Università
Ca'Foscari
Venezia

Master's Degree programme – Second Cycle
(*D.M. 270/2004*)

In Business Administration

Final Thesis

Ca' Foscari
Dorsoduro 3246
30123 Venezia

Income Inequality

Causes and consequences

Supervisor
Ch. Prof. Michele Bernasconi

Graduand
Nicola Mattiello
Matriculation Number 832222

Academic Year
2015 / 2016

Abstract

Income inequality is a consequence of the economic activity. This essay will investigate the characteristics of income inequality, starting from its definition. It will be described the behavior of income inequality through the last century, how it is measured and the theories which have tried to explain this phenomena. After an analysis of its causes and consequences, it will be presented the result of a questionnaire about the perception of income distribution in Italy. The last part will present the final considerations about this topic.

Ai miei Genitori,

Che mi hanno sostenuto

E creduto in me, sempre.

Contents

Introduction

In 2016 the richest one percent of the world population will own more than the other 99 percent[1]. From the 2006 crisis, the inequality in the world has been growing, year after year faster. President of US, Barack Obama, declared that the income inequality is *"the defining challenge of our time"*[2]. Christine Lagarde, president of the IMF affirmed that "*Income inequality has become a problem for economic growth and development*" and that to reduce it *"is not just morally and politically correct, but it is good economics*" [2015]. Bernie Sanders, candidate of the 2016 democratic primaries in United States affirmed that wealth and income inequality is the great moral, economic and political issue of our time [2016], even exponent of the US republican party have admitted that the concentration of income is become a problem[3].

What is income inequality? What are the causes of the wealth concentration? Why the most powerful men and women in the world are worried about it? How much do we really know about income inequality? These are some of the questions that I will try to answer through this dissertation.

First of all it is necessary to correctly understand what does inequality means. It will be explained the differences between inequality of results and inequality of opportunities and how they affect our everyday life.

The focus will then be pointed on the methods used for measuring inequality. Even if the most used type of inequality is based on income, there is more than one type of inequality. It is necessary to distinguish the differences among these measures and to understand when is more useful to use one instead another. There will be a confrontation between the principal indices in order to precisely understand the meaning of each one. We will study the way in which these measures are taken, how the data are collected and how much precise they are. This is a very important

[1] *"Richest 1% now wealthier than the rest of the world, Oxfam says*", Bloomber Business, January 18,
[2] *Obama: Income inequality " the defining challenge of our time"*, CBS News, December 4, 2013
[3] "Republicans Are Finally Talking About Inequality", Jamelle Bouie, Slate, January 2015

point because all the following analysis will be based on the data resulted from these methods.

Then, it will be analyzed the behavior of inequality in the last decades. This analysis will improve our knowledge about the inequality between (and within) different countries and its evolution during the time. We will try to contextualize the changes of the level of inequality with historical events like wars or financial crisis. The world has changed a lot and most of the characteristics of the past are not possible to be reproduced now, nonetheless it is important to know the events and the choices that had lead to the present situation.

In the chapter 3 we will analyze the causes of inequality, and how did they evolve during the years. We will search for correlations between inequality and other factors as globalization, technology improvements and education among others. Faster transport and a more connected world have improved the quality of life of many, but presented even some problems. Production has been frequently moved in low income countries in order to reduce costs, but workers in rich countries had seen a reduction in their wages. Technology made life easier and production booming, but it had also reduced the number of workers needed. Higher education's levels permits to improve human capital and increased the salaries of the most skilled, but also increased inequalities and the growing costs for tertiary education makes it not affordable for the poorest.

In the subsequent chapter we will take into consideration the effects produced by an unsustainable level of inequality. As we will see in fact, inequality is a self perpetuating process. If today the level of inequality is high, it will be harder to reduce it in the future. Income inequality is transmitted among different generations and reduces the opportunities of poor people's children in a long term. Growing inequality does not only reduce opportunities, it is also directly connected with criminality and threats social cohesion. Inequality can be moreover an economic problem, it has been considered a factor that can reduce economic growth and, sometimes generate financial crisis.

Inequalities are growing and also the attention of economists toward this issue. It is possible to reduce the level of inequalities, but is necessary that the population is aware of the problem. Do people have knowledge of the concept of inequality? Do they have an idea on how income is distributed in their country? Is this distribution fair? These are the questions that I decided to ask to Italian people through a survey. I was inspired by the work of Michael Norton, a Harvard professor who conducted a survey on more than 5000 Americans in order to understand their opinion and estimation about wealth inequality in US. The same survey was proposed in other countries in the world, and I have decided to prepare a similar one for Italians. The number of respondents is lower than the one for Norton's survey, however the results are interesting.

I truly believe that a correctly educated population can produce important changes in the world. My hope is that this work will contribute to improve the knowledge toward this issue.

Chapter one: Inequality of opportunity and inequality of results

Inequality is a word that brings in mind something which is not fair, something bad. If we think about civil rights, inequality automatic acquires a bad image: we all want to be considered equal in front of the law; an unequal judgment based on factors such as sex or religious belief would not be tolerated in today society. Taking a more mathematical approach, inequality means just that two quantities are not equal; in this case inequality is just a fact without good or bad implications. When it comes to income inequality, giving a judgment is not so easy. In the economical context, inequality measures the difference between a percentage of population and the percentage of resources, for example income, owned or obtained by that population. When the difference between the percentage of population considered and the percentage of income at disposal increases, inequality increases.

Would it be good if everybody perceived the same salary? Probably the best answer we could get comes from history, more specifically from the history of socialism. Karl Marx thought that the capitalistic economic model would have produce tension between social classes, and that would have bring to a revolution. Socialism would have been the unavoidable result of this revolution. The new economic model would have lead to social, juridical and economic equality for all citizens.

It is very hard today to imagine a world, or even just a society, with perfect economic equality. Although some undeniable attractive characteristics it would bring also serious problems. Why to work harder if I will get no incentives to do it? Why work at all? For sure there will be people who would do it because of common sense or because they think that this is just fair, but it will happen also the opposite. There will be a widespread “free riding” effect: people living from the results of work of somebody else. Would it be fair that a person, who has the means to improve the society, do nothing and still gains the same as somebody who works hard? Of course it would not. Equality is not a synonymous of fairness, and a perfectly equal society, even if it would be possible, would be very difficult to

be maintained. Of course the opposite scenario would be even less desirable: one person who owns all the wealth of the world. It would be very unlikely that this extreme type of society would be accepted.

A certain degree of inequality therefore is unavoidable; as it contributes to a favorable environment for economic activity. Inequality is often explained as the natural consequence of the marginal productivity theory. This neoclassical economic theory was published in the end of 19th century by John Bates Clark. The foundation of this theory is the *"Production function"* which is the relation between inputs and outputs in a production process.

The formula is Q = f(M,L,K). Production function considers three factors in the production: M is for the materials used in order to create the product, K is the capital needed for make the production possible (for example equipment, technology, buildings…) and L which is the cost of labor force: the workers' wages. These three factors have a different impact in the entity of output produced. Technology can deeply affect the importance of these factors: for example a telecommunication company is more capital intensive than a mining company, so the "K" factor will impact more in the former company than the latter. The marginal productivity theory investigates the importance of each factor. Studying the change in resulting output from employing one more unit of a particular input, helps to explain the impact of that input in the production. As result, each factor of production would receive a return equal to its contribution to the output. The labor force will obtain a wage which reflects the impact of the work in the final product. If this reasoning is expanded from a company to an entire society, inequality is soon defined. A person receives a particular income, measured on the contribution of his work to the well-being of the society. This theory was widely accepted at the beginning, however more recently some critics have been moved against it. Mathematically, the marginal product is a derivative of the production function in respect of one input. One of the necessary conditions for accepting a partial derivates is that the variables must be mutually independent. For the production function most of the time this condition is not respected: the contribution of one factor influences the contribution of others. In the same way is

not possible to correctly measure the contribution to the well-being of the society of a single person without consider the influence of others. However according to this theory, inequality is a consequence of the economic activity and therefore its presence is unavoidable.

Inequality is, and will be, always present where an economic activity is performed, however the level of inequality can vary. So, is there a level of inequality that is acceptable for the society but at the same time does not harm economic growth? It is hard to tell. A good starting point is to clarify two different concepts: inequality of opportunities and inequality of results.

The economic outcomes of an individual depend basically from two factors: Inner factors like talent, commitment or cleverness and outside factors like social class, birth place and even gender. We have equality of opportunities when outside factors have no impact in the economic result. Success, or the absence of it, is to be imputed just on the actions of individuals. In the presence of equality of opportunities, outer factors cannot advantage or disadvantage anybody while inner factors, or the ones which can be influenced by individuals, are the only ones that can determine a person's economic life. This scenario is not just fair, is advantageous for the economy and for the entire society: a person that does not have the opportunity to express its potential is a form of inefficiency. If somebody is committed to study, pass the exams, get a degree and becomes a doctor, some of its high income is to refer to its capacities. If the achievements of an individual are the result of, for example, its family influence, the equality of opportunities is no longer present [Atkinson, 2015]. The loss in the economic output is even bigger if this advantage of opportunities is obtained at expenses of somebody who is more qualified. Perfect equality of opportunities is hardly achievable. The degree of opportunity inequality differs from country to country, usually in relation of their development degree and social stratification.

The World Bank estimates the equality of opportunities of a country with an index called HOI (Human Opportunities Index). As we said, circumstances should not influence the access to opportunities, at least the basic ones. World Bank identifies

as basic opportunities the access to clean water, education and medical immunization among many others [The World Bank, 2006]. Satisfy these basic needs can produce a tremendous effect in the economy. According to the "Global Partnership for Education" if all children in low income countries left school with basic reading skills, it will lead to an estimated 171 million people that will escape from poverty[4]. HOI however is not a measure of inequality; it can be better considered a development index which is also sensible to inequality of opportunities. Moreover, as the index is sensible to the most basic needs, it is not suitable to measure inequality in developed countries as most (if not all) of them are usually guaranteed. Inequality of opportunities in developed countries assumes different connotations. As the basic needs are satisfied, inequality of opportunities is influenced by other factors. Social position of the family, financial possibilities, safe environment and the access to a good education are determinant factors which advantage some individuals and damage others.

Society should try to reach and improve the level of equality of opportunities; it is a concept which is both fair and good for economics. A study conducted in US, which is widely believe to be a land of opportunities, found that 90% of interviewed believed that government should do everything it can to ensure equality of opportunity[5]. The article 3 of the Italian constitution affirms that "*it is the duty of the republic to remove all economic and social obstacles which prevent the full development of the human person and the effective participation of all workers in the economic and social policy of the country*". Most of the people and institutions agree that to "level the playing field" is a practice that should be pursued, the methods that have to be used in order to reach this goal are, however, not clear.

If everybody could start from the same point and the possibilities of success were based just on talent and commitment the world would be a more efficient place. As we seen equality of opportunities is very different from socialistic idea of economic equality. The starting point would be the same for everyone but the outcome

[4]Source: http://blogs.worldbank.org/opendata/data-minute-what-inequality-opportunity
[5] *"Equal opportunity, our national myth",* The New York Times*,* February 16, 2003

would be different, in order to reward who get the best results. Starting from the same point is fair, but it is not enough. What happens after, until the finish line is even more important.

With equality of opportunities, people have the same opportunities to be successful, but are rewarded in different measures accordingly to their results. Working harder is rewarded with a salary premium in respect with the one who is lazy. As we seen this is a good incentive mechanism, and is also sustained by the theory of the marginal productivity. Even if the equality of opportunities is respected it is not sure that who are the best will succeeds, somebody could make the wrong choices, or just be unlucky. The development of a society is also measured with the attention that it gives to the weakest group of person. If somebody has no abilities or does not gain enough to survive or to have a decent life, it is normal to expect that the society will take care of him/her. Moreover, a lot of people would affirm that help should be detached from the investigation of the reason of that situation. If the difficulties come from an unlucky situation or because some wrong choices is irrelevant from the need to be helped [Atkinson, 2015].

The inequality of results leads to another consequence. Even if a generation starts in an equality of opportunities scenario, and ends with an inevitable inequality of results, the next generation will be affected. It would be probable that the new generations will experience a society with more inequality of opportunities. Children of high income families will have access to a high quality education; they will benefit of a bigger financial support and in general of more opportunities than children from low income families. As we will see, families play a big role in the inequality measures; the “lottery of birth” influences deeply the opportunity a child can have. It is undeniable that a (even fair) inequality of results in one generation, will lead to some inequality of opportunities in the next one.

Measuring this effect is not easy, and is not even measured with just one method. The correlation between inequality of results and inequality of opportunities is often measured by an index called “Intergenerational earnings elasticity index”. It

gives as result the earning difference from the average income of one generation associated with the same difference measured in the previous generation [Corak, 2013]. To give an example, suppose a country with an intergenerational earnings elasticity index of 40%. It means that if an individual earns 10,000 euro more than the average income, 40% of that difference (4,000 euro) will pass to the individual's children average income. The children will have an income of four thousand euro more than the average. A lower elasticity means a society with more mobility [Corak, 2013]. If equality of opportunities is completely respected, just 20% of the poorest quintile of population will see its children remain in the same quintile, 80% of them, instead, would became richer and reach a higher quintile [Stiglitz, 2012].

There are some aspects that it is need to take into consideration. First of all, how much inequality do we want? There is no an ideal level of inequality, and for this reason it is difficult to implement measures for change the inequality of a country. Moreover it is hard to evaluate the costs and the advantages of reducing inequality. Maybe the level of concentration of wealth is too high, but the costs of reducing it would be disadvantageous for the economy and would not give the expected results.

To give an answer of these questions is necessary to understand the social and economical causes and consequences of inequality. It will be showed the correlation with others indicator and some possible solutions to distribute the wealth in a more efficient way. First of all, it is necessary to understand how the indexes are made, and what do they measure in order to correctly evaluate the situation.

Chapter Two: Inequality Measures

2.1 Inequalities

Arthur Kennickell, an economist of Federal Reserve wrote: *"Inequality may seem a simple term but it may mean different things depending on the point of view"* [Kennickell, 2009]. This quotation is referred to the various methods inequality measures can be based on. For example many economists affirm that wealth is more unevenly distributed than income, and consumption is less concentrated that both [Pew Research Center, 2015]. Consumption, wealth and income are, according to OECD guidelines, three dimensions of the economic well-being. There is a degree of inequality in the distribution of each of these dimensions. To correctly understand the inequality level of a country or a society, it is important to analyze all these parameters and be able to choose which one to use accordingly to the situation.

2.1.1 Consumption Inequality

As we said, consumption inequality is usually lower than income inequality. Some economists affirm that consumption is a better measure for economic well-being because it is indeed the primary reason to earn income and acquire wealth. However consumption can vary not only in accord with the quantity of money at disposition, but also for cultural reasons. Generally European countries have a higher consume aversion than US. Moreover consumption inequality is not as linked with income as we think it is. The example of United States is eloquent: while the richest 20% of US families earn 61.8 percent of all income, they account just for about 38 percent of total expenditure [Pew Research Center, 2015]. Consumption trends are more difficult to be understood than the ones about income or wealth inequality, for example consumption can remain at the same level even if the income of a particular sub group is shrinking. People can resort to savings, or incur into debts in order to maintain the same well being. Clearly these solutions are not sustainable in the long term and lead to mistake the evaluation of overall inequality. Probably the main reason of why inequality is not often

measured from differences of consumption is the quality of data. Data collection is based on surveys, which provide detailed information on quarterly basis (In United States) for consumption expenditure of a representative part of households [Krueger and Perri, 2005]. In the attempt of measure inequality, many analysts noticed a general under estimation in the level of consumption in the data provided by the Consumer Expenditure Survey (CES from now on, it is the only micro level data set used by researchers in United States) [Krueger and Perri, 2005] especially among the wealthy people. Rich people systematically understate how much they spend, which lead to an under evaluation of the real inequality level [Aguiar and Bils, 2011]. Notwithstanding, some studies affirm that the general income inequality growth of the last years is mirrored by a similar increase in the magnitude of consumption inequality [Aguiar and Bils, 2011]. Moreover studies about consumption inequality provide interesting behavior of the different social classes: rich, poor and middle class. It is not a surprise that poor people spend a higher share of their income in food in respect of the middle and rich class. Conversely rich households spend significantly more on retirement programs and insurance plans than others [Bunker, 2015]. Even if in the last years consumption inequality is increased like income inequality did, it is increased in a different way. The data from CES reveal that the rich class is now saving at a higher rate than the other classes, and in respect to how much they saved in the past. If the saving rate of the richest increases, also their wealth will increase. Accordingly with these results, it has been noticed an increase of wealth concentration. Notwithstanding the bias in the surveys, the variation of consumption measured in a long time horizon is consistent with the variation of the level of inequality in a society. Moreover, while the majority of inequality measures methods in OECD countries are based on income inequality, in most countries of Africa, West Asia and South Asia, statistics present the distribution of household expenditure [United Nation, 2012]. As result it is needed extreme caution when making an inequality comparison among countries and regions.

2.1.2 Wealth Inequality

While much of the comparative studies on inequalities that are currently published refer to income, wealth is a critical factor of economic well being; moreover, it reveals a far more unequal world than the one obtain from income and consumption studies. In fact the Gini index (an index that, as we will see, measures the level of inequality and goes from 0 in a perfect equality to 100 for perfect inequality) measured on wealth ranges from 55 to 80, and it is higher than the one based on income distribution in all countries analyzed [United Nations, 2013]. Wealth is another factor on which inequality can be measured. Wealth is defined as the sum of total assets minus liabilities. The definition of "Assets" includes everything from cash to houses or stocks investments, however it does not include other type of capital such human capital or collectively held assets. According to the OECD's definition of wealth, on these factors, while important for communities, is not possible to exercise the right of ownership, and for this reason are not considered for wealth inequality measurements. One characteristic that differences wealth from income and consumption is that it is self perpetuating. For example purchasing a house is an act made, of course with the primary goal of having a shelter, but most of the time also with the secondary objective of owning an asset that will gain value over time. A similar intent is expressed with the purchase of stocks in financial markets. The structure of wealth differs between a developed and a developing country: the former hold a greater share of wealth composed by financial assets, while for the latter the major part is constituted by real assets such as lands or real estates. How wealth is distributed is critical information for measuring the stability of economic system and the general well being of a society. Moreover wealth is a determining factor that mines inter-generational mobility and its concentration can mine equality of opportunities. Wealth is much more concentrated than income: a study conducted in 2015 by OECD highlighted that, considering developed countries; on average the 10% of the wealthiest people hold half of the total wealth of the country. At the same time the poorer 40% own little over 3% of total wealth [OECD, 2015]. United States represents the most extreme case as the bottom 40 percent of Americans own an

overall negative value of wealth, it means that they owe more than they own[6]. This scenario is critical because high level of indebtedness impacts in a bad way the possibility of lower class to undertake investments in human capital, like child education, and as consequence weakening potential growth and reducing social mobility. For the bottom part of population the wealth, most of the time, is represented only by property houses. Basing on an OECD study which investigates the period between 1970 and 2013, there is a strongly significant positive correlation between the median net wealth and the annual real growth rate of real estate's prices [OECD, 2015]. This result suggests that the appreciation of houses is a key factor for higher median wealth. The real estate's value is linked with market's price. Between 2006 and 2011, in United States, real estate lost on average more than a third of their value [Stiglitz, 2012], depriving many families of their main source of wealth, often paying a mortgage based on the nominal value of the property (which partially explains why the bottom 40% owe more than they own). From the other perspective, the richest one, the concentration of wealth offers the opportunity to live "on the fat of the land"; meaning that the wealth already accumulated provides enough money for living. As consequence, it creates a distortion in the economy: there is a considerable gap between private incomes from wealth and social returns. When a certain degree of wealth is owned, it is possible to gain without creating value for society. Both of these scenarios lead to an under exploitation of human capital, producing the effect of a reduction of economy's efficiency. Wealth based inequality returns a very unequal scenario, but it is also very informative. The reason why inequality is not measured from wealth data is because of the absence of an agreed standard of measuring it which changes from a country to another. Moreover recent period featured significant swings in asset prices, which deeply impact on net wealth values. In order to correct these problems, in 2013 OECD issued a series of guideline named *"OECD Guidelines for Micro-Statistics on Household Wealth"* that will permit to the various national statistical offices and independent organizations, to use a common definition of wealth. In this way will be possible to compare countries' wealth inequality from

[6] "*If you thought income inequality was bad, get a load of wealth inequality",* The Washington Post, May 21, 2015

data set obtained with the same procedure. The most recent collected data on wealth are all expressed in constant prices referring to 2005, in order to neutralize the changes on net wealth prices over time. Inequality based on income, as we will see, contains also the gains produced by wealth, which means that the income inequality takes in consideration, even if not directly, the wealth distribution.

2.1.3 Income Inequality

Even if, as we seen, consumption and wealth inequality provide meaningful result, they incur in some problems which are difficult to solve. Wealth calculation rules are being only recently commonly accepted, consumption on the short term may provide results which do not correctly represent the real situation of society. The majority of inequality measurements are therefore based on incomes. Data on income are collected during several decades and give an acceptable representation of the level of inequality present in a society. How "incomes" are defined? This is an important question because it can change the measure of inequality in a deep way. The adopted definition of income is: *"The sum of all revenues, in money and in nature, during a given period of time or, equivalently, the maximum quantity of resources a family is able to consume maintaining constant its assets"* [Atkinson, 2015]. This sentence presents some issues that need to be analyzed in order to perfectly understand what is and what is not considered part of income.

The first problem this definition brings is to define the period of time to use. Clearly the longer the time horizon used, the better will be the quality of data collected. Considering the total income a person gets during all his life give us information about the overall economic opportunities he or she got. At the same time it will be possible to study also the total wealth owned by a person. As result it will be compute even the assets which do not produce income but that could definitely be considered a source of wellbeing, for example a car. Using this time period provides important information about the quality of life a person can enjoy during his lifetime and also about the evolution of his income. However, if this period of time is selected, to have the correct entity of a person's lifetime income, it would be necessary to wait until the end of person's life, which limits the

effectiveness of this choice. It could be possible, in a determined moment, to forecast all the future earnings a particular person will get during his life. This method is particularly complex and the results will hardly be consistent with reality. The most feasible solution is to reduce the considered time horizon. The shorter period has however some limitation, for example it does not consider the savings a person could have. There could also be the possibility to overvalue the yearly income: if for example the individual considered sells its property house, his earnings will be overvalued even if it is clear that it is an extraordinary income and it will not happen every year. Consider a short period of time has the advantage to be easier to measure: yearly income data are widely available and provides more easily interpretable information. As result, yearly income data are considered the most useful time horizon for measure inequality.

The definition of income comprehends *"all revenues in money and in nature".* This sentence leads to a new evaluation issue. The narrow interpretation of revenues considers just the direct income after taxes: it is composed basically by wages or salaries, the income coming from financial assets like dividend from shares and extraordinary incomes like from selling an apartment. However many income inequality measures use income before accounting the impact of taxes and transfer payments like social security, which act to reduce inequality. To consider or not these factors lead to a different evaluation of a country's inequality level [Pew Research Center, 2015].

If revenues are considered as "extended income", they will be constituted also by public services for example healthcare and education. This component is difficult to calculate, but do not consider it can lead to an important error on measuring inequality. For these reasons, the most widely used method to calculate the income is the one that accounts just wages and other source of income after taxes and redistribution, which are the sum of money at disposal by the receiver.

In the second part of the definition, incomes are defined as the "*quantity of resources a family is able to consume maintaining constant its assets".* In this sentence it is described the "receiver" unit of incomes: the family. The fact that the

incomes obtained are measured not for the single person but for the entire family presents a relevant issue. Apparently, to consider families as the basic social unit instead the single person makes little sense. It is easier to measure the income obtained by an individual than the one obtained by more people. Moreover the number of people a family can be composed of can vary in a material way from case to case. It is also clear that the income gained by a family of two people and the same income obtained by a family of five people cannot result in an equivalent level of wellbeing. At the same time, to maintain a particular level of wellbeing, income and number of people in a family are related, but in a complicated way. If the number of people and the entity of incomes double, the level of wellbeing of the family can be the same, be better or be worse. It is true that some expenses, like food, will more or less double, but for others there are some fixed costs. An example is the expenses for heating the house: it can be assumed that they will stay constant even if the population in the house grows. Another problem is how to define a family's "borders". Parents and children is the most obvious way a family is composed, but when a person can be considered part of a family or part of a different one? When a child grow up and starts to gain an income can be considered as part of a new family? Is it necessary that he or she reaches the economic independence? Or that lives in a different house? What if he or she lives in a house different from the one of the parents, but his/her income depends from the parents transfers? According to OECD, the basic social unit considered can be a single person*: "A person who lives alone in a separate housing unit"* or a family, defined as follows: "*A group of two or more people who occupy the whole part of a housing unit and share resources to cover living expenses"* [OECD, 2015]. Using this definition, the main factors which identify a family are between how many people the income is shared and how many individuals live in the same house unit. There are no limits of the number of people, or to the number of generations a family can be composed of, as long as every person lives in the same household and share the incomes. This type of family is called "Extended family", and it is considered as a single social unit in the calculation of inequality. Persons who live in health care institutions, military barracks etc. cannot be included in a family even if they are sustained by somebody else income, because they live in a different house unit

[OECD, 2015]. Using this methodology of measurement, household sizes among OECD countries vary in a substantial way. The range of average household sizes in the OECD area goes from 2.0 people per household in Germany to almost 4 in Mexico [OECD, 2015]. Unfortunately detailed data about the size of families are difficult to collect, and just few countries have detailed information about the composition of the household [Cowell, 2009]. Usually these data are obtained from voluntary surveys, and are sensible to evaluation errors and wrong estimations. When it comes to measure income inequality, the income of the household is attributed to each of its members, with an adjustment to reflect differences in needs for households of different sizes [OECD, 2016]; this procedure is known as "equivalizing" the incomes. The adjustments consist in giving a different weight for every component of the family, accordingly to his/her age and the relation with other individuals of the household [Cowell, 2009]. Unfortunately no adjustments are made in order to account the higher than average need of money of sick or handicapped people. The geographical area is another important factor that can increase or reduce the entity of income need in order to obtain the same well being. Even inside the same country, the differences may be relevant. Usually cost of life in rural areas is less than the one in urban ones. The costs of an apartment or of the restaurant are completely different even between different cities in the same country. Moreover climate and the associated costs can vary in a considerable way between different geographical points. For example, people who live in Paris will have to sustain more expenses for heating and clothes than the people living in a hotter French city like Marseille. Unfortunately usually these differences are not considered in national income inequality measurements because of the difficulties related to equalize these different costs of life.

As we seen, all the three ways used to measure inequality (Consumption, wealth and income) provide important and interesting information. Each one of these methods present pros and cons, inequality measured on income however is the most used one and also the most reliable because it has been used for a longer period than the others. In 2014 researchers developed a combined dataset that will use a harmonized data set and will help to understand the connection between

consumption, income and wealth [Bunker, 2015]. The results of this new approach are not yet available, but they could help future policy makers and economists in better understand inequality. When we will make statements about inequality in this essay they will be referred, if no differently specified, on the income measurement of inequality.

2.2 Functional Income Distribution

It exist a different measure of income: the functional income distribution (FID from now on). It is not based on the distribution of household's income but it examines the allocation of the main factors of production: labor and capital. It measures the shares of national income covered by wages and salaries on one hand, and profit, interests and rents on the other hand. The measure is useful in order to highlights the composition of income earned by households, and not just its entity like the personal distribution of income. FID assumes different values accordingly to the developing stage of the economy on which it is used. In developed countries wage earners covers 80 per cent or more of the active population. In developing countries the vast majority of population income comes from self-employed activity with low productivity and low added value. It is symptomatic of an economy based on agriculture or retail commerce [UNDP, 2012]. For countries where economy is based on revenues from extractive industries, the operating surplus is very high, the economy is capital intensive and the share of wages is therefore lower than the one recorded on economies with a stronger tertiary sector.

FID showed its usefulness in the years preceding the recent financial crisis: the economy was growing worldwide but wages were stagnating and their share on global income was therefore decreasing [Francese and Mulas-Granados, 2015]. The available data showed that in Germany and United States the declining labor income shares are associated with growing inequality and the increasing of concentration of incomes [Francese and Mulas-Granados, 2015]. Experience has shown that it is very difficult to reduce inequality if no analyses are made on how incomes are generated. According to several economists, Atkinson among all, there

are multiple reasons to consider FID as an important measure for inequality: for example it helps to link the social justice concerns with the fairness of different returns to different sources of income [UNDP, 2014]. The fact that yields produced by wealth are rising faster than the raise of the wages forecasts a more unequal future. More attention should be give to the analysis of the factors which affect FID and the relations between this tool and the more traditional income distribution [UNDP, 2014]. To conclude FID is a valid instrument for a more complete analysis of inequality.

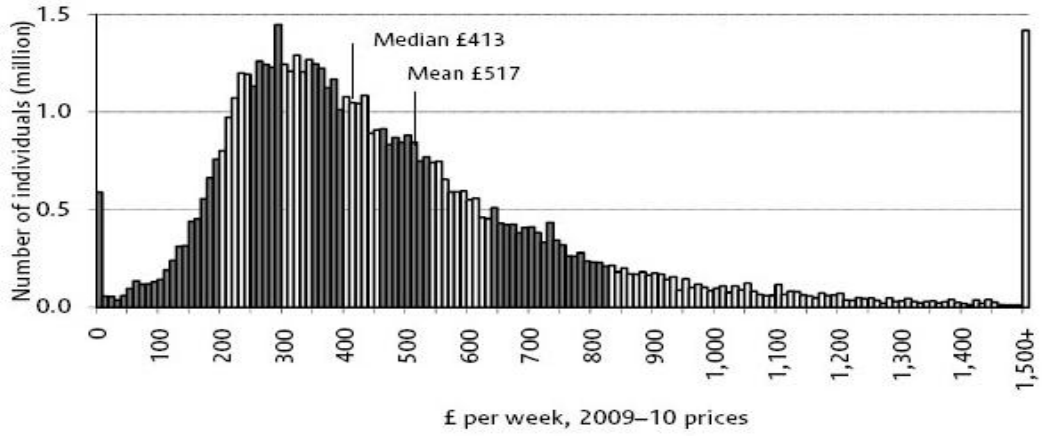
2.3 Diagrams

Inequality can be measured in different ways. Through diagrams it is possible to have a graphical interpretation of the distribution of incomes. This technique offers a more intuitive comprehension of the level of inequality, but it has the weakness of being hard to be compared with other distributions. Subsequently we will take in examination three of them.

2.3.1 Frequency distribution

Frequency of distribution is one of the most used representation tools by statisticians. The diagram is usually a histogram; it shows the number of people that get a particular value of income. X-axis represents each ranges of income, from the lowest to the highest; Y-axis measures the number of people which get the particular range of income: the higher the number of individuals that get a distinct income, the higher the respective bar.

Graph 1: Frequency distribution of income in UK (2009-10) Source: Institute for fiscal studies



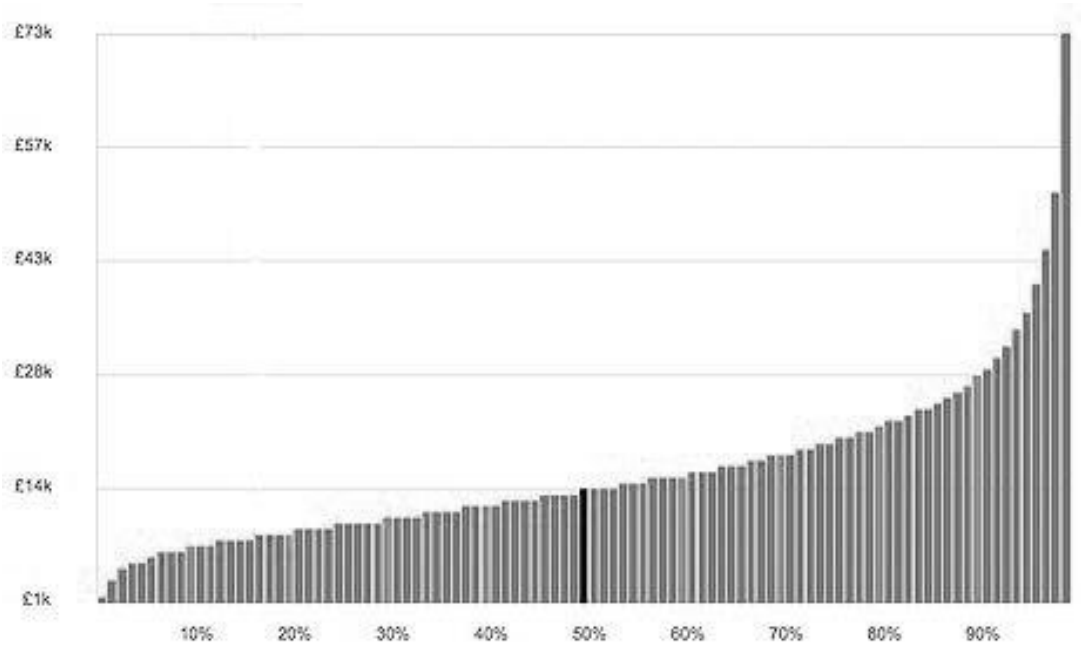
As we can notice from the precedent diagram, frequency distribution provides an easy comprehensible interpretation of income distribution. The median income can be calculated summing each bar until the half of the considered population is reached. One problem of this method is that, in the case of income distribution, it becomes difficult to read the upper tail of income. The X-axis is clearly reduced, as the maximum value represents a range that goes from 1500 pound to infinite. As we can see, the number of people present in this range is nearly one million and half, which made the respective bar the second one more populated in the graph. From this diagram is not possible to understand how the income is divided in the population which gets more than 1500 pounds per week. In order to correctly represent this part of population, the graph should be long some meters, and the bars on the upper tail would be so short that would be very hard to be interpreted [Cowell, 2009].

2.3.2 Pen's Parade

This diagram, also called "*Parade of Dwarfs and few Giants*", is one of the most attractive visual aids in the subject of income distribution [Cowell, 2009]. The curious name is explained by the creator himself, Jan Pen, as follows: *"Suppose that every person in the economy walks by, as if in a parade. Imagine that the parade takes exactly an hour to pass, and that the marchers are arranged in order of income,*

with the lowest incomes at the front and the highest at the back. Imagine also that the heights of people are proportional to how much income they get.[7]" The people which have little income (the dwarfs) in one hour will complete a much shorter distance than the richest person (one of the few giants). If when the parade is stopped we look at the position of every person in the economy from above, the image that we will see would be similar to the subsequent diagram.

Graph 2: Pen's parade diagram. Income distribution in UK in 2012. Source: Institute for fiscal studies



This diagram is as easy to understand as the frequency distribution, but has also other advantages. Differently from the frequency distribution, Pen's parade diagram places the population on the X- axis, and divides it in percentile. This technique permits to produce a representation of each percentile of population and as result makes extremely easy to find the median income. In the image above, the darkest bar represents the 50th percentile. Moreover highlights the presence of extremely high income which was one of the information difficult to get from the frequency distribution diagram. To obtain the mean income it is sufficient to divide total income of the economy for the number of people considered. The diagram exclude the presence of people with negative income, in this case there would be present, on the left side of the graph, some bars beneath the base line (to maintain

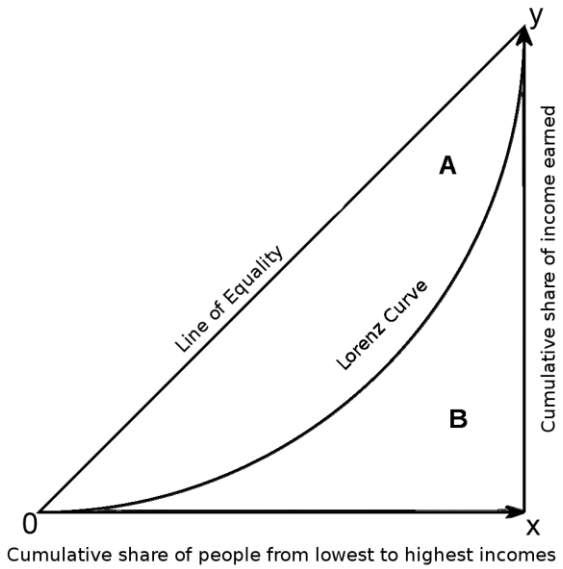
[7] "*The Height of inequality*" The Atlantic, September 2006

the image presented by Jan Pen, these people would have walked backward, and their height would be proportional to the entity of their debt).

2.3.3 Lorenz Curve

The Lorenz curve was introduced in 1905; it gives a graphic representation of the distribution of income [Cowell, 2009]. On the X-axis it is represented the population, ordered from the individual who receives less income on the left, to the individual who receives the highest income, on the right. Y-axis measures the income. The highest point is the total of the income perceived by the population considered. Lorenz curve plots the cumulative share of the total income and compares it with the cumulative proportion of households. Lorenz curve considers the minimum level of income a person can receive as equal to zero. If the Lorenz curve was a measure of net worth would start from a point below zero, as some people may have a negative net worth, due to debts for example.

Graph 3: Lorenz Curve



The 45 degree line represents the perfect equality situation. Each individual earn the same percentage of the total income. The curved line is the Lorenz curve; it cannot rise above the line of perfect equality. Moreover it is always convex toward the point x. If the Lorenz curve would pass through the points 0 – x – y it would show the extreme case of the perfect inequality scenario, where just one person

owns all the incomes of considered population. The point which shows the mean income of the distribution is the one in which the slope of Lorenz curve is parallel to the line of equality O-y.

An issue of the Lorenz curve, as well as the others diagram representation methods, is that it is difficult to compare two different distributions. If, for example, two Lorenz curves have to be compared, it is possible to state that a distribution is more equal than the other one only if the two lines do not intersect each other.

2.4 Indexes

Measure inequality is a useful, but not easy task. Calculate the level of inequality of a region, a country or even for the whole world, provides important information in order to evaluate the effectiveness of political economy decisions. An index should permits to compare the situation of a country in different periods of time, but also should offer the possibility to compare inequality between different countries and between different regions. The attention will be focused in the most important axioms an index should respect to correctly evaluate inequality and be as useful as possible. We will then present some of the most important and used index and we will analyze how the data are collected.

We will not analyze all the inequality indexes here. There is a multitude of indexes but just a few are widely used and therefore explained in this essay.

According to several studies, an inequality index should respect the subsequent axioms [Litchfield, 1999]:

The Pigou-Dalton Transfer Principle: if a quantity of wealth is transferred from an individual with income above the median to an individual that gets an income beneath the median, (as long as that transfer does not reverse the ranking of them) inequality decreases. If the number of people which get an income that is closer to the median one increase, tails in the distribution get shorter and therefore inequality is reduced.

Income Scale Independence: If the income of all the population increases by the same proportion, the inequality level does not change. For example if the income of each individual doubled, it does not affect the value of inequality. The ratio between an income and the median one does not change if each of them is multiplied or divided for the same value, inequality therefore stay constant.

Population Principle: If the population is replicated, the inequality level does not change. For example if the number of people at each income level is changed by the exact same proportion, there are no effect on the resulted measure of the index.

Decomposability: Inequality can be measured basing on different populations. In any case, the decomposability axiom requires a consistent relation between overall inequality and its parts. If inequality is seen to rise amongst each sub group of the population then it is expectable the overall inequality to rise too. Decomposability is a desirable characteristic in a index because policy analysts and economists may want to further investigate the contribution of different sub groups to the overall inequality, in order to develop more targeted policies.

2.4.1 Gini Coefficient

The Gini-coefficient is the most used for measure the inequality among a population. It was presented by the Italian statistician Corrado Gini in 1912 and it is still a valid index. Actually is the most used measurement method by the World Bank in order to calculate the inequality level. The value of the index goes from 0 to 1 (it is also possible to have data which presents the Gini coefficient in percentage, from 0% to 100%). A value equal to 0 is consequent of a perfect equality among the population analyzed: each person obtains the same income, or owns the same wealth (if inequality is measured on wealth). If the index is equal to 1, the inequality is at his maximum. The total income produced by a society is obtained by one person, conversely the whole wealth is at disposal of just one member of the population, and other people own nothing at all.

The Gini coefficient is a standard measure of the level of inequality in a society. One of the best characteristics of Gini Index is its simple graphical representation. The

index represents twice the area between the Lorenz curve and the line of equality (two times the area marked with "A" in the diagram of the Lorenz curve). The more the Lorenz curve approaches to the line of the equality, the more the Gini index approaches to the limit value of 0. Supposing just positive incomes, Gini index ranges from 0 to 1, or from perfect equality to perfect inequality.

The Gini coefficient is equal to one minus two times the integer of the Lorenz's curve (which is the area of B in the previous image). There are different formulas for calculate the Gini coefficient, the one based on Lorenz curve is an integer:

$$G = 1 - 2 \int_0^1 L(X)dX$$

One disadvantage of the Gini Index is that it measures just the value of twice the area between the Lorenz curve and the line of equality, but it does not distinguish how this area is distributed. If for example we take into consideration two different scenarios: both are composed by four individual and their income are: {1,3,3,3} and {2,2,2,4}. The resultant Gini coefficient for the two cases is the same but the distribution is quite different. To evaluate if one is to be considered more equal is not an easy task, it depends on how inequality is interpreted. It is often define that the "*distribution in which the poor have the larger part of the revenues is declared as more egalitarian"* [Mesnard, 1999]. According to this definition the second scenario results more equal than the first one although both have the same Gini value. The two societies take as example underline the fact that there could be relevant differences between different societies even if they scored the same Gini measure.

One issue of the Gini coefficient is that it is not easily decomposed. To better understand this problem it is useful to use an example. The society is composed by two groups; one group is more privileged than the other one. An interesting field of study is to evaluate how much of the inequality present in the society is due to differences between these two groups, and how much inequality is attributable to differences within them. A real situation in which this problem is showed is when global inequality is measured. Decomposability is necessary in order to discover if

the global inequality results mainly by differences between nations or differences within them. The decomposability axiom is not fully respected by the Gini coefficient[8]; in fact, it is only decomposable if the partitions are non-overlapping. In other words, to decompose the Gini it is necessary that the sub groups that are wanted to be obtained do not overlap in the vector of incomes [Litchfield, 1999].

Another problem presented by the Gini is that it tends to slowly react when there is a high concentration on top incomes. If there is a material change in the upper tail of distribution, the resulted Gini coefficient may not vary in a sensible way. The same problem is observed with changes in the lower part of the distribution. The estimation of Lorenz curve is based on the data collected from surveys. As we will see, the data collected in order to measure inequality are not immunized from errors, which can affect the precision of the coefficient. Some methods for correcting contaminated data have been developed recently, but their effectiveness is limited [Heshmati, 2004]. How the surveys are conducted, and to which errors they suffer from will be better explained later, for the moment it is sufficient to say that Gini index is sensible of under-coverage problems of top incomes, which can lead to an undervaluation of inequality level. It is worth to say that every index has some negative characteristics, we do not have to forget that Gini, like others indexes, reduces complex and structured data in just one value: some limitation are therefore unavoidable.

2.4.2 Atkinson Index

Atkinson index is a measure of income inequality. The name of the index comes from its creator: Anthony Barnes Atkinson. This index is one of the most popular welfare-based measures of inequality and shows some interesting characteristics.

As the Gini coefficient is based on Lorenz curve, Atkinson index is based on the social welfare function. Atkinson index provides a method of converting welfare function into inequality measures. Atkinson in fact established a link between changes in inequality and changes in social welfare with his index.

[8] "*Why are we still using the Gini?"* Frances Woolley, Worthwhile Canadian Initiative, September 2011

One peculiarity of this index is that it can be adjusted varying the society's attitude towards inequality. Atkinson observed significant discrepancies between countries about the level of objective inequality. Atkinson suggested that differing social norms may influence the policies implemented in order to manage inequality, therefore he introduced a parameter for taking into account the degree of socially acceptable inequality in each place [Lampert, 2000]. This parameter is called "inequality aversion" and it is represented by the letter "ε". If ε is equal to 0, society is not interested in the redistribution of income, in this case the higher the mean income, the higher the social welfare. On the contrary when ε tends to infinite, it is assumed that an infinite social utility is gained by a complete redistribution of incomes. As ε reflects a value judgment, its change leads to a different result of the index.

The Atkinson index can vary, as the Gini coefficient, between 0 and 1. If the index for a particular society scores, say 0.4, it can be interpreted that the population will accept to lose 40% of total income in order to obtain a more equal distribution. In other words it is possible to obtain the same social utility with 60% of total income.

One of the best aspects of the Atkinson index is that it can be decomposed in order to analyze how different sub groups affect the overall level of inequality in a society, which is possible only with important limitation for the Gini coefficient.

2.5 Ratios

The ratios are a more immediate way to represent inequality, are easy to compute and to understand but conversely they provide less information.

2.5.1 Range Ratio

Usually range ratio compares the highest and lowest tails of the income distribution. For example the federal range ratio considers the highest and the lowest five percentiles, UN prefers to compare the highest and the lowest quintile

(it is also called 20/20 ratio). The 20/20 ratio is considered as a good index for measuring human development and social cohesion. The problem with range ratio is clear: it takes into consideration just the lowest and the highest percentiles and does not count the others. It can be accepted when inequality has to be analyzed for a small society, but it is unsuitable for larger, like for a country. For this reason no information is given about the distribution of income within the middle class, as result the effective inequality can be very different than the one measured by the range ratio.

2.5.2 Palma Ratio

Palma ratio is the percentage of total income obtained by the richest 10% of population divided by the share of income obtained by the poorest 40%. For example a society which scores a Palma ratio= 3 means that the top 10% get three times of the income than the poorest 40%. The reason behind the focus on this two, opposite subgroups of income is simple. Gabriel Palma himself, the inventor of this ratio, discovered that households between the fifth and the ninth decile of income distribution have a relative stable share of total income. This "middle" 50% of people obtain a more stable level of income in comparison with the others tails of distribution [Cobham, 2013]. This observation holds if countries are compared each other, and even when the same country is compared in periods of time. Palma ratio therefore does not take into consideration the whole distribution of income, but just the most variable and most informative half. Gini index suffers of insensitivity in changes at the top and the bottom of the society, for this reason the Palma ratio can give some new information. Nobel Prize Joseph E. Stiglitz proposed a new goal for the UN Millennium goals which is to reduce extreme inequality getting all nations a Palma ratio of one [Stiglitz, 2014]. This means that the top 10% income earners get the same income of the bottom 40% of population.

2.6 Data collection

Data about income are collected in different ways, each one is subjected to some problem and its precision and methodology can vary across different countries. The data can be collected by national statistics offices like ISTAT in Italy or NSO in

United States or from other entities like the Luxembourg Income Study. Aggregated data gives information about the distribution of income in various countries and regions, in addition the dataset informs also on income shares by quintile, decile or percentile. From these data sets it is possible to calculate the level of inequality, for example using the Gini index. Income data are gathering basically from surveys, official records and tax returns.

2.6.1 Surveys

One of the most widely way to collect data are through a survey about the household income. This approach is mostly used by organizations that are willing to collect raw information on their own. In order to correctly collect the data it is necessary to survey a stratified and representative part of a society or of a country's population. Through the survey, people are interrogated about their income, wealth, assets, consumption habits, composition of the family, number of people living in the same household and more. However these kinds of data are not always reliable. It is not infrequent, for example that some individuals affirm to get a different income than the real one. Especially when the survey is addressed to wealthy people, it happened that they tend to underestimate the real entity of their income. This happens probably because of fiscal reasons or because they are not comfortable to disclosure how much they earn [Atkinson, 2015]. The problem is that those imprecise declarations cause a distortion of the measure of inequality. During an IMF study, it was observed a variation of the Gini index of 1.3 percentage points, while given the evolution of top incomes; the Gini should have increased by at least 2.3 percentage points[Jaumotte and Buitron, 2015]. Problems can arise also from how the survey is designed: in the 90s, to measure poverty rates in India, statisticians ask to population the entity of their consumption in the last thirty days. There were some statisticians that disagreed with this model, and decided to measure the consumption only asking the expenses of the last week. The difference was huge, and cut the poverty rate of India by half. 175 million people were not considered poor anymore even if their situation did not change [Deaton, 2013], just as consequence of a survey structured in a different way. Moreover, as we previously seen, surveys are addressed to households, a group of

people who live in the same house. This method does not take into consideration people who depend from the family, but live in a different place like college students, elders in retirement homes and patients in hospitals and more. This fact is important because it is likely that lead to an imprecise estimation of the distribution of incomes especially among the poorest people [Atkinson, 2015]. However, a clear advantage of this method is that if a person volunteers to be interrogated, it is assumed that he is more willing to say the truth than in the case of a compulsory method. Therefore it is probable that errors in declaration are the consequence of imprecise information at disposal of the interviewed [Cowell, 2009].

2.6.2 Tax return

It does not matter if a person is rich or poor; every person who gets an income is submitted to pay taxes. The main advantage of using individual income tax return for measuring the income is that they are widely used and people have to affirm the true (or run the risk of getting pursued). Useful information on income and wealth is often obtained from the analysis of these types of documents. The confrontation among different countries on this data presents however some issues. For example in the United Kingdom the data on incomes came from the employers which tend to declare the working hours of their employees based on the contract and not on the effective working hours. In France, tax returns from farmers and part time workers are not counted in the statistics [Atkinson, 2015]. Moreover the impact and the share of people who commit tax evasion change between countries, as result the accuracy of tax return method can suffer. An OECD study on 38 countries between 1999 and 2010 revealed that, on average, the size of shadow economic activities represented a 6% of GDP [Buehn and Schneider, 2012]. In Turkey, Bulgaria and Romania the shadow economy represent more than 9% of GDP, which limits the reliability of tax return documents. Furthermore often this method inaccurately represents the poorest part of population, since in some fiscal policies; people which own wealth and get an income below a certain entity may be exempted to draft the tax return [Cowell, 2009]. To conclude, surveys are a more flexible instrument, and can be adapted to collect data on particular

frameworks, tax returns are standard and may not consider some information that may be informative for investigate inequality. The advantages of this method are, of course, a huge amount of data. As everybody has to pay taxes, when their tax return becomes available, the analysis can be done on the overall population, not only on a representative part. Tax returns provide a representation of inequality less sensible to the distortions caused by under representation of some parts of population characteristic in surveys reports. As we seen tax return's reliability is limited by other factors, as result surveys represent the most used method of data collecting for measuring inequality.

Chapter Three: History of Inequality

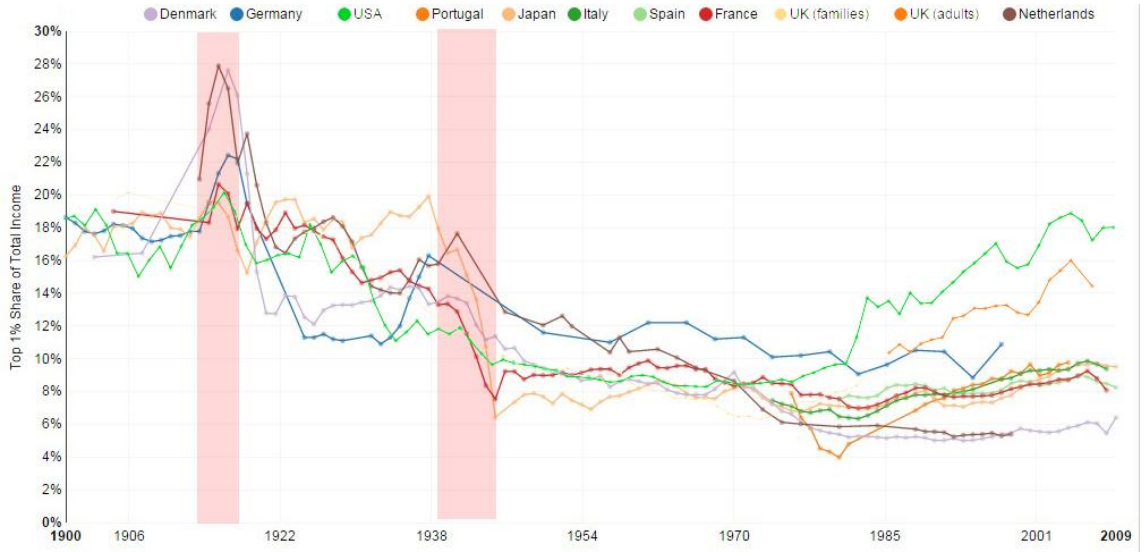
In order to correctly understand the behavior of inequality it is useful to analyze its evolution along time and space. The study of inequality is a relatively new field and the quality of the data is strictly related with developments in the technological and statistical fields. Notwithstanding, inequality is not a new phenomena and even without the modern measurements methods, many people (mainly but not only economists) wrote about it. The nature and the causes of inequality assume different explanations in relation to different historical moments. Before capitalism economic and political powers were highly concentrated. The explanation and justification for inequality were of religious nature: The richest and the most powerful were like that, because of divine will [Stiglitz, 2012]. With the advent of national states, inequality started to be seen not anymore as consequence of the divine will or a state of nature, but as a result of human society. In the middle of the eighteenth century Jean-Jacques Rousseau published the "*Discourse on the origin and basis of inequality among men*", an essay on the concentration of wealth. His opinion is that inequality can be reduced through the development of a more fair state, based on the *"social contract".* Rousseau delineated the essential points of the democratic state with a remarkable advance.

In the late eighteenth centuries one of the giants of economics, Adam Smith, described inequality in a powerful way: *"Wherever there is great property, there is great inequality [...] and the affluence of the few supposes the indigence of the many"* [Smith, 1776]. Inequality during Adam Smith epoch was for sure clearly visible. Unfortunately the quality of the data on incomes at the end of eighteenth century is unsatisfactory for today standards. The reliability of data became acceptable at the beginning of the last century, our analysis on the evolution of inequality starts therefore from this period.

3.1 Beginning of XX century

There were no computers in the early years of 1900s and the techniques of analysis were not as good as the ones used today, the data obtained by documents of that time however provide a useful tool to understand the evolution of the concentration of incomes and wealth over time. As we seen one of the most used methods to collect data is through surveys. Surveys were implemented just in few countries before 1970s, so the analyses of inequality based on this method of data collection cover just a period of few decades. Notwithstanding it is possible to dispose of some tables published by many countries which indicate the number of individuals who perceived a determined range of income. These tables were created for tax record purposes and permit an analysis which can cover more than a century of incomes.

Graph 4: Top 1% share of income from 1900 to 2009. (Source: Ourworldindata.org)



In the previous graph is reported the evolution of the income inequality. As the data are taken from the aforementioned tables, it reports the share of national total income owned by the richest 1% of population. This graph does not give the measure of a country's inequality but just the share of income owned by the richest which contributes to evaluate the concentration of incomes. It is necessary to underline that these statistics should be treated with caution. It is likely that the data underestimates the real share of total income obtained by the richest one

percent. Taxable revenues are often understated especially the ones who refer to the wealthiest people. These individual in fact have strong incentives to declare less than their real income, and can dispose also of better skills and more opportunities to do so [United Nations, 2012]. The graph still provides interesting information about the evolution of inequality during the last century. Efforts have been made in order to estimate the evolution of income inequality in a large number of countries during the twentieth century. These estimations generally confirm the evidence and trends showed for top income shares. It is easy to notice that today, on average; the richest one percent gets just a fraction of the share of income of the richest one percent at the beginning of the century. This fact suggests that inequality is reducing. However it can be seen that after the 80s, the share of income perceived by richest is growing, especially in US and in UK (represented by the two lines on the right top). In these two countries the share of income of the richest one percent is almost at the levels recorded in 1900.

Analyzing the evolution of income's share of the top one percent it is remarkable the relative high concentration of income during the 20s, at that time the wealthiest one percent of population accounted for between 15% and 20% of total income. This level was recorded not only for developed countries represented in the diagram, but even in developing ones such Argentina, India and Indonesia [United Nations, 2012]. Hyperinflation in some countries in Europe (mainly Germany) and the '29 crisis in US (subsequently spread in other countries) contributed in the declining of inequality level.

I have underlined the period of the two world wars and it is easy to see that, especially the Second World War has reduced inequality in every considered countries. During the First World War inequality did not suffer a shrink, in some countries like Netherlands and Denmark (which did not take part in the conflict), the share of the first one percent of population is instead grew. First World War was a conflict in which no big changes in borders were registered; destruction of population's goods was limited. The effects of the war were many, but inequality was not one of these. A remarkable change caused by the war is probably the

increasing share of GDP coming from taxation. Before First World War in US, UK, France and Sweden taxation produced less than 10% of national product; the influence of the state on economic and social life of the citizens was very limited [Piketty, 2014]. During the war, importance of taxation started to grew, probably pushed by the increasing expenses linked to the military efforts and to the after war rebuilding.

Second World War had much more deep effects in the income distribution. Every country showed in the graph registered a reduction in the inequality level during and subsequently the war. There is no particular evident difference in the reduction between the winner and the loser countries: a significant reduction of top shares occurred in 13 out of 14 countries with available data of that time. The only country in which top incomes increased their share of total incomes is represented from Argentina, which was the only non-combatant country with reliable tax records [United Nations, 2012]. It is clear that the reduction of inequality is a consequence of the chaos and the destruction of physical capital, produced by the war. The conflict had effects on regulation and taxation (in wartime taxes are use to fulfill the needed of defense). Unemployment sharply declined as all the human resources are used in the army or in the production of war equipment. Gasoline, meat and other goods were rationed, without particular differences in respect of social class. Prices and wages were fixed by the state, the market was strictly regulated, and the fiscal system was increasing its importance. In US top marginal tax rates ranged from 81%-94% during the conflict, and the number of people paying income taxes expanded tenfold: from 3% of US population in 1939 to 30% in 1940[9].

After the Second World War, share of top incomes does not show evident variations until the 80s. In many developed countries the State started to assume an increasingly large role in the economy. Frequently governments were active in nationalization of large companies and in the provision of public services. The focus of state in social issues avoided the increase of inequality. These approaches were common in the majority of developed countries; however there were

[9] Forbes, *"The cost of War",* November 26, 2009

remarkable differences between United States and European government's actions.

3.2 US case

In US between 1920 and 1929, just before the great depression, income inequality reached its peak: the richest 1% of population obtained more than the 20% of total national income. According to some economists, great depression was caused by several factors, the concentration of income and wealth is among these[Allgoewer, 2002]. The crisis was triggered by a shortage in consuming. The economy produced more than the demand because consumers did not have enough income to satisfy the offer. The great depression leaded to mass unemployment and to the collapse of the economy, but at the same time provided a push for reducing income inequality in the country. Marginal tax rates were increased enormously after the crisis. In 1944, after the implementation of the "Individual income tax act", the top marginal tax rate reached, for all income above $200.000 (in 2013 inflation-adjusted dollars is about two and half millions) a taxation of 94%[10]. Such high rate acted like a roof, discouraging individuals to get income above the highest taxation level. This extremely high tax rates started to slowly decline, reaching 70% in 1965, and had a sharp reduction during the Reagan era started in 1981.

Another reason of the decreasing of inequality could be identified in a revolution: the female entrance in labor market. In 1947 just a quarter of married women were working, thirty years later they were almost half: 47% [Atkinson, 2015]. The entrance of women in the labor market caused a reduction of inequality. The consequences were particular evident in lower classes. We do not have to forget that the data about inequality are collected analyzing families' situation. For a lower income family moving from a single income to a double one makes a huge difference in opportunities of improving the quality of life.

As we seen, growth of top income did not causes an increase of inequality level thanks to some relievers factors like the expansion of redistribution policies

[10] *"A brief history of income Inequality in the United States",* Matthew Johnston, http://www.investopedia.com/

operated by the state, a very high taxation of top income and the entrance of women in the labor market. After the 80s each of these factors reduced its effects and inequality began to grow again.

3.3 The welfare state

The main reason of the decline of inequality in European countries is the success of the welfare state. This type of politic was mainly financed by a progressive taxation on incomes. In most of the continental Europe countries were established state pension systems, which have an important role in reduction the poverty rate among the eldest part of population and the extension of helps within disable people [Atkinson, 2015]. In the period that goes from 1950 to the second half of the 80s, inequality suffered a reduction among almost all European continental countries. The GDP of all the countries grew, and the social expenses of all the economies increased at almost the same rate. The effects of these policies were remarkable. If we fix the poverty line at 40% of the median income of the country, (as the level used by most cross national studies to determine relative poverty [Kenworthy, 1999]) we can see the same trend among the main countries in Europe. The data are for the period between 1960 and 1991. In Italy relative poverty went from 30.7% to 14.3%, in France from 36.1% to 9.8% and in Germany from 15.2% to 4.3% [Kenworthy, 1999]. The reduction of relative poverty in Europe was mainly due to the tax transfers. If we compare the relative poverty rate measured before tax transfer and after tax, we can see an important difference. In Italy for example pre tax relative poverty was 21.8% in 1991, after tax this measure drops to 5% [Kenworthy, 1999]. This important decline of inequality level was observable since the 50s.

Another cause of the decline of inequality in Europe is found in the increase of wage shares on national income. In the late 70s European workers obtained high labor shares, which reached 75% of GDP in Spain and 80% in France[11]. Such high share of GDP made by wages produces an important effect on inequality. It means

[11] The Economist, *"Labour Pains"*, Nov 2nd 2013

that income came mostly as effect of work and not from wealth, like interest on capital or land annuity.

The growth of GDP in several countries and the contemporary downturn of income inequality in the period between the end of the world war and middle of 80s have interested various economists. One of the most famous attempts to explain this trend is surely the Kuznets' curve developed in 1955. The Kuznets' curve graphs the relation between GDP per capita of a country (in the X-axis) and a measure of inequality (in the Y- axis). The shape of the Kuznets curve is a reverse U.

A low GDP per capita is typical of a pre-industrialized country. Most of the population is dedicated to agriculture; most of the people live from the product of the land. People are generally poor, but the society has high levels of equity. As industrialization begins, GDP grows and people start to abandon the countryside and to move to the cities. The wages are higher, and the opportunities are more. Inequality rises, not only between people who live in the cities and people who live in the countryside, but even among workers in the cities and entrepreneurs, who obtain big profits. This stage is perfectly represented by United Kingdom, during the Victorian Age. Kuznets founds that as the GDP grows the inequality level increase too until it reaches a turning point. After that point, to an increase of GDP corresponds a decline of inequality. Kuznets explained this change with a higher care about population's needs by the government and institution. The political change was mainly due to a higher educated population that pushed for redistributive and labor friendly policies. Kuznets' curve encountered a fairly good success, but some events put this explanation in crisis. Kuznets curve predicts a very optimistic vision of inequality behavior. According to him, it is sufficient an increase of economic outcome to have a reduction of inequalities. Economic policies, government regulations, the structure of the fiscal system have no impact in this process; inequality will be reduced as long economy grows, period. Kuznet's curve is based on data of just one country (United States) and covers a period of just 35 years (from 1913 to 1948) [Piketty, 2014]. During this period, the bottom 90% of the United States population saw an increase of their income share from 50-55% to 65-70% of the total income. Some exceptional events happened in

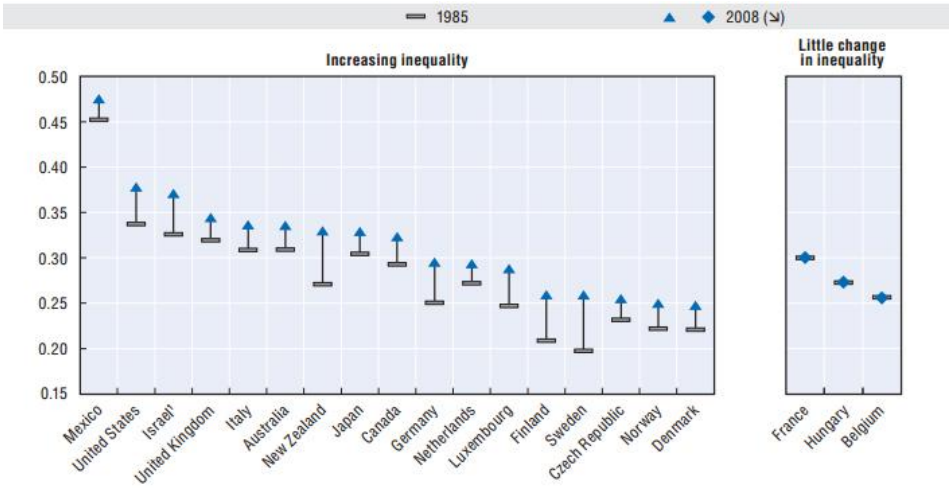
United States and to the whole world in this period: the financial crisis of 1929 with the consequent great depression, and the First World War, just to cite the biggest two. As we seen the effects on inequality was considerable, therefore it can be affirmed that the study of Kuznets are based on a very special period, with limitation in terms of time and space; probably the curve fits the evolution of inequality and growth in United States during this period, but it cannot be considered respected on a extended dimension. Soon some events put in discussion the effectiveness of Kuznets' curve. East Asian countries grew quickly between 1965 and 1990, manufactures and export was booming, but at the same time poverty reduced and life expectancy increased. The economic growth was achieved without increasing inequality, indeed active policies promoting equality probably enhanced growth [Stiglitz, 1996]. Another event that put in crisis Kuznets' curve was the new rise of inequality in advanced countries during the 90s.

3.4 Recent Years

After three decades of rapid growth and more equality in industrialized economies, things began to change. The 80s appears to be one of the turning points with a remarkable increase in income inequality in virtually all regions (in some countries this trend appeared earlier, in the 70s, in others later, in the early 90s) [United Nations, 2012]. From the 80s to the recent 2006 crisis, average real disposable household incomes increased all over OECD countries by a percentage of 1.6 every year on average. In the majority of OECD countries however the top incomes grew much faster than bottom ones, widening the gap between them [Cingano, 2014]. This coincided with the shift from post-war social consensus to the neoliberal policies born in US and in UK. Change in the political orientation was not the only cause of the inequality's trend inversion: rising of inequalities worldwide was due to some global causes, but it is not possible to generalize as every region had very different economic situations. Various countries and regions, especially the ones which had an economy in transition, have not seen a linear trend; some have followed an N-shape curve which is a growth inequality in 1990s, a decline of it on early 2000s and another growth since then. In many other

inequality rose more or less constantly, some other followed an inverted U shape: inequality increased in early 90s and started to decline on early 2000s [United Nations, 2013]. Within the same region, countries have followed very different trajectories. In some countries in Asia, the increase of inequality was consequence of rapid economic growth, whereas in Latin America was linked to economic stagnation or depression. During the 1990s Latin America was the region of the world where incomes were most unequally distributed, the Gini index there scored 49 [Babones and Rivaulla, 2007]. Sub Saharan Africa was the second most unequal region with a Gini index of 47, even if some countries like Burundi showed an inequality level significantly lower, in line with the one of developed countries. The other five regions presented a Gini that ranged between 30 and 40. The most equal regions during the 90s were two, Eastern Europe and Central Asia with a gini index lower than 34 [Babones and Rivaulla, 2007]. A study on 22 OECD countries revealed that income inequality in 2008 was higher than the one recorded in the mid 1980s. In few countries income inequality reported little changes and in Greece and Turkey it actually declined [OECD, 2011]. The Gini coefficient average of these 22 OECD countries scored a value of 29 in 1985; in 2008 it was rose by 10% hitting 32 [OECD, 2011]. This new rise in inequality affected the majority of industrialized countries. A determinant factor for the growth of inequality is the increasing return on skills. Wage inequality remained very stable until the 60s then, between 1963 and 1989 in United States the real average weekly wage for the least skilled workers declined by about 5%, while the average wage of most skilled ones rose by 40% [Murphy and Pierce, 1993]. Another element which caused this new trend is the downturn of wage share on total income.

Graph 5: Income Inequality in OECD countries between 1995 and 2008 (source: OECD Database on household income distribution and poverty)



Note: For data years see Table 1. "Little change" in inequality refers to changes of less than 2 percentage points.

Since 1980 the functional income distribution has shown an impressive decline in the share of wages in favor of capital. This shift was reported in both, developed and developing countries. Share of labor on income fell between five and ten percentage points in several developed economies. Since 1993 wage share on national income fell on average of 0.3 percentage points per year in developing countries. In developed the fell was even more important, with a reduction of 0.4 percentage points per year [United Nations, 2014]. There are two main causes that could explain this trend. One has been identified as the increased gap between productivity gains and level of wages [United Nations, 2012]. The other major cause has been the growing influence of the financial sector over the "real economy", and the changes produced in corporate governance policies which aimed at maximizing shareholder added value. The overall decline of wage share can also be partially explained by the "*ratchet effect*": wage share rapidly decreases immediately after a financial crisis or, more in general, an economic shock. In the long period wage share recovers, and started to rise again, but with a slower pace than the GDP growth. Some economists affirm that the wage share during the 90s was at an excessive level and could have led to the crisis [United Nations, 2014]. However financial crisis are rarely caused by bidding up wages, in the majority of the cases are triggered by others factors. As we previously said, on average a

reduction in the wage share raises Gini index in a statistically significant manner. Results of analysis made on various countries underline that on average a 10 per cent decline in the labor share would increase the inequality index of income by about 1 per cent [Francese and Mulas-Granados, 2015].

Wages account for three quarter of household incomes. The wages of highly educated people rose and the real salary of less skilled, as we seen, declined. This fact itself however, is not sufficient in order to explain the increasing income inequality in OECD countries. In the period between 1980 and 2008, most countries implemented regulatory reforms which affected the distribution of wealth. These reforms were aimed to strengthen competition in the good's markets and to make labor market more flexible. Many lost their employment, the protection legislations for workers with atypical contract became weaker and the minimum wages declined relatively to median wages [OECD, 2011]. On the other hand the composition of the income of the richest change. In the first half of the XX century, top incomes were composed basically of revenues from capital, from the second part of the century the share of wage on top incomes rose sharply. The wage component of the top incomes consists in bonuses (to top managers for example) and in stock options [United Nations, 2012].

Many OECD countries encountered the recent financial crisis with an already relevant level of inequality, which may have helped to trigger the crisis itself. Even if it is not commonly accepted that inequality is a key factor to create the environment for the beginning of the crisis, it is correct to affirm that the crisis had the effect of increase inequality. However the final impact is difficult to be measured because of the role played by different redistribution policies and fiscal systems implemented in each country.

The 2008 crisis actually led to a new increase in the wages share as companies profit declined faster than the average salary. In European Union the surplus achieved by companies fell by 8.5 per cent between 2007 and 2009, while the level of wage suffered a loss of only 1.2 per cent in the same period [United Nations, 2012], a similar behavior was recorded in United States and in Japan. The wages

share is however influenced by another factor: unemployment. Even if the entity of wages is stable during a recession, the wages share can fell if the unemployment increases. It is too soon to understand if the recovery of the wages' share is just temporary or will be preserved in the long term. It is however clear that a big role in deciding the future of labor is played by the policies implemented in order to overcome the crisis.

Lower income population is the group that lost more during the crisis and benefited less during the recovery period. On average, income of the poorest 10% of population fell at a higher rate than the richest 10% among 33 OECD countries. In countries where the crisis impacted the most, like Spain, Greece, Ireland and others, the average income of the poorest decile fell by more than 5% each year [OECD, 2015]. As we said, the impact of the crisis, especially on the poorest, is limited by taxes and redistribution policies. Before the crisis, an increase of income inequality was pushed by several factors; a relevant, even if not major factor was the weakening of tax-benefit redistribution. During the first years of the crisis, income inequality before taxes and redistribution increased sharply, even if redistribution was able to contained inequality after taxes. In more recent years, the resources of redistribution started to became scarce, at the same time income inequality before taxes and benefits continued to rise. As result, the upwards trend of disposable income inequality became stronger [OECD, 2015].

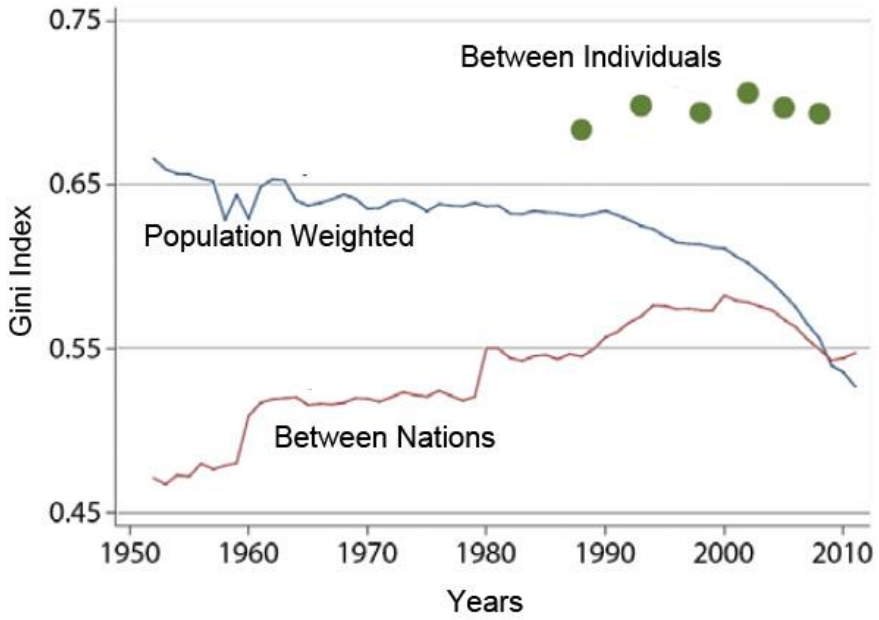
The gap between rich and poor is growing; income inequality reached his record among OECD in 2013. A study on OECD countries revealed that the richest 10% of the population had 9.6 times the income of the poorest 10%. In Mexico, the most unequal OECD country according to 2013 data, this ratio is above 30. Europe is one of the most equal regions, but with important differences within. Norway is considered one of the less unequal countries in world scoring 0.259 of Gini coefficient in 2012 [World Bank, 2015], compared with the 0.352 of Italy or 0.36 of Portugal. Moving to US, during the period 1979-2006 the poorest 90% of the population experienced a growth in the income of 15%, at the same time the richest 1% known an increase of almost 150% of the income [Stiglitz, 2012]. The very top incomes are in fact the key driver for increasing inequality. While in the

US the top 5% of population experienced an average income's growth of 1.5 per cent per year between 1980 and 2011 the incomes of the richest 0.1% grew 4 per cent per year on average [United Nations, 2013]. Inequality rose sharply in developed economies; however it is worth to underline that while inequality measured on gross income increased by 8 points between 1981 and 2000, inequality on net income increased by just 4 points thanks to the compensatory role of redistribution policies [United Nations, 2012].

3.5 Global Inequality

There are three different methodologies used in order to measure global inequality. Inequality Between nations compares their average GDP per capita without taking into account the differences on population of each country. Using this method China and Luxembourg have the same weight in calculate inequality, even if their represent a very different number of individuals. Weighted global inequality is the second methodology and basically is the same as the precedent one, but it takes into consideration the population, weighting each country in a different way according to the number of people which lives in it. The third and last method is the inequality among individuals and it does not consider anymore countries. It measure inequality among all the world population as it was just one country. This method is the last one introduced and requires data that are been available starting only from the mid 1980s.

Graph 6: Gini Index of Global Income Inequality Source: United Nations



3.5.1 Inequality between Nations

The first method to estimate global inequality uses as main measure the GDP per capita, it is the result of dividing GDP of a country for its number of citizens. The next step consists in calculate the inequality with the same procedure as when it is calculated nationally. The population is composed by the countries, and their income is their national GDP per capita. The main drawback of this concept is that per capita GDP is not the real income the population obtains. GDP measures corporate investments, healthcare costs, military expenses and other components which cannot be associated with household income. Moreover it assumes that all citizens of the same country gain the same income, which is an important simplification. According to the first method, measuring the global inequality between nations, between 1950 and 2000 inequality grew almost constantly. Estimations sustain that during the nineteenth century the difference between the richest country and the poorest was around 4 to 1. According to the precedent results the ratio is now more than 100 to 1. The reason is to be imputed to the industrial revolution. Until that moment, the average global GDP growth was around 0%. With industrial revolution GDP of some countries started to grow faster and faster in respect to others, as result the gap increased. After 2000,

inequality started to reduce; this trend was probably due to the effect of reduction of growth for developed economies and a remarkable increase of GDP in the developing countries. Developed countries now grow less than the global average, meaning that the developing ones are shorten the distances [United Nations, 2012]. If we consider the 15 richest countries and compare them with the poorest 15, it can be noticed that the trend starts to change. The ratio was 62.3 in 2000 and reached 55.8 in 2009. However, the 2008 crisis seems to have inverted this trend, and inequality between countries started to grow again since [United Nations, 2014].

3.5.2 Weighted Inequality between Nations

It is interesting, and probably more meaningful, to analyze the weighted global inequality. This approach evaluates in different way every country accordingly to its population. The higher the population of a country, the more its economic growth will impact on the global inequality level. The issue that this method presents is the same of the precedent one: it does not consider within country inequalities. In fact it implicitly assumes that each individual in which live in the same country obtains the same income. The results of the analysis made by World Bank include estimations. For example countries those are not able to provide data on GDP, like North Korea, Congo or Cuba, have been excluded or estimated. The consequence is that the measure of global inequality is not universally accepted [Milanovic, 2006]. Using this concept, the evolution of global income inequality appears to change. Until 1990s the level of inequality showed a slow but stable decline. During the same period, but utilizing the precedent method, the result was the opposite. From 2000 both methods show a decline in global income inequality, however the weighted approach records a faster reduction. The reason for the difference between these two results is most probably due to the impressive growth of the Chinese and Indian economy. These two countries count more than 2 billion of people which means more than a quarter of the today's global population. Poverty in China has been reduced and millions of people improved their economic

situation, shortening the distance with wealthier. The declining trend seems to have been weakened by the recent crisis, but it was not been inverted. Developing economies (or at least the more populated ones) seems to be in the right way to reduce their distance from developed countries. According to these results, it seems that inequality within countries is increasing, but inequality between countries is reducing, probably as effect of various phenomena like globalization. This assumption understates global inequality between households, and it is focus on measure differences between countries. However inequality between nations impacts on global inequality far more than inequality within nation. It is estimated that the "between" component accounts for two third of global inequality [Milanovic, 2006]. The country where a person was born, or where lives, determines the person's expected income far more than its skills [United Nations, 2013].

3.5.3 Inequality between Individuals

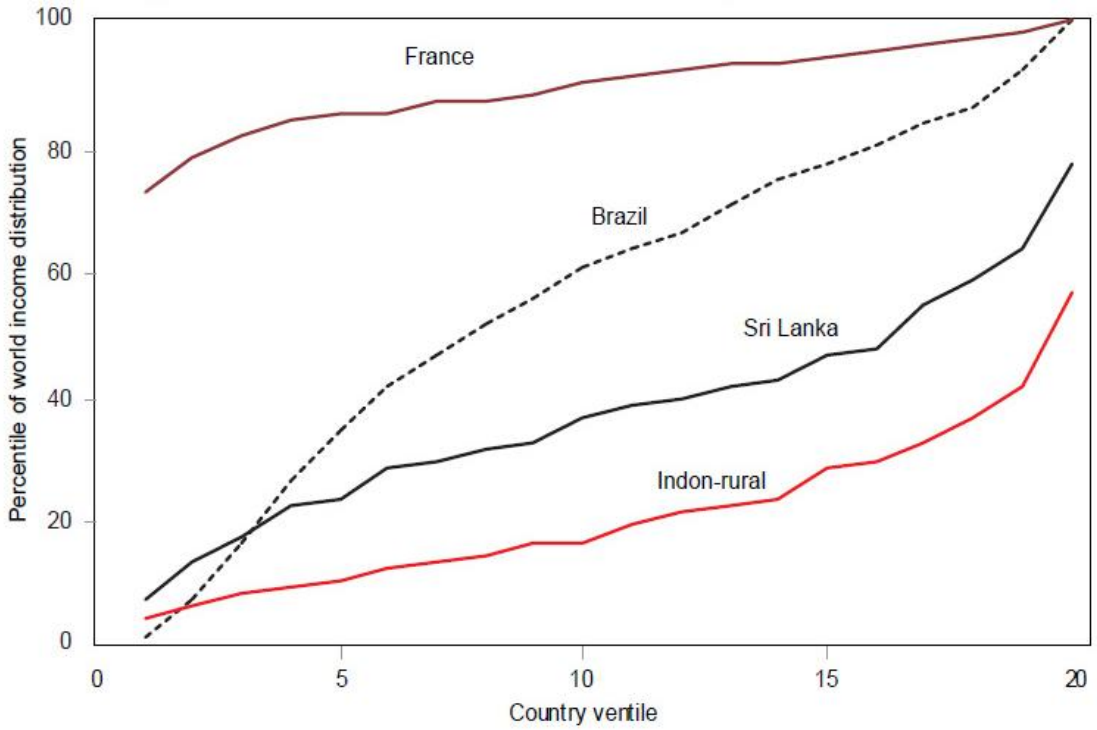
It is an approach that has to face some issues in order to reach a consistent result. The amount of necessary data for this approach is huge compared with the first two. First of all it is necessary to be able to convert all the currencies of every country in the world into just one. It is not as simple as one can imagine: the foreign exchange rates, for example, are useless, not because they change every day, but because they do not measure the real purchase power of the different currencies. With one euro in Thailand it is possible to buy more things than with the same euro in Europe: the price level between different countries can differ significantly. To make another example, according to various estimations, price level in India is only 40 percent of the one in United States [Deaton, 2013]. It is not possible to compare incomes of different countries if they are measured using the foreign exchange rates because the result would not be adherent with the real inequality. In order to correct this issue it is used an exchange rate not evaluated in the stock market: the Purchasing Power Parity rate (for now on PPP). The PPP is the result of researches made by international statisticians which measures prices

all around the world [Deaton, 2013]. PPP exchange rates are produced comparing the prices of comparable objects in different countries, like a kilogram of rice or one liter of milk. The amount of data needed to produce PPP rates is huge, and it needs a particular attention to details. When the prices of a similar item are compared in two different countries, there are many issues to face. An example could be the different quality of the object compared. Clearly a French bottle of wine will have a different price than a Chinese one. At the same time, the main item may not have the same level of popularity in different countries: pasta is considered a basic product in Italy, it is cheap and widely consumed. In other countries it may be possible to find pasta, even of the same quality of the one available in Italy, but it would be far more expensive as consumers are not used to buy it. Although these issues, PPP offered a more precise idea of the real value of currencies around the world, and it is much more useful than the traditional foreign exchange rates. However, PPP is a relatively new approach, therefore before 1980s there are no data available. It is also necessary to have an estimation of inequality within each country of the world, which is available only from household surveys. Once having converted incomes of people living all over the world in the same currency at PPP rates, and having weighted inequalities measured in every country for its own populations, the global inequality level is obtained. Basically global inequality measures the concentration of incomes assuming the whole world as one big nation where the same currency is used. Global inequality shows a different pattern than the one recorded studying inequality within the same countries. Global inequality barely changed between the 80s and the 90s, however in this period, its level was significantly high, with a Gini coefficient that scored 0.65 [United Nations, 2012]. This level of inequality is huge; in fact it is higher than the national inequality of any single country in the world. South Africa which is considered one of the most unequal country in the world scored a value of 0.634 in 2011 [World Bank, 2015]. It is not easy to imagine income inequality looking at the Gini value. A more understandable example of what a score of 0.65 means can be this: at PPP exchange rates, the top 10 percent richest individuals in the world obtain half of the total income, while the poorest 10 percent gets just the 0.7% of the total. In other words, the richest 5 percent gets

165 times more than the poorest 5 percent [Milanovic, 2006]. When China and India began to grow much faster than the global average inequality declined very fast, and the decline became even faster in the 2000s as more developing economies reported high growth rates. A decomposition of inequality between and within countries shows that a share that ranges between 68 and 83 per cent of total inequality (measuring with Gini coefficient) is due to differences between countries [Babones and Rivadulla,2007]. This evidence is underlines the evolution of the gap between developed and developing countries.

The concept of global inequality divides experts. One group sustains it is irrelevant, because there is no a global government or global authorities that have to manage this issue. Governments are national, and they can manage inequality only inside their own borders. According to this point of view, national inequalities are an issue, but not the global one. The other group has an opposite opinion, and believes that global inequality is a problem that affects everybody, as the fate of every individual is important, global inequality became an ethical problem. A more pragmatic reason adducted from this group to consider global inequality important is international political stability. As every person interacts with others, people compare their incomes not only with other citizens of the same country, but also with the one obtained by people living in different countries. People from poor countries may start migrating, encouraged by higher incomes and better standard of life offered by richer countries. Massive migration leads to strong tensions at international level, and are a difficult issue to manage for national governments [Milanovic, 2006]. Before industrial revolution, the (imprecise) measurements of inequality highlight that more than half of global inequality was due to income differences within nations. At that time differences between nations were relatively small, but with the advent of industrial revolution things changed. Nowadays about three quarter of global inequality is explained by differences in countries' mean incomes [Milanovic, 2006].

Graph 7: Position of different countries' ventiles in global income distribution. Source: "Global income inequality: what is and why it matters" Branko Milanovic



The previous graph reports the income distribution from a global point of view of four countries. If we analyzed the incomes of the poorest 5 percent of French people, we discover that, from a global point of view, these individuals obtain an income which places them on the 72nd percentile of the world income. The richest 5 percent of Sri Lanka population occupy the same percentile of the poorest 5 percent of French people. If France is compared with rural Indonesia, the two distributions do not even overlap: for the latter the range goes from 4th to the 56th world percentile. This consideration means that it is likely that the poorest individuals living in rich countries obtain more income than the richest individuals of a poor one. As consequence, it could be assumed that declining inequality between countries would lead to declining inequality between individuals from a worldwide perspective.

The world economic forum released on November 2014 a report with the top ten trends which will preoccupy 1767 experts from academia, business, government and ONG for the next 12-18 months. The deepening of income inequality was the most preoccupying trend [World Economic Forum, 2015]. Also from surveys

conducted on 44 nations evidenced that inequality is felt as an alarming trend. It is interesting to discover that the percentage of people that considers the gap between rich and poor a very big problem is much higher in countries who suffered the most in the recent economic crisis. In Greece, Spain and Italy more than 70% of population are concern on growing of inequality, in other developed countries this percentage is significantly lower [Pew Research Center, 2014]. People blame inequality on a variety of causes, but they consider their government's economic policies as the most responsible for the present situation. According to OECD countries with a higher income inequality also have a higher relative income poverty rate, regardless to how relative poverty is defined (usually it is defined poor a household who obtains an income which is 40, 50 or 60% of the median income) [OECD, 2008].

We had seen the evolution of inequality during the beginning of twentieth century until now. We had linked the variations of inequality's level to historical events like world wars and globalization, but to deeply comprehend inequality it is necessary to study other possible causes and understand their impact.

Chapter Four: Causes of inequality

As we had seen there are several reasons why income inequality is rising. Today inequality is a big issue and the level it has reached is widely considered as too high to be tolerated in a healthy society. To study the historical levels of income inequality helps to understand how it changes over the time. It is possible to reduce inequality, history gave us some examples. The most important decline in inequality levels are due to exceptional events. Both of the World Wars had a major impact in equalize the society, the crisis of 1929 and (just for a short period) the recent Great Recession are some examples. To obtain a more equal society it is possible even through less dramatic events: the reduction of inequality during the welfare state experience can give a better and more desirable example. However it is not always possible to replicate the past; the world changed a lot in the last half century. Some trends which have an impact on inequality are difficult to be contained. In order to try to reduce income inequality to an optimal level, it is necessary to understand the economic, political and social forces which affect inequality. Many factors affect income inequality, some drivers are endogenous and mainly determined by domestic policies, like education for example. Other factors are exogenous and national policies encountered many difficulties in trying to contain them. With the developing of globalization process, exogenous factors gained importance and affected in a more serious way inequality. As result it is necessary an international political will in order to contrast exogenous drivers. A deeper comprehension of the causes of income inequality helps to better understand costs and benefits of its reduction.

4.1 Globalization

Globalization is commonly used to describe the process of increasing interrelation and integration among different countries and region of the world. Infrastructures, fast transportations, internet, mobile phones are some of the factor which contributed to more strictly connections between economies and people.

The concept of globalization can be divided in three major factors. Trade globalization increased the simplicity of transport of goods, people and companies

between different states. Financial globalization is responsible to have removed some regulations which limited the transfer of money between countries, and made possible to invest in stock market all over the world. Technologic innovation is a key factor in make the globalization process real because it has reduced the costs of communications. Globalization is one of the key factors of income inequality variation in recent years. Each of its three components deserves a specific analysis in order to better understand its consequence on inequality trends.

4.1.1 Trade Globalization

After the collapse of the Berlin's wall, it began a new process that would change the world. Globalization was put in place thanks to new technological discoveries, political will and economic opportunities. Personal computer and internet allow a real time communication, faster transports permit to increase movements of people and the intensity of trades. New international organizations like WTO and European Union made clear that the world would become a more interconnected place, with supranational authorities. Companies exploited the opportunity of expanding the business even outside the country of origin. Of course globalization shows negative consequences too. Environmental problems, uncontrollable migration and terrorism are the most evident factors, but globalization affected also income inequality. In the attempt to reduce costs, many companies settled in rich countries decided to outsource the production in poorer ones. With lower customs duties for foreign products with faster and cheaper means of transportation than ever before, to export products became relatively easy. Non specialized workers in poor countries accept to work with a lower salary in comparison to those in the advanced countries. Conversely, other businesses need more qualified and highly educated personnel, these activities could not be outsourced so easily. Developed countries can offer a better education than the poor ones. The result is that developed countries saw an increase of skilled workforce demand opposed to a decline of not qualified works. As the demand of qualified workers increased, also the salary premium of more educated people rose. Income inequality in developed countries started to increase again. On one

hand not skilled workers had to accept lower wages under the threats of outsourcing the production toward a poorer country, on the other hand qualified workers could ask higher salaries. Trade globalization in this sense put on competition workers at a global level, not anymore in a regional or national level. Suddenly workers living in low cost of life's countries were able to compete for a job against workers from high cost of life countries. The effect of the increase of competition between workers is a reduction of wages, and of wages share on the composition of total incomes. High added value activities remain in developed countries, and low added value activities, like manufacturing, move to the poorer one. This trend signs a change in the history of inequality from a world perspective. A consequence of trade liberalization between countries can be derived by the Stolper-Samuelson theorem. Considering two products: product A is capital-intensive and product B is labor-intensive. As developed countries can dispose of large quantity of capital and poor countries offer a strong labor force, a shift in the economy's production of the two countries is produced when trade is been liberalized. Trade reduces the relative price of product B (labor intensive) which can be imported from the poor country, the developed country will shift the production towards product A (capital intensive) [McCulloch, 2005]. In the poor country, where low skilled labor is abundant, it will result an increase in the wages of low skilled workers, determining a reduction in income inequality. At the same time, in the rich country, the production is shifted to capital intensive product A, which is supposed to require the relatively abundant high skilled workers. Wage of these workers will increase, leading to an increase of income inequality in the developed country [IMF, 2007].

4.1.2 Financial Globalization

Globalization is associated not only to lowering the duties between countries and an easier movement of people and goods but even to increased capital openness, and an extended financial liberalization. This liberalization process, often sustained by financial deregulation, is one of the major aspects of globalization development. The effects of this process, made the financial market much more liquid and more sensible to instability periods. International capitals in fact quickly

respond to “panic attacks”, increasing the effects of gains and losses in stock markets. Financialization deeply affected the bargaining power of workers: companies are able to choose between much more investments options than before, having the opportunity to go abroad. The position of shareholders compared to the one of the workers is also improved: shareholders have more investment options, and companies manage the relations with them more carefully. Managers’ interests were aligned with the ones of shareholders through compensation based on shares value, as result more focus was put on short term goals. The International Labor Organization in 2008 observed that financial globalization has led to a shrink of wages’ share on GDP [United Nations, 2014]. The correlation is valid for developed countries as well for developing ones; in fact the middle and low income countries display a stronger relation between financial openness and wage share’s decline. If capital is free to move worldwide, the same is not possible for workers. Working abroad is more difficult than to move capital in different nations. It is particularly true for low skilled workers who have to accomplish several bureaucracy steps until to have the opportunity to work in another country. Finance deregulation was based on the idea that too many constraints and obligations to financial sector would have harm real economic growth. Little evidence was found to support of this theory, while there is a much more correlation between macroeconomic instability and liberalization. The cost of financial instability has usually fallen mainly on labor, causing a contraction of it. According to the United Nation, the main responsible of the fall in the labor income share is globalization, more specifically the financial aspect of globalization. In terms of relative contribution in fact, financialization contributed to 46 per cent in the fall, compared with just 19 per cent by the trade globalization and the 10 per cent of technology improvements [United Nations, 2014]. The remaining reasons for the decline of wages share is found in the reduction of union density (it will be analyzed later) and government policies.

4.1.3 Technical Change

Globalization is not the only cause of the recent rise of income inequality. Technological progress is often addressed as one key income inequality increase

factor. Information and communication technology are skill based and therefore has an impact on inequality. According to a 2007 IMF study, *"technological progress had a greater impact than globalization on inequality within countries"* [United Nations, 2014]. An OECD report affirms the same and suggests that *"technical is a more powerful driver of increased wage dispersion than closer trade integration"* [OECD, 2007]. Technological progress can lead to inventions that reduce the labor incidence in production of goods. The effect is that workers contribute in a smaller part in the profit generation. As consequence, the level of wages is reduced and inequality becomes to rise.

Technological change affects production factors and therefore income inequality. Although Technological progress and globalization are two strictly connected factors, some studies sustain that the former is more effective in increasing inequality. Technological progress can affect inequality in two opposite ways. Innovation permits to lower the costs of technological products like personal computer, in this case relatively less skilled individuals are more likely to access new technologies. On the other hand, if the equipment price remains high, the technology is affordable just from richer or more skilled individuals and therefore it leads to higher inequality. In this way technological change affects not only income distribution but even the functional distribution, changing the ratio between capital and wage share of incomes. The "capital bias" of technological changes reduces labor participation in profit and lends more returns on productivity directly to capital. Labor share measures how much of national income accrues to labor. It is calculated as the ratio of total wages of employees before taxes over gross domestic product. Labor share in OECD countries and Asia average just over 50% of GDP, however since 1993 starts to fall at a pace of 4 percentage points per decade [Lubker, 2007]. Each factor of production is compensated according to marginal productivity, the same happens to workers' wages. The labor share declines if the production became more capital-intensive, following the trend theorized in the marginal productivity theory. Technical change favors more skilled and educated people. Technology substitutes low skilled workers in doing simple tasks, lowering the demand of less educated

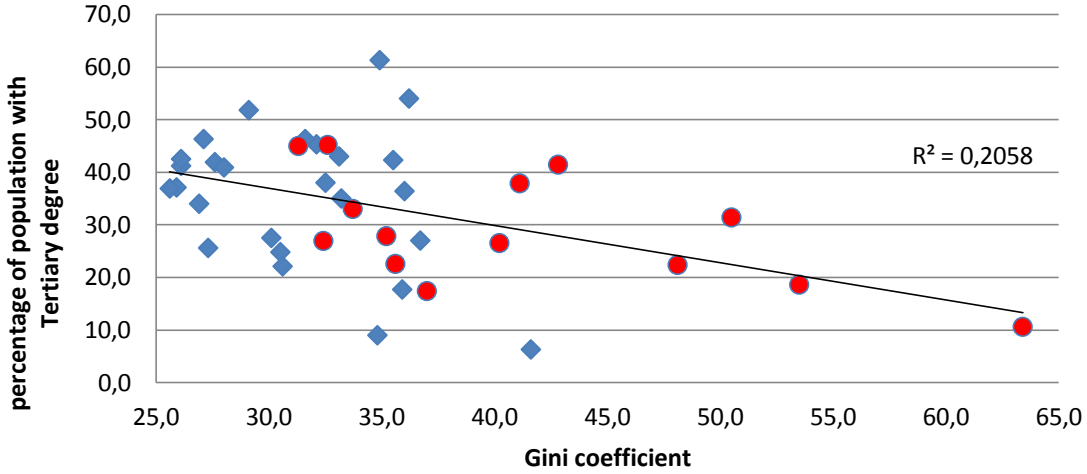
people. Technology innovation is pushed forward in order to satisfy some needs. New machineries are produced because they are profitable. They permit to replace scarce or expansive asset. Trade unions fought for higher wages for workers. The growth of salaries caused a growth in expenses faced by companies which, in order to contrast the declining in profit, searched other ways to reduce costs. Technologic innovation reduces low skilled workers' costs, but produces a growth of skilled workers' demand. In the future, skilled workers could become too costly and it is possible that some new technological innovation will reduced the need of this kind of workers.

4.2 Education

As we seen above, education level can be determinant in a country's inequality. An easy access to education is one of the most important factors in order to assure equality of opportunities, a limited access on the contrary reduces social mobility and perpetuate income inequality. This happens because high education level has a positive effect on the entity of income a person can obtain. Many OECD countries have experienced sharp increases in wage inequality between people with different education. In United States the wages of college graduates relative to wages of high school graduates increased by more than 25% between 1979 and 1995 [Acemoglu, 2003]. Nowadays, workers with at least a bachelor's degree earn about one million of US dollars more over their lifetime than Americans who only own high school diploma[12]. The globalization phenomena caused a transfer of manufacturing force from developed countries to developing ones. The sectors based on low skilled works have to face an increasing competition from poorer countries, especially on the wages level. On the other hand, in developed countries, has been recorded a growing demand of specialized and more educated workers. This trend determines an increase of specialized wages and a decrease of non specialized one in developed countries. Education became an important factor in determining the future income of a person.

[12] "Stephen Hawking: technology is making inequality worse", Heather Long, CNN Money October 12, 2015

Graph 2: Correlation between education and inequality level



To better understand the correlation between education and income inequality in a country it is useful to match the percentage of population that dispose of tertiary degree and country's Gini coefficient.

People with "tertiary education" are defined as those having completed the highest level of education. This includes high skill professions such as medicine. The measure is the percentage of same age population. The data are collected by OECD in 2013 and reports the percentage of population with tertiary degree on people between 26 and 64 years old in 40 different countries [OECD, 2014]. This percentage is reported in the Y-axis of the scatter plot (graph n.2). The X-axis measures the value of the Gini coefficient per country [World Bank]. It is easy to notice the negative correlation between education and income inequality. The "education premium" or the additional units of salary obtained by people who own a tertiary degree is a natural form of inequality. This premium is the result of the time invested in study, without a wage, instead of left the studies for working. As long as working instead of studying is a choice of the single person, it does not present a problem. Not everybody has the same interest in education, someone might prefer to study, and someone may prefer to work. The correlation between education and inequality is evident. The education level can explain more than 20% of inequality in one country. Of course education is not the only factor which

affects income inequality in a country, but I think that this result is very informative.

An important issue is presented by the accessibility of education. In the scatter plot I have highlight all the countries in which tuition fees for university (on average) are above 1000 USD per year[13] (red dots on the graph). It is interesting to notice that the vast majority of the countries which score a high number on the Gini coefficient (the most unequal countries) also request the highest tuition fees for tertiary education. Almost every country who request an average of tuition fees under a thousand of United State Dollars are European or belonged to the former USSR.

To choose a "line" in order to divide cheap and expansive costs for education is not easy. The average income of the population differs from country to country and the quality of education too. For example in Mexico, one of the most unequal country in OECD, tertiary education costs on average more than five thousand US dollar, at the same time the median income is little more than four thousand and half US dollar. Apparently it means that the vast majority of population cannot afford the expenses for tertiary education. The truth is that public universities cost around 500 US dollar per year, while the private ones more than eleven thousand[14]. The division between a cheap and an expansive tertiary education offers anyway valuable information. It is clear that in countries where the universities are most expansive, the percentage of population who have a tertiary degree falls. As a possible consequence of the lower education of the population, the society is more unequal. One problem of high tuition fees is not only the consequences on income inequality but also on inequality of opportunities. A poor family will face more troubles to afford education expenses for its children, as consequence the social mobility will be reduced. For example, in 2012 in Latin America only 20 per cent of children coming from the lowest quintile were able to complete secondary school compared with 80 per cent of children of the highest quintile [United Nations, 2012]. Unfortunately access to education is difficult, in particular for low income

[13] Sources: www.studyineurope.eu ; *"Education Indicators in focus"* OECD report 2011
[14] *"Here's what college education costs students around the world"* Business Insiders

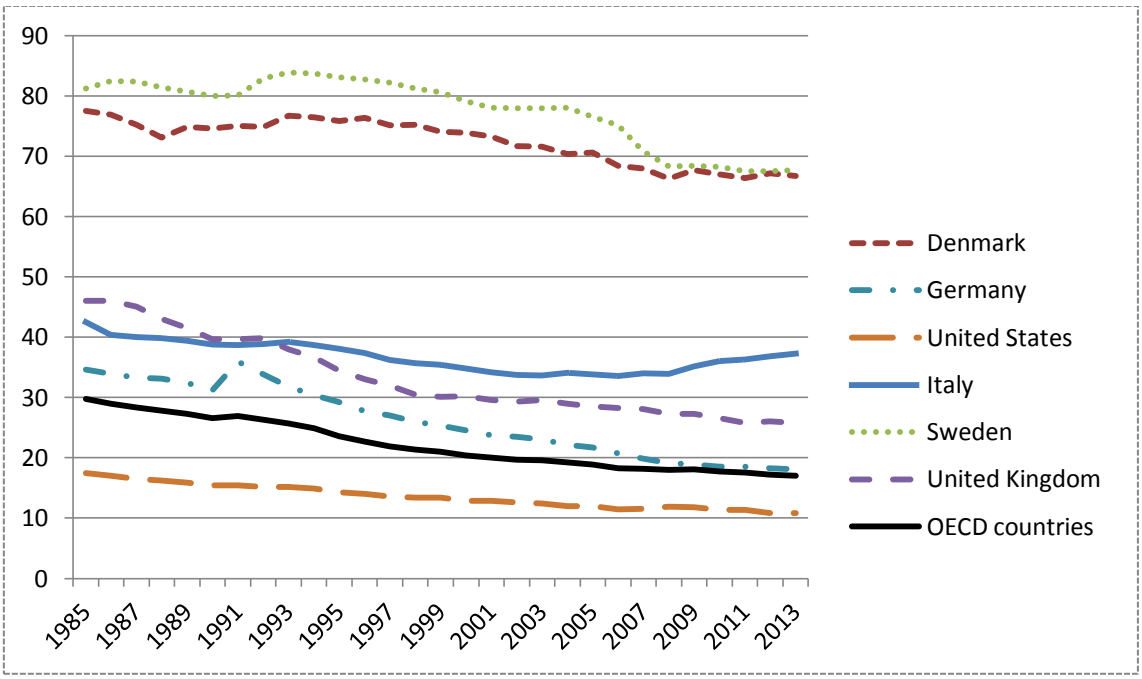
earners, in developed economies too. The growing privatization of the higher education sector is also source of concerns for many OECD economies as it reduces even more the opportunity of having a tertiary education degree for poor families. Good education leads to better paid jobs and, as in some countries access to education is reduced, and the cost is expensive, a higher income can buy a better education for the next generation. Education moreover has an impact on other phenomena like longevity, health, employability and participation in social life.

A powerful tool in the hand of the governments in order to contrast inequality is public education. As we seen, a higher education usually provides higher wages. This can be interpreted as a cause of inequality of results. As long as inequality of results is not too exaggerated, it is acceptable and gives an incentive in continuing the studies. Moreover it seems that as the supply of workers with tertiary education increases, the skill premium is reduced [United Nations, 2012]. This means that inequality of results will not increase if the access to education is wide. The main and the most unacceptable effect of education is the reduction of equality of opportunities. Public investments in education, made with the aim of reducing the access' barriers for the poorest, will be particularly beneficial in improving social mobility and therefore containing income inequality. Extending skills to the entire population instead limiting them to the wealthiest class will create wider social benefits and a more equal society. Policies that aim to give a broader access to tertiary education may require a long term investment; the results on inequality usually are noticed after 5 to 10 years [United Nations, 2012] but tend to be very effective.

4.3 Trade Unions

Rising of inequality is mainly due to the faster growing of top income with respect to the lower ones. As we seen the principals responsible for this trend are globalization and technologic development. However, there are other elements that did not reduce the rising of inequality. An example could be the declining power of labor market institutions. The erosion of these institutions affected both gross and net income inequality. The growth of top income was made possible also by the weakening of trade unions. When their bargaining power is reduced, top earners increase their wealth. Moreover, weaker labor market institutions can limit workers' influence on redistributive policies, which contribute to increase the after taxes income inequality [Jaunotte and Buitron, 2015]. The trade unions decline created an imbalance of power between workers and employers. Without the trade union protection, workers face threats with more difficulties. Moreover globalization with the increase of free trades has reduced the bargaining power of labor market institutions. To have a bad paid job is better than losing the job at cause of the outsourcing of the production.

Graph 8: Trade Union Density evolution across different OECD countries from 1985 to 2013



A useful way to understand the trend of weakening of labor market institutions it is useful to study the evolution of the trade union density. OECD defines the "trade union density" as the ratio of wage and salary earners that are trade union members, divided by the total number of wage and salary earners. Countries have different union tradition, in some countries like Denmark and Sweden, the density of labor market institutions is much higher than United States. The decline of "unionization" has several explanations: globalization, which increases the competition and reduces the bargaining power of unions, is one of the most obvious, but not the only one. Improvements in education levels reduce workers' incentives to organize unions, deindustrialization led to an increasing share of much less unionized (or non-unionized at all) sectors [Jaunotte and Buitron, 2015].

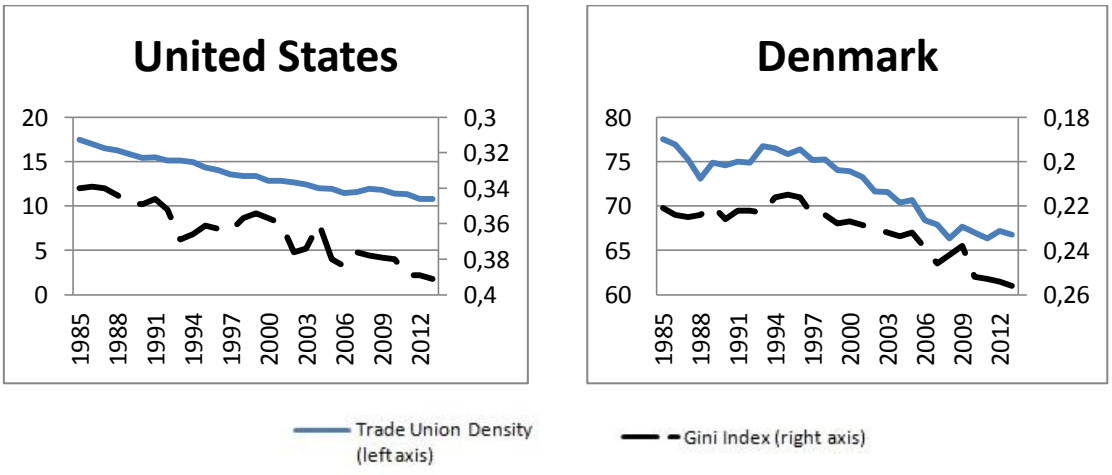
In the graph number three it is interesting to see that trade union density has drop significantly in the majority of the OECD countries represented from 1985. Denmark reduces its density of about 10 points, United Kingdom about 20 and, the average of OECD countries passed from 30 in the middle of the 80s to less than 20 nowadays[15]. An explanation of this trend is given by Milton Friedman who sustained that unionization produces higher wages for union members, with the consequence of fewer jobs. Moreover wages will tend to decline in non-unionized industries [Friedman, 2009]. Other critics affirm that unions spent many efforts in order to excessively benefiting insider workers which already have secure jobs at the expenses of outsider workers or unemployed people. The excessive wages obtained by insider workers and the increasing costs of union partnership may also have push companies to outsource the production in low-wage labor countries [Kramarz, 2008].

The decline of the unionization in most of OECD countries directly affects the level of income inequality. This conclusion is supported from matching the trade union density evolution from the middle 80s to 2013 with the changes in the Gini index in the same period. Unfortunately the Gini index data are not available for every country, especially in the 80s. OECD offers an incredible amount of useful data but for some countries, in some years, Gini index is not given.

[15] Source: OECD database, *"trade union density"*

For the scarcity of historical data, I have decided to match the Gini coefficient with the trade union density of two countries: United States and Denmark. In my opinion this comparison is very informative. These two countries are very different, geographically and politically. Moreover the trade union density is much higher in Denmark than the one in US; on the contrary inequality in the European country is much lower.

Graph 9-10: Comparison between the evolution of Gini index and Trade Union Density in United States and in Denmark, period 1985-2013 (source of the data: OECD)



These two graphs offer a comparison between Gini index and union density. The continuous blue line represents trade union density and it refers to the left vertical axis, the black dashed line is the Gini index and it refers to the right axis. As you can see, the right axis is overturned, in order to make an easier comparison between the two measures (getting down on the graph means an increase of inequality).

It is impressive to notice that to a reduction on the union density level corresponds an increase of inequality in the country. In Denmark the two lines seems to follow a more similar trend than in the US. There is a possible explanation of the stronger relationship of these two measures. In Denmark the trade union density is much higher than in the US, and so it is assumed to be its bargaining power. The reduction of the density in Denmark is also more important than the one experienced in the US (about 12 points in Denmark, about 7 in US).

In conclusion it can be affirmed that the weakening of trade union power has an impact on the inequality level of a society. The entity of the impact depends on the historical strength of the trade union in a particular society. The stronger the trade unions historically are in a country, the more their weakening will affect the equality level.

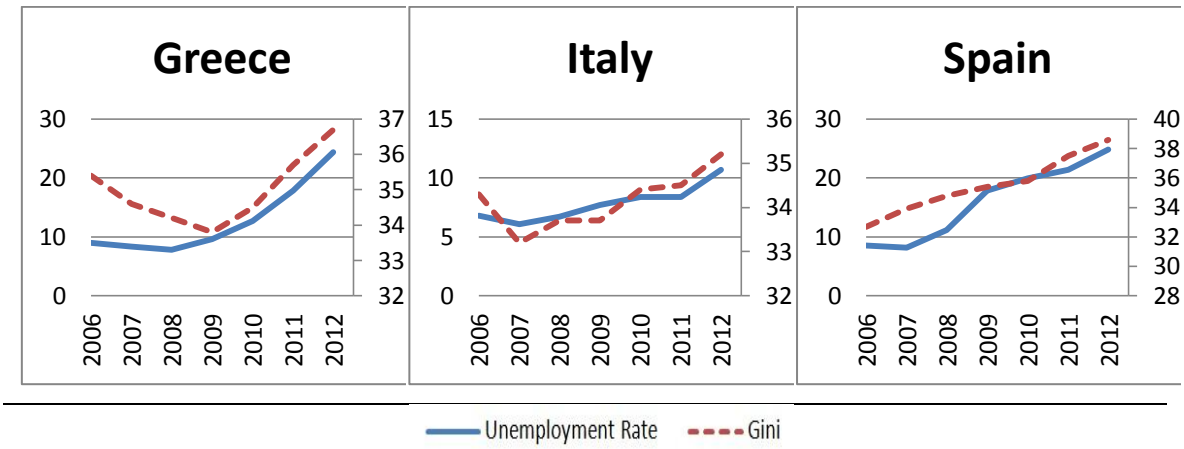
The role of trade unions is a significant determinant of the wage entity and partially explains the differences between high and low unionized countries. For example in English speaking countries where union density is low, there are high differences between salaries, but low unemployment. In continental Europe where unions are stronger, distribution of wages is more equal but it can be noticed more unemployment [Lemieux, 2008].

4.4 Labor Market

In recent years, earnings of workers have become more unequal in many countries. As we seen globalization and technical change played a major role in this trend, but also the labor market structure had a strong influence. Labor market influences the inequality level of a society. Labor market regulations affect the unemployment, gender equality and flexibility in the type of contracts. Each of these characteristic has an impact in the level of inequality a country has. In the attempt to measure income inequality, one of the most important factors to be considered is if people actually have an income. The higher wage inequality has been partially offset by a higher employment rate; however, not every social class experienced it. Employment rates among less educated people have fallen and unemployment remains high [OECD, 2008]. Unemployment is one key factor which increase the inequality and which lead individuals to worse their economic condition and damage their social position.

As result of the recent recession, unemployment rose in most of OECD countries. The official unemployment rate in the EU 16 countries using euro as currency rose to 10% at the end of 2009[16].

Graph 11-12-13: Comparison between Gini index and Unemployment Rate evolution in Greece, Italy and Spain between 2006 and 2012. (Source of data: World Bank for Gini, OECD for Unemployment Rate)



The three major countries in the euro zone which suffered the most an increase of unemployment rate are Italy, Greece and Spain. The graphs 6, 7 and 8 show the correlation between the increase of unemployment rates and the consequential increase of inequality. The correlation in these countries is clear, for other is less evident. The relation between unemployment and inequality is in fact much more complex and depends by other factors too. For example in countries where the state transfers for unemployed people are more consistent, the rise of inequality might be lower. France for instance, a country with a strong welfare guarantees more aids to unemployed people, as result inequality seems less linked to unemployment rates. Moreover there are problems of comparing the two measures as the inequality data are linked to annual income, but people might be unemployed just for some months. As result annual income could be under estimated and the resulted inequality over rated. Unemployment has a different effect in developed economies than developing ones. High unemployment has a secondary effect: if there are a lot of unemployed people, the labor supply grows

[16] *"Eurozone unemployment hits double digits"* UPI, January 8, 2010

and, considering the labor demand stable, wages will decline, make the inequality worse. Unemployment in developed economies is a particular serious issue due to direct monetary costs to both workers and employees and to the economy which operates at a level below its maximum potential.

At the other end, there are the top wages obtained by corporate executives' managers. An important part of their compensation is composed by stock options which make the distinction between wages and capital gains difficult to be identified. The increasing of top managements' compensation during recent years is astonishing and contributed in a remarkable way in amplify inequality level. According to the US Economic Policy institute from 1978 to 2014 the inflation adjusted CEO compensation increased of 997%, this trend becomes even more impressive if it is compared with the wage growth of the typical worker's annual compensation during the same period which is of just 10.9%[17]. The trend is recorded not only in US but also in different countries: UK's top managers are paid on average 143 times more than their average employee [High Pay Centre, 2014], in Italy a median wage earner needs around ten days of work to earn as much as his CEO in an hour[18]. The extremely high spread between median (or average) worker and top manager's income raises questions on the marginal productivity theory. As we previously said, according to this neoclassical theory, the compensation of a person is proportionate to his contribution to the profit and to the well-being of society in general. It is hard to assume that a top manager's skills, education and training are hundreds of time better than an average employee. Making a time comparison the productivity of top companies' management should have increased more than 9 times in 36 years in order to explain their higher wages. As for top earners in the financial industry, top managers' earnings often showed a distorted relation with their actual achievements, the compensation structure seems to have little to do with the real contribution to economic and social growth. Moreover high bonuses have led to an excessive risk raking which has contributed, especially in the financial sector, to a global instability [United

[17] "Top CEOs Make 300 Times More than Typical Workers", Lawrence Mishel and Alyssa Davis, Economic Policy Institute, June 2015
[18] "A week's wage", The Economist, June 2013

Nations, 2012]. According to IMF, the increasing of inequality in Germany, US, IK and in France has as main common cause the inequality of incomes from labor [Francese and Grandos, 2015].

The incidence of non standard forms of employment shows a strong increase in the last years. Part time employment for example represents the 19% of the total number of work contracts in the EU27. Temporary employments increased too and now have a share of 14% of the total number of working contracts [ETUI, 2012]. The vast majority of who have a temporary contract are young people. Most of them affirm that they have a temporary contract because they are not able to find a permanent one: in Spain for example, this statement is representative of 81% of youth population [ETUI, 2012]. The rising share of part time workers has some consequences: this category suffers a lower protection by the labor regulations and therefore in case of a global crisis or a shrink in a company's profit level, non full time workers are more at risk. In Europe temporary workers have been impacted hard by the recent crisis: in Spain ninety per cent of the jobs lost were represented by part time workers [United Nations, 2011]. One important issue of the modern labor market is the rising of in-work poverty. It is the rate of poverty risk (in Europe is fixed at 60% of the median household income) among the persons who are working. In Europe 8.4% of people who work is considered poor. It means that despite having a work, one person each twelve is considered indigent [ETUI, 2012]. This result is almost surely undervalued: as the income is measured in a family, it does not consider that young people often still live in the parental home, not having enough income to move to a proprietary house.

Changes in labor market, as consequence of policies that improve an implement the minimum wage can be determinant in reduce inequality. During the early 2000s, in some countries of Latin America, was recorded an important growth of minimum wages (in some cases, like Uruguay and Argentina it doubled [United Nation, 2014]). These changes have been a determinant driver of income inequality reduction.

Chapter Five: Consequences

It is now clear the evolution of income inequality in recent history, but why most of powerful people are afraid by the recent increasing of differences in developed economies? Which are the dangers our society will face if this trend continues? A high level of income inequality has several consequences. Inequality can reduce social cohesion and be a signal of low social mobility and lack of opportunities. Widening inequalities affects not only social indicators, but economic too. Inequality can reduce economic growth and macroeconomic stability. It can also affect the quality of political decision and lead to global crisis. The following topics are related with income inequality in both direct and indirect way.

5.1 Criminality

Inequality affects deeply social cohesion, reducing it in an important way. Social cohesion is difficult to measure, but an idea can be given by the impact of criminality in a society. Each of OECD countries has different criminal laws: a behavior which is considered legal in a country may be considered illegal in another one. At the same time, police efficiency can be different, in some countries could be better than others. Anyway, supposing similar police efficiency and criminal laws, it is interesting to compare some criminality indexes with income inequality.

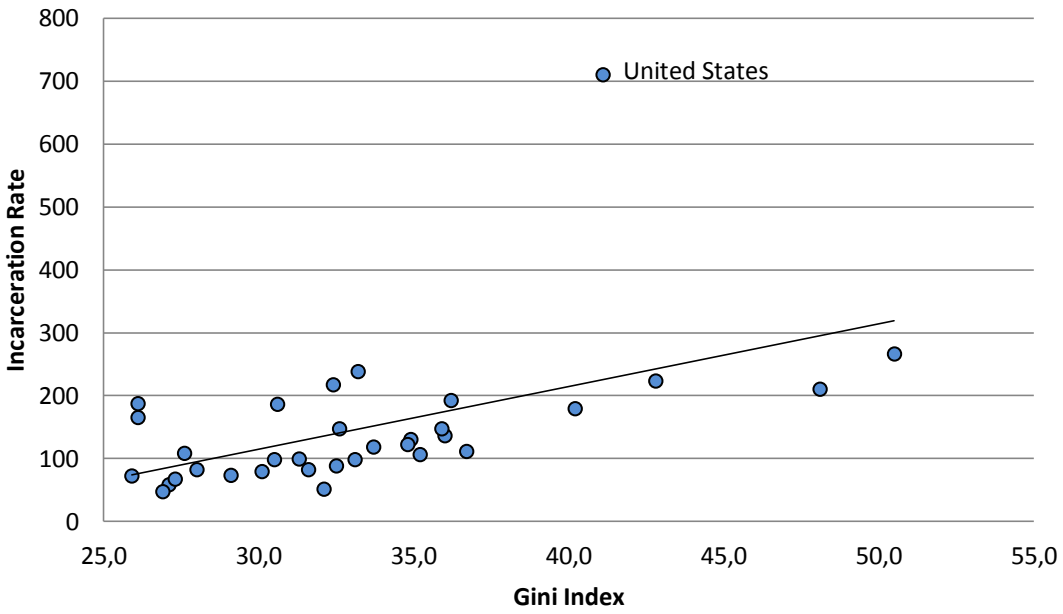
Incarceration rate is an important measure of social cohesion. It gives the number of inmate population each 100.000 citizens. Incarceration rates can give an idea of the number of crimes per citizen in a country. As we said, crime rates are linked with inequality: according to economics literature on crime, *"crime rates depend on the risks and penalties associated with apprehension and also on the difference between the potential gains from crime and the associated opportunity cost"* [Becker, 1968]. There are two facts about this sentence that have to be analyzed. The first one is that crime rates are correlated with the risk of being caught, and the years that the criminal may pass in prison. Where the risk of being caught is low or the penalty is short, it is likely that the crime rates will be high. Incarceration rate consequently is an underestimation of crime rate. The second

sentence that has to be analyzed is the one that affirms that crime rates get higher if the potential gains grow. According to this sentence, the more unequal a society is, the higher would be its crime rates because the wider the gap of wealth between rich and poor, the more the latter will have to gain at rich expenses.

Sociological theories on crime have observed that lower-class people, and people living in poorer areas, show a higher crime rates than other groups [Braithwaite, 1979]. The theory of "*relative deprivation*" affirms that inequality leads to reduce social cohesion, because the feeling of unfairness conducts poor to seek satisfaction even in non legal ways, at the damage of both rich and other poor people [Fajnzylber and Lederman, 2002]. Of course even rich people commit crimes, but the level of crimes committed by poor is usually higher and become even higher when inequality is broader.

The following chart puts in relation the inequality level (showed in the X axis, measured with Gini) with the incarceration rate (showed in Y axis, measures the number of inmates each 100.000 citizens) of 33 OECD countries.

Graph 14: Correlation between Incarceration Rate and Gini index in 33 Countries. (Sources: Incarceration rate from OECD statistics 2012/13, Gini from World Bank 2014)



The correlation is strong and clear. It could be even stronger if we do not take into account the measure of United States. This country present the highest incarceration rate per citizen among OECD area with a score of 710 inmates each 100.000 citizens, it means that an astonishing 2.2 million of US citizens are in jail. This rate is unusually high for OECD countries, in fact is the highest in the world[19]. An explanation of this anomaly is given by an international crime victims' survey which shows that general victimization rates in US are similar to the ones in Western Europe[20]. The important difference is that US has implemented laws, like "*mandatory minimum",* "*truth in sentencing*" and "*three strikes"* that imprison more types of criminal offender, and keep them in prison longer. Except the US case, the pattern is clear: more inequality leads to a higher incarceration rate (which is a consequence of higher crime rate). The impact of inmate population is not very relevant on government expenditure (According to the ministry of justice, the overall costs of the prison system in 2012-13 was more than 3 billion of pound [UK Ministry of Justice, 2014] which represents just the 0.1% of UK GDP). It is worth to say that to calculate the impact of maintaining the inmate population and the expenditures connected to prisons management are not the only factors related to crime rates. Adding to these costs the expenditures for police and for the public order, court costs and the reduced entity of investments, the impact of crimes on GDP would be higher. Not to mention the expenses and social consequences due to crimes and the loss of the contribution that inmates could provide to economic growth and to society in general.

5.2 Intergenerational Social Mobility

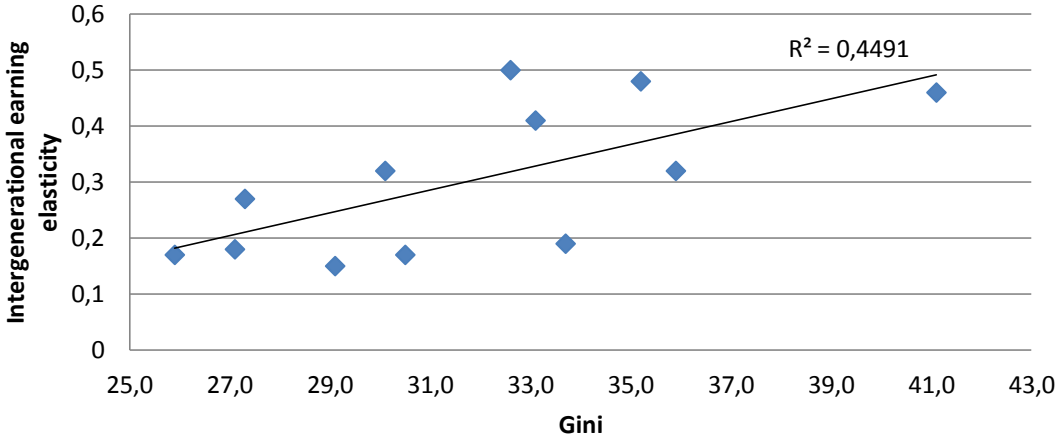
Intergenerational social mobility refers to the relationship between the economic situation of parents and the one that will be obtained by their children when they will grow up. If we look at intergenerational mobility, it can also be expressed as the probability of the children to improve (or worsen) their income condition in respect of the one of their parents. It is not the only measure for social mobility: intra-generational mobility takes into account the status changes within the life

[19] Aljazeera, "Five Things everyone should know about US Incarceration", 26 March 2013
[20] The Washington Post, "*Yes, US locks people up at a higher rate than any other country",* July 7, 2015

course, without relate it with the previous or subsequent generation. Intergenerational social mobility seems not related with income inequality because of the extent of the time take into consideration: while income inequality represents the distribution of income in a certain moment of time for a certain number of people, intergenerational social mobility analyzes the evolution of income across generation. The distribution of income of today however affects the distribution of income in the future, its effect last for more than one generation. Intergenerational social mobility therefore implies the simultaneous consideration of the social position of parents and their children, and it measures the dynamic impact of income inequality: concentration of income is not just a temporary situation, it affects society for a long period of time and interests more than one generation. The level of socioeconomic mobility in a society is an indicator of the extent of economic opportunities access and of human capital development.

As previously said, individual economic success is due to two different types of factors. The first one is represented by inner abilities, which change from person to person like talent or IQ. The second is the "environmental" factor: it may be family's social position and networks of people known. It is difficult to disentangle the effects produced by parents' economic status from the inherited abilities of their children. However across all countries, environmental factors have a major impact on a person's level of earning, although the impact of entity of the income achieved by the parents seems to have more influence in a child's future in Mediterranean European countries and in the UK [OECD, 2010] than in northern countries. Increase intergenerational social mobility may have positive effects on economic growth due to a better allocation of talents and of individual abilities in the society and economy.

Graph 9: Correlation between intergenerational earning elasticity and Inequality in 12 OECD countries. Sources: OECD, World Bank



The graph number 8 shows the relation between intergenerational earning elasticity and inequality. The higher the value of intergenerational earning elasticity, the greater is the persistence of earnings across generations, thus the lower is the social mobility across generation. If there is no intergenerational mobility at all the index scores 1. All poor children will become poor adults, all rich children, become rich adults. In the opposite scenario, with a value equal to 0, there are no relationship between family backgrounds and economic outcomes of children. The correlation between the two measures is very high: inequality explains almost 45% of the intergenerational earning elasticity. In general the countries with record the highest income inequality at a certain moment, exhibit also the highest income persistence across generation. Having a family with a high income in some countries determines high income level for its children. In some countries the social position of the family impacts almost for a half of its children success. The country with the highest intergenerational income mobility among the ones represented in the graph is Denmark: here just 15% of the difference between how much an individual earns and the average income is passed to the individual children. If the parents earn 10000 euro less than the average, the children will earn (on average) just 1500 euro less than the average income. The countries that scored the lowest income mobility are United Kingdom and Italy, where the elasticity index is almost 50%. Surprisingly, United States, the land of the American dream where hard work should be the key driver for success,

evidences a lack of income mobility too; here the index scores 47%. Moreover it is worthy to notice that in more unequal countries the absolute effect of intergenerational income mobility is higher than in the more equal ones. For example income distribution in Italy is wider than the one recorded in Denmark, so even if these two countries had the same intergenerational income elasticity, the absolute value of income effects would be higher in Italy, deepening inequality level more than in Denmark [D'Addio, 2007]. Even if the reliability of comparisons between countries is weakened by different data collecting methodology, generally the results highlight a higher social mobility in developed countries than in developing ones. These results are explained through the fewer opportunities for developing human capital in developing countries, which usually show a reduced access to quality education and a low level of job opportunities [United Nations, 2011]. There seems to be a correlation between the social mobility and the composition of society: countries with a small middle class present fewer opportunities for mobility. Analyzing the population divided in income quintiles, bottom and top quintile presented a lower degree of mobility while there are more opportunities to change the level of income for the quintiles near to the median [D'Addio, 2007]. A comparison between US and Canada analyzed the social mobility experienced by individuals raised by top decile and bottom decile parents. It turns out that US children were much more likely to occupy the same decile of their parents than in Canada. In US more than half of the children raised by top decile income parents falls above the 8^{th} decile, while in Canada there is less stickiness at the top and a much higher percentage of bottom decile children to rise in the top half of income distribution [Corak, 2003]. As result US records half of the social mobility of Canada, but interestingly, if the analysis is limited to the middle class, the degree of mobility in the two countries is very similar.

Children's future incomes are correlated with the one obtained by parents, but earnings are not the only source of income which is transmitted across generation. Parents can affect their descendent economic outcomes in several ways. Schooling choice is one of them: parents can prefer private investment in education, providing to their children a higher quality than the one obtained in public schools.

Parents can however increase the opportunity of their children to have a better socio economic position in the society also with transmission of social norms, work ethics and social networks, moreover in wealthy environments criminality rates are usually lower [OECD, 2010]. Even if these factors may be considered important, the literature suggests that parental income is one of the best predictors of future life chances of children. Results from several studies suggest that the wealth at disposal is even more correlated across generations than incomes earnings [D'Addio, 2007]. The high correlation of wealth across generations can be imputed to several factors like favorable fiscal rules on the taxation of inheritances in the developed countries (in Australia, Austria, Canada, Russia there is no inheritance tax at all, while in US the inheritance tax for US residents is applied only for real estate's which value is above 5.34 million of dollar, which means that just the 0.2% of estates have to pay any inheritance tax [EY, 2014]) or fertility rates (which are particularly low in the western world and therefore are considered a factor which increase the wealth concentration). Moreover it is possible that the propensity to save is similar for parents and children, as result it is more probable that wealth is maintained or increase across generations. Intergenerational transmission of wealth elasticity rate is higher for the wealthiest families; it is estimated to reach the 0.76 in US (the intergenerational earning elasticity for US is lower and scores 0.47). According to the Credit Suisse [2012], inheritance is an important component of wealth. For example, of the total 1226 billionaires on 2012 Forbes list, the 31% inherited a consistent part of their wealth from their relatives. It means than little more than two third of the billionaires were self made. Inheritance is important not only for top incomes earners but also for middle class as in many European countries between 12% and 26% of individuals declare to be home owner thanks to an inheritance [D'Addio, 2007]. The same Credit Suisse report [2012] suggests that inherited wealth accounts for almost half of the total wealth in OECD countries. In low growth or traditional societies, the share is likely to be higher. This relation is very important, it means that the higher is the inequality level in one country, the more probable is that this high level is maintained (or increased) in the future. One explanation is that with higher wage or income dispersion, returns to education

tends to be higher. As consequence individuals whose investments in education are not constrained by their family budget may benefit of bigger returns.

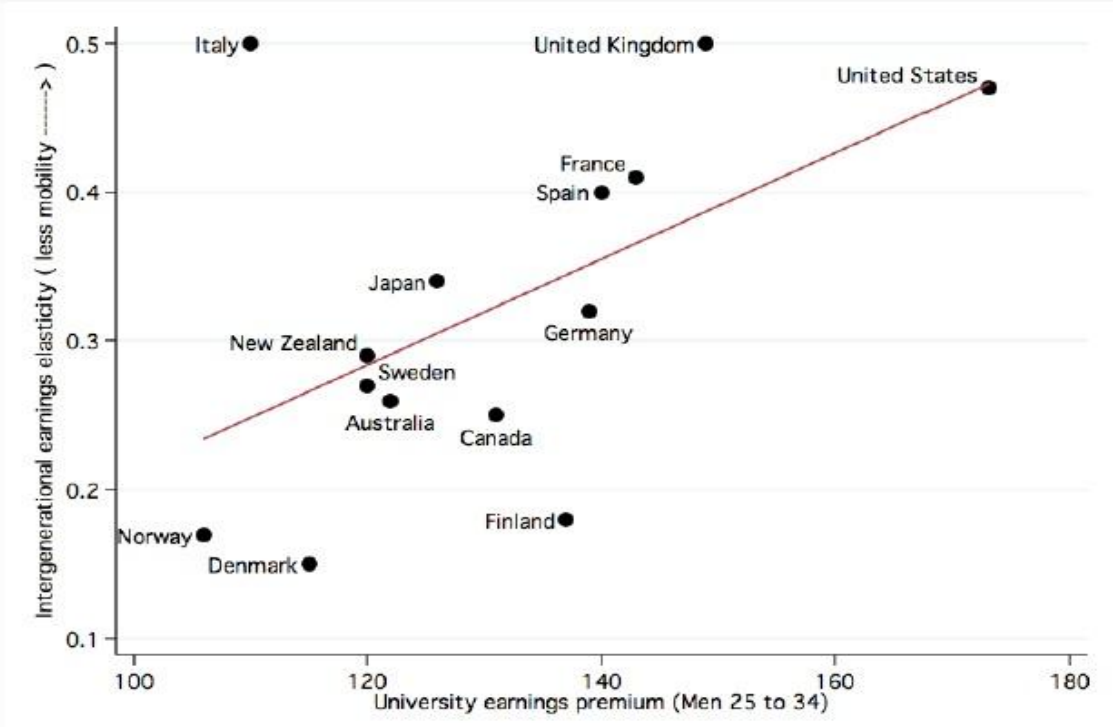
At the other end of distribution, the poorest part of population shows a high rate of intergenerational transmission of welfare income. It is reported that if parents used to rely on welfare income, their children will be more likely to receive a redistribution income. According to Page [2004], in US the intergenerational correlation coefficient for welfare is 0.32 with a three times higher probability to get a welfare contribution for individuals which received it during their childhood compared with who did not obtained any. Similar correlations degree where reported also in New Zealand, Australia and Sweden [D'Addio, 2007]. Inheritance welfare participation may be due to a reduce cost of participation to social aids for children who had already experienced the procedures to obtain them, but is likely that a lack of social mobility reduces the opportunities to improve the social condition and forces individuals to rely more in welfare transfers. A strong importance in the degree of welfare transmission is represented by the structure of welfare transfers: if the structure is purely passive (made just with in kind transfers, which assure an income, but not the opportunity to improve the socio economic position) it is more likely that the transmission across generation will be higher. When the welfare policies are more active and have a role in improve the human capital, for example with specialization courses which help to develop useful skill in the labor market, the welfare transmission rate is lower [D'Addio, 2007].

If the intergenerational persistence in income is deeper studied, we discover that education is one of the major factor that influences social mobility. Education determines human capital, and human capital is a key determinant of individual income. In some European countries like Ireland, Italy, Spain and United Kingdom, direct linkages between father's level of education and children's individual wage appear important [OECD, 2010]. Given that education level is determinant in defining the entity of wages, seems that education level of father determines education level of children and, as consequence, their income. Across all European OECD countries, coming from a family where the father has a tertiary degree

increases the probability of achieving tertiary education. The probability of achieving tertiary education if the child grows up in a lower educated family drops significantly. This mechanism affects society at a deep level. Differences in education leads to differences in wages, both are transmitted to the next generation, making society less mobile and reducing equity of opportunity generation after generation. Without proper policies, it is a self-perpetuating cycle. Some studies highlight that income mobility is higher in countries which promote public education than in the ones which present a higher share of private education [Solon, 2004] [Davies, 2005]. Policies designed in order to increase the quality and the access of college education have a strong role in improve the efficiency of the economy and to increase intergenerational income mobility, and reduce also income inequality in a long run. The comprehensive reform of education system implemented in Finland for example reduced intergenerational income correlation by seven percentage points, similar results were recorded in Sweden and Norway as effect of similar policies implementation [D'Addio, 2007].

Not only the access, but even the returns to education are an important factor in influencing intergenerational income mobility. The higher is the return to education, the higher are the incentives to invest in children education (for parents that can afford it) [Corak, 2013].

Graph 106: Correlation between Return in Education and Intergenerational Earnings Elasticity on 14 countries. Source: OECD, Corak (2013)



In the previous graph are compared the already seen intergenerational earning elasticity with the university earnings premium per country. University earning premium is calculated taking into analysis men from 25 to 34 years old and comparing the differences in earnings obtained by the ones with a college degree and their counterparts with a high school diploma. There is a correlation between the education premium and the intergenerational earnings mobility: in countries where the earning premium for graduates is higher, the social mobility tends to be lower. An important exception in this trend is represented by Italy, which presents the lowest social mobility (together with United Kingdom) and the second lowest social mobility among the countries considered. A high premium for tertiary education produces income inequality among individuals of the same generation, but the effect does not end during the lifetime of an individual. As we previously seen the probabilities for children to achieve a college degree are higher if their parents have obtained a tertiary education. The increase of probability is particular strong in Italy, Finland and Denmark where it is 30 percentage points higher, but is relevant even if United Kingdom (21%) and in France (23%) [Causa

and Johansson, 2009]. It is therefore more probable that the higher income obtained by parents with tertiary education will be invested in their children education, which will have more probability to achieve a college degree, gain more, and increase their socio economic position in respect to their non graduated counterparts. This trend is stronger in countries like US where college tuition fees are particularly high, and therefore the access to tertiary education is more difficult for low income families. The effect is an increase of income inequality level and moreover a lower intergenerational mobility of earnings. The second correlation it is not temporary, but holds over time: according to Maumder [2012] the increase of college returns in US from a level of 9% in 1980 to about 13% in 2000 was matched by an increase in the father-son intergenerational earning elasticity level which passed from 0.38 to about 0.55. The correlation between college premium and social mobility underlines the importance of education in determining income inequality level. Accordingly, in countries where tuition fees are absent or where it is essentially free to go to college (like Norway, Denmark, Finland, Sweden and Germany) social mobility is higher and income inequality is lower. Public policies are determinant in this topic. Cross country evidence suggests that a more progressive taxation (higher tax rate to higher incomes) is related with a lower influence of the socio economic background on students' achievement in secondary schools [OECD, 2010].

Apparently the degree of equality of opportunities can be related with the level of social mobility. With perfectly distributed opportunities, the probability for children to occupy the top decile income when they grow up would be equal for the ones raised by poor parents as for the ones raised by rich parents. In this case there should be a high social mobility. However in theory it is possible to record a high degree of social mobility even if the opportunities are unequally distributed. If for example a hypothetic society implements policies in favor of the poorest, offering to them the best education, and more possibility to improve their income while making harder for the richest to maintain their level of income, the resulted social mobility would be high. Poor people children would be more likely to improve their social position, while individuals raised by rich would encounter

much more difficulties to maintain the social position of their parents. In this scenario intergenerational social mobility would be considerable even if the opportunities were much more concentrated in the lowest section of incomes distribution. The precedent scenario however does not fit with the reality, at least the one experienced by OECD countries. It is much more likely that the distribution of opportunities is, as we seen; more concentrated on top income earners. A higher level of opportunities on the top of income distribution earners seems the main causes of the reduction of social mobility. If richest parents are more able to improve their children economic aspiration, while the poorest are less able, or not able at all, to do the same; social mobility will be reduced. The relation between the distribution of opportunities and the level of social mobility is complex, not everybody agrees that if intergenerational income mobility is low, it means that opportunities of improving the economic situation of children are unequally distributed. In fact the opportunity to increase the social position not always produces an effective better off. Personal choices are a key factor in achieve a better position on the social ladder, and cannot be related with the distribution of opportunities.

The high level of correlation between income inequality and social mobility seems to evidence that equality of opportunity is weakened by the level of concentration of income. If equality of opportunities would be completely disconnected by the distribution of income, there should be no relation with intergenerational social mobility. While some countries, like Australia and Canada which present a high social mobility even with a relative high level of inequality (compared for example with many European countries), seem to show no relations with the two measures, the majority of countries on the contrary reveal a strong correlation. The exception of Australia and Canada may be due to the higher mobility and income inequality scored by immigrants, by education friendly policies or just to a temporary situation that will be normalized in the future [D'Addio, 2007]. The last hypothesis seems to be confirmed by a 2015 study [Mendolia and Siminsky] which presented a new estimation of intergenerational income mobility rate for Australia of 0.35 (it was less than 0.2 in the estimations used in the 2007 D'addio report). If the

distribution of income recorded in a particular moment produces a discrimination of the incomes obtained by individuals of the subsequent generations, it seems clear that there is a negative correlation between income inequality and equality of opportunities. The American dream or the belief that no matter of its socio economic origins, if an individual works hard, will improve its economical condition seems to be more a dream than the reality. The high level of income inequality in US is probably been accepted because of the opportunity to move up in the social ladder. The real scenario seems to be totally different today; US occupy one of the last positions in terms of social mobility in OECD countries. The evidences collected seem to highlight that (at least in high incomes countries) increasing inequality is likely to weaken the social and economic mobility across more than one generation.

5.3 Crisis

The growing share of the very rich in total income is often identified as one of the causes of the two major financial crises of 1929 and 2008 [United Nations, 2012]. Especially for the still unresolved 2008 financial crises, inequality level and indebtedness are some of the major contributors of the economic instability. Even before the recent financial crisis, there was the idea that wealth inequality was a key factor in financial bubbles creation: the greater the inequality, the greater the bubble and, consequently, the greater its negative effects [Rowlingson, 2011]. Evidence in support of this theory is that the super rich have much more wealth that the one they need for consumption; therefore they address a vast amount of financial capital in the search of profitable investments, usually in the financial sector. In 2009 Milanovic affirmed that the real cause of the crisis was not to be found in hedge funds or others financial institutions, but rather in huge inequalities in income distribution. These inequalities generated larger than optimal huge funds.

Inequality can generate a greater market volatility and instability through its impact on the finance driven business cycle [Galbraith, 2012]. Some of the empirical evidences in support of this theory are provided by the measurement of

inequality level before financial crisis. More specifically analyzing the Great Depression of the 1929 and the more recent Great Recession it is possible to find that both were preceded by sharp increases in income and wealth inequality and a rise in the debt-income ratio among middle and lower class [Kumhof and Rancière, 2010]. Inequality was just one among many of the factors which triggered the two global crisis, other causes were find to be a wage stagnation and the financial deregulation; however the concentration of incomes is one of the most important ones [United Nations, 2011].

The relationship between inequalities and crisis is not one way. In fact economic crisis tend to create or deepen the already existing inequalities. As result, increasing inequality can lead to a crisis, which may have the effect to further increase inequality in a self perpetuating process. Financial crisis reduce the amount of money collected through taxation and as effect limit the spending capacity of states. In this scenario, countries have two choices: maintain the level of spending financing it with new debt, or cut the expenses. In European countries where the deficit GDP ratio cannot be above a certain level, the options are limited and the solution is to reduce the expenses and implement more austerity measures. During the recent crisis, many governments have been obliged to reduce public spending in socially sensitive areas like education or redistribution. Aids to the poorest have been reduced in the moment they were needed the most, increasing in this way the level of inequality in several countries [United Nations, 2011].

5.4 Economic growth

As we seen until this moment, inequality has several consequences which are mainly of social nature. There are worries that an increasing concentration of income and wealth will result in populist and protectionist sentiments and, as consequence, to a political instability. Moreover many economists like Picketty, Saez and Stiglitz underline that it is likely that income inequality and financial crisis are linked, if this turn to be true, concentration of income would be

considered as an important index for sustainable growth. Social issues have an impact on economic growth; income inequality is not an exception and affects in a considerable way the GDP outcome.

The relationship between inequality and economic growth is complex. Over the last years a large number of theoretical and empirical studies tried to determine the influence between these two measures, in particular if inequalities contribute in a positive or negative way to economics. The conclusions are divergent for theoretical researches. The front that affirms that income inequality reduces economic growth sustains various theories. Greater income inequality will become unacceptable for the citizens, in order to contrast this situation they will be more willing to promote a higher tax rate for the richest and a wider redistribution [Bertola, 1993]. Income inequality may also lead to political instability which will harm the economic situation of the country. A second consequence of income inequality on economic growth may be on consumption. Poor individuals' opportunity to spend is reduced as income inequality increases. Lower income households will have to renounce to children education if their income is not enough to permit to afford for it, or will reduce consumption of other goods. As result there is an under investment on human capital which over long term horizon, will reduce economic growth under its optimal level. The poorest spend almost all their income, which is not a lot, the richest spend much more, but it is just a little percentage of their gains. Middle class on other hand have more money than the poor, and spend a higher percentage of their income than the richest. Middle class is a key factor for economic growth. If the middle class real incomes struggled, as happened during the recent crisis, their consumptions habit will be harmed, and consequently it will harm the economic growth. Inequality effects are an under consumption and an under investment in human capital.

A contribution on the negative relationship between inequality and economic growth is represented by the empirical analysis made by Roland Bénabou [1996] of the economic evolution of two similar countries in the sixties: South Korea and Philippines. In the early 60s the two countries were similar in major economic aggregates like GDP, manufacturing share, and the composition of the export; even

the social indexes, for example school enrollment, population and urbanization were alike, moreover they are relatively close in geographical terms. In the next 25 years Philippines scored an average growth of 2% percent while Korea reached an average of 6%. According to Bénabou the difference levels of inequality in the 60s is the key element that explains this economic gap. South Korea inequality was in fact 17 percentage points lower than the one of Philippines, and the income ratio between the top and bottom quintile was just the half. However, sentencing that the higher income inequality in the Philippines in early 60s is the reason behind the lower economic growth in respect to South Korea is just a partial explanation. There are other possible causes for the differences in the economic growth of the two countries: Philippines in the 60s were a dictatorship country while in South Korea there was ruled by a republic government, geographically Philippines are an archipelago of more than 7 thousand islands while South Korea is basically a peninsula, which involve an easier background for the implementation of infrastructures, just to mention two other possible explanations for the economic gap. By the late 1990s, in order to investigate the relationship between inequality and economic growth, economists used to follow the same approach used by Bénabou: relate the income distribution of a country with growth rate for a long period of time (As we seen, Bénabou used a period of 25 years to compare South Korea and Philippines). The analysis was extended for a few other key variables, like population and school attendance rates. The results were interpreted by economists with a general consensus toward a negative relation between inequality level and economic growth, even if the evidences were admittedly not robust [Barro, 1999].

Sustainers of the theory that increasing inequality has a positive effect on economic growth present other opinion. Some degree of inequality has shown to be useful in pursuing economic growth, while to chase a more equal society may harm it. Inequality may be constructive, stimulating capital accumulation and technological innovation, increasing the potential investments in better quality education and health care [United Nations, 2011]. High inequality provides motivation for the poorest people. Work harder and risk more give higher returns,

and will permit to improve their social and economical position. Another aspect that sustainers of inequality present is that wealthy people are a source of investment for the economy. Redistribution is seen as a threat for economic growth: minimum wages, taxation and other public policies are costly; moreover it lead to tax burden which means that when the rich pay taxes that will be used for sustaining poor people, a part of them is lost for public administration inefficiencies.

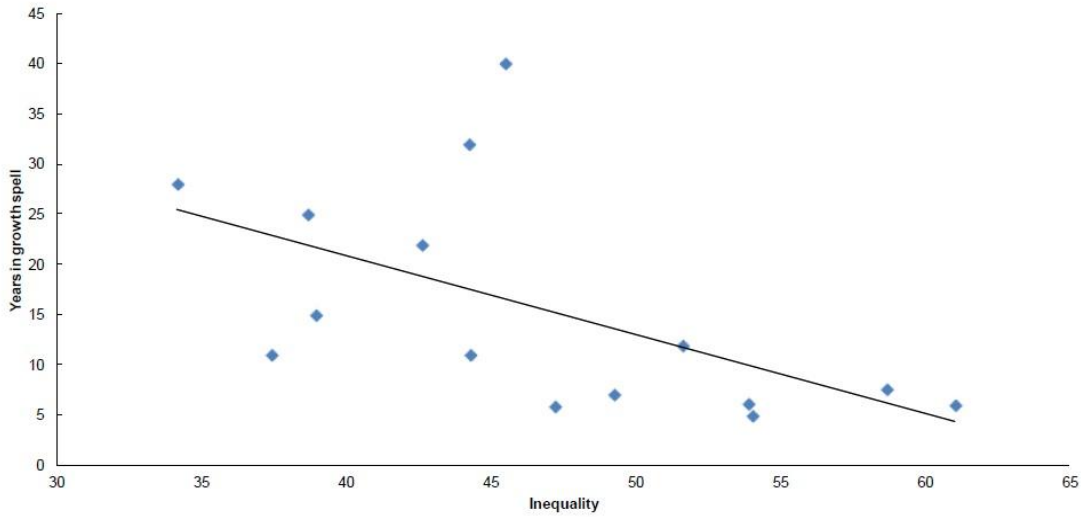
The typical approach used changed, and attention turned to analysis of panel data in order to examine the relationship between inequality and growth in a subsequent medium term, typically five years [Berg and Ostry, 2011]. Empirical studies conducted by Forbes [2000] found that an increase of inequality is positively related with economic growth, at least in the short term. This relationship is robust and demonstrated from the experience of various countries, notwithstanding, as the same author admitted; in the long run the correlation may weaken. In fact there is a strong positive correlation between the levels of corruption and inequality, at the same time corruption is negatively related with economic growth in long term. Moreover Forbes underlines that a higher share of government spending (for example in education and basic health care) impacts in a positive way on economic growth, even if they are inequality adverse policies. Another study in 2003 leaded to a new different conclusion that shows the complexity of the relationship between inequality and growth. The result of this study affirms that a change in either direction of inequality level was associated with a reduction of economic growth. The interpretation was that, in a short to medium term horizon, redistribution policies affect in a negative way growth [Banerjee and Duflo, 2003].

The main critic for these results is that the time horizon considered is too short. According to Pritchett [2000] to more correctly measure the relationship between inequality and economic growth it is necessary to consider a longer period of time. In this way, temporary events such recoveries and small recessions, will impact less on the overall results. Moreover, in order to obtain important social results like reducing poverty, it is important to implement policies that promote

sustaining growth over long term, which is more challenging that just igniting growth in a short term [Hausmann, Pritchett and Rodrik, 2005]. A more recent study, published by IMF sustains this position, affirming that attention to inequality can bring significant benefit for economic growth in a long time perspective, therefore reducing inequality and promoting growth may be two sides of the same coin [Berg and Ostry, 2011].

As we seen, even if the theories and have an opposite evaluation on the relationship between inequality and economic growth, both are sustained by empirical studies. Until just few years ago, the position sustained by the majority of economists was that inequality may be unfair, but is good for economic growth [Keeley, 2014]. However, in recent years, empirical studies on inequality were made, the data collection improved and new analysis techniques were developed. Taking into analysis the length of the growth spells instead the average growth in a medium period of time with the level of inequality measured by the Gini index, Berg and Ostry [2011] obtained a pattern.

Graph 117: Duration of Growth Spells and Inequality. Source: Penn World Tables and Wider World Income Inequality Database.



In the y axis of the diagram are set the number of subsequent years a country experienced economic growth. To improve the materiality of the results, the considered length of the spells is 5 years or more. The pattern seems to indicate that a low level of inequality is determinant in order to achieve a long, sustainable

growth [Berg and Ostry, 2011]. Countries with a low inequality level tend to experience longer growth period, while in unequal countries it fades more quickly and be slower [Berg and Ostry, 2011]. There are several factors which affect the length of economic growth duration like trade liberalizations, competitiveness or political institution's development; however inequality is indeed a large and statistically significant factor that impact in the economic growth. In fact it is also one of the most important variables in determining spell duration, it is calculated that a 10 percentile decrease in inequality increases the expected length of a growth spell by 50 per cent [Berg and Ostry, 2011].

The recent crisis and the apparently unstoppable raise of inequality contributed in identify inequality as one of the most important issues of our time and a danger for economic growth. In recent years institution like IMF, the OECD and even multinational companies like Standard & Poor's started to affirms that too much income inequality harms economic growth in a significantly manner [Keeley, 2014].

An OECD report concludes that inequality had caused a loss of more than 10 percentage points of economic growth in Mexico in the two decades before the great recession. As we seen Mexico scored one the highest inequality level of the OECD area, with a Gini coefficient of 0.48 in 2012, which is second only to Chile[21]. In Italy, United Kingdom and United States, three countries with a Gini coefficient that goes from 0.33 to 0.4 the growth would have been from 6 to 9 percentage points higher if their income inequality level would had remain at the level of the 90s [OECD, 2014]. An IMF report disproves the idea that increasing the income of the wealthiest people has the effect of boost economic growth. In fact, it reveals that an increase of one percentage point of income obtained by the richest quintile of population will drag down economic growth by 0.08 percentage points in five years[22]. As the wealthiest became richer, the economy will suffer. On the other hand, with a rise of the bottom 20 per cent of the incomes, the economy would be boosted.

[21] OECD Income Distribution Database (IDD)
[22] The Economist, "How Inequality affects Growth" June 2015

Another interest finding appears when inequality within the tails is analyzed. As we have underline before, Gini index has a decomposability problem, which makes hard to analyze inequality in one or more subgroup of a distribution. If different measures of inequality, like Atkinson index or ratios, are used, it became possible to study inequality within top earners or within bottom earners. The results of the analysis suggest that economic growth is more positively affected by a reduction of disparities of the poorest income gainers, than a reduction of the top incomes. Estimations of OECD affirm that lowering bottom inequality by half of a standard deviation would increase annual growth by 0.3 percentage points over 25 years, with a compounded gain in GDP of 7% during this period [Cingano, 2014]. Reducing the distance of the lowest decile from the average produces the strongest positive effect on growth. But also when the simulation is made on the second, third and fourth income decile the effects on growth are similar in magnitude as the ones achieved with the lowest decile. On the other hand, reductions of top incomes produce no statistically significant impact on economic growth. Top income data are more sensible to underestimation as we have highlighted when analyzing the surveys, however the results are considered acceptable. These findings reveal that, in order to achieve higher levels of economic growth, it is necessary to focus on improving the situation of the poorest, while reducing the income of the richest is less effective. Moreover, it is worthwhile to focus not only on the poorest 10 percent of population, but on the bottom 40%, as from an increase of their income economic growth will benefit. These results seem to confirm the utility of the Palma index, as it measures the differences between the top 10% and the bottom 40%. The most effective reduction in inequality are made changing these sub groups, also the effects on economic growth are maximized if the focus is on the bottom group.

Reducing the “distance” between the income of the poorest and the median income produces a positive impact on economic growth mainly thanks from a wider access of tertiary education. According to the human capital accumulation theory, inequality is dangerous for economic growth because it raises the relative costs of education, especially for the household in the bottom half of the income

distribution. This theory is supported by recent empirical studies, which analyzed the relations between short-term and long term growth rates with the development of human capital. The study was based on 21 OECD countries and the results highlight a positive and significant impact on the long run growth due to human capital development grade [Cingano, 2014]. Data suggest that one key method to lower inequality and increasing economic performances is making more affordable investments opportunities, particularly on education, for the poorest group of population. A free and of good quality education may be a valuable investment in order to increase economic growth while reducing income inequalities.

A recent study affirms that generally increased inequality may shorten growth duration in a long term horizon, but an important role in economic development is played by the policies that affect the income distribution. In fact poorly designed policies implemented in order to contrast inequality may create a distortion on incentives which can undermine growth and, as effect, hurt the poor [Berg and Ostry, 2011].

5.5 Taxes and Redistribution

Taxes and redistribution can be considered a factor that is a cause, a consequence of inequality. Poorly designed taxation policies, like reduce tax rates for top income earners are definitely a cause of inequality. Redistribution policies on the contrary are a consequence because it is a system that is implemented when the level of inequality is too high. Fiscal policies are important in order to increase or lower income inequality because they affect the income effectively obtained: the stronger the redistribution policies are, the higher is the reduction of income inequality levels. Fiscal policies impact on income inequality is very different from country to country: apparently the main key factor for its success is the development level of the economy. When the measure of income inequality is made on gross income, there are no significant differences between developed and developing economies, but when inequality is measured on income after taxes and redistribution, the difference is impressive. In developed countries Gini index fell by 13 points in the comparison between gross and after tax income, in developing economies the reduction is just 2 points [United Nations, 2012]. It seems that richer countries are better to reduce gross income inequality than the poorer ones. However in all income countries the difference of inequality before and after taxes is significant. These data clearly highlight the importance of social policies and of progressive fiscal system implemented by governments. To implement effective fiscal policies is necessary a strong political will. The wealthiest part of population is the one who have more to lose from a redistribution policy, and often is the part of population that can lobbying government's exponents. Top income earners have divergent interests than the other part of population. With a greater opportunity of investing in education and healthcare, it is preferable to have higher quality schools and better hospitals even if they are more expansive. Therefore this part of population will be more willing to pay for these services privately than to contribute with taxation in order to expand their access to the poorest.

Redistribution policies are a useful tool, when correctly combined with the fiscal system, in order to obtain a reduction of inequality. The OECD observed that the entity of change between gross and after taxes income inequality has declined in

recent years, probably as effect of globalization and deregulation policies. Fiscal policies became more regressive, reducing their rate on top income earners. The goal was to improve the gains of the richest in the hope of obtain the effect of an increase of economic growth. This theory is well exemplified by the tax cuts operated by United States' president Reagan. Over the course of his two terms as president, the taxation of top individual income tax rate went from 70 per cent to 28 per cent. The number of tax brackets before Reagan were 16, ranging from 14% to 70%, after his presidency there were just two brackets with marginal rates ranging from 15% to 28%[23]. This impressive regressive change on taxation, was motivated by the expectation that from the reduction of tax rates on top income, the state would have gain more money, thanks to an increase of savings and a higher occupation rate [Stiglitz, 2012]. However the only effect obtained was a reduction of tax revenues for the government. Bush era followed the example of Reagan and the results were the same: an increase of the deficit level.

The effects of taxes and redistribution on inequality started to decline soon after the Reagan's presidency, since the 1990s not only in US but in many other countries. The redistributive capacity was particularly harmed on the benefit side. Cut to benefit levels and the failure of transfers to the poorest group of population were the effect of the attempt to contain public expenditure. The reduction trend in redistribution is one key factor of the increasing inequality, according to the Asian Development Bank a progressive tax system has a considerable impact in reducing inequality, but cash and in kind transfers can help even more. Redistribution had contributed to a reduction of inequality in many countries of Latin America, with the best result in Argentina, where Gini index fell by almost 7% points [United Nations, 2014]. Similar programs have been replicated in some Asian countries like Pakistan and Philippines, with the hope to reduce poverty and inequality in Asia. According to OECD, social expenditures such as basic education and social health care reduced income inequality on average by one fifth maintaining a constant expenditure on GDP since year 2000.

[23] The daily caller, "Ronald Reagan raised taxes 11 times? The real story", June 2012

Recent OECD studies were focused on top incomes and its relative tax rates. As top earners now have a greater ability to pay taxes than in the past, a change in the tax systems is necessary in order to ensure a fair contribution of the wealthiest individuals to the whole society. This effect can be achieved not only increasing the marginal tax rate for the top incomes, but even through the elimination of tax deductions which usually benefit much more the wealthiest than the poorest [Cingano, 2014].

Social transfers and taxes play a major role in reducing the level of inequality within a country. Both have direct effects on the concentration of income, the degree of the impact is correlated to the level of progressiveness of fiscal system [United Nations, 2013]. In the OECD area, taxes and transfers have a significant redistributive impact: on average Gini index before a tax is reduced by about a quarter after the taxation [Joumard and Bloch, 2012]. Usually high direct taxes on income and property are considered progressive as they hit with a higher rate the top incomes and the properties of the richest. Indirect taxes are considered a regressive taxation method because hit with the same taxation rate the consumption without discriminating rich from poor. The progressivity / regressivity of a tax or a transfer is measured by comparing the amount of transfers across different quintiles (or deciles) [Lustig, 2013]. If the transfer comes from a quintile above the median to a quintile below the median, the transfer is considered progressive. The same when a tax rate is higher for a quintile above the median than for a quintile below it.

In a sample of 36 countries, social transfers have had higher effectiveness in reduce inequality than taxes: of the observed reduction of Gini Index after taxes and redistribution, 85% is a consequence of social transfers while only 15% of such reduction is due to the effect of taxes [United Nations, 2014]. In member countries of the OECD an increase of 1 percent in social transfers corresponds to a reduction of inequality of 0.3 percent, the effect of the same increase in tax rate is almost negligible [United Nations, 2014].

The role of redistribution in reduce inequality is determinant, but to be truly effective redistribution policies must be supported by a strong political will. The recent growth of inequality can be explained also with the global policy shift toward less Government intervention on markets and, as consequence, a decline of efforts in redistributive policies. With some exceptions, policies have not become increasingly redistributive as inequality has grown [United Nations, 2014]. An empirical study on Latin America's countries, where the level of inequality is historically high, highlights the positive effects of direct taxes on personal income: in Uruguay and Mexico direct taxes are responsible for a reduction of the Gini index of 2.8 and 2.6 percent respectively [Lustig, 2013].

In theory, when inequality is above the acceptable level, voters start to evaluate more the advantages of redistributive policies, and are more willing to sustain an intervention of the state in the economy. There should be some evidences that more unequal countries experience a stronger pressure to increase trade and capital regulations, more impact of welfare policies and a stronger labor protection. This theory does not find confirms in practice, at least in OECD area. Taking as example the ecperience of US, one of the most unequal countries in the area, with the highest income inequality pre tax shows the lowest redistribution level [Benabou, 1996].

Solon [2014] affirms that progressive policies have an important role in reducing the level of inequality. Taking as example the public contribution on education, it is not important just the entity of the investment, but also how it is structured. If the public programs are addressed to benefit the lower part of population in terms of income distribution, for example widening the access to quality education in the early childhood is likely to be more effective in reduce income inequality than if it was directed in private tertiary education accessible only to the richest. According to Corak [2013] this approach should be applied in all aspects of public policies which have influence on the relationship between families and labor market such as healthcare, taxes and transfers.

Chapter Six: Perceptions about Income Inequality

As we seen, income inequality affects our social and economical life. Criminality, low social mobility, poverty are just some of the consequences that are related with the increasing inequality in our country and more in general in the world. Income concentration is recently worrying the most powerful personalities in the world, from US president Barack Obama to the IMF director Christine Lagarde. Even if at its beginning the recent global financial crisis, hit the richest part of population, which income depends in a relevant share from stock market's situation, in the long run middle and lower class suffered the most. As inequality hits harder the middle and lower class, this part of population should be sensible to this issue. But do we really know how high inequality level is?

The first step required in order to solve a problem is admit to have one. To reduce income inequality to a sustainable level it is important to understand if the population is aware of how income is distributed in their own country. If the population is correctly informed, it will be more able to critically evaluate the political campaign and therefore to vote for the candidate which is more sensible to people's problem. If for example people underestimate the level of inequality of their country, probably there will be fewer consensuses for a measure which aims to reduce it, or for a politician which ask for more investments in redistribution policies. An informed population represents the first step for a change. Fortunately the voting power is perfectly equally distributed in democratic countries, the vote of a top 1% income earner values exactly the same as the one of the poorest individual.

The idea for this survey comes from the results presented by a Harvard professor, Michael I. Norton. In his 2011 paper, "*Building a better America, One wealth quintile at a time*" he presented the results of a survey conducted over more than five thousand Americans. The survey was divided in two questions, the first one asked to choose between three different distributions of wealth, the one which they considered the closer to their ideal distribution. In fact the three different distributions were: a perfectly equal distribution of wealth, the wealth distribution

of US and the wealth distribution of US. The second group of questions asked to Americans to assign the share of total wealth that they thought was owned by each quintile of US population. The data collected highlighted that Americans underestimates the actual level of wealth inequality in US. A similar survey was conducted in Canada and in the UK highlighting a considerable information gap between the estimation and the reality. I have decided to conduct a similar one in Italy.

6.1 The Survey

Income inequality in Italy is not at the level recorded in US or in Mexico, but it is higher than the OECD average. Gini index in Italy is 0.33 while the OECD average is 0.32, and the ratio between the top 10% income earners and the bottom 10% is 11.4 versus 9.6 [OECD, 2012]. The literature about income inequality is very wide, and it is mainly focused on estimations of the distribution of income or wealth in a country, or on the possible causes which lead to today's situation or on the investigation of correlation between inequality and other social indexes. However the literature about how people perceive inequality is much more limited. Moreover, evaluations on how income should be distributed are given mainly by philosophers and economists, while the opinions of common people usually are not further investigated.

The primary goal of this survey is to understand if the interviewed sample of people is aware of how income is actually distributed in Italy. Having a precise knowledge of the issue is a determinant factor in order to solve it, if the perception resulted from this survey does not adhere with reality it is likely that this issue will not obtain the degree of importance it deserves. The second goal that this survey wants to reach is to discover how individuals evaluate the ideal income distribution in the country. Measure how people think income should be distributed in the society is useful from several points of view. It can give an idea of how much people are averse to inequality, and if they consider fair that somebody have more than somebody else. This ideal income distribution can be useful also

for the policymakers which can get some information about the average Italian preferences on regarding inequality in policy debates.

The third and last goal is to investigate the importance of the role of some other factors in determine the income earned. Do Italian people think that hard work and skills play an important role in determining the level of income a person earns? What about other factors like education or family connection? It will be interest to discover even if people think that these factors should have a different importance than the one which actually have.

6.2 Survey structure

The survey used in order to reach these goals is divided in 10 different questions. Three of them are aimed to obtain information about the individual: sex (male or female), age (divided in 5 subgroups) and an estimation of its relative income (if the income earned by him or his family belongs to the top 25%, bottom 25% or to the middle class). An investigation on these characteristics of the interviewer is interesting in order to discover if there are significant discrepancies in the answers given between male and female or individuals with different ages. It is interesting also to further investigate the income earned by the individual, in order to analyze if the perception of inequality is influenced by the social class a person occupy.

The next four questions asked to the participants to provide evaluations about income inequality.

1. Imagine that the total income produced in Italy is equal to 100. How much of the total income is earned by the richest 20% of population?
2. Imagine that the total income produced in Italy is equal to 100. How much of the total income is earned by the poorest 40% of population?
3. According to you, how much the richest 20% of population should earn?
4. According to you, how much the richest 40% of population should earn?

These questions aimed to further investigate how Italian population perceives income inequality in their own country, and how they think it should be

distributed in an ideal society. Individuals can answer typing a value in the text box near the question.

Questions 1 and 2 provide the key answers for this survey. The aim is to analyze the knowledge of people about income inequality in Italy. These answers will lead to three possible scenarios and two possible conclusions. People underestimate income inequality, people over estimate income inequality or the interviewed have, on average, a correct idea on how income is distributed in Italy. In the first two scenarios people are not well informed, or are not particularly interested in how income is distributed. The misalignment between perception and reality lead to an irrational evaluation on this issue that could reduce the objectivity when they will have to express a political vote. In the third scenario people are aware of real income inequality and are able to correctly evaluate the different political proposals about these issues.

Questions 3 and 4 have a different goal. They aimed to understand how people think income should be distributed in an ideal society. The results will be interesting from a double point of view. First it will be provided information on how people feel about inequalities. Is it correct that somebody earn more than the others? The ideal society is the one that eliminates every income differences, providing the same income to everybody, no matter of their skills, talent or will to work hard? A society where more talented people or more hard workers are rewarded with for example social recognition and higher responsibilities instead a higher income? Or it is correct that somebody earn more than everybody else, even if the higher income is not always to be imputed by talent or hard work but for example by family's economic condition or social connections? As we seen, from an economic point of view, a certain degree of income inequality is not only fair, but is desirable in order to assure an economic activity in the society.

I chose to change the structure of the survey used by Norton for two reasons. The first one was to try to simplify the work of the interviewed. Asking the percentage of total income earned (or wealth owned as in the paper of the Harvard professor) by each quintile of population would have been too complicated. Moreover the

probability of unacceptable answers would have been higher. The second reason is that I wanted that interviewers to be free to answer In the Norton's survey people had to choose between three different ideal distributions. One of this was the socialism idea of wealth distribution, everybody own the same as anybody else: an extreme distribution. The second distribution was the actual wealth distribution in US, which is highly unequal. The top 20% own more than 80% of total income while the bottom 20% own about 0.2% of total income. The third distribution proposed is the one recorded in Sweden which is an equal country. The fact that 92% of Americans prefer the Swedish distribution instead the US one is not particularly surprising since the US one is highly unequal and, for this issue, is far to be considered as an ideal country. I have decided to left more freedom of choice for the ideal distribution in my survey in order to identify the ideal distribution of income. I have also decided to analyze the perception of people about income distribution instead the wealth one.

The last group of questions is made in order to understand the point of view of Italian people on the origins of income inequality in Italy. After that, it is asked to make a comparison with the factors that should determine the differences in income in an ideal society.

5. According to you, in what measure the income earned by an individual should depend on: (0 = not important at all, 5 = very important).
    a. Hard work and skills
    b. Luck
    c. Family conditions
    d. Education
    e. Social connections

6. According to you, in what measure the income earned by an individual depends in the real world on: (0 = not important at all, 5 = very important).
    a. Hard work and skills
    b. Luck
    c. Family conditions

d. Education
e. Social connections

7. Do you agree with the following sentences? (0 = do not agree at all, 5 = totally agree).
    a. A minimum income should be assure to everybody in order to assure a decent quality of life
    b. Who works harder should be richer
    c. Poor people are lazy
    d. To reduce inequalities should be a task of the government

For each question, the interviewed had to choose a value between 0 and 5 according to his/her preferences. The survey is designed in order to assure an evaluation for every sentence, if a sentence or a factor is not evaluated, it is not possible to conclude the survey, and the answers in this case will not be present in the records.

The goal of the question number 5 is to understand which factors should be the most important in order to determine the income of an individual. From this analysis it will be possible to better comprehend when income inequality is considered acceptable. For example, it can be more socially accepted that somebody earns more than somebody else if the gap is to be imputed to his ability than to his family income. The answers will provide information about which factors are "legitimated" to create income inequality and which one are not socially accepted.

Question number 6 wants to investigate the opinions of people about what factors are determinant in the creation of inequality in the real world. The answers will help to understand what degree of equality of opportunities is present in Italy. It is likely that the interviewed will answer with his/her personal experience or with the knowledge of somebody else experience. According to several studies, social mobility in Italy is scarce and the family's social position influence in an important manner the opportunity of children. However, as the vast majority of the countries

(not only OECD), education plays an important role in improve the socio economic situation of children also in Italy. It will be interesting to see if the interviewed are aware of the importance of education and family's economic situation in order to climb the social ladder or they identifies other factors which are determinant to achieve this goal.

Question number 7 is more general and aims to further investigate the opinion of Italians on some different issues. If it is correct that a minimum wage should be assure to everybody, no matter the behavior, will to work or abilities a person shows. Usually this question not only measures the level of adversity to poverty of people, but can also be useful to understand if opportunities are equally distributed. If people thinks that the government assures to everybody the same opportunities, and that who is willing to work hard will be rewarded with a higher income, it is more probable that they think that who does not earn enough money is because he or she is lazy, therefore he or she is not worthy to get a minimum wage. In the case the country offers a low social mobility, it is more probable that people are favorable to a minimum wage. The level of social mobility is tested even with the evaluation of the sentence that affirms that poor people are poor because they are lazy. The sentence "who works harder should be richer" measures how much people are favorable to inequality of results. It is probable that the higher is the agreement encountered by this question, the more a higher income will be accepted, and a higher level of inequality will be tolerated (as long as the reason behind the creation of inequality, like hard work, is considered socially accepted). The last question concerns the role of the government in reducing (or at least managing) inequality. The question is meant to understand if the government is responsible not only to assure the equality of opportunities but also to limit the inequality of result. According to the answers given, it will be measured the will of population to implement redistributive policies in order to reduce income inequality.

6.3 Errors and Dataset Cleaning

Questions about the interviews (sex, age and social class) do not create particular problems. When the analysis comes to the questions about the evaluation of income inequality and how it should be distributed, things became more complex. A relevant part of answers are not acceptable, therefore it has been necessary to proceed through a dataset cleaning procedure.

Not every answers recorded in this questionnaire can be accepted, the questions were created with the aim to make the interviewed to reflect about the issue of income inequality in Italy. Given the complexity of the argument I could not accept the risk to compromise the results of dataset accepting also the answers given without thinking.

In fact questions 1 – 2 and 3 – 4 are complementary. When the interviewed gives the answers estimating the share of total income obtained by the first 20% and the poorest 40% (or the share that they should get in an ideal society for questions 3 – 4), he implicitly gives an estimation of the share of the middle 40% of population remained. In this way it is possible to recreate the assumed distribution of income for all population. It is, of course, a simplification of reality because it is not likely that the poorest person in Italy earns as much as the one in the bottom 40th percentiles of the distribution, however it gives an estimation of the income gap between the top and the bottom tail of the distribution.

Some interviewed gave contradictory answers, which could not be acceptable because they highlighted a misunderstanding of the question or a wrong evaluation.

Table 1: Example of unacceptable answers

Sex	Age	Question 3	Question 4
Male	18-30	25	40
Male	18-30	10	40

The second line of the table presents the first type of error. Question 3 asks what share, in an ideal society, the top 20% earners should get of the total income produced. Even assuming the perfect equal distribution of income, the socialist idea of society, everybody will earn the same, so the richest will earn as much as anybody else, therefore the 20% of population will earn 20% of total income. It is not possible that the richest 20% of population earns less than the 20% of income, in this case it could not be considered the 20% richest. As result, every answer to question 3 which report a value below 20 could not be acceptable.

The subsequent table shows three other errors that make the answers unacceptable:

Table 2: Example of unacceptable answers

Sex	Age	Question 1	Question 2
Male	18-30	84	9
Female	18-30	60	40
Female	18-30	80	30

The three answers in the table are all unacceptable for achieving the goals of this survey. Analyzing the first raw, if the answers of the two questions are considered separately, there would be no reason to accept the result. However, if we consider both answers we can discover the error. The answer to the question number 1 (what is the share of income obtained by the richest 20% of population) is acceptable because it report a number higher than 20 and lower than 100 which is the maximum value acceptable. The answer to the question number 2 is also acceptable because it supposed a share of income earned by the poorest 40% which is lower than 40 which is the maximum value. However the two questions combined implicitly return the share of total income that the remaining 40% of population, representing the middle class, is supposed to get. The interviewed assigned 84% of total income to the richest and 9% to the poorest, affirming implicitly that the remaining 40% of people (which are poorer than the richest but richer than the poorest) earns the remaining 7% which is less than the share of the income that the poorest is supposing to get. It is not acceptable an answer that

implies that the 40% of poorest people gets more the than the 40% of population representing by the middle class which is richer by definition.

The answers recorded in the second raw are also unacceptable. The reason is similar to the previous case, the share of income that is supposed to be earned by the middle class. In this case the error is even more evident: middle class does not get any income while the poorest get 40% of the share.

Analyzing the last raw we can notice that the sum of the share which rich and poor are supposed to get is more than 100, therefore the answers cannot be accepted and will not be further considered.

Another potential error could be encountered if the share of the middle class is more than two times bigger than the share earned by the top 20% income earners. In this scenario, the average person in the middle class would earn more than the average person of the top 20% richest, which is a paradox. If the answers collected lead to this scenario, they will be discarded.

Some respondents gave acceptable answers to questions 1 and 2, but not acceptable answer for the subsequent two questions and vice versa. As mentioned before, the main goal of this survey is to compare the opinions of the interviewed on how it should be distributed the income in Italy, how people think income is distributed and how it is actually distributed in the real world. The fact that some persons answered in an acceptable way to the first two questions but not to the subsequent two (or vice versa) means that the interviewed did not correctly understand the questions, or did not think enough in order to give an acceptable answer. When this happens, I decided to do not consider all the four answers made by the interviewed.

Questions from 5 to 7 does not present particular problem. I decided to accept the answers produced by every respondent for these last questions. The nature of these questions is in fact different from the ones before and there are no wrong answers, therefore there are no reasons to reject them. The preferences resulted in

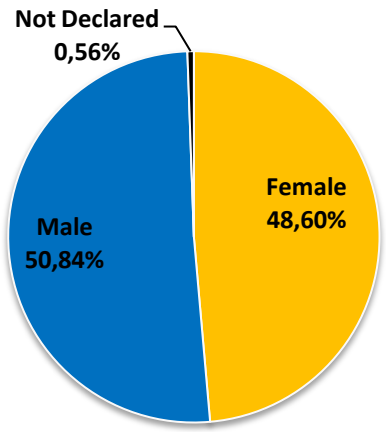
these last questions will be composed even by the ones made by the individuals who produced not acceptable answers for the questions 1 – 2 – 3 – 4.

Following the method previously explained, I performed the dataset cleaning procedure. The dataset contained a considerable number of unacceptable answers; therefore the estimations provided by YY individuals for these four questions were not be inserted in the results. The share of respondents who answered in an unacceptable way to at least one of the questions 1 – 2 – 3 – 4 is more than half of the total: 54.79%.

6.4 Dataset Analysis

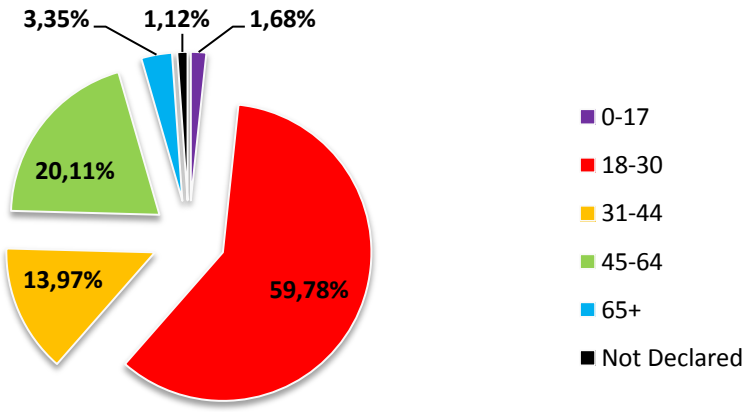
The survey has been filled by 179 individuals. Of these, 87 were females representing 48.6% of the respondent population and 91 were males representing 50.84% of total, while 1 did not declared this information.

Graph 18: Sex distribution of respondents



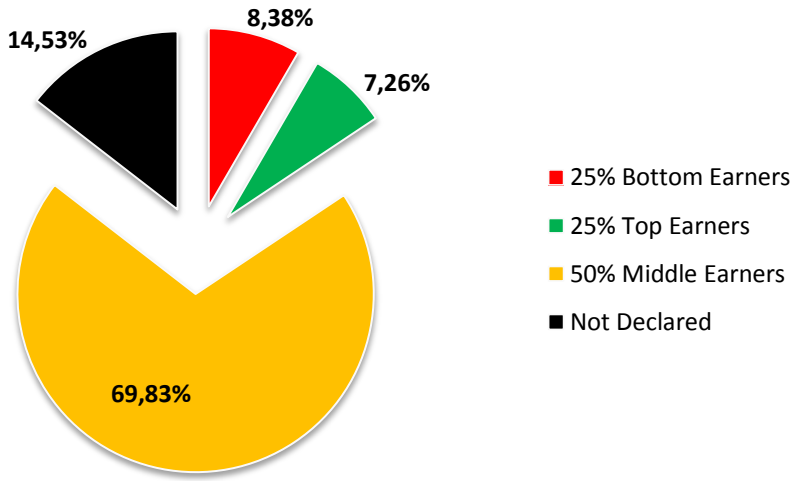
The survey has been completed by individuals of every age's subgroup, comprehending a people of less than 17 years old, to others aged more than 65 years. The subgroup of 18-30 years old is however the most represented, with the 59.78% of the respondents. Subgroups of 0-17 years old and of 65+ years old are the less represented.

Graph 19: Age distribution of respondents



The question about income has been answered by 153 individuals representing 85.5% of the total. 26 individuals chose to not declare their income class. The analysis of the economic classes revealed that the vast majority of respondents consider themselves as components of the middle class, which is represented by the 81.7% of the individuals which have answered to this question. The other two classes, the 25% poorest of population and the 25% richest of population are represented by a sensible lower share of people, with 9.8% and 8.5% of respondents respectively.

Graph 20: Economic classes' distribution of respondents



This survey, even if less ambitious than the ones produced by national statistic institutions shows a similarity. When it comes to analyze the income a household gain, the number of rich people is lower than the expected and somebody does not feel comfortable to give an answer at all. As the number of individuals which consider their income different than the one earned by middle class is low, these class may be considered less representative and the answers comparison between different classes may be less reliable.

6.5 Questions 5-6

Analyzing the results of the questions 5 and 6 it will be possible to further investigate the opinion of the interviewed about the importance of certain factors in determining the income and how much they should matter in an ideal society. As previously explained, the factors take into consideration are education, luck, hard work, social connections and family's socio economic conditions. The higher the gap of results between the two questions, the higher the distance of Italian society than the one dreamed by Italians. The factors considered can be divided in two subgroups: the one that can be influenced by individual actions (education and hard work) and the other that does not depend on the individual (luck, family's socio economic situation and social connections).

6.5.1 Hard work and Skills

Hard work and skills is a factor that can be modified by individuals' actions, therefore it is accepted as an important determiner of the level of income in an ideal society. There are no relevant differences in the evaluation of the importance of this factor in an ideal society if we compare sex, socio economic class and age. The importance of hard work and skills in determining the income is widely recognized and accepted, in fact 120 individuals on 179 assigned the maximum importance to this factor which scores an average importance of 4.51/5. Hard work and skills is in fact recognized as the most important in an ideal world.

Table 3: Answers to question 5.a "*Hard Work and Skills*"

	Frequency	Percentage
0	3	1,68%
1	2	1,12%
2	2	1,12%
3	6	3,35%
4	46	25,70%
5	120	67,04%
Total	**179**	**100,00%**

When we analyze the answers to question 6, about how much hard work and skills actually determine the level of income in Italy, we can notice a significant difference than the precedent results. The average results about the perceived impact of this factor on income shrinks to 2.72/5. The gap is relevant and underlines the perception of hard work has a marginal importance on determining the income. It is interesting to notice that the gap between the importance that hard work and skills should has and the importance that it actually has in Italy is of 1.79 points. It is not the widest among all the factors but it is enough to transform hard work from the most important in an ideal society to the less important in the real Italian society.

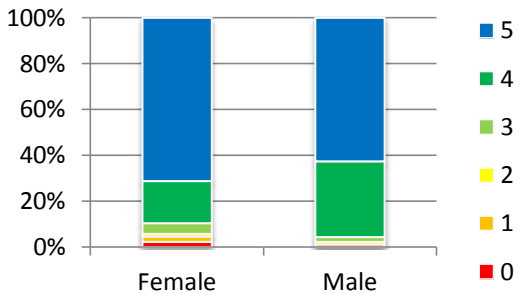
Table 4: Answers to question 6.a "*Hard work and Skills*"

	Frequency	Percentage
0	8	4,47%
1	15	8,38%
2	40	22,35%
3	78	43,58%
4	32	17,88%
5	6	3,35%
Total	**179**	**100,00%**

The comparison between the resulted answers about hard work underlines the idea of the distance of Italian society from an ideal one, but also reflects the perception that commitment in Italy is pointless, at least if the goal is to improve the income obtained. Analyzing the results taking into consideration other

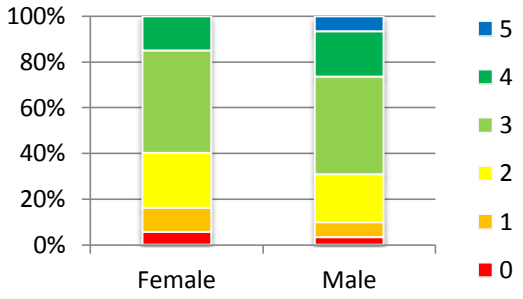
variables it is interesting the gap between the two answers given by women. While more than 71% of them rated hard work with the highest value (5/5) in an ideal society, no one confirmed the evaluation in the real society. The average evaluation for question 6 for females was 2.53/5, which is lower than the average males' evaluation (2.89/5).

Answers to question 5.a, divided for sex



	Female	Male	Percentage
0	2	1	1,69%
1	2		1,12%
2	1	1	1,12%
3	4	2	3,37%
4	16	30	25,84%
5	62	57	66,85%
Total	**87**	**91**	**100,00%**

Answers to question 6.a, divided for sex



	Female	Male	Percentage
0	5	3	4,49%
1	9	6	8,43%
2	21	19	22,47%
3	39	39	43,82%
4	13	18	17,42%
5		6	3,37%
Total	**87**	**91**	**100.00%**

These results seem to highlight that women feel that their commitment is not rewarded with a higher income. Although females evaluate more the importance of hard work than men, they are more disillusioned about its importance in Italian society. Probably this result is a consequence of gender inequality in terms of income which is present in Italy and, unfortunately, even in many other countries.

Compare the answers given according to different ages; it seems that people became more disillusioned as they get older. Although the gap it is not very wide, individuals aged between 18 and 30 evaluate the importance of hard work with an

average score of 2.77, while at 45-54 it reaches 2.64. This result can be interpreted in two different ways: it can be possible that as people improve their knowledge about the society, they evaluate less relevant the impact of commitment. A different interpretation can be that the society is changing and young people perceived that today hard work has a bigger impact than in the past.

6.5.2 Education

The second and last factor which can be determined by the actions of the individual is education. On question 5, education scores the second highest average evaluation with 3.84/5. Importance of education is recognized as determinant by the vast majority of individuals, 48 on 179 assigned to it the highest evaluation. The answers recorded for question 5 are homogeneous among different sex, ages and socio economic class.

Table 5: Answers to question 5.d "*Education*"

	Frequency	Percentage
0	3	1,68%
1	3	1,68%
2	7	3,91%
3	42	23,46%
4	76	42,46%
5	48	26,82%
Total	**179**	**100,00%**

Question 6 analyzes the importance of education in determining the income obtained in the real Italian society. As hard work, it can be noticed a shrink in the average score respect the precedent question. The average value drops more than one point, to 2.74. Education results more important than hard work in Italy, but not as determinant as it should be. There are no particular differences if the answers are divided for sex or ages.

Table 6: Answers to question 6.d "*Education*"

	Frequency	Percentage
0	5	2,79%
1	12	6,70%
2	45	25,14%
3	82	45,81%
4	32	17,88%
5	3	1,68%
Total	**179**	**100,00%**

The analysis of the answers taking into consideration the differences in socio economic position is less reliable than others because the majority of individuals consider themselves to belong to the middle class. However, analyzing the average results for education divided for economic class, interesting differences can be noticed.

Graph 21: Answers to question 6.d "Education" divided for income

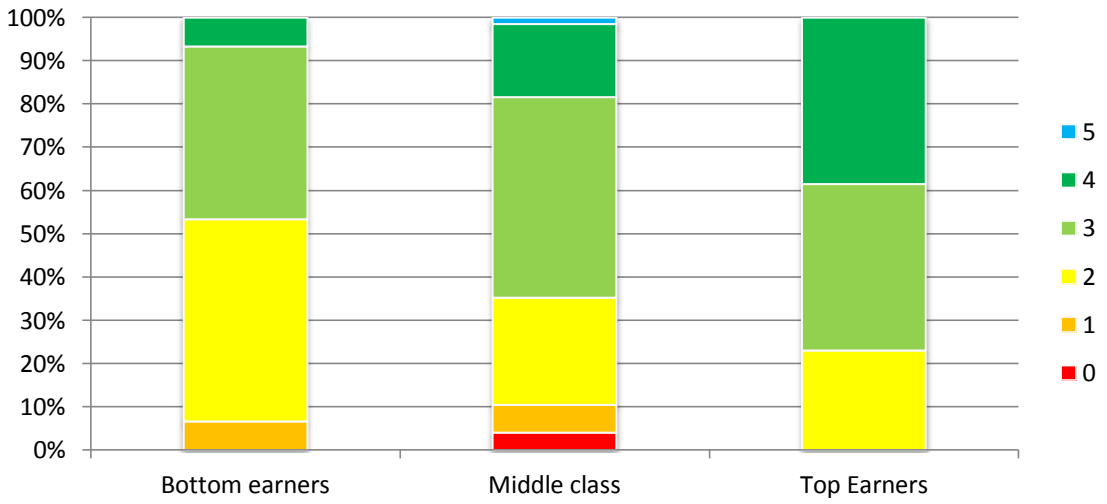


Table 7: Answers to question 6.d "Education" divided for income

	Bottom Earners	Middle Class	Top Earners
0	0,00%	4,00%	0,00%
1	6,67%	6,40%	0,00%
2	46,67%	24,80%	23,08%
3	40,00%	46,40%	38,46%
4	6,67%	16,80%	38,46%
5	0,00%	1,60%	0,00%
Total	**100,00%**	**100,00%**	**100,00%**

On average rich people consider education more important in defining the income than the other classes. In fact in question number 6 while lower and middle income earners gave an evaluation of 2.47 and 2.7 respectively, the rich assigned an average score of 3.15. This data, even if obtained by a restricted number of individuals, seems to confirm the results presented by the studies precedent analyzed. Rich people tend to evaluate more education and are more willing to invest in human development than the other classes.

The fact that the analyzed population does not consider education as important in determining the income is a dangerous signal. As seen before, OECD, United Nation and other entities identifies in education the main factor in order to improve the socio economic position in basically every country analyzed. If this factor is not considered useful by Italians there could be a serious problem of under exploitation of human capital which would probably lead to increase the level of inequality in this country.

6.5.3 Luck

The first factor which it is not possible to control by the single individual is luck. As every factor in this group, its impact on income distribution in an ideal society should be reduced. The individuals interviewed expressed the same opinion and assigned to this factor an average importance, in a perfect society, of 1.41. As expected, on average each category divided by age, sex and income assigned a low value of this factor in an ideal society without particular differences.

Table 8: Answers to question 5.b *"Luck"*

	Frequency	Percentage
0	53	29,61%
1	50	27,93%
2	37	20,67%
3	31	17,32%
4	5	2,79%
5	3	1,68%
Total	179	100,00%

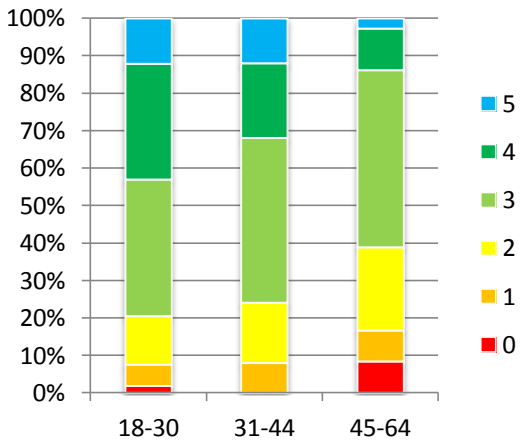
Results of the question number 6 highlight that the impact of luck in determining the income in Italy is higher than it should be. The average result assigned to luck a value of 3.07 which is more than double than the one expected in a perfect society.

Table 9: Answers to question 6.b *"Luck"*

Frequency	Percentage	
0	5	2,79%
1	12	6,70%
2	28	15,64%
3	72	40,22%
4	45	25,14%
5	17	9,50%
Total	179	100,00%

In this question the impact of luck in determining the income present some differences regarding different categories. On average male assigns a slightly lower impact of luck than females. Analyzing different ages, the impact of luck in determining income is lower as the individual gets older.

Answers to question 6.b "Luck" divided for age



	18-30	31-44	45-64
0	1,87%	0,00%	8,33%
1	5,61%	8,00%	8,33%
2	13,08%	16,00%	22,22%
3	36,45%	44,00%	47,22%
4	30,84%	20,00%	11,11%
5	12,15%	12,00%	2,78%
Total	**100,00%**	**100,00%**	**100,00%**
Average Answer	**3.62**	**2.89**	**2.47**

A possible explanation of this result could be that in the long period the effects of luck on an individual tend to be less relevant than it seemed in a younger age. Analyzing different income, even if, as said before, is a less reliable result, it is

possible to record an interesting trend. The perceived importance of luck is related with the income earned. In fact the richest consider the luck more determinant than the poor and the middle class do. It could be expectable that, as Italy seems to be a non meritocratic country, the lower income class would have assigned a higher importance of luck, instead rich people seems to recognize luck as determinant in the level of incomes.

6.5.4 Family conditions

Family's economic situation has been previously investigated, and it resulted one of the most important factors which affect of social mobility. Among OECD countries, Italy scored the highest level of intergenerational income elasticity, which made it a country where family income plays a major role in order to define the income of the next generations. The average answer to question number 5 highlights the feeling of unfairness towards this factor: in an ideal society it should have a very low impact in determining the income. The average score for this factor is 1.66/5. There are no particular differences between any of the categories considered.

Table 10: Answers to question 5.c *"Family's conditions"*

	Frequency	Percentage
0	48	26,82%
1	30	16,76%
2	46	25,70%
3	40	22,35%
4	12	6,70%
5	3	1,68%
Total	**179**	**100,00%**

Answers to question number 6 reveal the perceived impact of family's socio economic conditions in determining the income. The gap between this and the previous answers is important: family's conditions more than double its effect on income, raising by 1.81 points and reaching 3.47 points. It resulted to be the

second most determinant factor among the analyzed ones. There are no interesting differences if these answers are divided for sex, income and ages.

Table 11: Answers to question 6.c *"Family's conditions"*

	Frequency	Percentage
0	9	5,03%
1	9	5,03%
2	15	8,38%
3	40	22,35%
4	68	37,99%
5	38	21,23%
Total	**179**	**100,00%**

The results of this survey on family's condition seem to be compatible with the ones presented in OECD's studies. Family's condition is confirmed to be a key factor in determining the income in Italy.

6.5.5 Social connections

The last factor analyzed on questions 5 and 6 is "social connections". To get a higher income thanks to the fact of knowing somebody results to be the most detested among the factors considered. In an ideal society it would have almost no importance at all. The average score that this factor should have is just above 1, precisely 1.11/5. Everybody, no matter to the category, dislikes this factor and considers that it should not be determinant at all.

Table 12: Answers to question 5.e *"Social Connections"*

	Frequency	Percentage
0	78	43,58%
1	44	24,58%
2	31	17,32%
3	14	7,82%
4	10	5,59%
5	2	1,12%
Total	**179**	**100,00%**

The perceived real importance of social connections in determining the income is much higher, in fact according to this survey is the most important factor among the analyzed ones. With a score of 3.89/5 social connections results the most disliked but at the same time the most important determinant of income in Italy. The impressive gap between the importance social connections should have in an ideal society and the importance they actually have in Italy (2.78) is an index of how much opportunities are unequally distributed in this country.

Table 13: Answers to question 6.e *"Social Connections"*

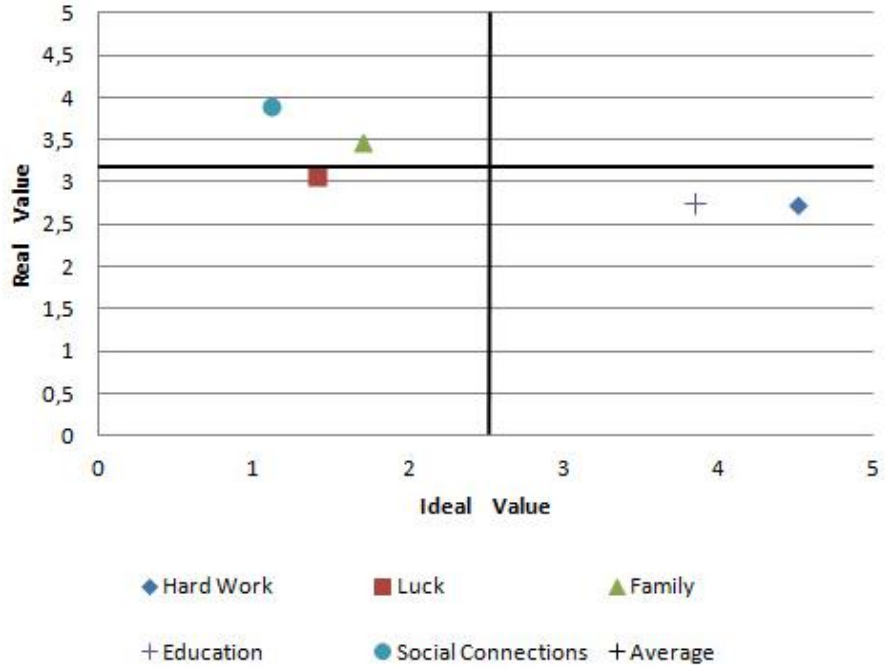
	Frequency	Percentage
0	6	3,35%
1	5	2,79%
2	8	4,47%
3	26	14,53%
4	73	40,78%
5	61	34,08%
Total	**179**	**100,00%**

There are no particular differences if answers are divided for sex or age. The most important, even if not surprising, is the gap between evaluations of rich and poor. Poor people assigned an average of 0.87 as the ideal value for this factor, while rich assigned 1.31. Even the perceived importance in Italy is very different: 4.07 for poor and 3.38 for rich. The most natural way to interpret this evaluation gap is that poor considers social connections, or the absence of them as the main cause for their situation.

6.5.6 Further Considerations

The answers to the questions 5 and 6 highlight the distance of the Italian society from an ideal one. According to the results of this survey the two factors on which the individual has the ability to impact on (education and hard work) are the most valued in an ideal society, but the less important in Italy. On the contrary, factors like social connections, family's conditions and luck are considered the most

important even if they should have much less impact in determining the income in an ideal world.



All the factors taking into consideration in questions 5 and 6 are plotted in the previous diagram. In the X-axis are represented the ideal value that each of the factor should have in an ideal society according to the respondents. In Y-axis are represented their value in Italy according to the respondents. The two black lines represent the average values of every factor. Each of the four quadrants represents a different scenario. On the top left there are the factors that should have an impact on income lower than the average but have an impact above the average in the real society. As we can see this quadrant is occupy by two factors: family's conditions and social connection. On the top right quadrant there are the factors that should be and actually are important in defining the income. Unfortunately no factors are present in this quadrant. The bottom left quadrant contains the factors that should have and actually do have an impact on income below the average. In this quadrant is present just one factor: luck. The bottom right quadrant contains the factors that should have an impact on income above average but in reality are less important than the average. In this quadrant we can find two factors: Hard work and education. An ideal society should have all the factors in the top right and bottom

left quadrants. The real situation in Italy is that just one on five factors is in the ideal quadrant.

6.6 Question 7

6.6.1 A minimum income should be assure to everybody in order to assure a decent quality of life

The majority of interviewed agreed with this sentence. The average score recorded is 3.68 meaning that it is considered fair to provide to everybody a minimum income. It is not further investigated the origin that this income should have or the specific required in order to obtain it. The interpretations could have been many: that there should be a minimum wage guaranteed to every worker, or that every person, worker or not, should obtain an income. Different interpretations are therefore associated to this sentence; however the aim is to measure the adversity to poverty of people.

Table 14: Answers for question number 7 *"A minimum income should be assure to everybody in order to assure a decent quality of life"*

	Frequency	Percentage
0	7	3,91%
1	12	6,70%
2	18	10,06%
3	30	16,76%
4	39	21,79%
5	73	40,78%
Total	**179**	**100,00%**

The answers present some differences according to the category. Women are much more likely to completely agree with this sentence than the male. In fact more than half of the women assigned the maximum level of agreement to this sentence, while less than a third of the men do the same.

Graph 22: Distribution of answers for question number 7 "*A minimum income should be assure to everybody in order to assure a decent quality of life*" divided for sex

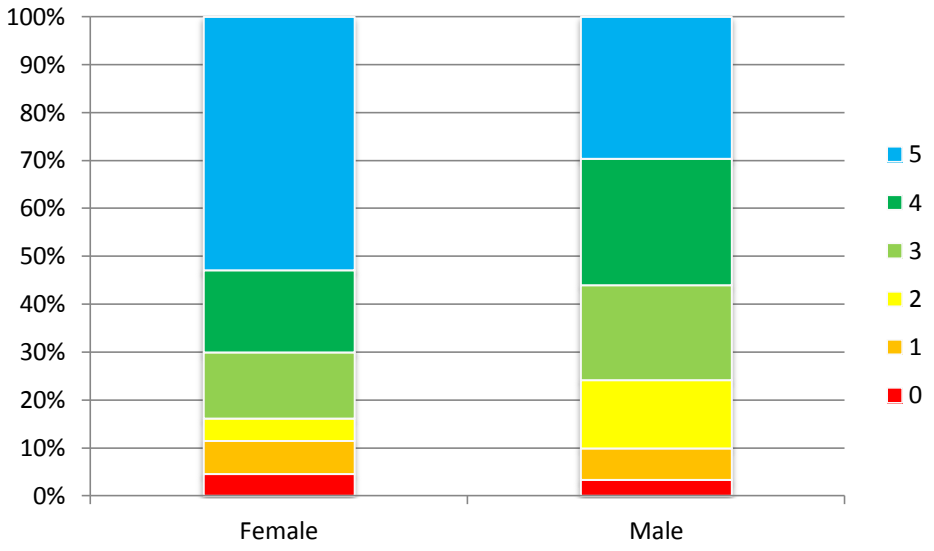


Table 15: Answers for question number 7 "*A minimum income should be assure to everybody in order to assure a decent quality of life*" divided for sex

	Female	Male
0	4,60%	3,30%
1	6,90%	6,59%
2	4,60%	14,29%
3	13,79%	19,78%
4	17,24%	26,37%
5	52,87%	29,67%
Total	**100,00%**	**100,00%**

If the answers are categorized by age, there are no remarkable differences, while if the analysis is focused on the income; poor people on average agreed more with this sentence than the rich did.

Table 16: Answers for question number 7 "*A minimum income should be assure to everybody in order to assure a decent quality of life*" divided for economic classes

	Bottom Earners	Middle Class	Top Earners
0	0,00%	4,00%	7,69%
1	6,67%	8,00%	0,00%
2	6,67%	10,40%	15,38%
3	13,33%	16,80%	30,77%
4	20,00%	20,80%	30,77%
5	53,33%	40,00%	15,38%
Total	**100,00%**	**100,00%**	**100,00%**

Clearly as lower income people are the ones that will obtain more benefit from a minimum income; they are more likely to agree with the sentence. Rich people on the contrary showed less interests in the minimum wage, notwithstanding on average they are favorable to it (the average value assign to this sentence by rich is 3.23, by poor is 4.07).

6.6.2 Who works harder should be richer

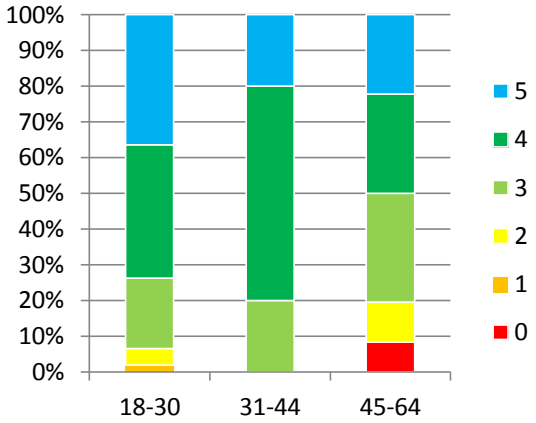
Are Italians socialists? According to the answers recorded for this sentence they are not. The majority of Italians affirms to agree that more talented or harder workers should earn more. Monetary reward seems to be the fair way to recognize the efforts of working people; a certain degree of inequality is therefore accepted.

Table 17: Answers to question 7.b "*Who works harder should be richer*"

	Frequency	Percentage
0	4	2,23%
1	2	1,12%
2	9	5,03%
3	39	21,79%
4	69	38,55%
5	56	31,28%
Total	**179**	**100,00%**

More than 91% of respondents affirmed to be favorable to this sentence (people which gives a value between 3 and 5 are consider to agree, people which vote between 0 and 2 are consider to disagree). People agree that it is fair a certain degree of income inequality if it results from personal skills like hard work and talent. There are no remarkable differences in answers between rich and poor or males and females while on average young people seems to agree more with this sentence than older: the average result for people between 18 and 30 years old is 4.02, people between 45 and 64 years old produced an average value of 3.36/5.

Graph 23: Answers to question 7.b "*Who works harder should be richer*" divided for ages between 18 and 64 years old



	18-30	31-44	45-64
0	0,00%	0,00%	8,33%
1	1,87%	0,00%	0,00%
2	4,67%	0,00%	11,11%
3	19,63%	20,00%	30,56%
4	37,38%	60,00%	27,78%
5	36,45%	20,00%	22,22%
Total	**100,00%**	**100,00%**	**100,00%**

6.6.3 Poor people are lazy

In an efficient and meritocratic society, like the one dreamed by the people interviewed in this survey, who works hard will obtain a sufficient income. In this society poor people are poor probably because they are lazy. Italy is however perceived like a non efficient society, the level of income seems to be determined more by luck and social connections than by hard work and skills. Poor people are in this situation probably not only because their fault, but because they had less opportunities to obtain a higher income.

Table 18: Answers to question 7.c *"Poor people are lazy"*

	Frequency	Percentage
0	59	32,96%
1	61	34,08%
2	37	20,67%
3	15	8,38%
4	6	3,35%
5	1	0,56%
Total	**179**	**100,00%**

As expected, the average agreement resulted for this answer is very low, just 1.17/5. The level of agreement is almost equal for men and women; it seems to decline as people gets older and gets a lower income.

6.6.4 To reduce inequalities should be a task of the government

When income inequality is too high, the government should take action. According to this survey, Italians on average agrees with this sentence and identifies as one of the tasks of the state the responsibility to manage inequality. The average agreement resulted is 3.39: more than three quarter of the interviewed expressed an agreement of 3 or higher.

Table 19: Answers to question 7.d *"To reduce inequalities should be a task of the government"*

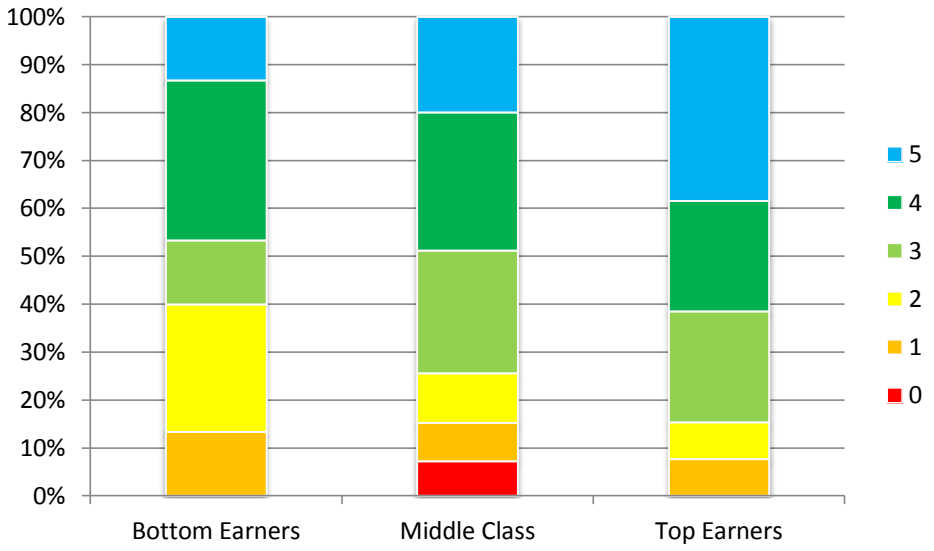
	Frequency	Percentage
0	9	5,03%
1	13	7,26%
2	20	11,17%
3	40	22,35%
4	52	29,05%
5	45	25,14%
Total	**179**	**100,00%**

The answers are similar among different ages and different sex; however it is possible to notice a higher average agreement with this sentence for rich people. It seems that the richest are favorable to a reduction of inequalities, which is a strange approach because they are the category which will lose more if the government would operate in this sense. It is likely that, in order to reduce inequalities, the governments would increase the taxes to top income earners and redistribute the money collected in favor of poorer people.

Table 20: Answers to question 7.d *"To reduce inequalities should be a task of the government"* divided for income classes

	Bottom Earners	Middle Class	Top Earners
0	0,00%	7,20%	0,00%
1	13,33%	8,00%	7,69%
2	26,67%	10,40%	7,69%
3	13,33%	25,60%	23,08%
4	33,33%	28,80%	23,08%
5	13,33%	20,00%	38,46%
Total	**100,00%**	**100,00%**	**100,00%**

Graph 24: Answers to question 7.d *"To reduce inequalities should be a task of the government"* divided for income classes



According to this scenario, it would be normal to expect a negative reaction for richest and a positive from the poorest. Even if the number of interviewed belonging to one of these two categories is not high enough to be reliable, it is interesting that the level of agreement with this sentence increases with the increase of the income. The average agreement produced by poor income earners is equal to 3.07 while for rich ones, is 3.77. A possible interpretation for these results is that for poor people it would be enough that the government works in order to improve the level of equality of opportunities instead of reducing inequality of results.

6.7 Questions 3-4: Ideal income distribution

In Italy, as in every other country in the world today, incomes are not equally distributed. Do Italian people think that the ideal distribution should admit some differences, or that everybody should earn the same income? An initial hint for answer to this question is given by the precedent analysis about the sentence "*Who works harder should be richer".* The majority of people agreed with this opinion, therefore it is likely to find a certain degree of income inequality in the ideal distribution.

Table 21: Answers to question 3 "*According to you, how much the richest 20% of population should earn?"*

	Frequency	Percentage
10	4	4,94%
20	15	18,52%
25	3	3,70%
30	18	22,22%
35	4	4,94%
40	19	23,46%
45	2	2,47%
50	12	14,81%
60	4	4,94%
Total	**81**	**100,00%**

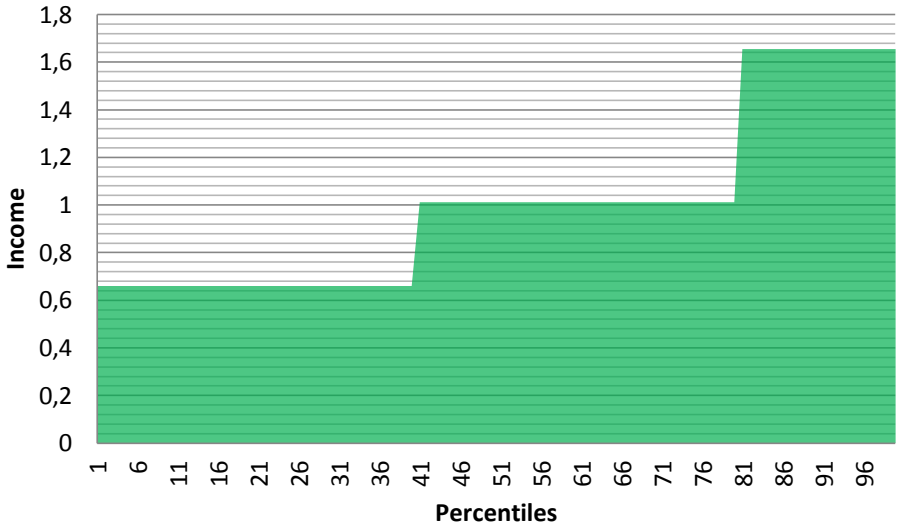
Table 22: Answers to question 4 "*According to you, how much the poorest 40% of population should earn?"*

	Frequency	Percentage
8	1	1,23%
10	4	4,94%
15	5	6,17%
20	25	30,86%
25	13	16,05%
30	15	18,52%
35	4	4,94%
40	14	17,28%
Total	**81**	**100,00%**

The average result assigns to the richest 20% of population the 34.38% of total income, while the poorest 40% should obtain 25.9% with the remaining 39.72% to the 40% of people which represents the middle class. In order to represent the

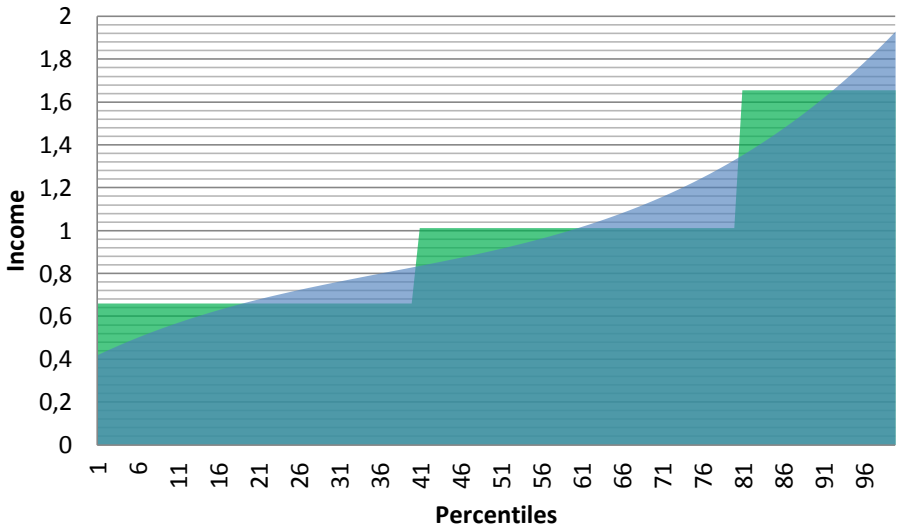
results I have decided to use the Pen's parade. Income earners are distributed from the one who earns less on the left to the one who earns the most on the right.

Graph 25: Ideal income distribution according to the survey's results



As imagined, Italians accept a certain degree of income inequality even in an ideal society and refuse the "socialistic" idea (in the case of socialism, everybody would earn the same income, in this graph everybody would earn an income equal to 1). It is likely that within each of these sub groups, the income is not equally distributed. If this was the case, there would be just three possible values of incomes. The distribution represented in the graph therefore would be smoother. In order to achieve a better graphical representation I have decided to reproduce the distribution following a polynomial tendency line. The total income and the share of income obtained by each class is maintained constant. The choice of representing the distribution following the tendency line has been made just for obtain a better graphical representation. The result is in the following graph.

Graph 26: Ideal distribution and smoother ideal distribution produced with a tendency line



As we can see the new distribution is smoother and admits an increasing income from a percentile to the next one. In order to further analyze the distribution and compare it with other real cases I will present the Palma ratio and the 20/20 ratio. The result is that, on average the richest 20% obtains about 2.9 times the income of the bottom 20%. This ideal ratio seems unachievable in reality. According to OECD [2016] the most equal country (if the analysis is limited to 20/20 ratio) is Denmark with a ratio of 3.5. Other countries reached a similar result: Finland, Norway and Slovenia are just some of the countries which recorded a ratio lower than 4. If the analysis moves to the Palma ratio, which compare the total income earned by the richest 10% with the one earned by the bottom 40%, the ideal distribution chosen by Italians scores a value of 0.67. This value is very low (as said before, the economist Stiglitz proposed to reach the value of 1 as a millennium goal), but it is not unachievable. According to OECD [2012] the Palma ratio for Slovak republic in 2012 was equal to 0.83 which is the lowest value recorded in that year among OECD countries. The ideal distribution of income is by definition ideal, however it does not seems too far to be achieved.

It is interesting to analyze the differences among the answers given by women and the ones given by men. The ideal distribution for female respondents is more equal than the one preferred by men. In fact the ideal share of total income that the

richest 20% should earn is 30.97% of total while men's average is 36.5%. The share of total income that the poorest 40% should have is instead more similar for both sex: 26.5% for females and 25.5% for males. There are no particular differences if the answers are divided according to age or economic classes.

6.8 Question 1-2: Perception of the real income distribution in Italy

Real income distribution in Italy is different than the one desired by Italians, every interviewers knows that because nobody gave the same answers to questions 1 and 3 and to question 2 and 4. Italians already know that the real distribution is skewed than the one defined as desirable. They also know that real distribution of income in Italy is more unequal than the one preferred. There are two questions that this survey aims to answer to: Are Italian aware of the real income distribution in Italy? If not, how much did they mistake?

Table 23: Answer to question 1 *"Imagine that the total income produced in Italy is equal to 100. How much of the total income is earned by the richest 20% of population?"*

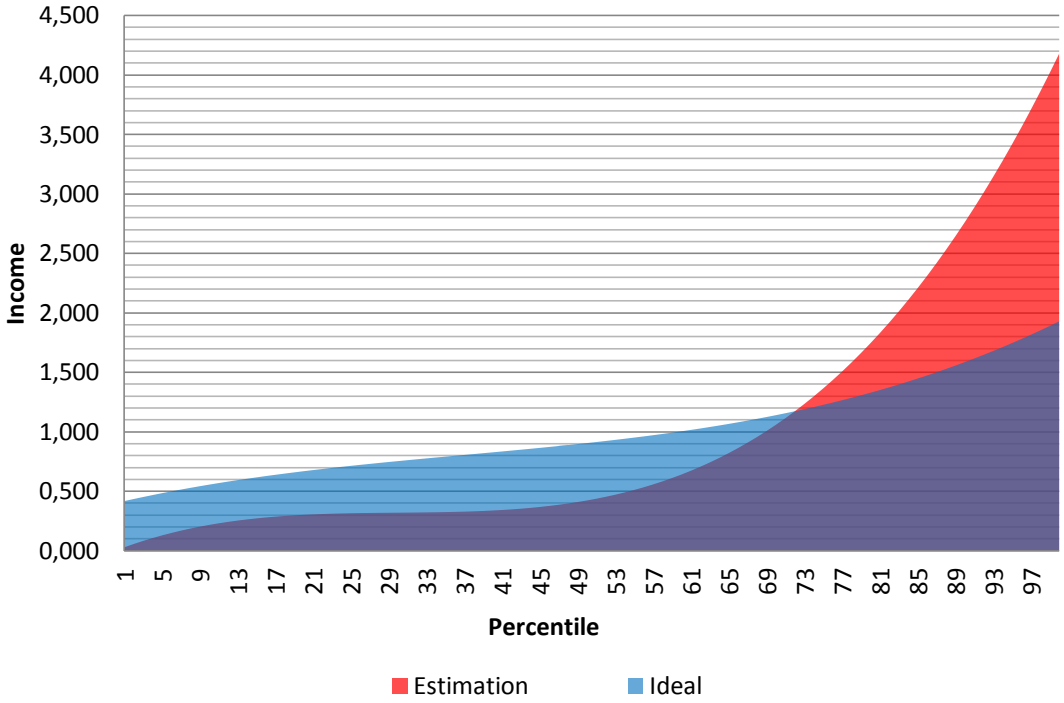
Answer	Frequency	Percentage
30	1	1,23%
35	1	1,23%
38	1	1,23%
40	3	3,70%
45	1	1,23%
50	10	12,35%
60	21	25,93%
65	2	2,47%
70	15	18,52%
80	17	20,99%
85	1	1,23%
90	7	8,64%
95	1	1,23%
Total	**81**	**100,00%**

Table 24: Answer to question 2 *"Imagine that the total income produced in Italy is equal to 100. How much of the total income is earned by the poorest 40% of population?"*

Answer	Frequency	Percentage
1	3	3,70%
2	3	3,70%
3	3	3,70%
4	1	1,23%
5	18	22,22%
7	1	1,23%
8	7	8,64%
10	21	25,93%
15	13	16,05%
20	9	11,11%
25	1	1,23%
30	1	1,23%
Total	**81**	**100,00%**

The estimation of the percentage of average income earned by the 20% richest Italians is 66.40% of total. According to the interviewed therefore, almost two third of all the income produced in Italy goes just to 20% of population. The poorest 40% on the contrary is assumed to earn just the 10.06% of total income. The remaining 23.54% of income is obtained by the 40% of people which occupy the middle class. As said before the supposed distribution is skewed in respect to the ideal one: according to the people interviewed, rich people earn almost the double (66.40% instead of 34.38%) and poor people less than half (10.06% instead of 25.90%). If we show the results in a diagram (following the polynomial tendency line as explain before) the difference between the two distributions is clear.

Graph 27: Comparison between Ideal and estimated distribution of income in Italy according to the survey's results.



Low and middle income earners obtains, according to the estimation a sensible lower share of income than the ideal one, while the richest obtains almost twice the income considered as fair.

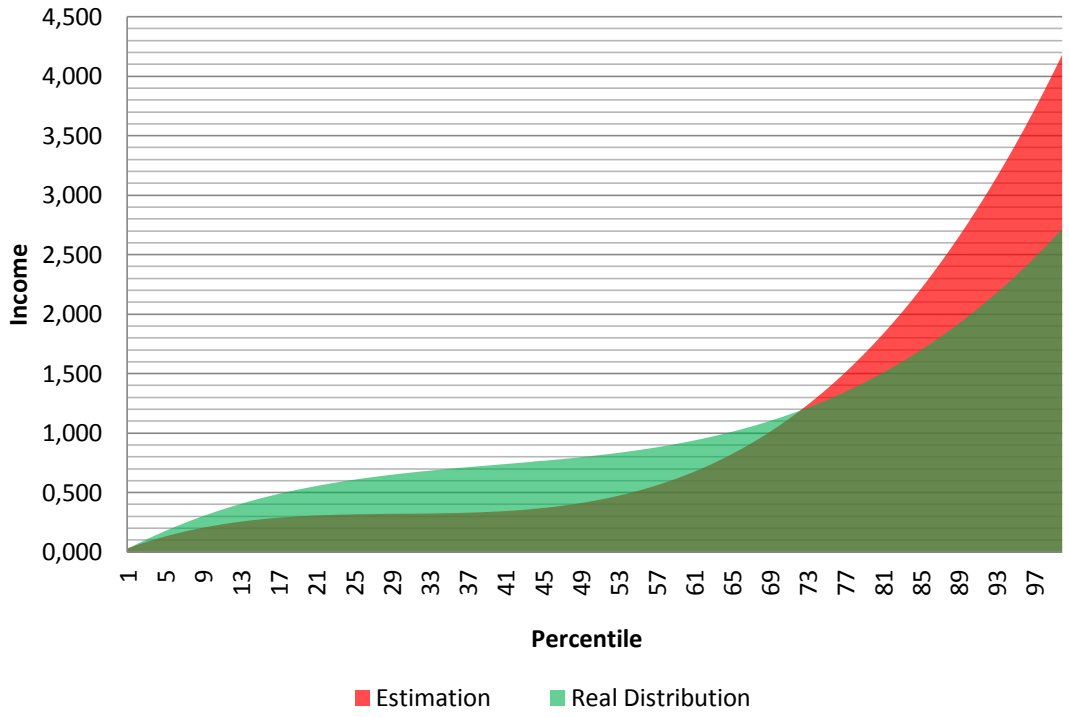
If we analyze the ratios produced by the estimated income distribution in Italy, the produced values shows a much more unequal society. The Palma ratio (ratio between how much earn the 10% of the richest and the 40% of the poorest) is equal to 3.34 from a 0.67 considered fair. According to the World Bank [2014], a similar palma ratio was recorded in Chile with a score of 3.5, in Costa Rica with 3.3 and in Panama with 3.6 in 2009. If the research is limited only to high income countries, the ratio of 3.34 the third highest (behind Chile and Qatar). If real Italian income distribution would result similar to this one, the Stiglitz goal of reaching a Palma ratio equal to 1 would look like unachievable.

The 20/20 ratio returns a similar result, the value of the ratio passed from an ideal 2.9 to an estimated 14.21 meaning that it is estimated that the 20% richest people in Italy earns more than 14 times than the poorest 20%, which almost 5 times

more than the ideal ratio. A similar result in the 20/20 ratio is scored by Dominican Republic (14.3) Venezuela (16.0) Chile (15.7) or China (12.2). Except Chile, none of these countries is a member of OECD organization.

Does the estimation of income inequality in Italy is similar to the real one? Fortunately it is not. According to "*Index Mundi*" Italy is a much more equal country than the one perceived by people interviewed in this survey. In fact the share of income obtained by the richest 20% of population is equal to 40.94% of the total (the estimated share was 66.40%) while the 40% of poorest earn 19.51% of the total income (the estimated one was 10.06%). The following graphic comparison between the reality and the estimation gave us a visual idea of the gap of the two distributions.

Graph 28: Comparison between estimated and real distribution of incomes in Italy

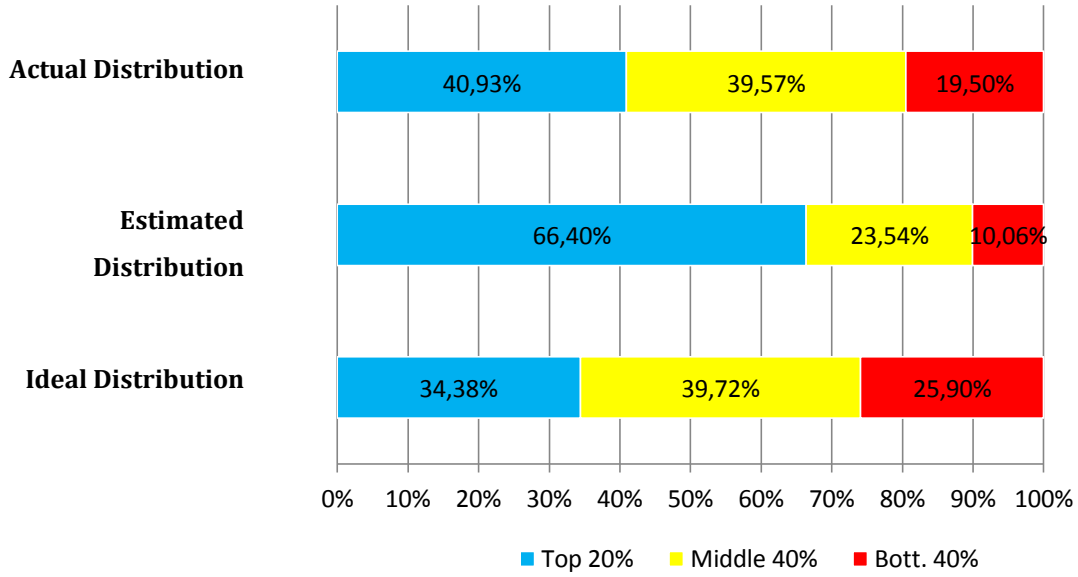


Income in Italy is actually more equally distributed than the recorded perceptions. In fact the real 20/20 ratio is equal to 6.5 which is higher than the ideal 2.9 but less than half the estimated one (14.21). This value is much closer with the ones recorded in the OECD are: New Zealand scores 6.8, Spain 6, Greece 6.2 and France

5.6. The Italian value is also considerably lower than the one scored by US (8.4) and UK (7.2). The Palma ratio for Italy is equal to 1.21 which puts the country much closer to the goal value proposed by Stiglitz. Similar values are recorded in other European countries like Spain or United Kingdom.

It is useful to resume the results of the survey in three charts. The bottom one represents how respondents think income should be distributed. The second one show how they think it is actually distributed in Italy and the one on top represents the actual distribution.

Graph 29: Bar chart of the actual, estimated and ideal distribution of income in Italy



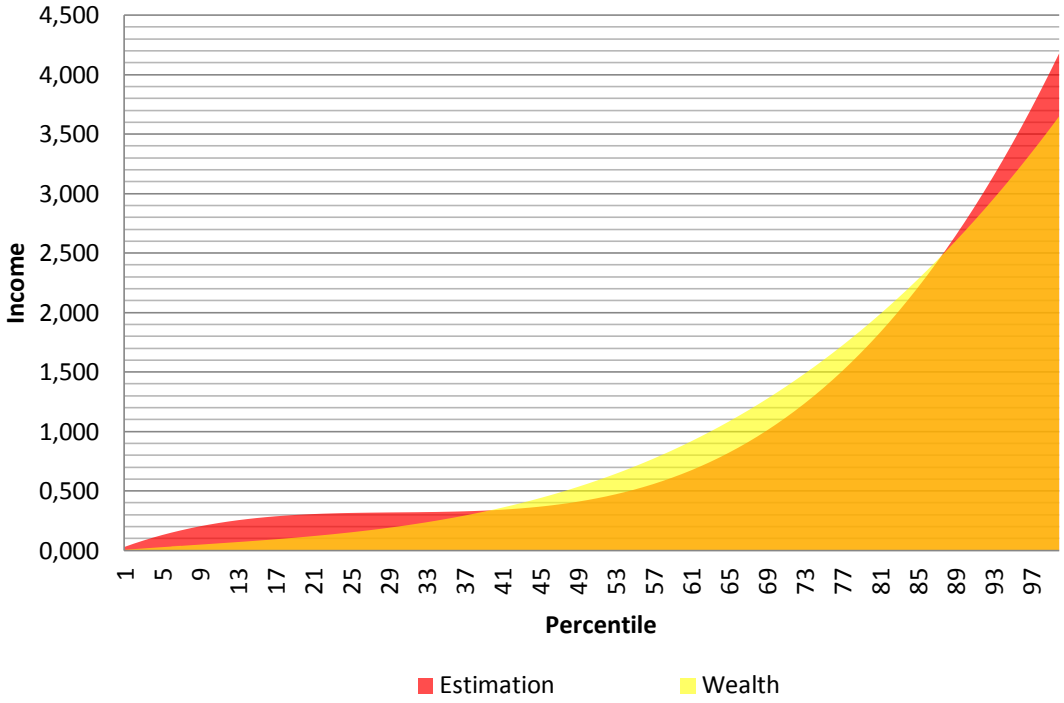
On average people that fulfilled the survey (in an acceptable manner) overestimate the level of income inequality in Italy. In fact, the actual distribution of income in Italy is closer to the ideal one than to the estimated one. This wrong estimation can be due to poor information about this phenomenon or to an excessive perception about income obtained by richest. There are also other possible explanations for this mismatch, like the bias of the data collection methods. In fact also the income distribution published by Index Mundi are a resulted of estimation. The data on which it is based have been collected from surveys or from tax returns and, as seen before, are subjected to some errors. In surveys rich people often underestimates

their own income or they tend to not answer at all. Tax returns suffer of tax evasion problems, which is a particularly important phenomenon in Mediterranean countries like Italy. An Italian minister affirmed in a conference that less than 800 people in Italy declared more than 1 million euro income[24] which is an incredible little number for the word's seventh richest country. It is possible therefore that the tax evasion reduces the reported level of inequality and that accordingly the estimation produced by people on this survey is closer than the real income distribution.

It is likely that people based their answers on data published by media. Usually the information encountered in the media about inequality is more often based on the distribution of wealth than the distribution of incomes. This choice is probably due to the fact that, usually, wealth is much more unequally distributed than incomes and therefore the news has a bigger impact on the people. I have decided therefore to compare the estimation of income distribution and the distribution of wealth in Italy. The questions of the survey were intended to obtain an evaluation of the distribution of income; however it is possible that some individuals confuse the word "*income*" with "*wealth*" and answer to the question with the data they remember from the news, which were probably based on wealth. If, as we seen, people overestimated income inequality maybe it is due to the fact that some of them gave an estimation of wealth distribution. Even if the comparison is between two different factors, I think it is interesting to see if the evaluation produced from this survey is closer to wealth distribution than to the income one.

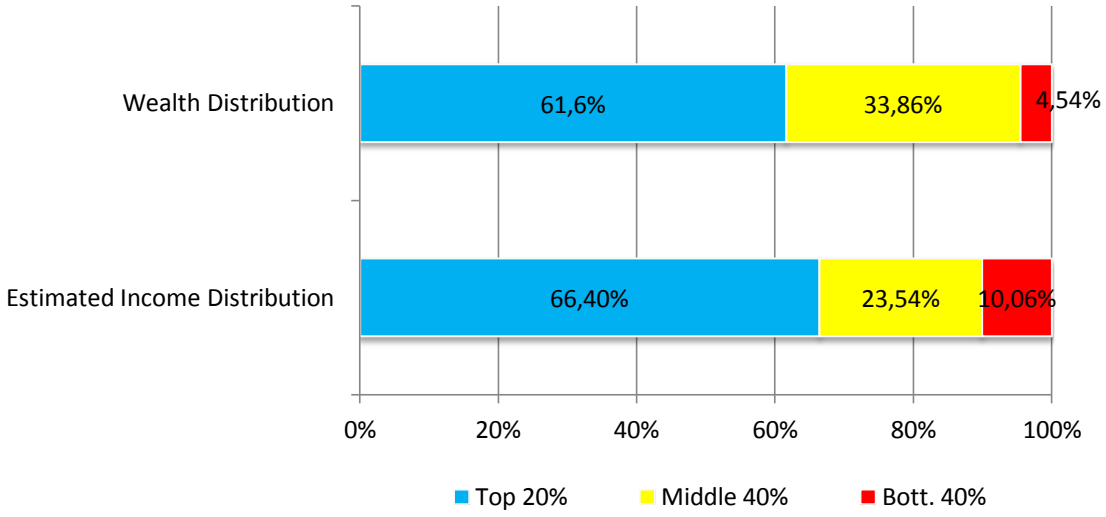
[24] "*Tax evasion is a national pastime afflicting southern Europe*", CNN, November 3, 2011

Graph 30: Comparison between estimation of income distribution and actual wealth distribution in Italy



As we can see from the diagram, the estimation given in the survey it is much closer to the real distribution of wealth than to the real distribution of income in Italy. If we represent the two distributions in a bar chart it is possible to appreciate the gap in an easier way.

Graph 31: Bar chart of the estimated distribution of income and real distribution of wealth in Italy



Even if it is closer to the real distribution of wealth, the estimation made presents some relevant differences from reality. The share that respondents think the richest 20% have is over estimated even if the comparison is on wealth. However also the share owned by the poorest is over estimated by more than two times. Middle class in Italy actually is richer than it is thought. As happens in many countries, in Italy wealth is much more unequally distributed than income. The wealth owned by the poorest 20% is barely visible in the diagram; therefore the Palma ratio produced much more impressive values than the ones recorded for income. Wealth distribution in Italy scored a Palma ratio of 6.78, meaning that the top 10% richest own almost 7 times more than the poorest 40% of population. Italians richest 20% of population owns more than 60% of the total wealth, while the poorest 20% of Italians own less than 1% of the total wealth. This astonishing inequality is not uncommon when is referred to wealth. Also in UK the richest 20% own about 62% of total wealth [ONS, 2012], in Canada the wealthiest 20% own more than 70% [Broadbent Institute, 2014] and in US even more: 84% of total wealth is owned by the richest quintile of population [Norton, 2011].

Conclusions

Inequality is not just the difference between the amounts of income received by different individuals. It is not just the difference in the amounts of wealth they own. Inequality is not just about money, it is much more. Inequalities are a key factor in determining the quality of life, the level of education and the opportunities that a person could get.

As we seen inequalities are the natural consequence of the economic activity. It is perfectly normal to have differences in the income gained or in the wealth owned among different individuals. Inequality was present since the beginning of history, somebody have more, and somebody have less. It has evolved: inequalities in the societies of the past were related with the military power, or the religious one. With the advent of capitalism, inequality started to be related with capital. Some critics were against the system, and a perfectly equal society was theorized, but it never became real. Generally people do not want that everybody get the same income or own the same amount of wealth: it is fair that who works harder and is better skilled obtains more than somebody who is lazy. Inequality in this sense is fairer than perfect equality. If somebody deserves more is fair that he gets more, as long as everybody has the same opportunities to do so. Not everybody has to obtain a degree, but it would be fair that everybody have the same opportunity to attend college.

Inequality is a self perpetuating process. A certain level of inequality is fair, but if it is not controlled it will increase. The concentration of income or wealth tends to increase because it impacts on the distribution of opportunities. As we seen the level of income an individual gains, determines the one that his or her children will gain during their life. Even if opportunities are distributed in a fair way in one generation, the inequality of results will create an advantage for children born in the richest families, while it gets harder for children born in poor families to access at the same opportunities. A reduction of social mobility is inevitable and affects more who has an extreme level of income: the very rich and the very poor often

show fewer changes in their socio economic position than the individuals of the middle class.

Inequalities are recorded not only between people of the same society, but even between countries and among individuals all over the world. Despite relevant problems of measurement we know that, if measured on the entire world as it was a single country, the level of inequality is higher than the one recorded even in the most unequal country. This result highlights the fact that the quality of life a person could aspire, it is often related to the country in which is born. It is often better to be poor in a rich country than in the middle class of a very poor one.

Inequality today has reached a very high level, unusual in the recent history. The consequences that this raise produces are many and are starting to worry even the powerful people in the world. Criminality, economic crisis and under exploitation of human capital are some of the factors related with the increase of inequality. Inequality is often related with a reduction of social mobility. Even if Italy is not a particularly unequal country, it shows a low level of social mobility. As we analyze, even the respondents to the survey are aware of this fact. This characteristic of Italy could lead to an increase of the level of inequality.

Rising of inequalities is a worrying trend, but it is not unstoppable. The first step in order to manage it is to be aware of the problem. It is impressive that, according to the study of Norton in US and similar others conducted in Canada and United Kingdom, the level of inequality is so under rated. If people cannot correctly estimate how much unequal is the distribution of wealth in their country, it is less probable that they will choose the right policy in order to correct the situation. The results of the survey that I have conducted in Italy show some differences. Respondents on average over estimated the level of inequality in Italy. The survey that I have presented is based not on wealth but on income, which is more equally distributed in almost every country. As wealth is often more concentrated than income, it is possible to assume that, if the survey was based on wealth distribution, it would have produced an even more unequal distribution estimation. When the estimation of income distribution is compared with the

actual wealth distribution it is possible to notice that, in this comparison, inequality is better estimated.

Italy is a more equal country than US or United Kingdom but, surprisingly, respondents think it is unequal. However the information gap that Italians showed in this survey is not only opposite (Italians think their country is more unequal than is actually is, while in the other surveys the estimated inequality is lower than the real one) but also lower than the one made by Americans or by British.

It is also interesting to notice that, when it was asked to assign an ideal distribution of income, Italians and Americans gave similar answers. It seems that the concept of ideal distribution is very similar even across different cultures. Italians often agrees about the problem of their country, especially on the high importance of social connection in order to improve their economic situation, and on the lower importance of hard work in defining incomes.

I think that respondents of the survey are on average aware about the inequality present in Italy, even if most of the time the actual situation is better than it appears. As I have showed, rising inequality is a dangerous trend, however it seems that Italians are aware of the problem and they could evaluate contrasting policies in a correct way.

References

- Acemoglu Daron (2003). *"Technology and Inequality",* National Bureau of Economic Research, Winter 2003
- Aguiar Mark, Bils Mark (2011). "*Has Consumption Inequality Mirrored Income Inequality?"* National Bureau of Economic Research Paper No. 16807
- Allgoewer Elisabeth "*Underconsumption theories and Keynesian economics. Interpretation of the Great Depression*", May 2002
- Atkinson Anthony (2015). "Inequality What Can Be Done?" Harvard University Press
- Babones Salbatore,, Alvarez-Rivadulla Maria José (2007). "*Standardized Income Inequality Data for Use in Cross National Research*". Sociological Inquiry Volume 77, Issue 1, Pages 3-22
- Banerjee Abhijit Duflo Esther (2003). *"Inequality and Growth: What can the Data Say?".* Department of Economics and NBER
- Barro Robert (1999). *"Inequality and Growth in a Panel of Countries".* Harvard University
- Becker Gary (1968). "Essay in the Economics of Crime and Punishment". National Bureau of Economic Research 1-54
- Bénabou Roland, (1996). *"Inequality and Growth".* NBER Macroeconomics Annual 1996, Volume 11
- *Berg Andrew Ostry Jonathan (2011) "Inequality and Unsustainable Growth: Two Sides of the Same Coin?",* Andrew Berg and Jonatham Ostry, IMF discussion Note, SDN/11/08
- Bertola Giuseppe, (1993), "Factor Shares and Saving in Endogenous Growth", American Economic Review, 83, 1184-98
- Braithwaite John (1979). "*Inequality, Crime and Public Policy*", National Criminal Justice Reference Service NCJ 063769
- Broadbent Institute (2014). *"The wealth gap"*, December 2014
- Buehn Andreas, Schneider Friedrich (2012). "*Size and Development of tax evasion in 38 OECD countries: what do we (not) know?"* CESifo Paper Discussion Series, November 2012, University Munich, Munich, 2012.

- Bunker Nick (2015). "*The role of consumption in economic inequality",* Washinton Center for Equitable Growth, April 2015
- Causa Orsetta, Dantan Sophie Johansson Asa (2009). *"Intergenerational Social Mobility".* OECD, France
- Cingano Federico (2014). "Trends in income inequality and its impact on economic growth", OECD Social, Employment and Migration working papers, France 2014
- Cobham Alex (2013). "*Palma vs Gini: Measuring post-2015 inequality*". Center for Global Development
- Corak Miles (2013). "Income Inequality, Equality of Opportunity and Intergenerational Mobility", IZA DP No. 7520
- Credit Suisse (2012) "Credit Suisse: Global household wealth falls 5.2% to USD 223 trillion, with Eurozone crisis as backdrop", Credit Suisse media releases
- D'Addio Anna Cristina (2007). *"Intergenerational Transmission of Disadvantage: Mobility or Immobility across Generations? A Review of the Evidence for OECD Countries".* OECD Employment and Migration Working Paper, OECD Publisher, Paris
- *Davies Jonathan (2015)."The social Exclusion Debate: Strategies, Controversies and Dilemmas*". Policy Studies Vol.26 (No.1) pp. 3-27
- *Deaton Angus (2015). "The Great Escape".* Press Princeton
- *Desilver Drew, (2015). "The many ways to measure economic inequality",* Pew Research Center, September 2015
- ETUI (2012). "Benchmarking Working Europe 2012". ETUC and ETUI, Brussels
- European Trade Union Institute (2012). "Benchmarking Working Europe 2012". ETUI aisbl, Brussels
- *EY (2014). "Worldwide Estate and Inheritance Tax Guide 2014",*
- Fajnzylber Pablo Lederman Daniel, Loayza Norman (2002). "*Inequality and Violent Crime*". Journal of Law and Economics, vol. XLV

- Forbes Kristin (2000) "A Reassessment of the Relationship Between Inequality and Growth". The American Economic Review. Vol. 90 N. 4 869-887
- Francese Maura, Mulas-Granados Carlos (2015). "Functional Income Distribution and its Role in Explaining Inequality". IMF Working Paper WP/15/244
- Friedman Milton (2009). *"Price Theory"* The Richest Man in Babylon
- Hausmann Ricardo, Pritchett Lant, Rodrik Dani (2005). "Growth Accelerations". Journal of Economic Growth, Vol 10, pp 303-29
- Heshmati Almas (2004). "*Inequalities and their measurement". IZA DP No. 1219*
- High Pay Centre (2014). The State of Pay: High Pay Centre briefing on executive pay
- High Pay Centre 2014 Analysis, UK
- IMF (2007). "World economic outlook, October 2007: Globalization and Inequality" IMF research dept. Washington D.C.
- Jaumotte Florence and Buitron Carolina (2015). *"Inequality and Labor market Institutions",* IMF Staff Discussion Note, 15/14
- Joumard Isabelle, Pisu Mauro, Bloch Debra (2012). *"Less income inequality and more growth - Are they compatible? Part 3."* OECD Department Working Papers, No. 926, France
- *Juhn Chinhui, Murphy Kevin, Pierce Brooks (1993). "Wage Inequality and the Rise in Returns to Skill*", The Journal of Political Economy, Vol. 101, No. 3 June 1993, pp. 410-442
- *Keeley Brian (2014) "Is Inequality good or bad for growth?"* OECD Observer
- Kennickell Arthur (2009). *"Ponds and Streams: Wealth and Income in the U.S., 1989 to 2007",* Federal Reserve Board, Washington, D.C.
- *Kenworthy Lane (1999). "*Do Social-Welfare Policies reduce poverty? A Cross-National Assessment". Social Forces 77(3):1119-39

- *Kramarz Francis (2008). "Offshoring Wages and Employment: evidence from data matching imports, firms and workers",* CREST-INSEE, CEPR, IZA and IFAU
- Krueger Dirk, Perri Fabrizio (2005). "Does Income Inequality Lead to Consumption Inequality? Evidence and Theory". Federal Reserve Bank of Minneapolis, Research Department Staff Report 363
- Lemieux Thomas (2008*). "The changing nature of wage inequality", J Popul Econ 21:21-48*
- Litchfield Julie (1999) "*Inequality: Methods and Tools".* Text for WorldBank
- Lubker Malte (2007). "*Labour Shares*", International Labour Office, Geneva
- *Lustig Nora (2013). "The Impact of Taxes and Social Spending on Inequality and Poverty in Argentina, Bolivia, Brazil, Mexico, Peru and Uruguay: An Overview"* Commitment to Equity, Working Paper No. 13, April 2013
- McCulloch Rachel (2005). "Protection of real wages: the Stolper-Samuelson theorem".
- Mendolia Silvia Siminski Peter (2015). *"New Estimates of Intergenerational Mobility in Australia".* IZA DP No. 9394
- *Mesnard (1999). "Gini index, inequality comparisons and maximin axiom: a paradox".* Journal of Economic Literature C43, D63, I32
- Milanovic Branko (2006). "Global Income Inequality: What it is and Why it Matters?" Desa Working Paper ST/ESA/2006/DWP/26
- Miles Corak (2013). *"Inequality from generation to generation: the United States in comparison".* University of Ottawa
- Norton Michael, Ariely Don (2011). "Building a Better America – One Wealth Quintile at a Time". Perspectives on Psychological Science 2011 6: 9. Published by SAGE
- OECD (2007)*. "OECD Annual Report 2007".* OECD Publishing, Paris
- OECD (2008). "Growing unequal? Income Distribution and Poverty in OECD countries". OECD Publishing.
- OECD (2010) "Economic Policy Reforms, Going for Growth". OECD Publishing, Paris. 181-196

- OECD (2011), "Divided We Stand: Why Inequality Keeps Rising", OECD Publishing. 21-45
- OECD (2014), Education at a Glance 2014: OECD Indicators, OECD Publishing
- *OECD (2014). "Inequality hurts economic growth, finds OECD research", OECD Newsroom*
- OECD (2015), "In It Together: Why Less Inequality Benefits All", OECD Publishing, Paris
- OECD (2015). SF1.1: Family Size and Household Composition. OECD Directorate of Employment, Labour and Social Affairs. September 2015
- OECD (2016), Income inequality (indicator). doi: 10.1787/459aa7f1-en
- ONS (2012). "*One fifth of the UK population have most of the wealth*", Office for National Statistics Wealth in Great Britain
- OurWorldInData "Income inequality – Empirical view" OurWorldInData.org
- Pew Research Center, *"*Emerging and developing economies are much more optimistic than rich countries about the future", October 9 2014
- Piketty Thomas (2014) "Capital in the XXI Century". 24-60
- Rowlingson Karen (2011). "Does income inequality cause health and social problems?" Joseph Rowntree Foundation
- Smith Adam (1776). "*The Wealth of nations*", Part II, Of the expense of justice
- *Solon Gary (2013). "Theoretical Models of Inequality Transmission across Multiple Generations",* Panel Study of Income Dynamics, University of Michigan, July 2013
- Stiglitz Joseph (1996). "Some lessons from the east Asian miracle" The World Bank Research Observer, August 1996
- *Stiglitz Joseph (2012). "The price of inequality: How Today's Divided Society Endangers Our Future". W. W. Norton & Company*
- Stiglitz Joseph, Doyle Michael (2014). *"Make Eliminating Extreme Inequality a Sustainable Development Goal" Ethics and International Affairs Journal of the Carnegie Councile*

- UK Ministry of Justice (2014) “Costs per place and costs per prisoner”, October 28, 2014
- UNDP (2013). “*Humanity Divided: Confronting Inequality in Developing Countries”.* UNPD publishing, New York. Chapter 3
- *United Nations (2012)“Trade and Development Report, 2012”* United Nations, Geneva Conference 2012
- *United Nations (2013). “Inequality Matters, Report on the World Social Situation”.* United Nations publication ST/ESA/345
- World Bank (2015). Global Monitoring Report 2014/2015: Ending Poverty and Sharing Prosperity. Washington, DC: World Bank. doi:10.1596/978-1-4648-0336-9
- World Bank (2016) “*Visualize Inequality, HOI Methodology*”, World Bank Visualize Inequality
- World Bank Data Site
- World Economic Forum, (2015). *“Outlook of the global agenda 2015*” World Economic Forum Publishing