rate are directly affect labor income share. Thus, labor structure, sectorial labor structure, unemployment, female labor participation rate are all to be studied to illustrate the relation and effects on labor income share and how income inequality is related with these factors.

3.3.1 Household Income and Labor Force Participation Rate

Labor participation rate also plays an important role in labor income share and accordingly in income inequality. Since labor participation rate is very low in compare to OECD countries, labor income share is apparently low in Turkey. While labor participation rate is around more than %60 in Europe, It is still about %50 in Turkey. Low female labor participation rate is the main reason of this case. Between 1994-2004 the average labor for participation rate is %51 for Turkey; today, in OECD countries it is about %60. For instance, %62 in UK and US, %64 in Sweden, %60 in Germany (World Bank, 2015). Therefore, labor force participation rate affects LIS and household income in Turkey.

During 2004-2013 Turkey has reached a high level of labor participation rate in compare to past years. Increasing labor participation rate increases labor income share and accordingly changes income distribution in economy.

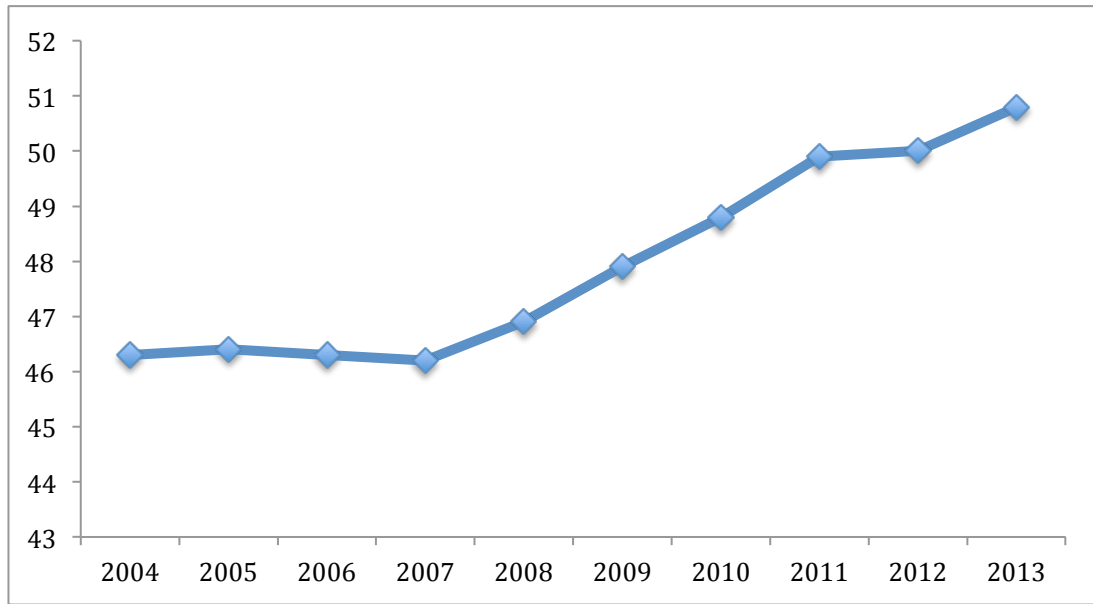


Figure 3. 8: Labor Force Participation Rate (%)

Source: Derived From TUIK, 2015.

In 2004, labor participation rate is around 46% then in 2013 it is %51, which is a significant change in last decade (Figure 3.8).

Since education level is increasing and the perception of female employment in Turkish society, labor participation is increasing no surprisingly. Not only labor participation but also skilled labor participation is also increasing with capital deepening. In this way, labor income share is expected to increase and this factor plays a significant role on income inequality.

Despite increasing labor participation rate, female ratio in labor force is still astoundingly low in compare to OECD countries. Female ratio in labor participation rate repress labor income share low and income inequality high accordingly. In Turkish society women play still a passive role in economy not as an obvious convention but as a subconscious culture. Since there are huge distinction between professions as ‘male’ and ‘female’ there is a significant gap in professions such as engineering or any other ‘masculine’ professions. Even this cultural expectation creates less motivation for women to work more or effort more to play more productive role in economics in Turkish society. These factors are effective on labor participation rate and income inequality accordingly.

Though low female labor in labor force, this ratio is also increasing like labor participation rate and labor share income admittedly. In this way, this factor contributes to labor income share and declining income inequality. Especially after the crises in the beginning of the decade, woman participation in labor force increased from 23.3% to 30.8% which is a considerable rise despite the fact that it is still low in compare to developed countries (Figure 3.9). This contribution in labor force is remarkably in education and management rather than intermediate labor force.

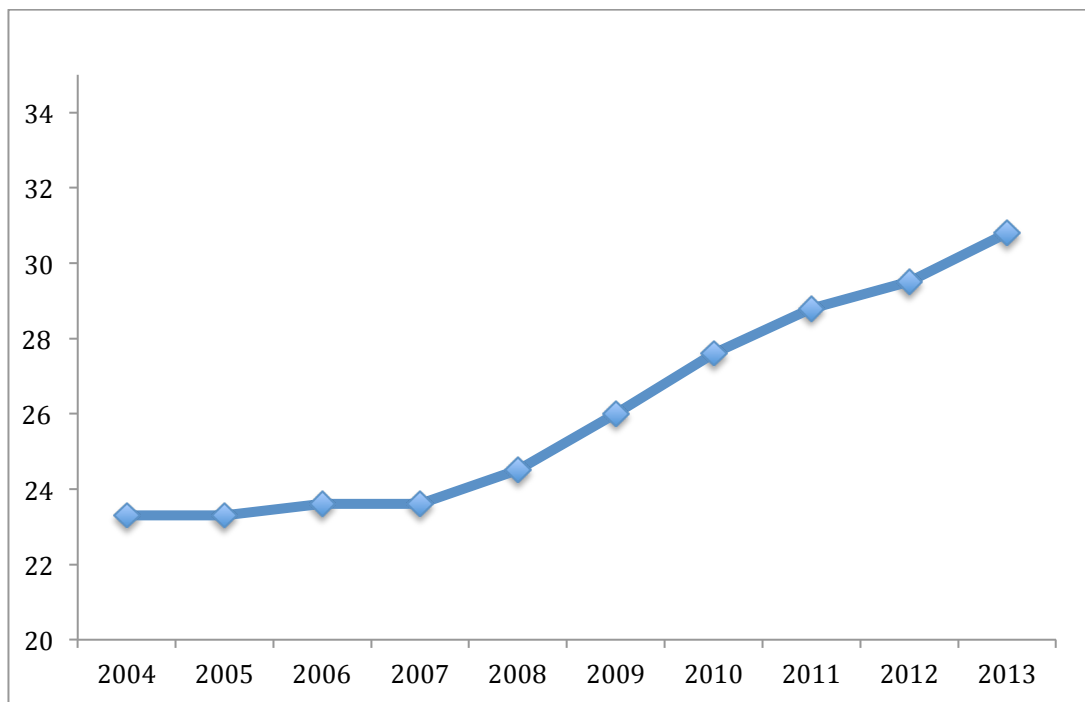


Figure 3. 9: Female Labor Participation Rate (%)

Source: Derived From TUIK, 2015.

Despite the fact that female labor participation rate is astoundingly low in Turkish economy in compare to OECD countries, there is an increase from 2004 to 2013 from 23% to %31 (Figure 3.9). Female labor participation rate is effective on the increase in labor participation rate. Thus the change in labor participation rate can be explained by the increase in female labor participation rate.

3.3.2 Unemployment

Unemployment is a structural long run problem in Turkish economy. Since discouraged workers do not count in labor force, unemployment rate stays less than actual rate (Bozdağlıoğlu, 2008, 46).

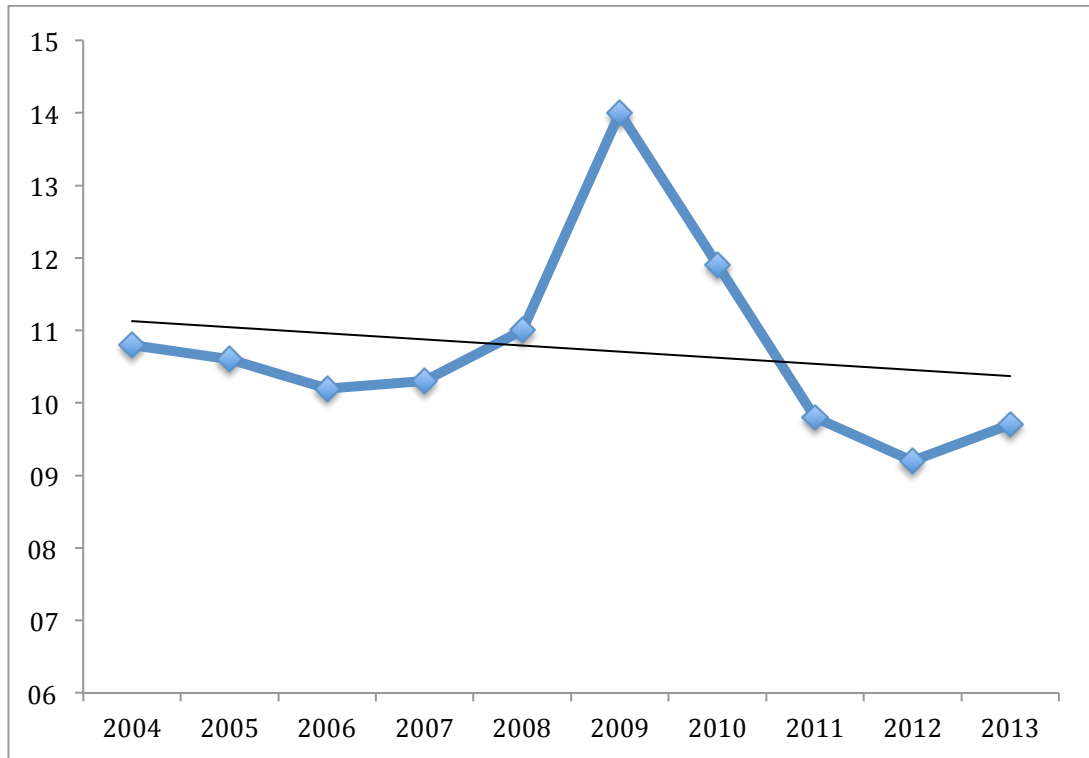


Figure 3. 10: Unemployment Rate (%)

Source: Derived From TUIK, 2015.

Unemployment did not change much in 2004 to 2013. In 2004 unemployment rate is around 11% and in 2013 it stays high around 10% (Figure 3.10).

Unemployment is a long run structural problem in Turkish economy. Since there is not sufficient intermediate labor force, there is a dependent structural trade gap, which contains of intermediate goods. Basically there are two kind of labor force in Turkish economy, unskilled labor force who works for minimum wage and high skilled workers such as engineers, doctors or economists who work in management.

Therefore, labor force participation rate is low and unemployment is always high and stable Turkish economy. In particular, discouraged workers and female labor force who are not eager to work traditionally are not count for unemployed. Thus,

unemployment rate stays still and labor force participation is stays higher than its actual rate.

Labor is not theme of this study, however low labor participation, and high unemployment profile cause low level of labor income share. Thus unemployment also plays a significant role in income inequality.

3.4 Tax and Transfer Payments: Redistributive Side of Inequality

Evidently income tax is one of the main components of a reliable efficient redistribution policy. Turkey has a low profile of income tax to GDP ratio for long. There are political and economic reasons of this structural trend.

One of the reasons is the lack of an independent supervisory authority such as Interval Revenue Service (IRS) as in USA. Independent authorities are more stable institutions those are less correlated to government or any other elected governor. In this way, independent institutions create more respect and culture. In contrast, income tax system or any other supervisory system cannot be managed continuously.

Another significant reason is that, since members of parliament who make lows in Turkish political system, gains more of low profile of income tax system, resist more income tax admittedly. So that, from 1980 to 2012 there is no a dramatic change in income tax which fluctuates around six percent (Figure 3.11). This profile can be count one of the most significant reason of high level of income inequality despite declining from 1994.

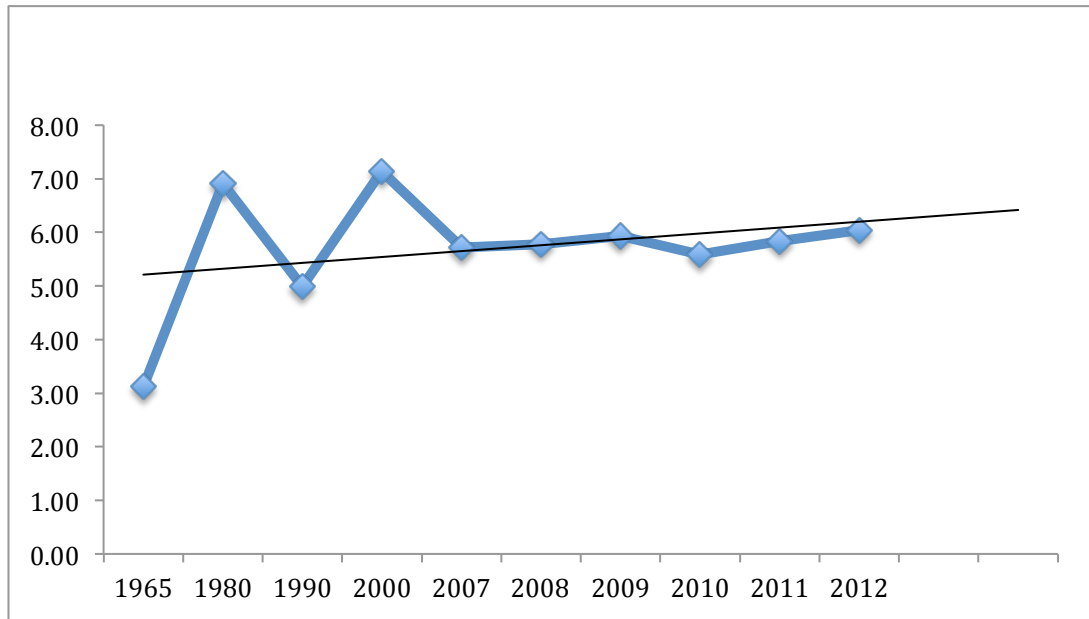


Figure 3. 11: Income Tax to GDP (%)

Source: Derived From GİB, 2015.

Income tax is not collected as easy as consumption tax is. Thus, Turkey needs an independent institution like IRS as U.S has. Since there is no sufficient law and institutional background, Turkey confronts a huge income tax gap, which is consumed for luxury import goods and services indeed.

Though there is an increase in income tax, obviously it is not significant from 1965 to 2012. In particular between 2000 and 2012 there is no significant change either. Since income tax is one of the most significant components of redistributive side of income distribution, tax system is an obstacle in income inequality for Turkey.

Apart from tax system, transfer payments is able to effective on redistributive policy, which determines how tax system is used for changing income inequality. There is no significant change in transfer payments in 2006 to 2013. Transfer payments is a kind of redistribution policy, however without a well-planned income tax system, transfer payments would be inefficient. Therefore, transfer payments is an indicator, however not as effective or primary as income tax is.

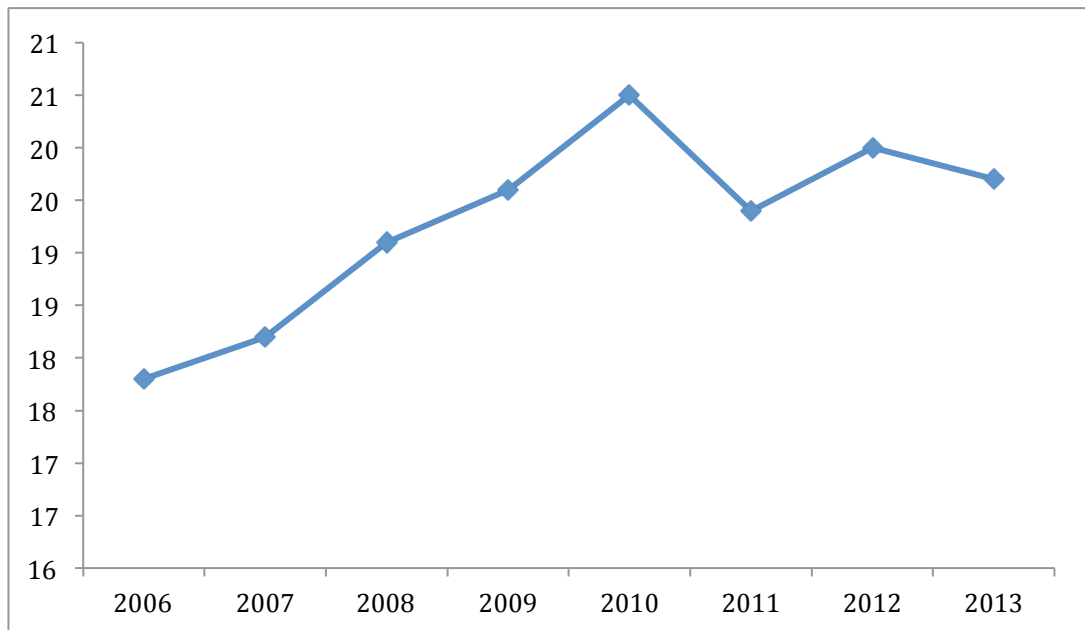


Figure 3. 12: Transfer Payments (% of GDP)

Source: Derived From TUIK, 2015.

3.5 OECD and Turkey in Terms of Determinants of Income Distribution

In OECD countries, in contrast to Turkey, LIS is about %15 percent higher, income tax is twice time more than Turkey generally; labor participation rate is higher in comparison to Turkey as well. Not surprisingly, income distribution is more equally distributed in comparison to Turkey and income inequality is remarkably lower than Turkey.

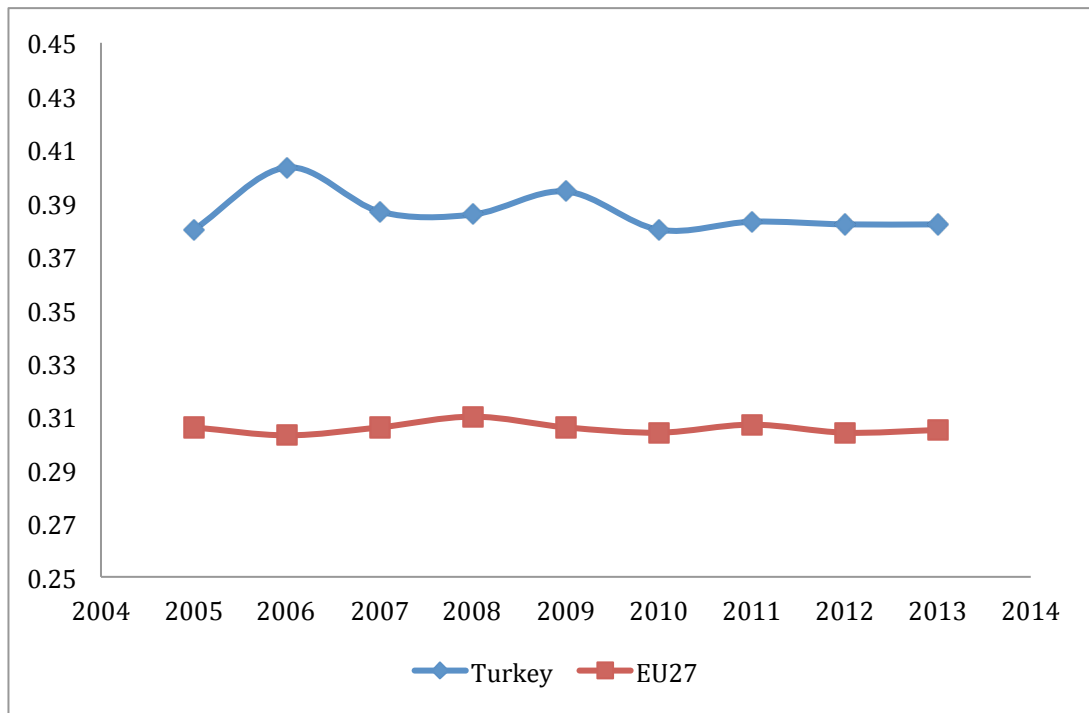


Figure 3. 13: Gini Coefficient Turkey and EU27

Source: Derived From Eurostat, 2015.

Total tax is also a significant indicator to show the potential of redistribution policies. Total tax to GDP ratio shows that, how much redistribution can a government achieve. In this way, it is obvious that OECD countries have remarkably higher potential to lessen income inequality by using tax income.

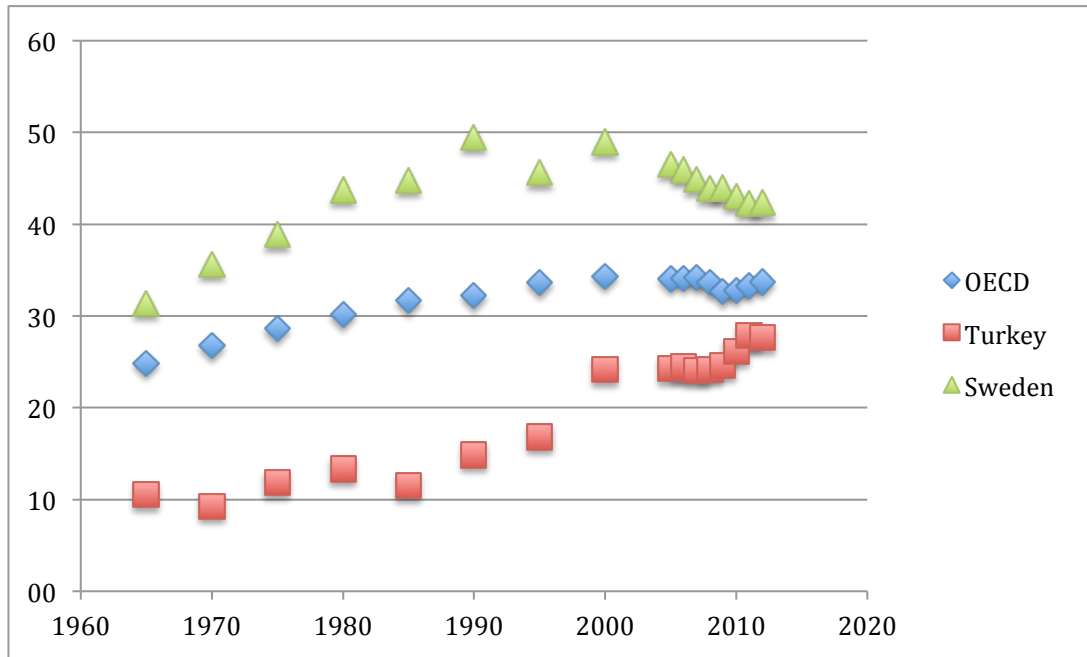


Figure 3. 14: Total Tax to GDP (%)

Source: Derived From GİB, 2015.

However, total tax to GDP does not show the difference between income tax and consumption tax. Hence income tax is itself an income distribution decreasing indicator, it must be distinguished whether income tax or consumption tax.

As it is clear in chart below, also income tax is significantly higher in OECD countries. Astoundingly in Sweden it is four times more in compare to Turkey. Gini coefficient is also very low which is 25.4 in 2014 in Sweden while 0.38 in Turkey, in 2013 (Figure 3.14).

In OECD countries, both distributive and redistributive side of income distribution is better than Turkey. Labor income share is higher and income tax and transfer payments are also higher than Turkey. In this way, while Gini coefficient is around 0.38 in Turkey, it is around 0.30 in OECD countries.

OECD countries have a average Palma ratio of 1,19 while Turkey has almost 2 in 2012 (Eurostat 2015).

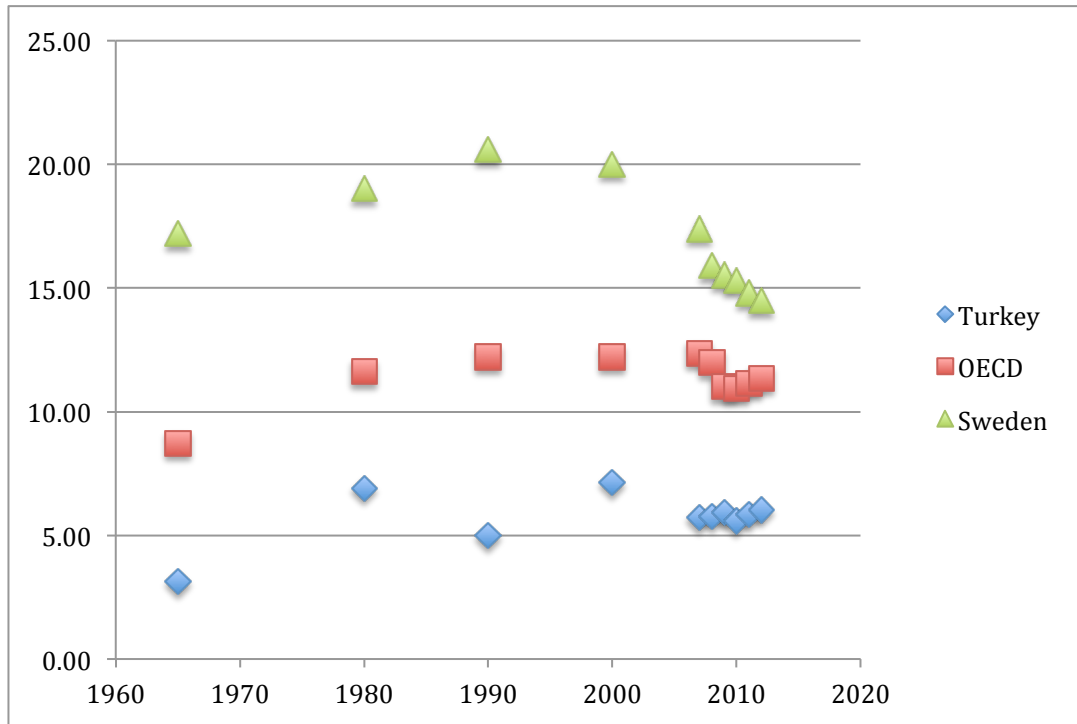


Figure 3. 15: Income Tax to GDP (%)

Source: GİB, 2015.

In general, OECD countries lose labor income share even though it is still high in compare to rest of the world. Productivity increase more than real wages in OECD countries, in this way labor income share declines.

Labor income share declined in general in OECD countries and in advanced economies such as Germany, U.S. and Japan from 1980 to 2010. While labor income share is over 70% in advanced countries such as Germany, Japan and U.S. it has declined about 65% in 2010 (Stockhammer, 2012, 1). However, despite the decline in labor share in OECD countries, it is still acceptably high and income inequality is low accordingly.

In short, OECD countries have higher labor income share levels and labor participation levels as well. As redistributive policies, OECD countries apparently higher income tax levels and lower income inequality in comparison to Turkey.

4 THEORETICAL APPROACH TO INEQUALITY AND FACTOR SHARES

In this part, theoretical side of income inequality and its components are studied. In particular, labor income share, markup and elasticity of substitution is analyzed regarding capital deepening and the effects on income inequality. In addition Piketty's theory of income inequality related to rate of return on capital and growth is also discoursed.

4.1 LIS, MARKUP and Elasticity of Substitution Relation

Labor income share is affected by various variables through wage policy to technical change or production methods. If labor is easily substitutable of capital, admittedly labor shares decline through capital deepening. On the other hand there would be less competitiveness in labor market since labor is easily substitutable. In this regard, the relation between labor income share and capital is crucial in determining labor income share and income inequality accordingly.

Determinants of labor income share and the relation between determinants and labor income share must be illustrated to understand how labor income share move with other macroeconomic factors.

Consider the CES production function

$$Y_t = F_L(K_t, L_t) = \left[\alpha K_t^{\frac{\sigma-1}{\sigma}} + (1-\alpha)(A_t L_t)^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}} \quad (4)$$

F_L is the marginal product of labor, A_t is labor augmenting technology, Y_t is national output level, L_t employment level, K_t represents labor augmenting technology, and $\sigma > 0$ is the elasticity of substitution between capital efficiency units of labor.

To include markup in the model,

$$m_t w_t = F_L(K_t, L_t) = (1-\alpha) \left[\alpha K_t^{\frac{\sigma-1}{\sigma}} + (1-\alpha)(A_t L_t)^{\frac{\sigma-1}{\sigma}} \right]^{\frac{1}{\sigma-1}} (A_t L_t)^{\frac{-1}{\sigma}} A_t \quad (5)$$

where m_t represent price markup and w_t is the wage per unit of labor at period t .

By the equations above, labor income share (LIS) is defined as

$$s_t = \frac{w_t L_t}{Y_t} = \frac{(1-\alpha)}{m_t} \left(\frac{Y_t}{A_t L_t} \right)^{\frac{1-\sigma}{\sigma}} \quad (6)$$

If elasticity of substitution is one as Cobb-Douglas model assumes, ($\sigma=1$) then LIS depends on markup.

$$s_t = \frac{w_t L_t}{Y_t} = \frac{(1-\alpha)}{m_t} \quad (7)$$

The equation above shows that labor income share is inversely related to price markup and if markup is equal to one, labor income share would be constant. In equation (6) labor income share depends on markup and average productivity, average productivity can be illustrated as

$$\left(\frac{Y_t}{A_t L_t} \right)^{\frac{1-\sigma}{\sigma}} = \frac{1}{\alpha \left(\frac{K_t}{A_t L_t} \right)^{\frac{\sigma-1}{\sigma}} + (1-\alpha)} \quad (8)$$

and thereby labor income share can be written as

$$s_t = \frac{1}{m_t} \left(\frac{1-\alpha}{\alpha \left(\frac{K_t}{A_t L_t} \right)^{\frac{\sigma-1}{\sigma}} + (1-\alpha)} \right) \quad (9)$$

The equation above shows that if elasticity of substitution is lower than one, increasing capital deepening increases labor income share and vice versa (Yılmaz, 2015). Otherwise, i.e. if elasticity of substitution is higher than one then the higher capital deepening, the lower labor income share is. More formally,

$$\frac{ds_t}{d(K / AL)} > 0 \text{ If } \sigma < 1 \quad (10)$$

$$\frac{ds_t}{d(K / AL)} < 0 \text{ if } \sigma > 1 \quad (11)$$

$$\frac{ds_t}{d(K / AL)} = 0 \text{ if } \sigma = 1 \quad (12)$$

Since this study explore the changes in elasticity of substitution and the change in labor income share accordingly, CES production under imperfect competition, is used in equations to able to illustrate change in labor income share rather than Cobb-Douglas model which takes constant labor income share. Therefore, elasticity of substitution can be less or greater than one enables changes in labor income share. Trying to explain variations in the labor share it is need to depart also Cobb-Douglas production function assumptions, constant returns to scale and labor embodied technical progress generates strong restrictions on the behavior of the labor share. Then it is explored in the study what if there is capital-augmenting technical progress and constant elasticity of substitution is subjected by showing results for a constant elasticity of substitution production function (Bentolila, Saint-Paul, 2003, 5).

As a consequence, exploring the elasticity of substitution in Turkey would enable studying labor income share and income distribution accordingly. Raurich, et. al. (2011), use CES production function instead of Cobb-Douglas, and calculated elasticity of substitution between capital and labor lower than one for USA and higher than one for Spain. If these figures are accurate then capital deepening implies increasing labor income share for USA and decreasing labor share for Spain. This finding illustrates that, elasticity of substitution and capital deepening play a key role on labor income share.

4.2 LIS and Elasticity of Substitution

Apparently, labor income share is one of the main components of income distribution, which is studied within the theme of functional income distribution. Labor income share is a useful way of looking and analyzing income distribution as functional income distribution does. Indeed, a considerable part of population makes

a living on wages and labor, rather than profit or rental income, wage and accordingly labor income share is effective on income distribution and income inequality.

As Bentolilla-St. Paul (2003) points out, labor income share (LIS) is constant is taken as a granted “stylized fact of growth”. LIS hasn’t been aroused an interest among economists. However, since labor income share has an impact on income distribution and income inequality, heterodox economic theory is particularly very much interested in labor income share and LIS takes place in political debates. On the other hand, the labor share is very popular in political debates as a measure of how the “benefits of growth” are shared between labor and capital (Bentolila, Saint-Paul, 2003, 1).

Production function, elasticity of substitution and markup are highly related of labor income share; in this regard the relations and assumption are to be made and then the case for Turkey must be determined and studied. As Yılmaz (2015) noted, labor income share (LIS) is constant under the assumption of Cobb-Douglas (CD) production function and perfect competition in growth theory. However empirical studies shows that LIS is time varying in most countries in medium run and long run.

LIS taken constant in general literature, therefore, labor share income does not seem interesting or effective on macroeconomics for long. Afterward empirical studies shows that LIS is effective and not constant, in particular, when price markup is considered.

Generally, studies does not consider markup while calculating or analyzing labor income share, but in few studies markup is considered as an important component of labor income share apart from the assumption of perfect competition and Cobb-Douglas production function. It is usual that markup is ignored under the assumption of real wages are equal to marginal product of labor in market fundamentalism. If there is a gap between real wages and marginal product of labor, then price markup is mentioned and is considered at least in empirical studies.

As Bentolila and Saint-Paul (2003) explained in their paper the decline of labor income share since the mid-1980s is often used by unions in Europe as an argument against policies of low wages or moderate wages, and also used by governments to

make reasons to increase taxation of profits. In the same paper also mentioned considerable medium-run movements in the labor share over a period of 35 years.

It is obvious that there are large cross-country differences in the behavior of the labor share even among developed countries in compare to other countries. On the other hand, the change in real wages doesn't seem effect labor income share directly as it was in Germany and France. There are fall in both countries in labor income share and in the meanwhile, there are rise in real wage levels. However there are also positive examples such as Japan. It can be concluded that developed countries have high level of labor income share and better income inequality levels. In this way, increasing development and growth, labor income share, declining income inequality is seemingly correlated. As it is seen in Japan example, labor income share raised to 68% from 57.5% between 1970 and 1990 (Bentolila, Saint-Paul, 2003, 1). Not surprisingly the sharpest growth also carried out at the same period in Japan while labor income share catches Europe levels.

In macroeconomics factors shares are significant either explicitly or implicitly. Some models predict factor shares as Cobb-Douglas by predicting coefficients of labor share and capital share. On the other hand, apart from models, the movement in factor shares is also significant for income distribution. So that, socioeconomics and also sociology interested in factor shares. Factor shares actually constitute a categorization, which helps to improve a way of analyzing income and the structure of economy as well.

On the other hand, factor share is a good measurement of productivity in macroeconomics. The change in factor share through a period of time also enables to explain the structure of economy and productivity accordingly. If labor income share is increasing, it can be interpreted as increasing productivity or real wage increase. Since labor-intensive goods have less surplus value generally (except handcraft, luxury goods for instance), labor intensive production methods generally are not expected to increase labor income share as it is in China. Therefore, it is expected an increase in productivity rather than increasing labor-intensive production methods. However, since productivity move upward generally, a decline in labor share does not mean declining labor productivity admittedly, it can be explained capital deepening instead. Countries such as Germany or France, those have more capital

intensive production methods and technology are expected to have lower labor income share than countries which have higher real wages and less capital intensive production methods and possibly have more natural resources, such as Nordic countries. In 1990, Finland or Sweden showed labor shares around 72%, while France or Germany had values around 62% (Saint-Paul, Bentolila, 2003, 2). A decline in labor income share is strongly depends on elasticity of substitution rather than real wages. As in Europe, real wages can be higher but through capital deepening, substitution between capital and labor is more effective on labor income share.

Another advantage of having labor share statistics, one can grasp structural and political factors those contribute to changes in interpersonal inequality (Rodriguez, Jayadev, 2010, 1).

4.2.1 Skill-Biased Technical Change and LIS

Technical change and production methods such as technology intensive or labor-intensive production, affects directly labor income share and capital share. As it is studied in this study, labor income share is effective on income distribution and income inequality accordingly. So that, the reasons of the decline or already low labor income share as it is in Turkey is to be analyzed to grasp fundamentals of income inequality, even though income inequality is declining like in Turkey through 1994 to 2013.

As Acemoğlu (2000) notes, the change in production methods in last sixty years technical change is skill biased; through this perspective change in labor income share is expected admittedly.

There are various aspects of income inequality and labor share is one of the significant one; on the other hand skill-biased technical change is possibly not the first and foremost but an important reason of low labor income share, which needs to be added. So that, understanding skill-biased technical change and labor income share relationship is necessary. As Acemoğlu discussed skill-biased technical change has impact on wages, labor income share and income inequality accordingly.

“The early twentieth century evidence was so powerful that Griliches (1969) suggested capital and skills are intrinsically complementary. Nelson and Phelps (1967), Welch (1970), Schultz (1975) and Tinbergen (1975) also argued that technological developments increase the demand for skills. Events since then support this notion. Personal computers, computer assisted

production techniques, and robotics appear to complement skilled workers, replacing many labor intensive tasks. In this light, it is perhaps natural to view the increase in inequality over the past several decades as a direct consequence of technical change. (Acemoglu, 2000, 2)”

As Acemoğlu (2000) notes, in the 20th century, it is widely believed among economists that technological advances favor more skilled labor. However, before twentieth century, industrial revolution generates fear, or even worse outbreak to technological advances and machinery, because of that technology replaces manual jobs.

Acemoğlu (2000) asserts that, probably not in last sixty years in this century, through 20th century technological advances are skill replacing, however in recent decades skill-biased technical change accelerated in response to acceleration in skilled labor force supply.

Wages for low skill workers also have fallen in real value in previous thirty years, while the increase in supply of low-skilled workers during same time (Acemoğlu, 2000, 38). Not only the decline in low-skilled workers demand, but also the increase in skill-biased technological change is able to decline labor income share and increase income inequality. There are various literature asserting increasing effect of skill-biased technical change on wage inequality and income inequality (e.g. Card, Dinardo, 2002). Widespread view focus on increasing skill-biased technical change in last decades increased wage inequality. Theoretical side of this view is not topic of this study, however technical change and wage inequality is an important aspect of income inequality.

Despite the fact that, labor income share is increasing in Turkey, labor income share is still has a low profile in compare to OECD countries. On the other hand, even in OECD countries have low level of labor income share and declining labor share is a popular topic (e.g. Karabarbounis, Neiman, 2013). In this regard, skill-biased technical change is explanatory due to the fact that declining labor shares even in OECD countries, which have high real wage levels.

4.3 Markup and Competitiveness in Labor Market

As Unveren and Sunal (2015) noted, markup is one of the significant reason of low labor income share in Turkey. Markup is not acceptable under perfect competition in other words in perfectly competitive markets. Markup cause also less firms and less

demand for labor force, since there are less firms and less competitiveness in comparison to perfectly competitive markets, firms are able to pay less wage levels to workers and thereby decline general wage level and labor income share accordingly. In this way, the high the markup the low the labor income share especially in developing countries such as Turkey. Empirical studies also shows that OECD countries, which have low levels of markup, also have higher levels of labor income shares.

In the counterfactual scenario, price markup would be zero and as Ünveren and Sunal (2015) noted, Turkish economy would have about %65 labor income share as OECD have. This significant note explains that how competitiveness and effects of competitiveness on labor market is determinative on labor income share. The gap between labor share of Turkey and the OECD average can be explained almost only by imperfect competition. If Turkish had been perfectly competitive, the estimated parameters imply that labor share in Turkey would be 64% which is very close to average of OECD and US level of 65%. Even with different instrumental variables this result is quite robust (Unveren, Sunal, 2015, 3)

In this way, Turkish economy has very low level of labor income share in comparison to OECD countries which have about %65 labor income share roughly while Turkey has just %48 in 2013 according to Turkish national Statistics Institute. However, Penn World Table (PWT) provides about %35 labor income share level for Turkey. There is no clear explanation for how it is calculated; on the other hand %35 level is not acceptable for a developing country, especially if OECD level, %65 is considered low in comparison to 1980 period with about 75-80% labor income share levels in Europe.

Markup, labor income share, and elasticity of substitution is highly related and studied in various literatures. For Spain and U.S labor income share is found %63 and %57 respectively. Not surprisingly and as it is noted, markup is 27% and 39% respectively. Higher markup makes lower labor income share expectations (Raurich, Sala, Sorolla, 2011, 28).

For Turkey, Yılmaz (2015) found that high level of markup around 60% that implies forty percent of national income (GDP) is generated by market power and this case decrease competition, thus cause lower labor income share.

Though markup is outstandingly high in Turkish economy, labor income share, which is the main topic of this study, is increasing and income inequality is decreasing in the meanwhile. Despite the fact that income inequality is still far worse than Europe, it is getting better gradually in 1963 to 2013. However, there is no such trend in markup in Turkey. So, a trend in markup is also very significant in labor income share and income inequality as well. Evidently, there are cycles and fluctuations on markup as Yılmaz (2015) noted and explored for Turkish economy especially until 2002 then it is seen that there is an increase in markup between 2002 and 2011. In this period, Turkish economy has high levels of growth in comparison to 1990-2001. So that there is a contradiction between increasing markup while decreasing income inequality through 2002 to 2011. In this way, it can be assert that elasticity of substitution and capital deepening are more effective on labor income share and thereby effective on income inequality for Turkey.

4. 4 Growth, Capital and Income Inequality

Growth and inequality relationship is a popular debate for long. As Kuznets's popular theory claims classical economic theory consider growth can decline income inequality. Kuznets claims that growth decline inequality as an inverted U-shaped, means first growth is possible to increase inequality but in long run growth causes or enables inequality decline gradually. In this way, inequality is to be placed second priority behind the growth goals. However, as time passes, especially through the decline of labor income share in Europe, inequality begun to increase gradually.

There are various but not enough tool to measure income inequality, however, various tools such as, Palma ratio, Gini coefficient, and top income statistics all indicates that income inequality is increasing all around the world. In 2002, 0.1% top income holders take more than 6% of income in U.S while it was 2% in 1976 (Piketty, Atkinson, 2010, 270). Piketty and Atkinson (2010) illustrates that 0.1% top income holders take more than in compare to 1970 not only in U.S but also in Canada, Argentina, Spain, Italy, France, U.K, New Zealand, Australia, Portugal.

After French economist named Thomas Piketty gathered data of last two century and analyzed the relationship between the rate of return on capital and growth in his book *Capital in the Twenty-First Century* (2013), and caused a widespread dispute.

Mainly, Thomas Piketty asserts that, growth rate can be very low and exceptionally high sometimes, however rate of return to capital almost always stay higher than growth. In this way, wealth holders, in other words wealthy minority of society accumulate more wealth and as of this function, get higher level of income which means more income inequality.

According to Piketty (2013), the primary reason for the high level of concentration of wealth in traditional agrarian societies and other societies prior to World War I is low growth rates while having higher rate of return on capital. However the pioneer societies are exception of this case.

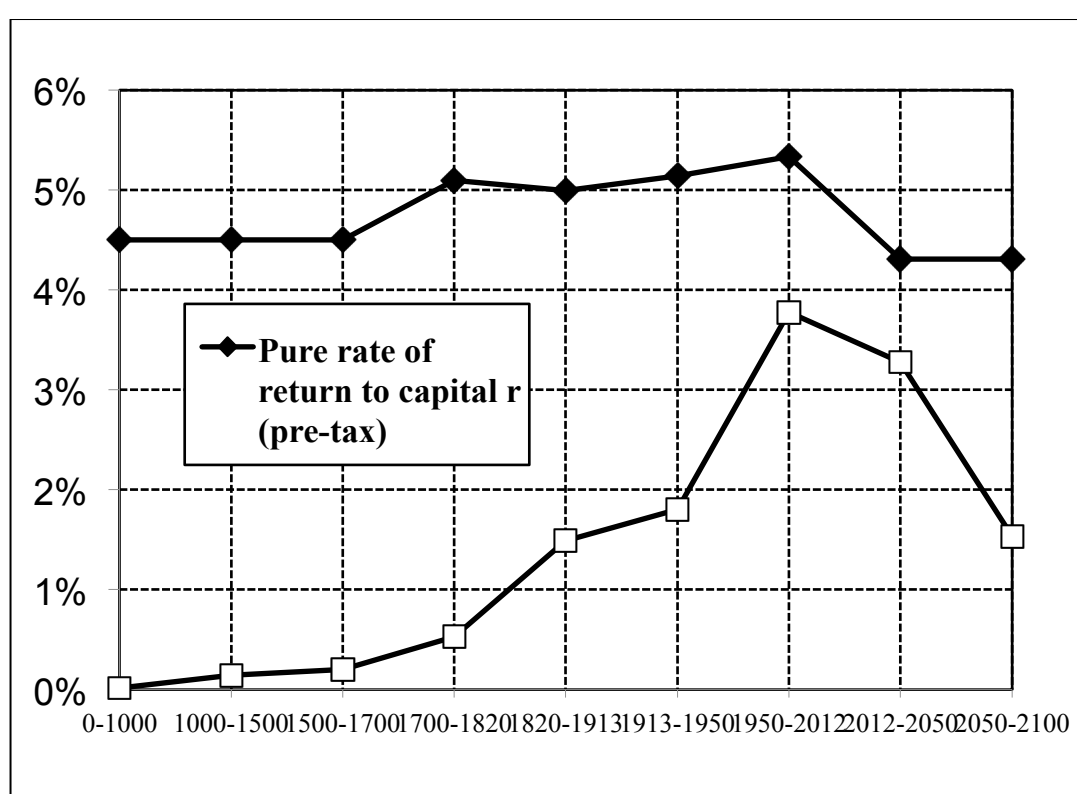


Figure 4. 1: Rate Of Return Vs. Growth Rate At The World Level, from Antiquity Until 2100

Source: Capital in the Twenty-First Century, 2013, 354.

This structural fact generates divergence between poor and rich. Piketty (2010) gives an example to support his assertion that a world with low growth rates such as 0.5-1% a year, and rate of return on capital exceeds with 4-5% a year, generates divergence theoretically, just like as it was in eighteenth and nineteenth centuries.

Piketty states that, if one saves more because of his or her fortune is large enough to live well while consuming, then his fortune is able to increase more rapid than economy. In this case, inequality will increase even if wealth people put no effort on labor (Piketty, 2013, 351).

To support this theory and perspective there are enough data through last two century. Between 1820 and 1910 the gap between $r > g$ in France was always positive. In 1820 almost 4% and 3% in 1910 (Piketty, 2013, 352).

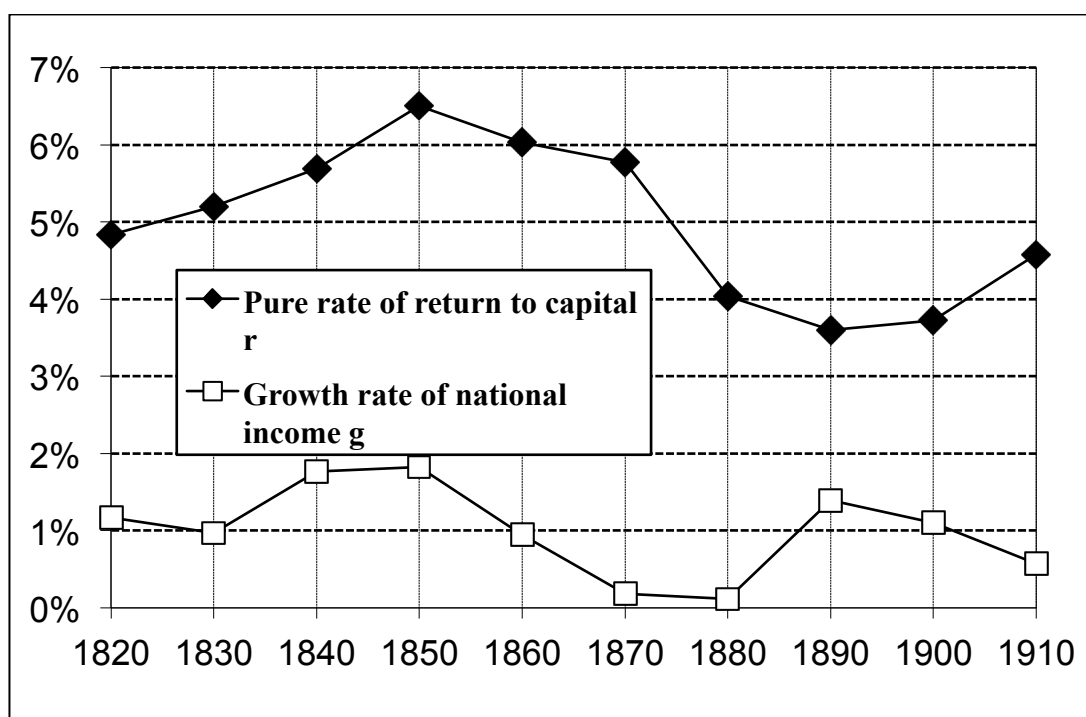


Figure 4. 2: Rate of Return to Capital and Growth: France 1820-1913

Source: Capital in the Twenty-First Century, 2013, 352.

The gap between rate of return capital and growth was always positive but reduced in twentieth century and widen in twenty-first century again (Piketty, 2013, 354). However, this gap shows that there is a minority who has higher income as a function of wealth or inheritance.

Piketty's theory and data seem plausible and the study supports his theory with evidence. However, it is not proven that $r > g$ case always creates income inequality. Here are various answers to Piketty's theory such as Mankiw (2014). As Mankiw illustrates, even the rate of return on capital exceeds growth rate, heirs will consume

some of the wealth they inherit. Theory and empirical studies says that about 3 percent of wealth is consumed as a plausible estimate. Thus, wealth accumulates at a rate of about $r-3$. Secondly, wealth is divided among a growing number of descendants. Mankiw assumes a classical family of two children, so wealth is divided in two every generation. Since generations are about 35 years apart, the number of descendants grows two percent a year. Therefore $r-2$ in addition to $r-3$ from the first case makes wealth $r-5$ grows, if r is greater than 5%. Mankiw adds that many governments impose taxes on both bequests and capital income about 2 percent. To sum up, wealth grows about $r-7$ per cent, so $r-7 > g$ must be hold to increase income inequality (Mankiw, 2014, 4).

Apart from political disputes, there is widespread idea that wealth inequality creates income inequality and income tax or fortune tax is a good way of recovery of income inequality. Thus, $r-g$ is a significant indicator of how income inequality moves in a certain time period.

5 THE CASE OF TURKEY

5.1 LIS and Capital Deepening

The case of Turkey is analyzed in this chapter with regard to Chapter 3. Due to the fact that elasticity of substitution is lower than one in Turkey (see Yılmaz (2015)), which is indeed the typical case, capital deepening, which has been continuing for decades, theoretically implies a secular increase in labor income share. Interestingly, the data indeed exhibits an increase in labor income share accompanied with a decline in Gini coefficient. Not surprisingly the change in both variables are parallel in 2002-2013.

Particularly, let us focus on the last decade of income distribution in Turkey with a comparison with the last six decades. It is seen that Gini declines gradually from 1963 to 2012. Although early studies especially before 1994, regarding income inequality have certain methodological defects those are noted in chapter one; increasing capital deepening, labor income share and declining income inequality are theoretically coherent.

Not only in last decade but through 1940 to 2010, Turkey had a capital deepening. Especially after mid 1960's there is an increase in capital deepening in Turkey. Capital to GDP ratio increased from less than 2 to over 3 (Altuğ, Filiztekin, Pamuk, 2008).

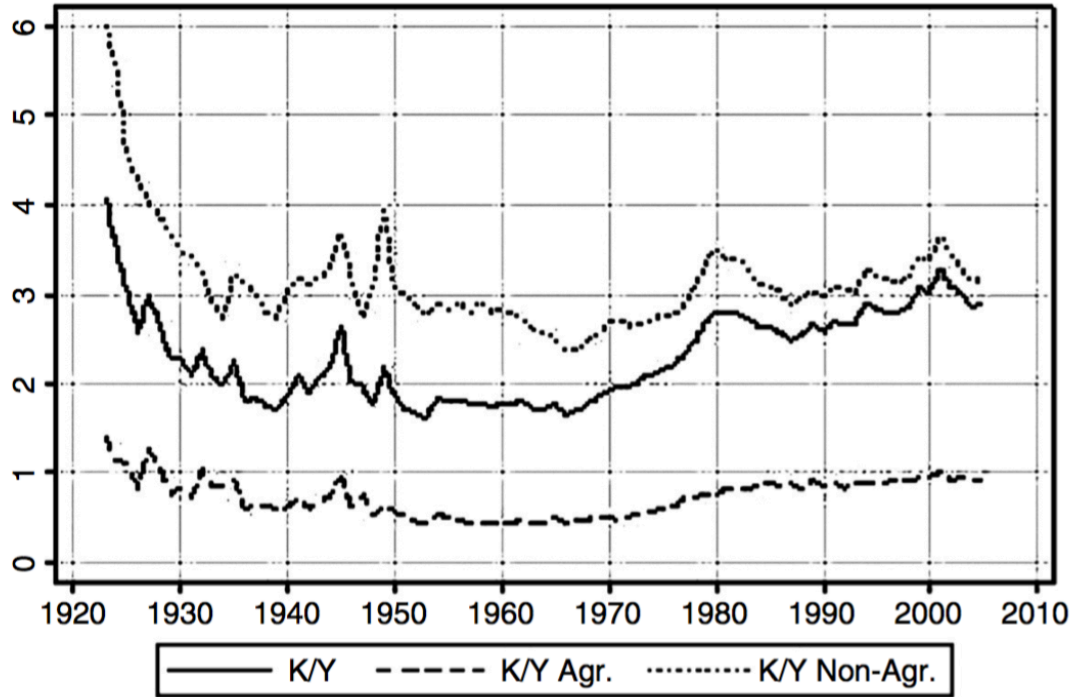


Figure 5. 1: Capital Deepening

Source: Pamuk, Filiztekin, Altuğ, 2008.

Not only in last decade but through 1940 to 2010, Turkey had a capital deepening. Especially after mid 1960's there is an increase in capital deepening in Turkey. Capital to GDP ratio increased from less than 2 to over 3 (Altuğ, Filiztekin, Pamuk, 2008).

In particular, the increase in non-agricultural sectors has a sharp increase in Capital/GDP ratio. This figure also supports that capital-deepening process is able to decrease income inequality through 1960 to 2000.

Though, capital deepening should increase labor income share when these two factors of production are complements, it is still low in comparison to Europe because of high price markup as Unveren and Sunal illustrated (2015).

Price markup is significantly high in Turkey. As Yılmaz (2015) notes, price markup is %60 in Turkey which means %40 of GDP generated by market power. Since markup directly affected labor income share, without markup labor income share would be as high as in Europe. This is another factor of high-income inequality in

Turkey. Therefore, capital deepening explains declining income inequality while the persistence of high inequality level can be explained by high price markup.

In contrast to most of European countries, elasticity of substitution between capital and labor is less than one in Turkey, capital deepening increased labor income share in 1994-2013 and affected income distribution apparently (Yılmaz, 2015,13). Increasing labor income share is one of the prominent variable in the distribution of income and functional income distribution in Turkish economy. However, price markup is still astoundingly high in Turkey and creates upward pressure on income inequality.

5.1.1 Labor Participation, LIS and Income Inequality

That labor participation rate is still low in Turkey seems as a plausible explanation for low LIS compared to those of Europe. Labor participation and unemployment are two sides of the coin regarding the issue of remarkably low LIS in Turkey. However, there are various aspects of low LIS. In this study, it can be concluded that high price markup is the main reason of low LIS (see chapter three). On the other hand as noted in the second chapter low labor participation rate and high unemployment rate repress LIS as well.

Since there are restricted data especially before 2002, and changing methodology of Turkish National Statistics Institute econometric models or estimations have some shortcomings. Due to incoherence of data of women participation rate before 2005, it is not included in the model; however, labor participation rate and female ratio in this rate is significant in LIS. As data accumulate there will be possibility of conducting more comprehensive research on income distribution or income inequality. On the other hand, this study focuses on LIS and capital deepening rather than labor participation. However, since labor force participation is an affective variable, it is noted in this part.

5.2 Piketty Case for the Turkish Economy

As is widely known, the theory of Thomas Piketty, in short, $r > g$ case is actual also in the Turkish economy. Despite $r > g$ case is actual; decreasing real return of capital is a positive variable for Turkish economy in terms of declining income inequality. It is

seen $r-g$ is rarely negative in 2001-2012 so, $r>g$ case is observed. But, income inequality is decreasing. Therefore Piketty's claim, namely that $r>g$ induces high income inequality, does not seem to play a role in the Turkish economy between 2001 and 2012 as it is seen below.

One explanation is that data is limited to conclude whether Piketty's rule holds or not for Turkish economy. In 'Capital in 21th Century' book, Thomas Piketty has studied long run data, which consist of almost data of the last two century. As far as we are concerned, there is not sufficient data to survey an econometric study in such a depth.

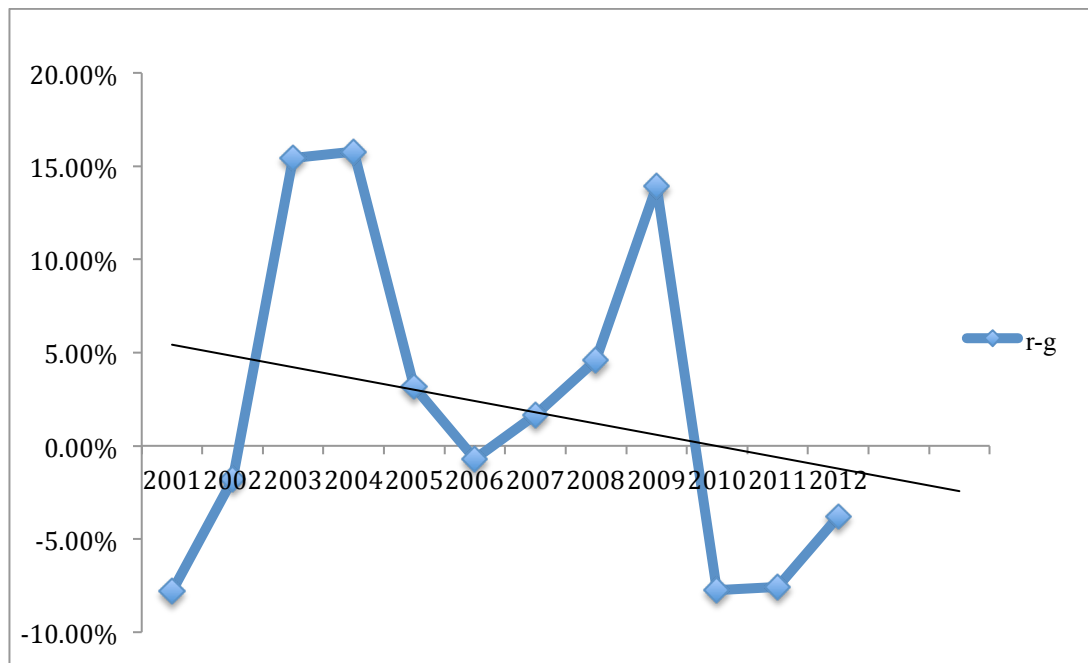


Figure 5. 2: Rate of Return on Capital, 2001-2012

Source: Derived From TUIK, 2015.

However, though $r>g$, rate of return on capital is decreasing in 1997 to 2013, there is a downward trend - albeit not a strong one- as can be seen in $r-g$ graph. Hence, despite being generally positive through 2001 to 2012, negative trend in $r-g$ graph is supportive for Piketty's theory that enables the decline in income inequality.

On the other hand, though Piketty's theory is prominent among social scientists, Mankiw's (2014) objection is possible to be right for Turkey. Nonetheless, decreasing real return on capital and growth rate relation is worth to remark.

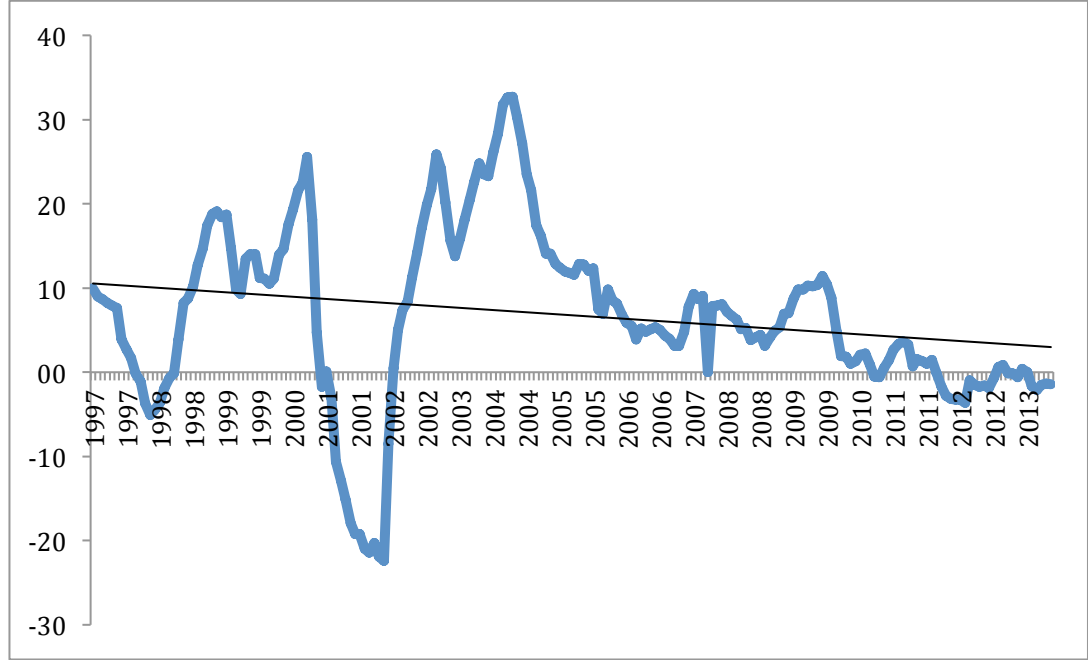


Figure 5. 3: Rate of Return on Capital

Source: TUIK, 2015.

5.3 Statistical Analysis on Income Inequality

Since the range of data is restricted, and this study follows theoretical approach and macro determinants more than empirical methodology, the statistical part is suggestive rather than conclusive.

Through previous discussions and data noted throughout this study, it seems there is relation between LIS and income inequality in Turkey. Therefore, firstly correlation between LIS and Gini is to be checked. Then let us also see the correlation between $r-g$ and Gini.

In addition to theoretical approach, correlation is added to see another statistical method to be suggestive. Correlation between Gini and LIS is equal to -0.70563 that shows strong negative relationship. Therefore correlation says that increasing LIS decrease Gini. T test seems also significant -3.05. The correlation between Gini and

r-g is equal to -0.013 and t test is 13.65. So that there seems no correlation between Gini and r-g. Also Gini, LIS, and r-g data are plotted below. In charts it seems Gini and LIS move negatively while r-g and Gini shows no noticeable relation.

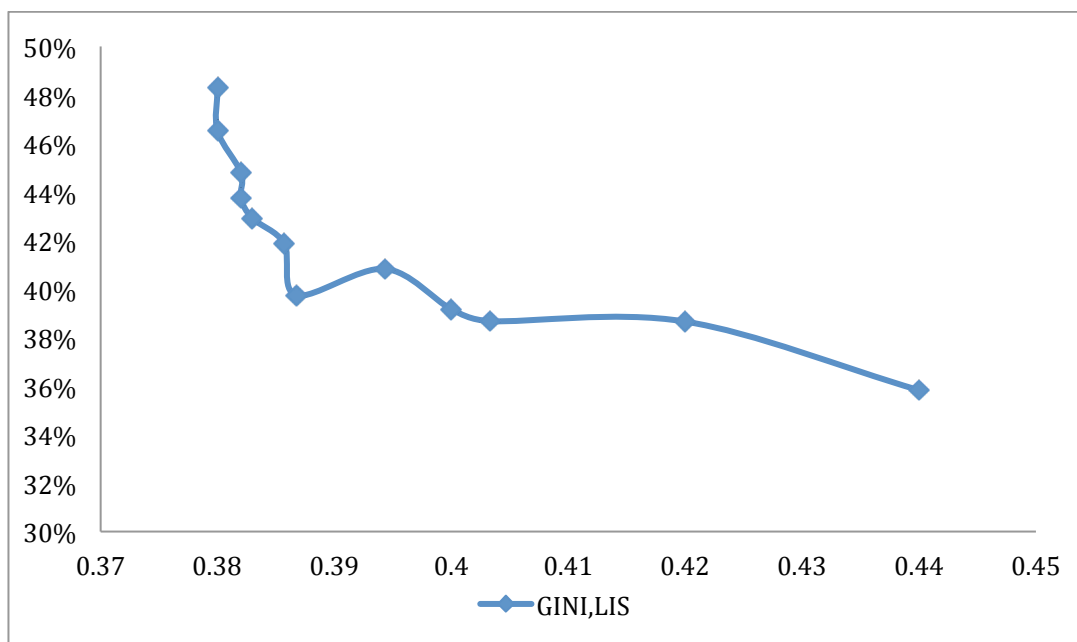


Figure 5. 4: Plot illustration of Gini Coefficient and LIS in 2002-2013

Source: Derived From TUIK, 2015.

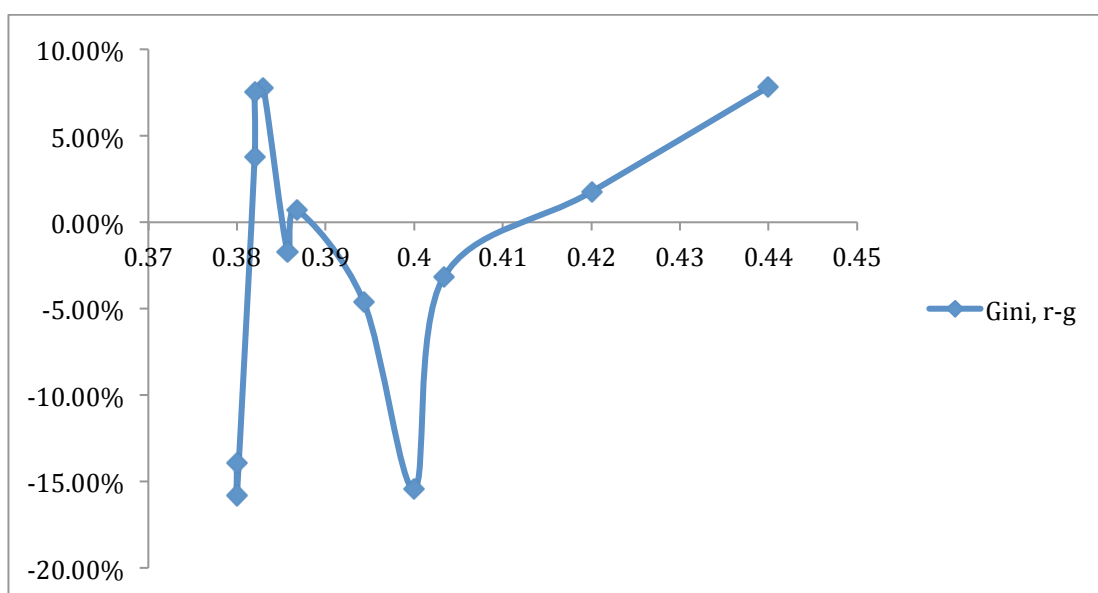


Figure 5. 1: Plot Illustration of Gini Coefficient and r-g in 2002-2013

Source: Derived From TUIK, 2015.

In addition, despite the fact that data is restricted, let us estimate a linear relation between Gini and 'r-g' and labor income share. Since 'r-g' is expected to affect income inequality with a time lag; one year is taken the time lag because of the short range of the data. This model is suggestive and helps to understand the relation of main independent variables as it is analyzed in this study theoretically.

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t-1} + \varepsilon \quad (13)$$

$$Gini_t = \beta_0 + \beta_1 LIS_t + \beta_2 (r-g)_{t-1} + \varepsilon \quad (14)$$

Table 5. 1: Regression Analyses, Gini, LIS, r-g

<i>Regression Statistics</i>	
Multiple R	0,6811021
R Square	0,4639001
Adjusted R Square	0,3298751
Standard Error	0,0103452
Observations	11

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0,000740881	0,00037	3,461296	0,082600535
Residual	8	0,000856189	0,000107		
Total	10	0,00159707			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0,5245739	0,050998859	10,28599	6,87E-06	0,40697028	0,6421774	0,40697028	0,6421774
LIS	-0,312037	0,118619087	-2,63058	0,030151	-0,58557317	-0,038501	-0,5855732	-0,038501
r-g	-0,065533	0,044810947	-1,46243	0,181766	-0,16886728	0,0378012	-0,1688673	0,0378012

Source: Calculated by the Author by Using TUIK, 2015 Data.

As this two variable model regressed in table 5.1, LIS explains %97-confidence level and significant, however, 'r-g' seems not significant.

Table 5. 2: Regression Analyses, Gini and r-g

<i>Regression Statistics</i>								
Multiple R	0,013296							
R Square	0,000177							
Adjusted F	-0,11091							
Standard F	0,01332							
Observatic	11							

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regressor	1	2,82352E-07	2,82E-07	0,001591	0,969049634
Residual	9	0,001596787	0,000177		
Total	10	0,00159707			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0,390702	0,0042731	91,43282	1,14E-14	0,381035197	0,400368	0,3810352	0,40036805
r-g	-0,00194	0,048579466	-0,03989	0,96905	-0,11183235	0,107956	-0,1118324	0,10795642

Source: Calculated by the Author by Using TUIK, 2015 Data.

In table 5.2, when model is changed and regressed with one variable, ‘r-g’ seems still insignificant and not able to explain the change in Gini.

Table 5. 3: Regression Analyses, LIS

<i>Regression Statistics</i>								
Multiple R	0,5661975							
R Square	0,3205796							
Adjusted F	0,2450885							
Standard F	0,0109802							
Observatic	11							

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regressor	1	0,000511988	0,000512	4,24659	0,069398711
Residual	9	0,001085082	0,000121		
Total	10	0,00159707			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0,4830264	0,044952434	10,74528	2E-06	0,381336937	0,584716	0,3813369	0,58471588
LIS	-0,218449	0,106006105	-2,06072	0,0694	-0,45825183	0,021353	-0,458252	0,0213531

Source: Calculated by the Author by Using TUIK, 2015 Data.

In Table 5.3 When LIS is single variable; LIS seems still explanatory at %94-confidence level.

Despite the fact that data is restricted, to survey a more reasonable test without statistical defects, correlation and regression analyses are conducted purely to be suggestive. As the theoretical analysis, empirical results are also supportive of that Gini and LIS are related in terms of declining income inequality in Turkey. Though there is no clear relation between r-g and Gini in long run and with wide range of data, r-g could be also explanatory.

6 CONCLUSION

In this study, income inequality and the dynamics behind are studied for Turkey. It is seen that income inequality declined through 1963 to 2013. In particular, since regular data gathered after 2002 by Turkish National Statistics Institute, some simple statistical tests are done to search the relationship and support theoretical part of the study.

In part two, main income inequality indicators, Gini coefficient, and Palma ratio are illustrated. A regular and long-term decline has seen in both indicators. Following graphs are to see the relationship between these indicators to other macro factors such as, income tax, labor force participation rate and particularly labor income share.

Documenting labor income share statistics, it is found that there is a noticeable increase in labor income share. Since there is a noticeable increase in labor income share, data related to labor income share are also illustrated in part two. OECD countries and Turkey are compared in terms of income inequality and related statistics. It is illustrated that income inequality is very high in Turkey relative to OECD and labor income share is noticeably low either. In part three, the relationship between elasticity of substitution, markup, capital deepening and labor income share are illustrated theoretically and how the increase in labor income share affects income inequality illustrated as well. In addition Piketty's famous theory regarding return on capital and growth is discoursed.

In last part, the case of Turkey is studied by combining part two and part three. Moreover, to be suggestive, restricted data are analyzed whether it is supportive of theory those are noted or not. In conclusion, LIS and income inequality in Turkey seems related and since elasticity of substitution between capital and labor is less than one, capital-deepening process has positive effect on income inequality in Turkey.

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