The Rise of a Modern Plutocracy

An econometric analysis of the evolution of top incomes in the developed
countries over the period 1978-2010

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'It is only in the backward countries of the world that increased production is still an important object; in those most advanced, what is economically needed is a better distribution' (J.S. Mill, 1848).

Chapter I - Introduction

Introduction

The distribution of income has always been a widely discussed topic as it is one of the main (economic) characteristics of a society. People's attitudes towards, or reactions to, actual income distributions can be significantly influenced by the correspondence (or lack thereof) between their ideas of what is normatively tolerable, and what they actually see in the society around them (Sen, 2000, p. 60). Several scientific disciplines have worked extensively on the determinants and impact of economic inequality, inter alia Sociology, Political Science, Political Economy and Economics.

The Neo-Classical economist Pigou argued that, on the basis of utilitarianism, a more equal distribution was better. Core underpinning was the decreasing utility of consumption. In other words, the utility of an extra dollar consumption for a rich person was less than for a poor person. When the highest aggregate welfare of peoples was to be aimed, rigorous distribution was needed (Pigou, 1953). This idea was formalized as the Pigou-Dalton principle (Stanford Encyclopedia, 2012).

Public discussion

The increase in income inequality in the United States was one of the major underpinnings of the 'Occupy Wall Street' movement. Indicatively, one of their slogans was 'we are the 99%', referring to the income distribution between the wealthiest one percent and the rest of society. At a meeting of a well-known international institution, the World Economic Forum of 2014, the widening gap between the rich and the poor was targeted as the defining issue for the coming decades. Furthermore, a recent survey conducted in the United States showed that two-thirds of the Americans were currently dissatisfied with the way income and wealth are distributed in their nation (Gallup, 2014).

Evolution of top incomes

A specific form of income distribution is the share of total personal income that is captured by the top incomes (i.e. the top 1% of the income distribution). From the Second World War onwards the top one percent income share remained stable or decreased moderately in all the developed countries[1]. However, from the late 1970s a steep rise in the share of income captured by the top one percent occurred in some developed countries, first observed in the USA and the UK. This rise in the top one percent was remarkable, as the rest of the top decile (P90-99) saw no increase during the period after the late 1970s. The other developed English-speaking countries (Canada, Australia, New Zealand and Ireland) soon followed track, and their top one percent saw a similar rise in their share of income from the late 1980s onwards. Such a rise in the income share of the top one percent was observed as well in the South-European countries. The top one percent in both Italy and Spain moderately increased their share from the 1980s onwards, while the increase in Portugal was strongest. The income derived by the P90-99 increased as well in Italy and Portugal. The top one percent in the North-European

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[1] The only exceptions are Finland and Germany as their top one percent income share increased moderately until the 1970s and Japan, where the share of income captured by the top one percent boomed during the 1970s.

countries observed as well an increase in their share of income, but only from the beginning of the 1990s onwards. The rest of the top decile (P90-99) in the North-European countries saw no increase in their share of income, similar to the observations in the English-speaking countries (The World Top Incomes Database, 2014).

In contrast with the English-speaking, North- and South-European countries the other developed countries saw no increase in the share of income captured by the top one percent during this period. The income share of the top one percent in the Netherlands, Switzerland, France, Germany, Denmark and Japan remained stable or only increased relatively moderate in the period 1978-2010 (The World Top Incomes Database, 2014). In the following tables the data of the top income development described above is summarized to give a brief overview. In the first and second row the share of income captured by the top one percent of the personal income distribution is presented and in the third and fourth row the absolute and relative changes.

Country Year	UK	Australia	US	Canada	New Zealand	Ireland	Portugal	Italy	Spain
1979	5.9	4.8	9.7	8.5	5.8	8	4.5	6.8	7.6[2]
2009	15.4	8.9	18.1	13.3	7.8	10.5	9.8[3]	9.4	9.3
Absolute change	+9.5	+4.1	+8.4	+4.8	+2.0	+2.5	+5.3	+2.6	+1.7
Relative change	161%	117%	87%	56%	34%	31%	118%	38%	22%

Table 1. Top income development in the English-speaking and South-European countries throughout the period 1979-2010 (The World Top Income Database, 2014).

Country Year	Sweden	Norway	Finland
1990[4]	5.2	4.3	4.6
2009	8.4	7.1	7.5
Absolute change	+3.2	+2.8	+2.9
Relative change	62%	65%	63%

Table 2. Top income development in the North-European countries throughout the period 1990-2010 (The World Top Income Database, 2014).

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[2] 1981

[3] 2005

[4] The year 1990 is chosen for the North European countries as the increase in the share of income captured by the top percentile occurred from this year onwards, while it still decreased during the 1980s.

Country Year	France	Netherlands	Switzerland	Germany	Denmark	Japan
1979	7.8	6.0[5]	8.4	10.7[6]	5.4	8.4
2009	8.1	6.4	10.5	12.7[7]	5.4	10.4
Absolute change	+0.3	+0.4	+2.1	+2.0	0.0	+2.0
Relative change	3.8%	6.7%	25%	18.7%	0.0%	24%

Table 3. Top income development in the Middle European countries and Japan throughout the period 1979-2010 (The World Top Income Database, 2014).

The aim of this paper

The main topic of this paper is the heterogeneous evolution of the share of income captured by the top one percent as observed since the late 1970s in the developed countries. It was demonstrated that the evolution of top one percent income share differed substantially among the developed countries. The aim of this paper is to explain this difference. The research question formulated is therefore as follows:

What is the reason that the share of income captured by the one percent has increased substantially in some countries in the period 1978-2010 while it has remained stable in the other developed countries?

The contribution of this paper

The main contribution of this paper is its comparable focus, as it studies a large number of countries. Most current studies on the increase in top one percent income share have a country-specific focus, especially focusing on the United States (Gordon & Dew-Becker, 2007, 186). However, it has been observed that the top one percent income share have been increasing in several developed countries over the past decades. There are several studies that try to explain to evolution of top income shares in other countries than the US, but those studies do not have a comparative approach (Roine et al., 2009, p. 975). This research focuses on the evolution of top one percent income share on the basis of a wide set of developed countries and aims to unfold the specific determinants.

Theory - Financialization

Three theories will form the basis of this research. The first theory that will be used in this research deals with financialization. Financialization refers to two independent processes. The first process is financial services firms' increasing importance (in economic, social and political terms) to the society. The second process, which will be used in this research, is the linked trajectory of nonfinancial firm's increased involvement in financial activity (Tomaskovic-Devey & Lin, 2011, 539). One important element through which financialization is linked with the rise in the share of income captured by the top one percent is the increase in 'performance-related pay'. Performance elements in remuneration increasingly take the form of stock options, as this is an effective way of aligning the interest of (top) employees and shareholders and thus of improving incentives to make business more efficient and profitable (Bell & Van Reenen, 2010). It is expected that this process of financialization plays a bigger

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[5] 1977
[6] 1980
[7] 2007

role in the countries where the top percentile income share has risen in contrast with the countries where it has remained stable.

Theory - Superstars

Another theory that will be used in this research is the Superstar theory (Rosen, 1981). Rosen argued that the top labors in some sectors, such as arts, literature and sports, increasingly take the form of superstars. The reason hereof is twofold. The first is the close connection between personal reward and the size of one's own market. The second reason is the scale of the sector, which has increased substantially due to technological change (Ibid, p. 845). The 'best' television programs, movies and literature are supplied to a global market instead of a national or regional market. There is in other words a strong tendency for both market size and reward to be skewed toward the most talented people in the activity. The theory of Superstars can also be applied to some financial and non-financial business activities (Kaplan & Rauh, 2013, p. 36). It is expected that the phenomenon of Superstars has been important in both financial and non-financial sectors in the countries where the share of income captured by the top one percent has risen.

Theory - Financial sector

The third theory that will be used in this research focuses on the financial sector. It is related with the theory of financialization, but the difference is its predominant focus on the financial sector (instead of the influence of finance on the non-financial sector). Several authors (Philippon and Reshef, 2009; Roine et al., 2009) have claimed that the growth of (and change in the working of) the financial sector in some countries does explain for a great extent the rise in the share of income received by the top one percent in these countries. Philippon and Reshef (2009) argued that the deregulation of American financial sector since the late 1970s has increased the skill-intensity of the sector which has led both to a higher aggregate marginal productivity as well as the capturing of rents by the laborers. The increased share of income captured by the top one percent could thus be explained by the deregulation and growth of the financial sector since the late 1970s.

Structure

In the following chapter the evolution of the top one percent income share will be related with general income inequality as well as some other indicators of income inequality. The subsequent third chapter gives some insights in the functional income distribution of the top one percent in the developed countries. Main reason for analyzing the functional income distribution is the expectation that the change in the personal income distribution can be partly understood by analyzing the functional income distribution. In the fourth chapter the relevant literature in this field of study and the relevant theories for this research are discussed, whereupon the hypotheses will be constructed. In the following fifth chapter the most important concepts used in this paper will be discussed as well as the main arguments for the time period, the country selection and the applied econometric techniques. In the subsequent sixth chapter the conceptualization will be described. Additionally, the hypotheses will be operationalized and the utilized data will be discussed. In the seventh chapter the analysis will be presented, concluding as well with the most important results. In the last chapter the results of this research will be discussed and some suggestions for future research will be given.

Chapter II - Personal income distribution

Introduction

In this research the focus will be on the evolution of the top one percent in the developed countries. The aim of this chapter is to relate the evolution of the top one percent of the personal income distribution with other changes in the personal income distribution. Before discussing the various measures of income inequality the concept personal income will be explained. There are various forms of income, such as labor income, non-financial capital income, financial capital income and business income. Personal income in that sense is all income that is actually received by the individuals or households in a country during the year from all sources.

Country grouping

Various tables and figures are used in this research. For the purpose of presentation the developed countries are subdivided in four 'groups'. The grouping of countries in these regions is based on geographical characteristics as well as the evolution of the top one percent of the personal income distribution in these countries. An additional selection criteria for the grouping of the countries is their difference in form of capitalism. The 'variety of capitalism' literature divides countries on the basis of their difference in economic and political institutions. Widely used models are the Anglo-Saxon[8], Scandinavian[9] and the Rhineland model[10]. The four regions constructed are the following:

English-speaking countries: US, UK, Ireland, Canada, New Zealand and Australia.

South-European countries: Portugal, Spain and Italy.

Middle-European countries & Japan: France, Germany, the Netherlands, Switzerland, Denmark and Japan.

North-European countries: Norway, Sweden and Finland.

Income inequality measures

There are various ways to analyze (personal) income inequality. Four measures will be discussed in this paragraph. The most widely used is the GINI-coefficient, based upon a formula constructed by the Italian statistic Corrado Gini. It measures income inequality along a range of zero to one, whereby zero implies total equality and one is complete inequality. A second measure, that is used extensively, is the Theil index. It is less common to use than the GINI, but is has the advantage of being additive between regions. In other words, it can be used to measure the weighted average of inequality within subgroups, plus inequality among the subgroups. A third way to measure income inequality is by using the 'decile dispersion ratio'. Then the income share of a certain proportion, for example the upper 10 percent of the income distribution, is compared with another proportion, for example the lowest 10 percent of the income distribution. This measure is straightforward, but it is less applicable for measuring the middle-income groups' position. The last possible measure is a more 'absolute measure', by measuring the proportion of people living under a certain welfare stand (for example

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[8] Characterized by a limited role of the government and a free market economy: English-speaking countries.

[9] Characterized by a socio-democratic welfare state and a free market economy: Middle-European countries.

[10] Characterized by a strong redistributive welfare state and a free market economy: North-European countries.

having less than a 1$ per day budget). This measure is very useful for analyzing the position of the poor, but has less utility for the general income distribution analysis (World Bank, 2013).

Income inequality

In this chapter three measures of personal income inequality will be used. The first is the GINI coefficient, as this gives a clear indication of the evolution of general income inequality in a country. The subsequent measure that will be used is the 'decile dispersion ratio'. The purpose of using this measure is to give insights in the relative position of income groups in the personal income distribution. The focus will be on the upper-middle income group (P90), the middle-income group (P50) and the low-income group (P10). It is expected that a change in the GINI coefficient over a period of time in one country is 'reflected' in a change in the P90/50 or the P90/10 ratio. The third (and last) measure used in this chapter is the income share of a certain proportion of the personal income distribution. It was already mentioned in the introduction that the top one percent of the personal income distribution increased their share of total personal income in some countries over the period 1978-2010. In this analysis both the share of income captured by the top one percent as well as the share of income captured by the rest of the top decile (P90-99) will be illustrated. The aim of this analysis is twofold. On the one hand the heterogeneous evolution in the top one percent income share in the period 1978-2010 in the developed countries can be detected. On the other hand will this analysis show that the increase in the top one percent (in some developed countries) is a unique event in most developed countries, as the rest of the top decile observed no increase in their share of income in most developed countries throughout this period

Part I – GINI coefficient and decile dispersion ratio's

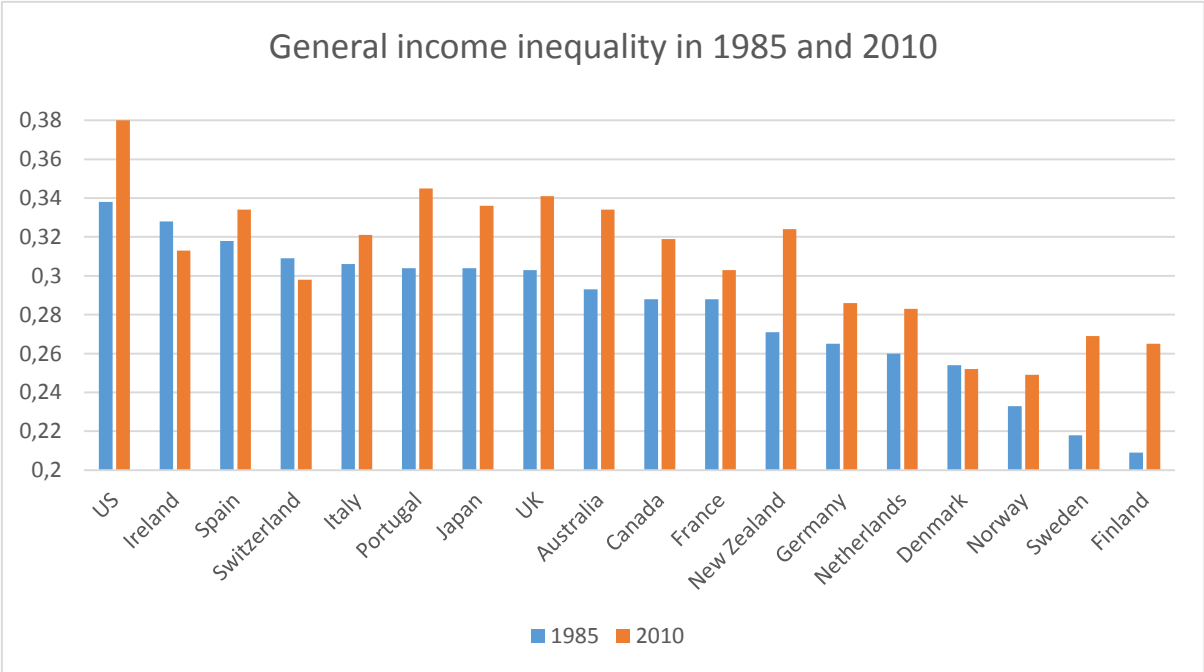In the table beneath the GINI coefficient of the developed countries is presented for the years 1985 and 2010[11].

Figure 1. The evolution of income inequality in the OECD countries over the period 1985-2010 (OECD, 2014a; LIS, 2014).

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[11] The year 1978 would have been optimal in this perspective, but here is limited homogenous data regarding the GINI coefficient available for developed countries prior to 1985.

In the figure above it can be observed that income inequality increased in most developed countries relative to the mid-1980s. In this research 18 of these OECD countries are analyzed, whereof only Ireland, Switzerland and Denmark had a lower GINI coefficient in 2010 relative to 1985. The strongest increase in the GINI related income inequality took place in the English-speaking and the North-European countries.

Before analyzing the share of income going to the top percentile of the personal income distribution other indicators of income inequality will be presented. The indicator used is the disposable income decile ratio (P90/10 and P90/50). At first the evolution of those two income inequality measures (plotted over the period 1978-2010) will be presented for the English-speaking countries.
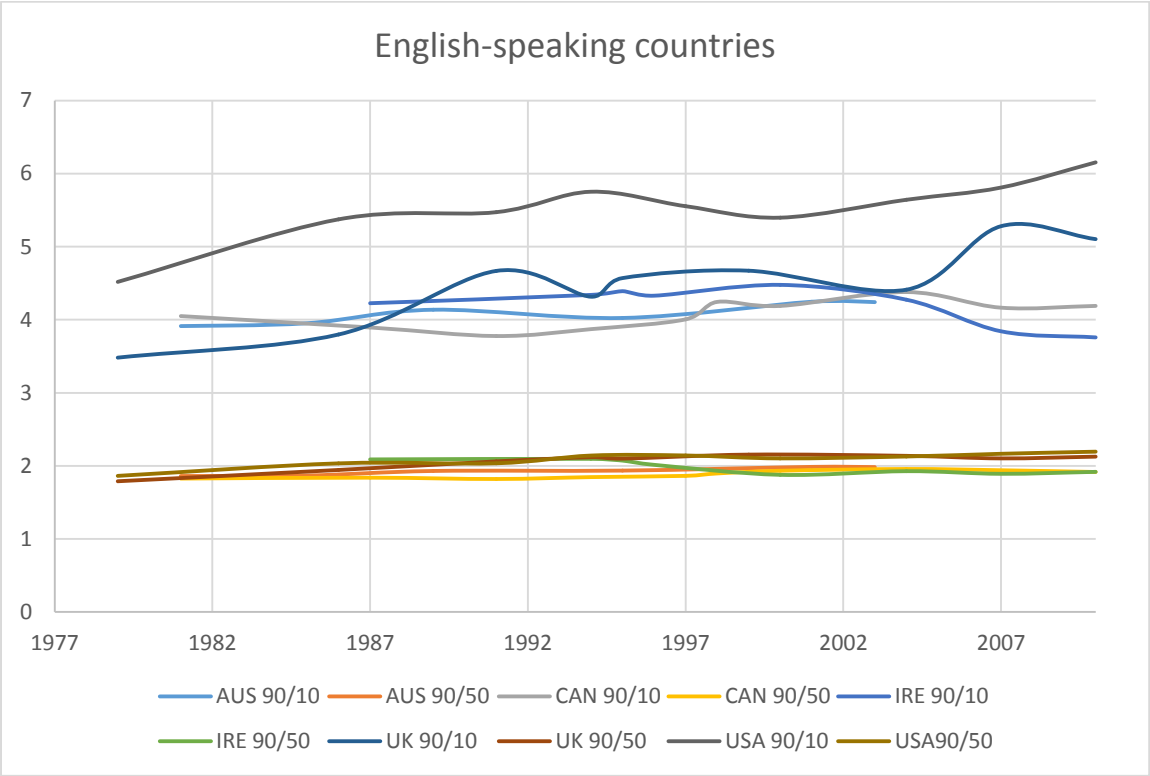

Figure 2. The P90/50 and P90/10 personal income ratios in the English-speaking countries throughout the period 1978-2010 (Luxembourg Income Study, 2014).

It can be observed in the figure above that there was almost no change in the P90/P50 ratio in the period 1978-2010. The income derived at the 90th percentile was twice the income derived by the median income (50th percentile) during the whole period in all the English-speaking countries. The rise in income inequality can thus not be explained through a rise of the upper-middle income group versus the middle income group. The P90/10 ratio, that measures the income inequality of the upper-middle income group versus the lower income group, shows a different evolution. Especially in the United States and the United Kingdom the ratio increased from about 4.5 (3.5) in the late 1970s to more than 6 (5) in 2010. An increase in the P90/10 was as well observed for Australia and Canada throughout this period, although less steep. Ireland is the only exception in this case, as this country observed a decrease in the P90/10 ratio since the 2000s, after a moderate increase in the period before. Part of the rising income inequality in the English-speaking countries can thus be explained by a widening

income differential between the (upper)-middle income group and the lower income group. In the following graph the same income inequality indicators are plotted for the North European countries[12].
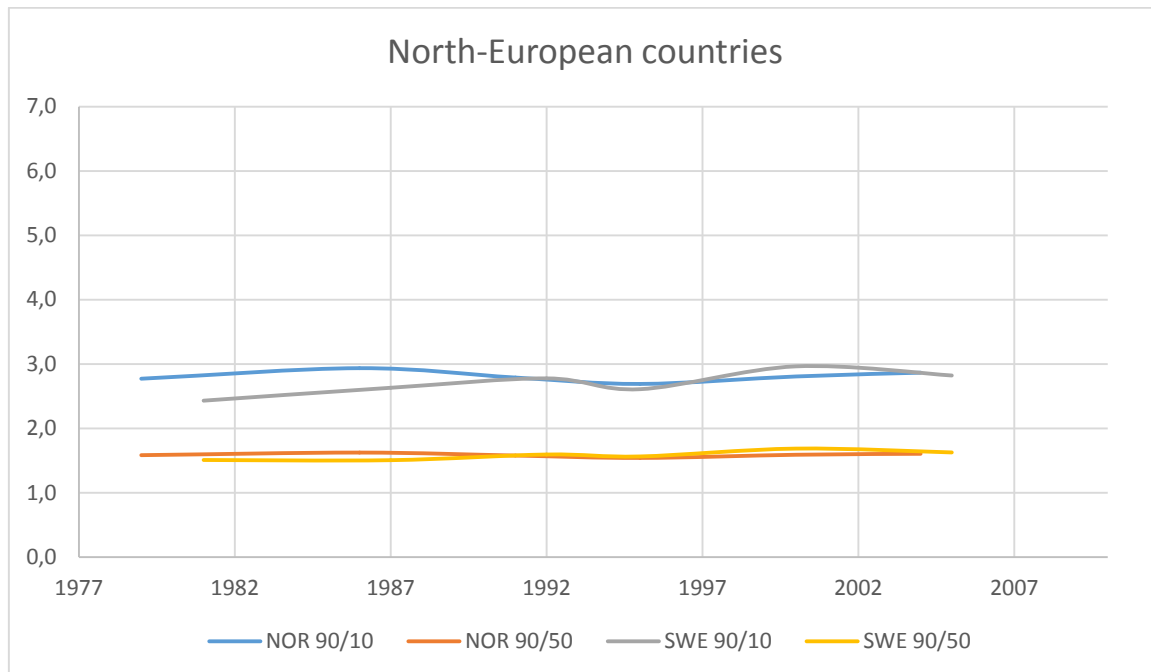

Figure 3. The P90/50 and P90/10 personal income ratios in the North-European countries throughout the period 1978-2010 (Luxembourg Income Study, 2014).

It can be observed in this graph that the relative income of the upper-middle income group for this group of countries did not change in comparison with the median (middle income group). The ratio remained stable around 1.5 throughout the whole period. The evolution of P90/50 ratio is thus similar to the English-speaking countries. The ratio of income of the lower-income group versus the upper-middle income group (P90/10) has however not been stable. In Norway the ratio declined somewhat between 1985 and 1995, where after it slightly increased. In Sweden the ratio rose during the 1980s, declined during the beginning of the 1990s and stabilized thereafter. The lower-income groups have thus lost moderately in Sweden during the period under analysis, while it has been more or less stable since the beginning of the 1980s in Norway. This could explain why income inequality has risen more substantially in Sweden than in Norway throughout the period 1985-2010.

In the graph below a picture of income inequality development of the middle-European countries is presented[13]. It can be observed that the same pattern regarding the P90/50 applies as well for the middle-European countries. The ratio of the 90th percentile remained between 1.5 and 2 relative to the income of the 50th percentile in all middle-European countries. Furthermore, the ratio has not changed over the whole period after 1978 in these countries. The ratio of the P90/10 differs between the middle-European countries (lowest for Denmark, highest for France) and with regard to the other developed countries. The income of the 90th percentile has been roughly stable over the entire period relative to the 10th percentile in the middle-European countries, while it was more volatile in the other developed countries. The only exceptions are France and Denmark (where it decreased before 1990s) and Germany, where it rose steadily during the whole period (from 3.0 to 3.6). This seems to explain

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[12] There is no data available for Finland.

[13] Japan is not included in this analysis as no (comparable) data is available for Japan.

the substantial rise in income inequality in Germany, which was observed in figure 1 (general income inequality).
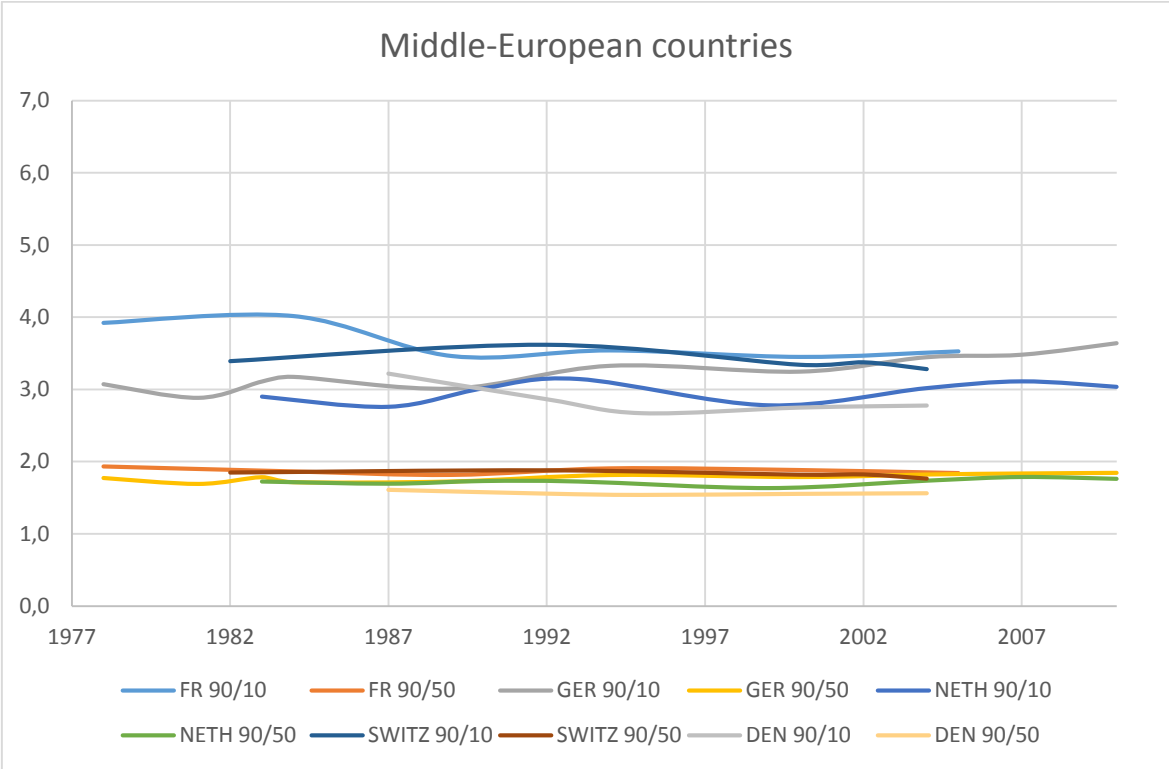

Figure 4. The P90/50 and P90/10 personal income ratios in the Middle-European countries throughout the period 1978-2010 (Luxembourg Income Study, 2014).

The last two countries under analysis are Spain and Italy[14]. These two countries do not differ regarding the stability in the P90/50 ratio as observed in the other developed countries. The ratio has been stable around two, similar to the English-speaking countries. The ratio that gives an insight in the relative income of the lowest income group versus the upper-middle income group (P90/10) has not been stable throughout this period. Both in Spain and Italy the ratio increased from about 4 to 5 during the 1990s. Thereafter it decreased again, with a peak in 1995 for both countries, where it steeple rose again in the late 2000s in Spain. Part of the rising income inequality in the South-European countries thus stems from the rising income inequality between the upper/middle income group and the lower income group.

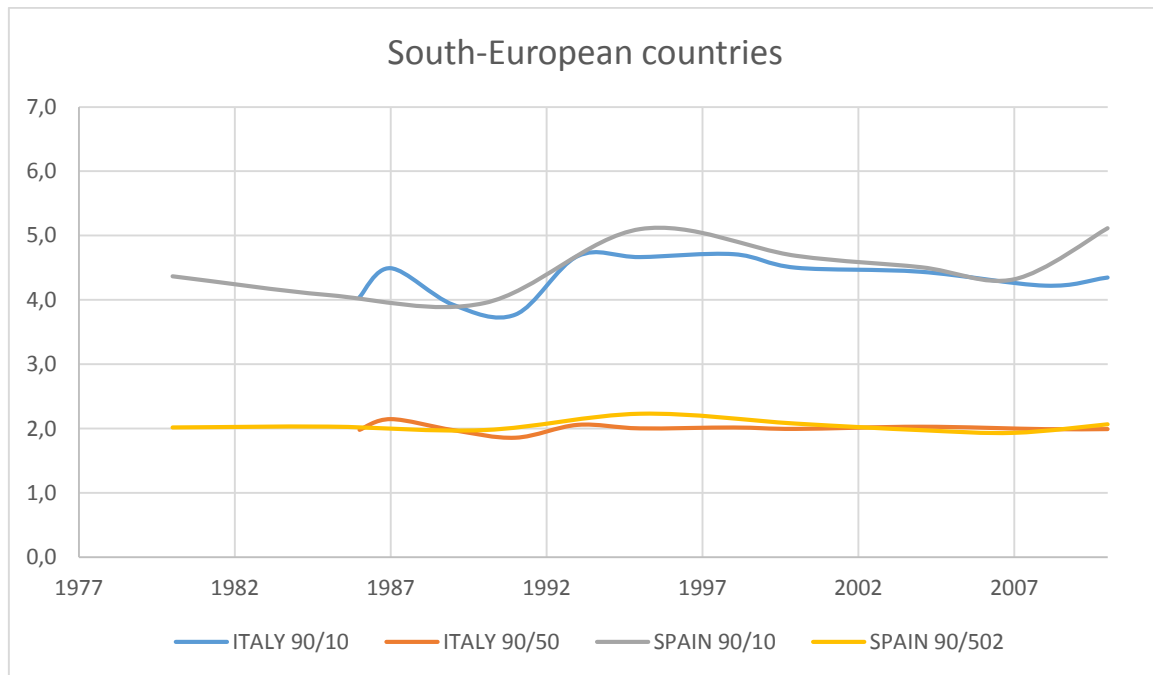[14] There is no comparable data available for Portugal.

Figure 5. The P90/50 and P90/10 personal income ratios in the South-European countries throughout the period 1978-2010 (Luxembourg Income Study, 2014).

Part II – Intra top decile evolution

In the part above it was observed that income inequality rose in almost all the developed countries over the past decades. It was furthermore concluded that part of this rise could be explained by the rise of the (upper)-middle income group versus the lower income group. Another dimension of the rise of the income inequality is the increased share of income going the top one percent, the main topic of this research. In the following part the evolution of income going to the top decile will be analyzed. The focus will be specifically on the share of income going to the top one percent as well as the share of income going to the P90-99. Aim of this intra-top decile analysis is to unfold the remarkable rise of the top one percent income share as observed in some developed countries.

The following graph presents the share of income captured by the top one percent in the English-speaking countries over the period 1945-2010.

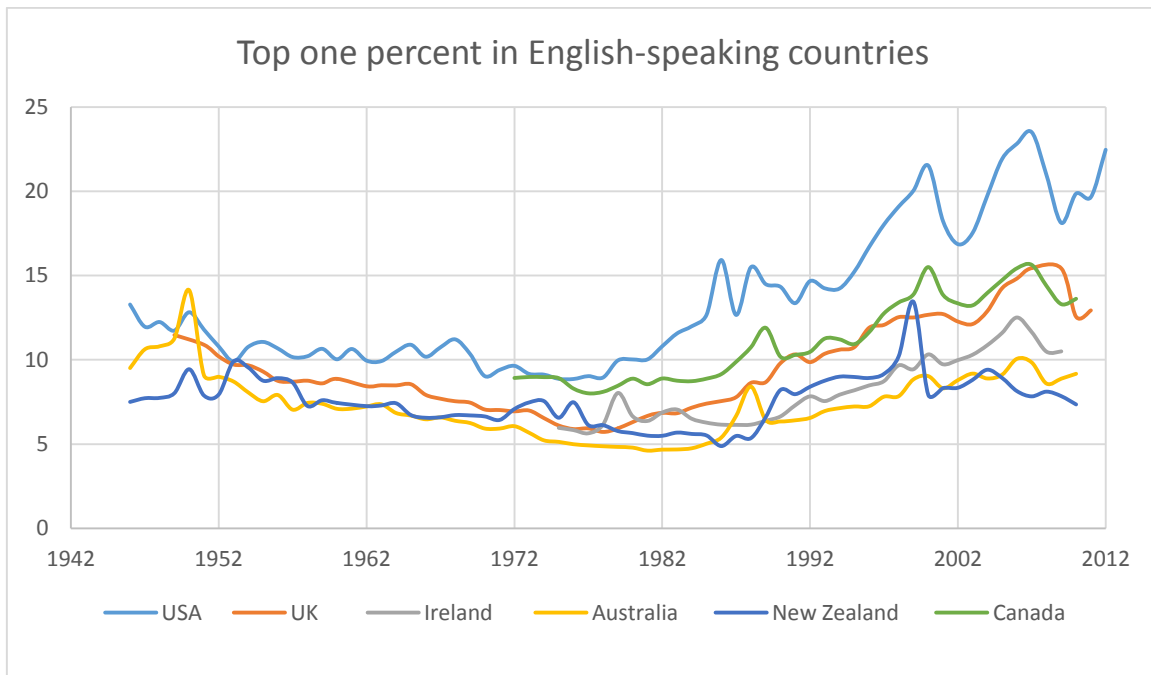**Top one percent in English-speaking countries**

Figure 6. The evolution of the top one percent in the English-speaking countries throughout the period 1945-2010 (The Top World Income Database, 2014).

It can be well observed that the share of income captured by the top one percent declined moderately during the post-WWII period until the late 1970s. However, from 1978 onwards the income share captured by the top percentile increased substantially in the United States and the United Kingdom. About a decade after this increase in the share of income captured by the top one percent it started to rise as well in the other English-speaking countries. In the following graph the evolution of the share of income captured by the rest of the top decile (P90-99) will be presented. In this graph it is observed that the rise in the top one percent differs from the rest of the top decile.

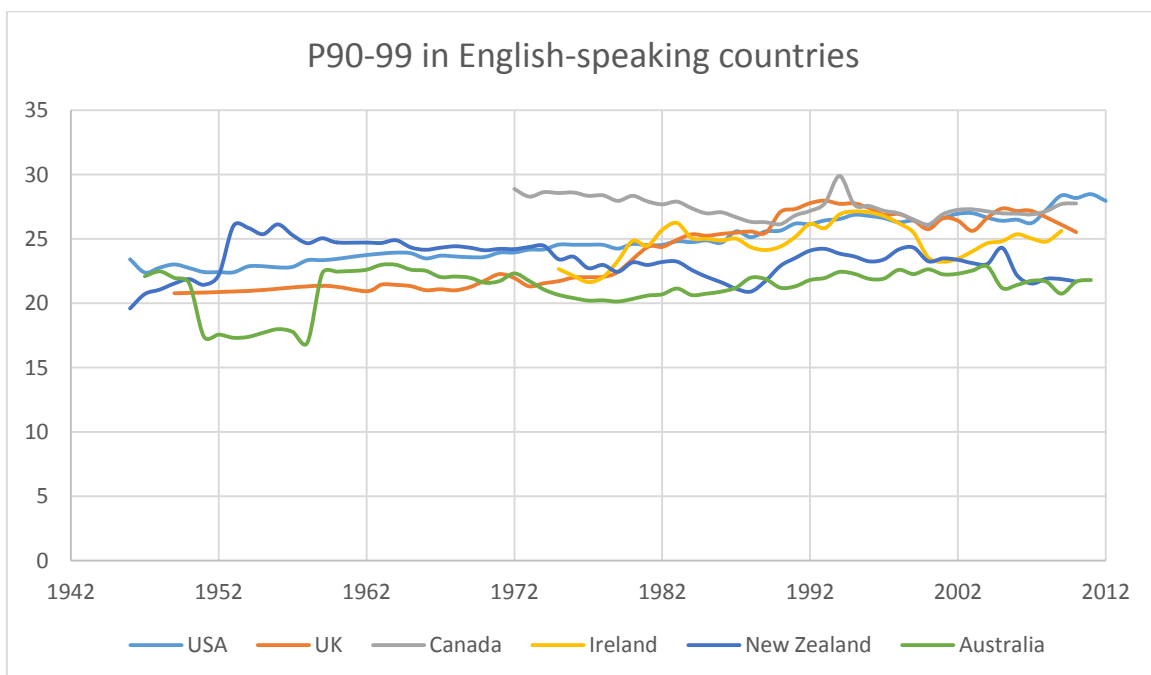**P90-99 in English-speaking countries**

Figure 7. The evolution of the P90-99 of the personal income distribution in the English-speaking countries throughout the period 1945-2010 (The Top World Income Database, 2014).

It can be observed that the share of income captured by the P90-99 remained more or less stable in all the English-speaking countries during the whole post-WWII period. Now that the evolution of the top incomes intra the top decile has been analyzed the same variables for the North-European countries will be presented. In the following graph the share of income captured by the top one percent of the North-European countries is plotted.
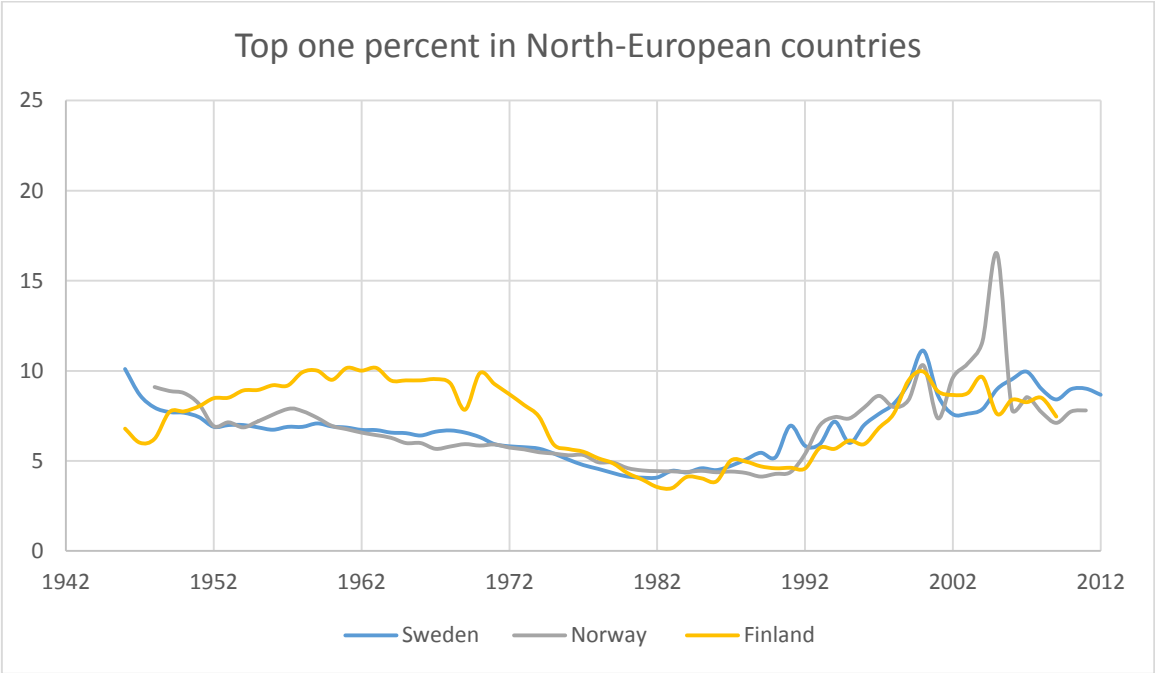

Figure 8. The evolution of the top one percent in the North-European countries throughout the period 1945-2010 (The Top World Income Database, 2014).

It can be observed that in all North-European countries (except for Finland) the share of income declined during the post-World War II period. The strongest decrease for all the North-European countries occurred during the 1970s, while the share of income captured by the top one percent stabilized thereafter during the 1980s. From the 1990s onwards the share of income captured by the top one percent increased in all the North-European countries. The absolute increase is modest compared with the English-speaking countries, but the relative increase is similar to the increase in the income share of the top one percent in the English-speaking countries during the 1978-2010 period. It was observed that in the English-speaking countries the rest of the top decile (P90-99) saw no increase in their share of income during the whole post-WWII period. The data presented beneath shows a similar picture for the North-European countries.

Figure 9. The evolution of the P90-99 of the personal income distribution in the English-speaking countries throughout the period 1945-2010 (The Top World Income Database, 2014).

It can be observed that the rest of the top decile in the North-European countries received a stable share of total personal income in the period 1945-1970, while it decreased during the 1970s. However, in the whole 1980-2010 period the share of income captured by the P90-99 increased only moderately. The increase is furthermore much smaller in comparison with the increase for the top one percent. Now that the data for the North-European countries is presented the same variables will be shown for the South-European countries.

Figure 10. The evolution of the top one percent in the South-European countries throughout the period 1975-2010 (The Top World Income Database, 2014).

It can be observed in the graph that the top one percent share of income increased during the post-1980 period in the South-European countries, especially in Portugal. However, the increase in Spain and Italy is substantially lower relative to the North-European and English-speaking countries. In the following graph the share of income captured by the rest of the top decile is presented.
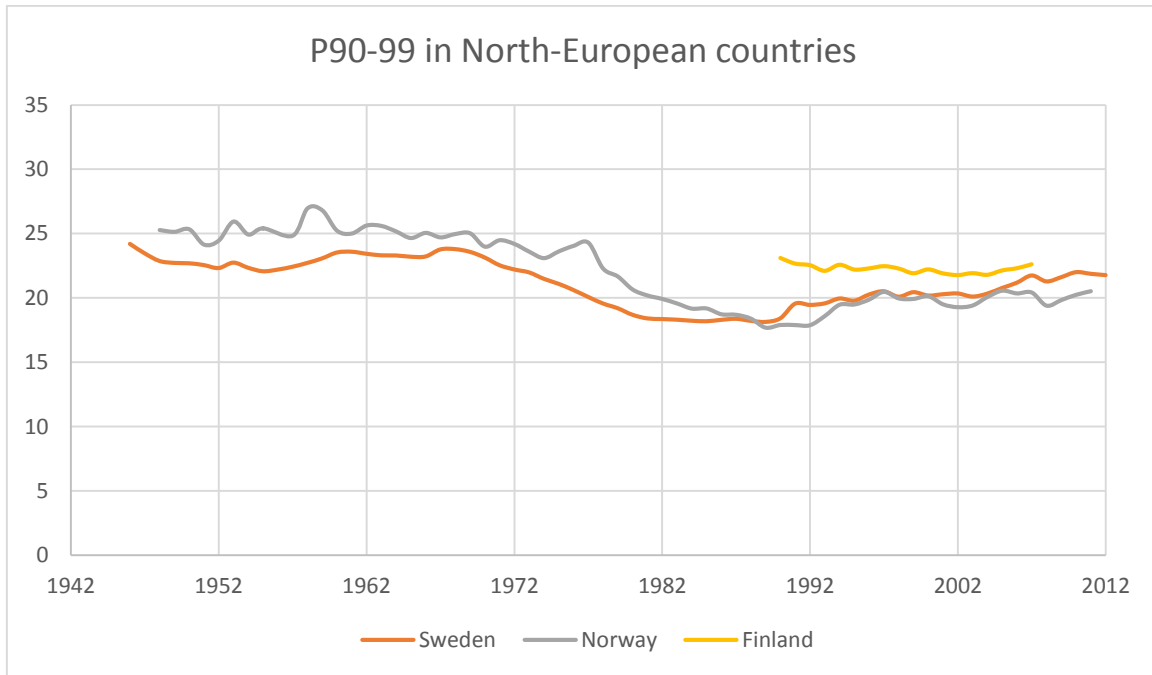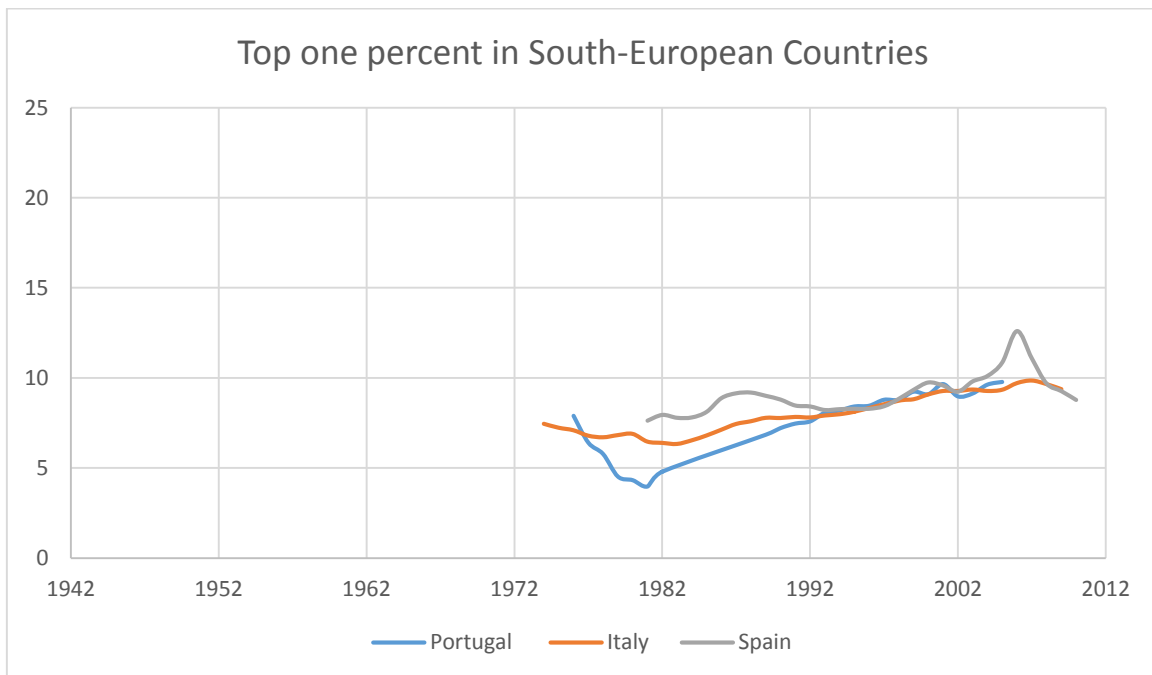

Figure 11. The evolution of the P90-99 of the personal income distribution in the English-speaking countries throughout the period 1975-2010 (The Top World Income Database, 2014).

There is no clear trend to be observed for the P90-P99 regarding the South-European countries. It can be detected that in Portugal the P90-99 observed a steep decline in their share of income after the Carnation revolution while it increased again after 1980. In Italy the P90-99 saw a steep decline in their share during the late 1970s, while they increased their share again in the post 1980 period, reaching a similar level in 2010 compared with the mid-1970s. The share of income captured by the rest of the top decile in Spain was rather stable during the post 1980 period (there is no data available prior to this period).

The last group of countries (middle-European & Japan) that will be analyzed differs from the other countries as their top one percent income group saw no substantial increase in their share of income during the post 1978 period. This can be observed in the following graph.
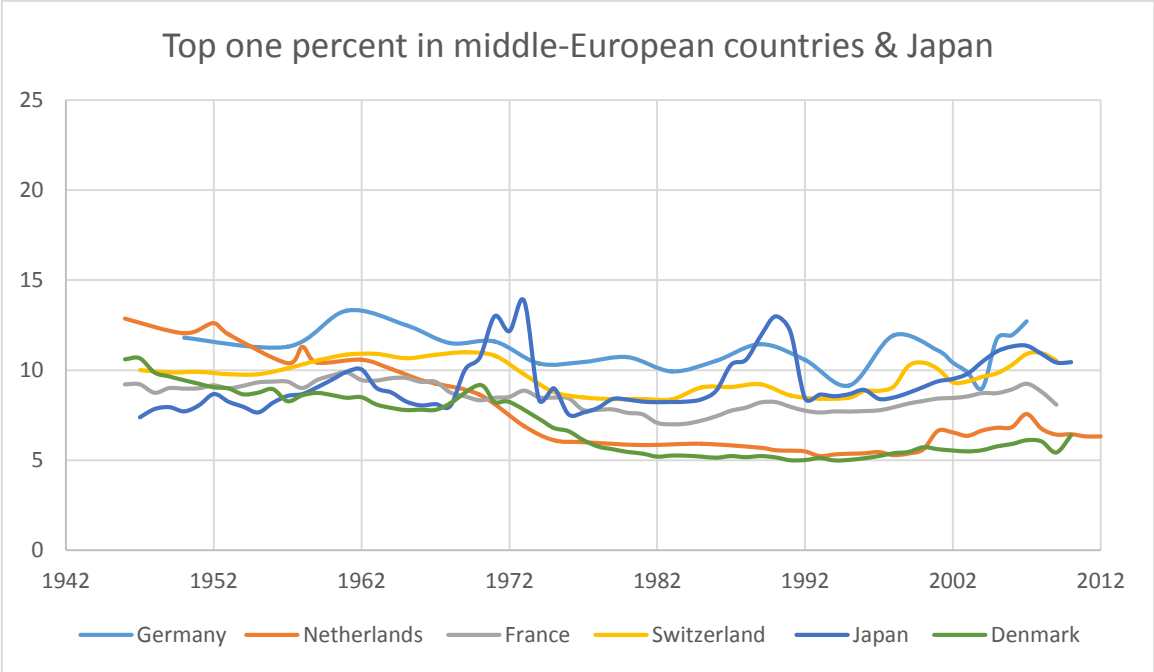
Figure 12. The evolution of the top one percent in the middle-European countries and Japan throughout the period 1945-2010 (The Top World Income Database, 2014).

The top one percent share of total personal income was rather stable in the post-WWII period in Germany, the Netherlands, France, Denmark and Switzerland. The only exception is Japan, where there were two periods where the top one percent observed a sharp in- and decrease of their share (in the 1970s and around 1990). Except for those two short periods the share of income captured by the top one percent in Japan was fairly stable during the post-WWII period. The evolution of the income share captured by the rest of the top decile will be presented in the following graph.
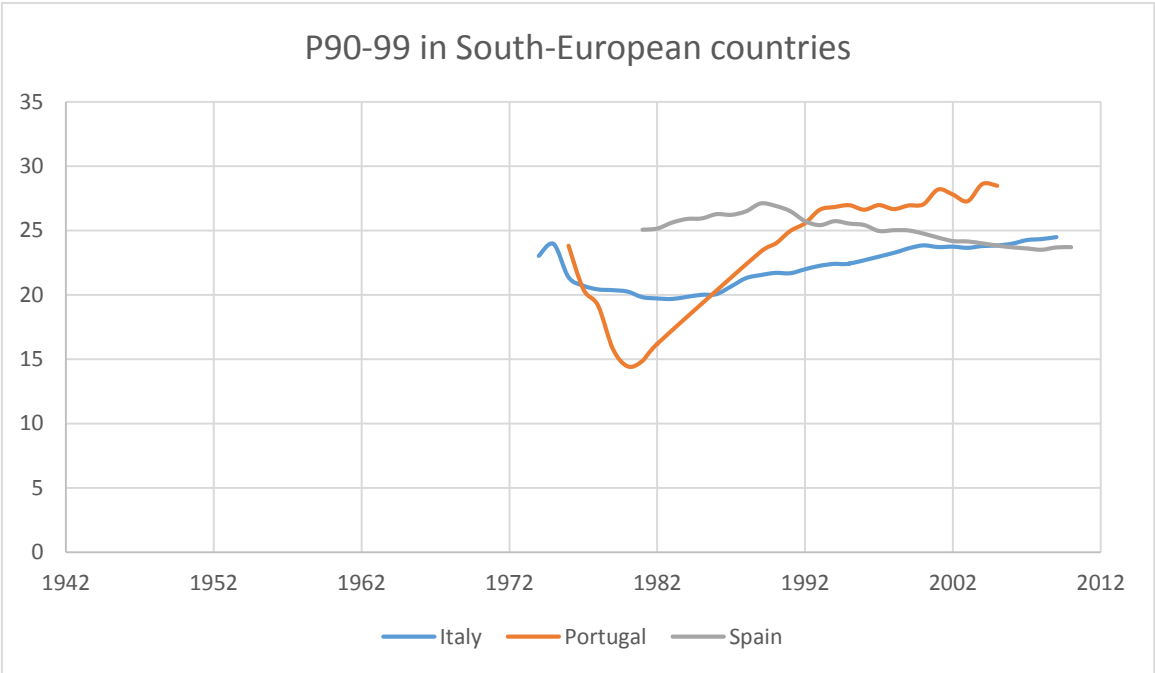

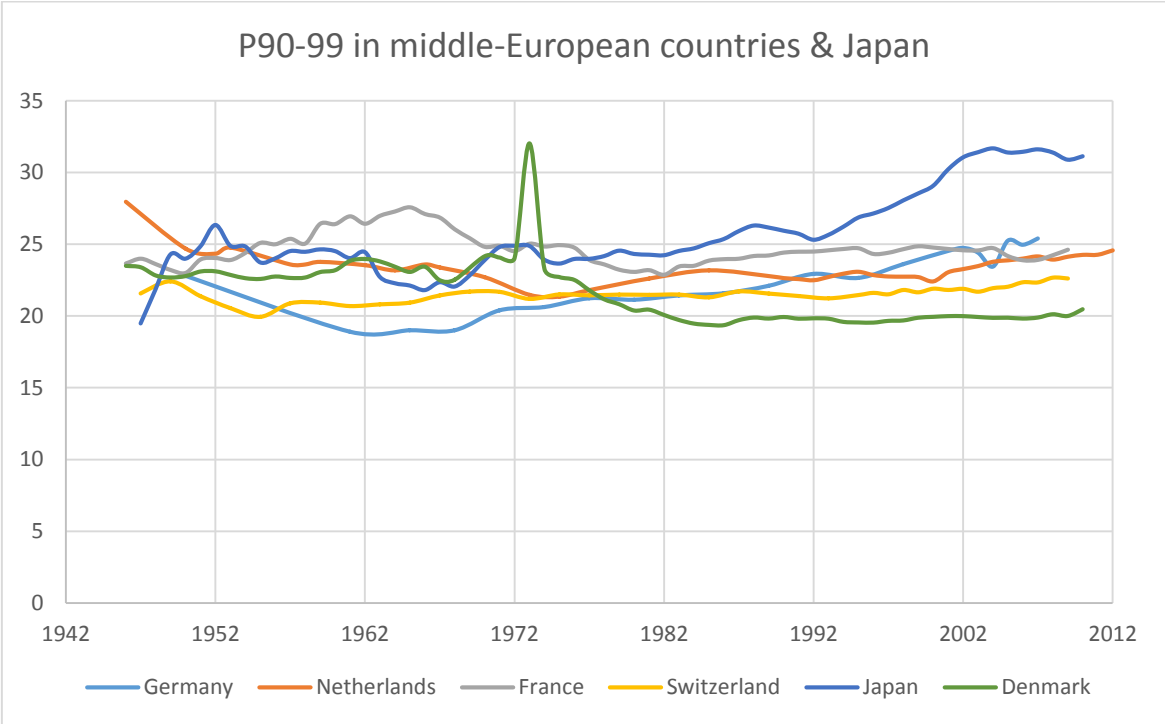*Figure 13. The evolution of the P90-99 of the personal income distribution in the Middle-European countries and Japan throughout the period 1975-2010 (The Top World Income Database, 2014).*

The graph above shows a similar picture of the P90-99 evolution compared with the English-speaking and North-European countries. In all the countries, except for Japan, the share of income captured by the rest of the top decile was fairly stable during the whole post-WWII period. The only exception, again, is Japan. In Japan the share of income captured by the P90-99 increased moderately after the late 1960s and more strongly during the 1990s.

Intra top 1%

In the analysis above it was observed that, in the countries where the top one percent of the personal income distribution gained throughout the period 1978-2010, the rest of the top decile did not gain[15]. However, there are as well some differentiations intra the top one percent and it will be demonstrated that the income gains were not evenly spread among the income groups intra the top one percent. For the purpose of this analysis the top one percent will be subdivided in the income group P99-99.5, the income group P99.5-99.9 and group P99.9-100. The information will be presented as income groups' percentile share of total top one percent income increase. When total income gain was for example 4% for the entire P99-100 group and one percent point hereof was spread to the P99-99.5, one percent point to the 99.5-99 group and two percent points hereof to the P99.5-100 then the first and second group took 25% and the latter group 50% of the income increase. The countries that will be analyzed are the countries where the top one percent increased substantially during the 1978-2010 period (English-speaking, North[16] and South-European countries) as well as the countries where there was no substantial increase in the top one percent income share (middle-European countries and Japan).

Country	US	UK	Australia	Canada	Ireland	New Zealand
P99-99.5	11.5%	17.5%	16.5%	14%	20%	9.5%
P99.5-99.9	24.5%	32.5%	33.5%	31%	n.a.[17]	n.a.
P99.9-100	64%	50%	50%	55%	n.a.	n.a.

Table 4. Income gain spread over the period 1978-2010 intra the top one percent in percentiles (The World Top Income Database, 2014).

Country	Italy	Spain	Portugal	Sweden	Norway
P99-99.5	27%	5%	29%	17%	12.5%
P99.5-99.9	33%	15%	38%	30.5%	32.5%
P99.9-100	40%	80%	33%	52.5%	55%

Table 5. Income gain spread over the period 1978-2010 intra the top one percent in percentiles (The World Top Income Database, 2014).

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[15] Except for Portugal, Italy and Sweden.
[16] Except for Finland.
[17] Not available.

Country	Denmark	Germany	Switzerland	Netherlands	France	Japan
P99-99.5	5%	20%	9%	50%	8%	25%
P99.5-99.9	23%	17%	18%	n.a.	28%	37%
P99.9-100	46%	63%	73%	n.a.	64%	38%

Table 6. Income gain spread over the period 1978-2010 intra the top one percent in percentiles (The World Top Income Database, 2014).

It can be observed in the tables above that the top 0.01 percent of the personal income distribution took in almost all countries the largest share of the income increase. This was strongest in Spain and Switzerland and most modest in Portugal, the Netherlands and Japan. It can be concluded that, although all income groups in the top one percent gained, the gains were strongly skewed towards the top. Furthermore, there does not seem to be any difference regarding the income gain skewedness between the countries where the share of income going to the top one did or did not substantial increase.

Chapter III - Functional income distribution

Introduction

The main topic of this research is related with the personal income distribution. However, some insights can be derived by looking at the functional income distribution. The functional income distribution deals with the source of the personal income, where it is normally subcategorized in:

1) Wages and salaries/employment income
2) Proprietors/rental income
3) Corporate/entrepreneurial/business income
4) Interests and dividends income

For the purpose of this chapter the subcategories will be defined as follows: Labor income, business income and capital income[18]. The purpose of this chapter is twofold. The first goal is to analyze the functional income distribution of the top one percent during the late 1970s and the last year of the analysis, 2010. The second goal is to show the alterations in the functional income distribution throughout this period; the differences between the late 1970s and 2010. The functional income distribution data availability is limited[19] and a less uniform picture can be derived regarding the functional income distribution of the top one percent than regarding the personal income distribution. In the following figure the functional income distribution of the top one percent in 1978 is presented.

Figure 14. The functional income distribution of the top one percent of the personal income distribution (Top World Income Database, 2104).

It can be observed in the figure that labor income was the most important source of income for the developed countries during the late 1970s. There is only one country where another source of income was more important (business income), being Germany. This source, business income, was as well the

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[18] Capital income than is made up of both financial (rents/dividends) as non-financial (rental) capital income.
[19] There is no data for the following countries available: New Zealand, Ireland, United Kingdom, Norway, Denmark, Switzerland and Portugal.

second most important source of income for most developed countries, especially for France and the Netherlands. Capital was of least importance (in magnitude), but was nonetheless more than 20% of total top one percent income in the US, Canada, Spain and Italy during the late 1970s. In the following figure the same data for the year 2010 (or nearest) is presented.
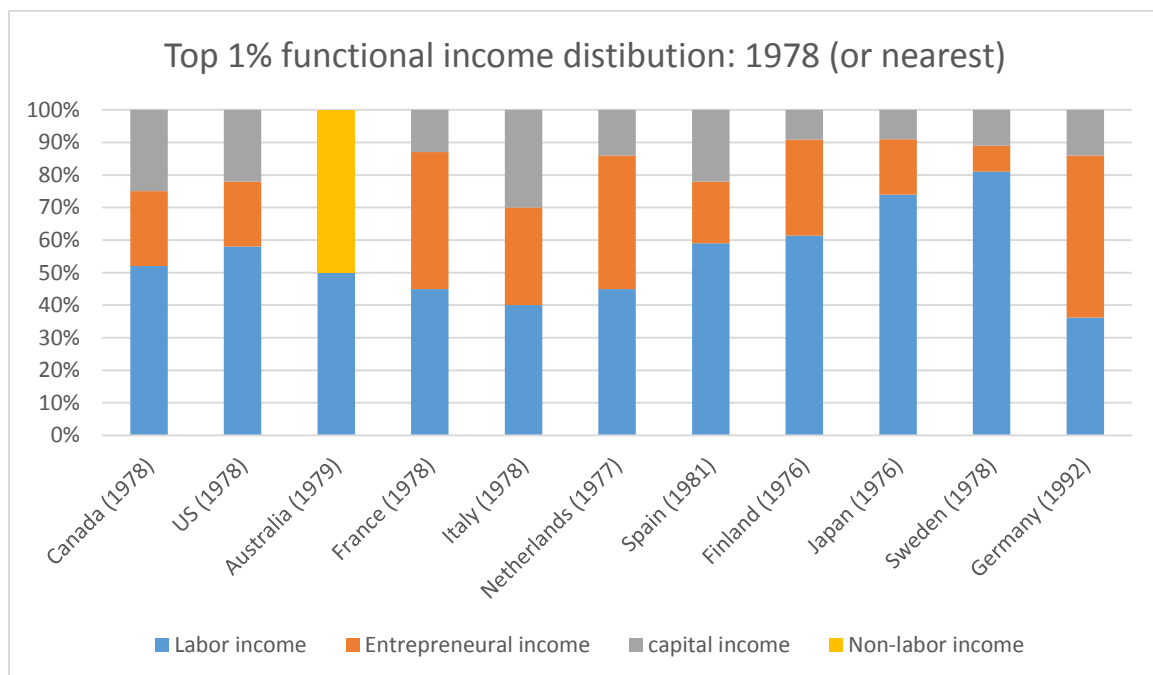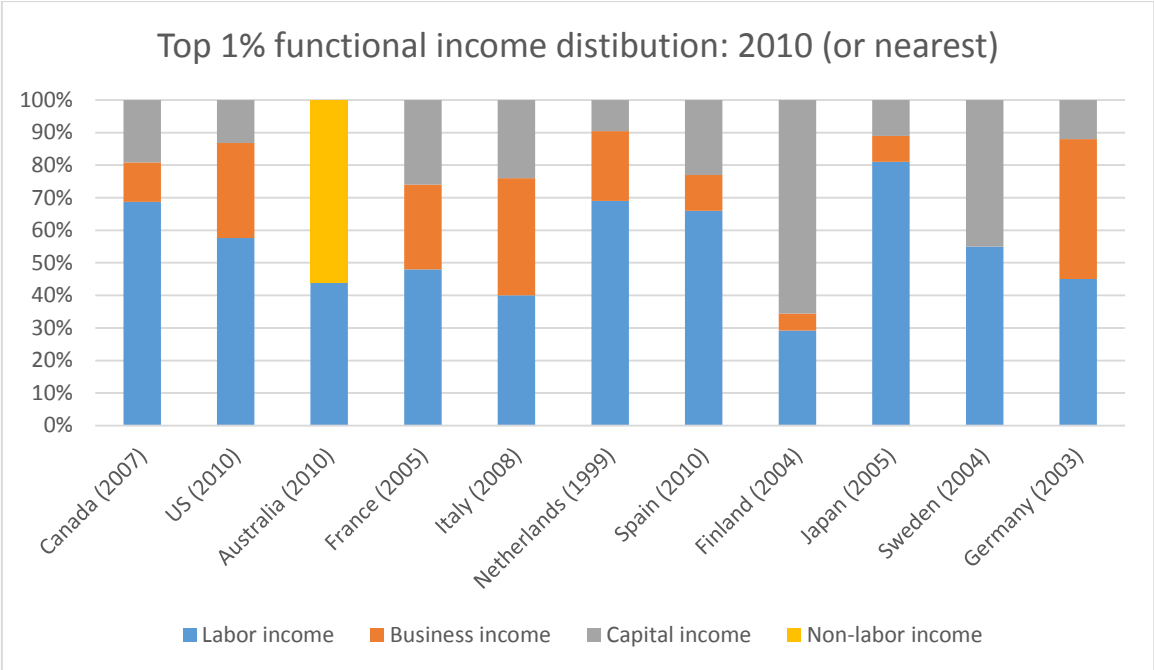

Figure 15. The functional income distribution of the top one percent of the personal income distribution (Top World Income Database, 2014).

It can be observed that labor income is still the most important source of income for almost all the developed countries. Its importance has furthermore increased for some countries, namely for Canada, France, the Netherlands, Spain, Japan and Germany. However, capital income has as well become of more importance in some countries, as observed in France, Sweden en especially Finland. The development of business income differs substantially among the developed countries. There are few countries where business income is more than one third of total top one percent income (only Germany and Italy). However, its importance increased substantially in some countries (the US and Australia) but decreased in others (Canada, France, the Netherlands, Finland, Sweden and Japan).

What can we learn from the functional income distribution of the top one percent?

 It has come to the forefront that labor income was the most important source of income in the late 1970s and that its importance has further increased in most countries. However, capital income has as well gained in importance during the last decades, especially in the North-European countries. Business income is still of great importance in Italy, Germany and the US, but is currently of limited importance in the other developed countries.. The theoretical explanations will therefore focus both on labor and capital.

Chapter IV – Theory and related empirical research

Introduction

In this chapter the most important theories and empirical research that aim to explain the evolution of top income shares will be discussed. The renewed interest in the evolution of top incomes in the field of Economics started with the research of Piketty on the long-run distribution of top incomes in France (2001; 2003). After this pioneering study other studies of top incomes in developed countries were undertaken, inter alia by Atkinson, Saez and Veall. Those studies were majorly descriptive in their approach and jointly established a whole new dataset on the evolution of top incomes in the developed countries. The studies were ultimately gathered in two edited volumes by Atkinson and Piketty (2007; 2010) and the underlying data was published online in the 'The World Top Incomes Database'. The first two theories that will be discussed (skill-biased technological change and globalization) are usually applied to explain functional income distribution, but are utilized as well to explain the evolution in top one percent income share of the personal income distribution. The other theories that will be discussed are more specifically constructed to explain the evolution of the share of income going the top one percent.

Skill-biased technological change

One of the most well-known theories in the field of Economics regarding economic inequality is related with wage dispersion in terms of skill-biased technical change. The basic idea following from this theory is that relative wage and employment changes among different skill groups are linked with both market forces of supply and demand and labor market institutions. It is argued that there has been an increased rate of growth of the relative demand for highly-educated and 'high-skilled' workers driven by skill-biased technological changes, largely associated with the spread of computers and micro-processor-based technologies in the workplace (Autor, Katz & Krueger, 1998). Acemoglu (2002) argues that the rate of growth of technology has been higher than the rate of supply of skilled workers since the 1970s, while during the period between the Second World War and 1970 this growth rate (of demand and supply) was equal. The main hypothesis that can be derived from this theory is that the increase in the share of income captured by the top one percent is driven by technological change that favors skilled labor. This difference between skilled and unskilled labor is reflected in the 'skill premium', which has risen substantially since the late 1970s. The authors of this theory argue that this technological change has not led to an increase in the share of income captured by the top one percent in some European countries due to institutional factors. These institutional factors (such as labor market rigidities) in Europe led to 'wage compression', which limited income inequality. A related argument from Acemoglu (2002, p. 61) is that Europe does have more wage compressions due to the effect of labor market institutions on technology choices. The European labor market, in this line of reasoning, will give greater incentives to adopting labor-complementary technologies, and will reinforce wage compression. The theory falls however short in explaining why the rest of the top decile has not increased its share of income during the last decades. As most laborers in the P90-99 are high skilled it is expected from this theory that their share of income would have increased as well. The theory of skill-biased technological change is therefore not expected to explain most of the evolution in the share of income captured by the top one percent. It could however be that skill-biased technological change in interaction with other developments (for example in the deregulation of the financial sector) could explain part of the increase in the share of income captured by the top one percent. The hypothesis constructed on the basis of this theory is as follows:

Hypothesis I: The heterogeneous evolution in the share of income captured by the top one percent in the developed countries throughout the period 1978-2010 cannot be explained by skill-biased technological change.

Globalization

A second important theory in the field of Economics regarding income inequality is globalization. The key argument in this theory is the Stolper-Samuelson theorem which states that the rewards for the factor in which the country is relatively well endowed will increase while the rewards for the factor in which it is relatively poorly endowed will decrease. As in most developed countries the factor skilled labor is relatively abundant, skilled labor will reward from international trade (globalization) while unskilled labor is expected to lose. In other words, the wages of skilled labor will increase (reflected in the skill premium) while the wages of unskilled labor will decrease (Krugman & Obstfeld, 2007, pp. 58-64). The top one percent income share is therefore expected to rise through the logic of this theorem as most wage earners in the top one percent are skilled laborers. This theory falls short in explaining the evolution in the share of income captured by the top one percent for two reasons. The first reason is the stable share of income captured by the P90-99 in most developed countries during the 1978-2010 period. It is expected from this theory that their share should have increased as well during this period. The second shortfall is the heterogeneity in the share of income captured by the top one percent with regard to the developed countries, while it is assumed that all developed countries have participated in the globalization process.

The study by Roine et al (2009) is based upon a large dataset of 16 developed countries over the 20th century. They found through panel estimation techniques that periods of high economic growth (above average) did tend to be pro-rich (i.e. the top one percent). Another variable positively influencing the share of income going to the top percentile is financial development (while banking crises appeared to be detrimental). Globalization (the trade share of GDP) did however not show a significant effect on the share of income going to the top percentile. The hypothesis derived for this research is as follows:

Hypothesis II: The heterogeneous evolution in the share of income captured by the top one percent in the developed countries throughout the period 1978-2010 cannot be explained by the process of globalization.

Marginal tax rates

Another theory that more specifically aims to explain the evolution in the share of income captured by the top one percent is related with the top marginal tax rates. It is argued that the decline in the top marginal tax rates since the late 1970s explains the rise in the pre-tax personal income share. There are mainly three trajectories through which higher top marginal tax rates reduce the share of income captured by the top one percent, all related with the elasticity of reported earnings with respect to the net-of-tax rate. The first channel through which higher top marginal tax rates reduce the share of income captured by the top percentile is the reduced incentive to work. It is stated that, as the marginal utility of working an extra hour is reduced due to the higher top marginal tax rate, the rich people will work less and hence earn less. The second channel is the substitutability of taxable cash compensation with other forms of compensation such as non-taxable fringe benefits, deferred stock-option or pension compensation. As the top percentile income earner observes that it is more favorable (with higher top marginal tax rates) to substitute taxable earnings to non-taxable earnings, the reported share of income earned by the top percentile will be reduced. The third and last channel through which the share of top percentile income will be reduced is related with the marginal productivity. The marginal productivity of high-earners is in general hard to observe. Often top earners try to increase

their pay through an increased effort to influence corporate boards. High top tax rates might discourage such efforts aimed at extracting higher compensation (Atkinson et al., 2010, p. 55).

Most studies that focus on top incomes relate its evolution with the impact of top marginal tax rates. Examples of these studies are Saez (2004) for the United States; Saez and Veall (2005) for Canada; Moriguchi and Saez (2007) for Japan; and Roine and Waldenström (2008) for Sweden. These studies suggest that marginal tax rates do, to a great extent, determine the share of income going to the top incomes. An insight derived through these studies is the increased responsiveness to tax rates among high-income groups. The top tax rates are for example a more powerful determinant of the top one percent share than of the next nine percent share. However, there are as well some shortfalls detected from these studies. The most important drawback is related with the top marginal income taxes in the middle-European countries, which have decreased as well during the 1978-2010 period. However, in these countries the share of income captured by the top one percent has not increased throughout this period, which seems to limit the explanatory power of top marginal tax rates.

Most studies in this field of study focus on the United States and there has been limited comparative studies on the evolution of top incomes in the developed countries. The study by Atkinson and Leigh (2007) is however an example in which cross-country comparisons are made. The study by Atkinson and Leigh (2007) focuses on the Anglo-Saxon countries and analyses the top one percent income data regarding the entire 20th century for the USA, Canada, the UK, Australia and New Zealand. The authors did furthermore estimate to what extent taxation impacts the evolution of the top incomes. Their main independent variable, the top marginal tax rate, explains about one third to one half of the rise in the income share of the richest percentile group over the period 1970-2000.

However, it is hypothesized in this research that the evolution of top marginal tax rates is not a fundamental determinant of the (pre-tax) share of income going to the top one percent. It is expected that the apparent impact (suggested by empirical research) of top marginal tax rates on the top one percent income share disappears when more fundamental variables are included. It can be argued, for example, that top marginal tax rates decrease whenever a government with a 'neoliberal' agenda is in power. However, another aspect of this neoliberal policy may be the deregulation of the financial sector: the hypothesized 'genuine' determinant of the share of income going to the top one percent. There is in other words expected to be a spurious relationship between top marginal tax rates and the top one percent income share. The hypothesis derived through this theory is the following:

Hypothesis III: The heterogeneous evolution in the share of income captured by the top one percent in the developed countries throughout the period 1978-2010 cannot be explained by the evolution of top income marginal tax rates.

Corporate Governance

A vast amount of literature in the field of Economics relates income inequality with corporate governance. Corporate governance in this perspective is defined as the 'fundamental question of in whose interest corporations are run' (Sjöberg, 2009, p. 519). There is normally a divide made between the 'Anglo-Saxon' and the 'Continental-European' model. The first model is characterized by a strong focus on shareholder's value. Companies in this ideal-type model are conceived as a bundle of assets that are deployed in order to maximize shareholders' short-term earnings. In contrast with the 'shareholder' model stands the Continental-European model that emphasizes 'stakeholder value'. Companies are in general financed through banks which diminishes the importance of capital markets. This last model is as well characterized by a relative importance of labor. There is a centralized wage-bargaining system at the macro level and 'business-labor' co-operation and information exchange at the micro level (ibid, p. 523). There are various channels through which the characteristics of corporate

governance is hypothesized to influence top income inequality. Bebchuk relate the 'managerial entrenchment' aspect of corporate governance with top income inequality. Bebchuk et al (2002) argued that '*when changing circumstances create an opportunity to extract additional rents, either by changing outrage costs and constraints or by giving rise to a new means of camouflage, managers will seek to take full advantage of it and will push firms toward an equilibrium in which they can do so*'. Another corporate governance related explanation is the change in social norms and institutions. Piketty and Saez (2006) argued for example that the 'outrage constraint' once played an important role in preventing executives and their peers on the board from colluding to grant excessively high pay, but that those have weakened in some countries. For example in the United States, the opposition to high pay has reduced substantially over the last few decades. A third aspect related with corporate governance in the increased importance of finance in the non-financial sector (so-called financialization). This last aspect of corporate governance will be utilized in this research and will be discussed in the following part.

Financialization

Financialization is defined as the linked trajectory of nonfinancial firm's increased involvement in financial activity (Krippner, 2011). One explanation through which financialization has influenced executive compensation is through the implementation of 'pay-for-performance' practices. Pay-for-performance is a very common pay model for high-pay workers, mainly through bonuses, stock-options et cetera. The reason for the increased importance of variable pay is the process of financialization. Variable pay is normally used by institutional investors to align their interests with the interest of the managers to overcome the 'principal-agent problem'. For example, executives target their economic activities in such a manner that it maximizes their short-term (variable) pay. It is argued that the increase in the 'pay-for-performance' is thus related with an increased importance of institutional investors (Tomaskovic-Devey & Lin, 2011, p. 545; Sjöberg, 2009, pp. 519-524). The study of Gabaix and Landier (2008) aims to explain why CEO pay has increased in the period 1980-2003 in the US. They relate the increased pay of CEO's with the increased stock-market scale of the firms these CEO's manage. They found in their study that the size of the largest 500 firms in the USA (measured in the stock market valuation[20]) has increased 6-fold in the period 1980-2003, in accordance with the rise in the CEO's pay (which increased as well with factor six). However, the results by Gabaix and Landier (2008) have been criticized by various economists. Gordon and Dew-Becker (2007) for example, argue that the elasticity between firm size and CEO compensation has only been between 0.1 and 0.15 in the 1980-2003 period.

In this research the focus will be on the process of financialization, as discussed above. The process of financialization has driven the change towards pay-for-performance practices which has influenced, as hypothesized, the share of income going to the top one percent. As nonfinancial firms' involvement in financial activities has increased during the past decades 'pay-for-performance' has become more important as well. It is argued that this explains the rise in the share of income going to the top one percent. The hypothesis derived is as follows:

HIV: The increase in nonfinancial firms' involvement in financial activity leads, through the pay-for-performance practices, to a higher share of income going to the top percentile of the personal income distribution.

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[20] Value of debt plus equity (Gabaix & Landier, 2008, p. 65).

Superstars

Another theory that aims to explain the evolution in the share of income captured by the top one percent is based upon the 'Economics of Superstars' article by Rosen (1981). Rosen argued in this article that *'in certain kinds of economic activity there is concentration of output among a few individuals, and marked skewedness in the associated distributions of income and very large rewards at the top'* (Ibid, p. 845). In the (economic) sectors to which the phenomenon of Superstars applies there are two common elements. The first is the close connection between personal reward and the size of one's own market. The second element is the strong tendency for both market size and reward to be skewed toward the most talented people in the activity. Due to technological improvement the 'superstars' can assist more consumers. It is therefore possible for the superstar to supply a larger market. The theory of Superstars does, according to Rosen, not only apply to sports and arts but as well to other sectors. Examples of professions to which the structure of superstars may apply are public executives, private executives, financial executives and corporate lawyers. According to this theory, the labor market for superstars (both in the financial as in the non-financial sector) has become more global, partially due to technological development. An example of research in this field is the study conducted by Saez and Veall (2005). They have shown through their research that the top incomes in the English-speaking provinces of Canada have risen (to a great extent) in line with US top incomes (especially since the creation of the NAFTA), while the top-incomes in the French-speaking provinces have not. It is suggested by the authors that this empirical event underlines the theory of superstars, as the wages of the English-speaking Canadian laborers at the upper sight of the income distribution are determined by the US-Canadian labor market.

An area in the top income literature that gives insight in the Superstar structure focuses on the distribution of professions in the top one percent of the personal income distribution. An example of such a study is the one undertaken by Bakija, Cole and Heim (2010). This study aims to give insights in the distribution of professions in the top one percent of the US personal income distribution. Their research unfolds that the most important group in the top one percent is 'executives, managers and supervisors (non-finance)', as they made up 36% of the total top one percent tax payers in 1979 and about 31% in 2005. The second biggest group in the top one percent is the 'medical profession', as they made up 17% of the persons in the top one percent group in 1979 and 16% in 2005. The third biggest group in the top one percent are 'financial professions'[21] who made up 14% of the top one percent taxpayers in 2005 (7.7% in 1979). The last profession which constitute more than 5% in the top one percent are 'lawyers', making up 8.4% in 2005 (and 7% in 1979).

A second interesting insight from this study are their results regarding the share of total personal income captured by the different professions in the top percentile. The top one percentile in the US received about 17% of total personal income in 2005, whereas this was only 9.2% in 1979. Interestingly, the group of 'executives, managers and supervisors (non-finance)' in the top one percent received about 6.4% of total personal income (3.7% in 1979) and the group 'financial professions' about 2.8% (0.8% in 1979). The total increase in the share of income captured by these groups in the period 1979-2005 is therefore 4.7 percentage points of total personal income. As the total share of personal income captured by the top one percent has increased about 7.8 in this period, these two groups together captured about 60% of the total increase in income in the period 1979-2005. Another group that has substantially increased its share of income in the top one percent are 'lawyers'. Their share of total personal income increased from about 0.6% in 1979 to about 1.22% in 2010, a twofold increase (Bakija, et al., 2010). The hypothesis constructed on the basis of the Superstar theory is the following:

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[21] Including management.

Hypothesis V: The more internationalized the labour market for top talent (superstars) the higher will be the share of income going to the top one percent of the personal income distribution.

Financial sector

An important theory relates the rise of income captured by the top one percent with the evolution of the financial sector. There are mainly two channels through which the financial sector is related with the rise in top incomes. The first channel is the increase in wages paid to the workers in the financial sector. The second channel is the increased importance of financial assets in the determination of remuneration of high-paid workers in (non)financial sectors. The compensation of some professions (inter alia executives, financial professionals and top earners in high-technology) can be expected to be heavily influenced by financial market assets prices, particularly stock prices, which went up dramatically at the same time as the increase in the top decile income share in the United States (Bakija et al., 2010, p. 6). This channel was already described in the theoretical part above regarding financialization (hypothesis IV). This theoretical part will therefore focus on the first channel.

There are mainly two changes in the working of the financial sector that explain why the wages in the financial sector have increased dramatically. The first change is the deregulation of the financial sector, which has increased its skill-intensity. The second channel is the change in corporate structures, which has increased the difficulty in determining the risk attached to firms. There have only been a few studies that link the rise in top incomes with the evolution of the financial sector. The study of Phillipon and Reshef (2009) could be interpreted as a first attempt to links these two phenomena. The authors did focus primarily on the evolution of the US financial sector over the 20th century. However, the aim of this study is not to explain the rise in the share of income captured by the top percentile, but it gives interesting insights. The authors claim that financial jobs have become more skill intensive, complex, and highly paid since the 1980s. The main reason for this evolution is that financial deregulation and corporate activities linked to IPOs (Initial Public Offerings) and credit risk have increased the demand for skills in financial jobs. However, the authors do state in this article that the compensation of employees in the financial industry appears to be too high to be consistent with a sustainable labour market equilibrium. They estimate that rents account for 30% to 50% of the wage differential between the financial sector and the rest of the private sector. The authors furthermore analyse the wage evolution of various subsectors in finance (being insurance, credit intermediation and other finance). The average wage per full time equivalent in 'Credit Intermediation' and 'Insurance' has a ratio of between 1.0 and 1.5 relative to the non-farm private sector in the period 1970-2006. However, the ratio for the 'Other Finance' subsector has risen from about 1.0 in the mid-1970s towards 4.0 in 2006. This study therefore shows that the wages paid in the financial sector since the late 1970s are far higher than it should be expected from the sustainable labour market equilibrium, especially in the 'Other Finance' subsector (Ibid).

Another article in this field is the one written by Bell and Van Reenen (2010). In their study the focus is on the rise in the share of total aggregate wage captured by the top one percent in the United Kingdom. They focus primarily on wage inequality (labour income) and found that in the period 1975-2008 the top one percent increased their share of total aggregate wage by 6 percentage points. They relate this rise with the change in compensation practices, especially in the finance sector. They estimated that about 82% of all the workers in the top one percent receive part of their income through bonuses, whilst variable pay makes up about 40% of all earnings in the top one percent. The authors furthermore calculated that 60% of the rise in income share of the top percentile over the period 1998-2008 accrued to labourers in the financial sector. An important insight from this article is this exceptional rise in income going to the finance workers. One explanation put by Bell and Van Reenen (2010) is the capturing of rents in the finance sector, as the finance sector saw a rise of 156% in gross

value added (GVA) per employee over the period 1995-2007 (while GVA was only 65% for the entire economy). An alternative explanation posed by the authors, which explains the extreme skewedness in wage earnings, is the Superstar theory. They argue that workers in the financial sector are not perfect substitutes, which creates heterogeneity in remuneration. Especially due to technological change (globalization and increased liquidness of markets) there has been a rise in the number of markets and asset types that workers in the finance sector can trade. However, the theoretical explanations put by the authors are highly suggestive and no thorough empirical research is undertaken regarding this last hypothesis. The hypothesis derived from the theory explained above is as follows:

HVI: An increase in the skill-intensity of the financial sector leads to a higher share of income going to the top percentile of the personal income distribution, whereas the larger the financial sector the greater the effect.

Chapter V – Methods of inquiry

Introduction

In this chapter the methods of inquiry will be discussed. Furthermore the main concepts used in this research will be clarified. It will also be discussed on what basis the selection of countries under analysis is made as well as reasons for the chosen time period under analysis.

Quantitative versus qualitative

This research can be qualified as a quantitative research. The main reason for choosing a quantitative approach is the wide sample of countries analyzed (18 in total) over a long time period (1978-2010) which leads to a large number of observations. Whenever qualitative research would have been chosen only a smaller sample of countries could have been analyzed. The upside of qualitative research in this perspective is its in-depth character. However, this research aims to explain the evolution of top percentile income share in the developed countries in a comparative perspective. It is thus expected that quantitative research yields better results in this perspective than qualitative research.

Quantitative estimation techniques

There are various quantitative estimation techniques which could be applied to analyze the evolution of the top one percent of the income distribution, depending on the regression model. One such regression model could be a simple linear regression model, using OLS (Ordinary Least Squares). The dataset would then consist of the same 18 countries, measuring the share of income going the top one percent in 2010, as well as the observations for the relevant independent variables in 2010. However, the major problem with such a simple linear regression is the (possible) presence of factors that do vary across the states and influence the dependent variable, but which are not taken into account (omitted variables). These factors will then bias the derived results (omitted variable bias) (Wooldridge, 2009, p. 481). With the application of panel data, both cross-sectional data (18 countries) and time series data (1978-2010) are combined. Panel data allows to control for variables that cannot be observed or measured like cultural factors or differences in business practices across companies; or variables that change over time but not across entities (states) (Torres-Reyna, 2014). In the analysis part three panel data techniques will be taken into account: Fixed Effects, Random Effects and First Differencing. The pros and cons of these techniques will be discussed as well as the possibility of using these techniques (whether elementary assumptions are ensured).

Personal income distribution

There are various ways to measure income and in this research the focus will be on pre-tax personal income. Pre-tax personal income[22] is the income individuals derive ex-ante government redistribution. Furthermore, the personal income distribution is the main concept used in this paper, which shows how income is divided by quintiles among all the families/households/individuals in the country. The focus in this paper will be on the share of income captured by the top incomes. There is however no straightforward definition of who belongs to the top incomes. It was observed in chapter two that there has been a remarkable rise in the share of income captured by the top one percent of total personal income, while the share of income captured by the rest of the top decile remained stable for most developed countries. The focus will therefore be on the top one percent of the personal income distribution. Most data used in this paper is based upon income tax data and household surveys.

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[22] Also called 'market income'.

Database

The data regarding the top one percent of the personal income distribution stems from the online 'World Top Income Database' provided by Sir Tony Atkinson and Thomas Piketty. In this dataset the income shares of the top one percent are calculated on the basis of tax records, where the derived top one percent share of income is based upon 'pre-tax gross income'. The data presented is fairly homogenous but words of caution are needed. One problem is the unit of observation, which varies between 'the individual' and 'the family'. Another problem is related with tax avoidance and evasion as individuals (especially the high-income persons) have a strong incentive to understate their taxable incomes. The effect of tax avoidance and evasion is unknown, and treating the presented data as a perfect representation of the 'real' personal income distribution may not be appropriate. However, it is assumed that the data used in this research does not differ too much from the factual data, making generalizations on the basis of this data validate (Roine & Waldenström, 2009, pp. 8-10). Another drawback of the data is the heterogeneity in the forms of income that are covered. For six countries capital gains[23] are taken into account (USA, Canada, Sweden, Spain, Germany and Japan) whilst not for the other 12 countries. The reason hereof is the limited availability of top income data including capital gains. We will however estimate the hypotheses on both variables: one dependent variable[24] with 12 countries excluding capital gains and 6 countries (mentioned above) including capital gains and one dependent variable[25] with all top income data excluding capital gains.

Country selection

There is normally a distinction made between the developing and the developed countries. In this research the focus will be on the developed countries, as it is assumed that the 'stage of economic development' is more homogenous intra developed countries than inter developed and developing countries. This is important as the aim of this research is to analyze whether the variation in the independent variables explains the variation in the evolution of top incomes since the late 1970s. Whenever developing countries would have been included the explanation would (as is expected) not so much be in the variation of the same independent variables, but more due to the economic-stage specific variables. With regard to the developed countries the selection made by the United Nations Statistics Division is leading[26]. These countries are Japan and South-Korea (from the region Asia), Canada and the United States (from the region Northern America), Australia and New Zealand (from the region Oceania) and the countries from West-Europe. With regard to these countries a selection is made with regard to the availability of homogenous data, on the basis of the 'World Top Incomes Database'. The countries under analysis in this research are the following:

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[23] A capital gain is: *'An increase in the value of a capital asset (investment or real estate) that gives it a higher worth than the purchase price. The gain is not realized until the asset is sold'* (Investopedia, 2014).

[24] This variable is named INCOME.

[25] This variable is named INCOME2.

[26] The UN (2014) mentions however that: *'There is no established convention for the designation of "developed" and "developing" countries or areas in the United Nations system… The designations "developed" and "developing" are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process'.*

1) *The United States*
2) *Canada*
3) *The United Kingdom*
4) *Ireland*
5) *New Zealand*
6) *Australia*
7) *Norway*
8) *Sweden*
9) *Finland*
10) *Denmark*
11) *Italy*
12) *Portugal*
13) *Spain*
14) *The Netherlands*
15) *Germany*
16) *France*
17) *Switzerland*
18) *Japan*

Time selection

The period under analysis in this research is 1978-2010. There are two reasons for this time selection. In the period between WWII and 1978 all countries under analysis (except for Germany, Finland and Japan) had a stable or slightly declining share of income going to the top percentile. However, from the late 1970s onwards top percentile income share began to rise substantially in some countries while this increase was not observed in the other developed countries (The World Top Income Database, 2014). This evolution of top percentile income shares was already extensively discussed in chapter two. The heterogeneous evolution of the top one percent income share in the developed countries occurred from the late 1970s onwards until today. As the heterogeneity in the dependent variable is aimed to be explained in this research the time selection is based upon the variation in the dependent variable. 2010 is chosen as the last year of the analysis as (almost) no more recent data is available.

Chapter VI – Operationalization

Introduction

In this chapter the various hypotheses will be operationalized. Next to the discussion of the optimal operationalization it will be stated if all 18 countries are covered and whether all years of analysis (1978-2010) are included in the database.

Skill-biased technological change

Skill-biased technological change is a change in the production technology that favors skilled over unskilled labor by increasing its relative productivity, and therefore, its relative demand. From a traditional economical viewpoint technical change is 'factor neutral'. However, recent technological changes have been predominantly in favor of skilled labor, hence the term skill-biased technological change. Skill-biased technological change is not only dependent on 'technical change' but as well on the level of human capital. The more human capital an economy embodies, the stronger the skill-biased technological change will be. However, in this research the focus will be predominantly on technical change. One way to measure technical change is through the 'Total Factor Productivity' (TFP). In a Neo-Classical output function output is determined on the basis of labor, capital and TFP. TFP in this perspective measures the effect of technical growth and efficiency. The measure taken in this research for technical change is therefore the growth rate of TFP[27] throughout the period 1978-2010. The data regarding the TFP for the 18 countries stems from the Penn World Tables Database (2014).

Globalization

It was already discussed in the theoretical part of this research that globalization is an important explanatory variable in the income inequality literature. There are however various definitions of globalization, whereas normally a divide is made between cultural globalization and economic globalization. In the field of Economics the focus is generally on the second definition. Regarding economic globalization various measures are used in the field of Economics that aim to unfold to what extent countries are economically globalized. Roine and Waldenstrom (2009) operationalize economic globalization as the sum of exports and imports as a share of GDP in their research regarding top income development. In this research the same operationalization will be used. There are two reasons for choosing this definition. The first reason is the assumption that the developed countries, that are abundant in capital and skill-intensive labor, will trade products which use these factors with products from countries where there is an abundance in low-skilled labor. It is expected that the sum of exports and imports as a share of GDP measures this process of globalization. The second reason it the wide availability of data for all 18 countries over the period 1978-2010 regarding this definition. The database used for this variable (sum of exports and imports as a share of GDP[28]) is the 'OECD Trade Indicators Database (2014b)'.

Marginal tax rates

The most important explanatory variable in the top income literature is the personal income tax rate. All developed countries have a progressive tax system, implying that higher incomes face higher tax rates. The persons in the top one percent of the personal income distribution do face the highest scale of taxation, named the 'top marginal tax rate'. The most important measure of marginal tax rates is

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[27] TFP is measured at constant national prices (2005=1).
[28] Measured in 'current prices' and 'current exchange rates'.

therefore the 'top marginal personal income tax rate'. The data regarding the top marginal tax rates stems for the 'Tax Policy Centre (2014)', an independent research organization related to the 'Brookings Institution' and the 'Urban Institute'. The data is covered for all 18 countries under analysis in this research over the period 1978-2010.

Financialization

The fourth important theory in this research is related with the process of financialization. It was hypothesized in the theoretical section that the rise in level of CEO pay (since the late 1970s) has been driven predominantly through pay-for-performance models. These pay-for-performance models are especially used in listed companies to overcome the principal-agency problems between the investor and the manager. It was therefore argued that the increased power of investors in the (non)financial sector has driven the increased importance of variable pay (Tomaskovic-Devey & Lin, 2011, pp. 545-546). The increased importance of variable pay in the earnings of top managers is therefore linked with the increased importance and size of listed companies. The variable financialization is therefore measured through the 'market capitalization of listed companies as percentage of GDP'. This data stems from the World Bank Development Indicators (2014a) and is available for all 18 countries for the period 1988-2010.

Superstar

Superstar theory argues that, due to globalization, small differences in 'expertise' for top talent are extremely overvalued: *'In certain kinds of economic activity there is concentration of output among a few individuals, and marked skewedness in the associated distributions of income and very large rewards at the top' (Rosen, 1981, p. 845).* It was hypothesized, on the basis of Superstar theory, that the increase in the share of income captured by the top one percent in some countries could be explained by the coming about of an internationalized labor market for top talent. The hypothesis is that, for example the earnings of a top manager in New Zealand, is no longer determined on the basis of supply of and demand for top managers in the domestic market of New Zealand, but predominantly on the basis of an Anglo-Saxon (or possibly international) market for top managers. The impact of a globalized labor market is especially of importance for the earnings at the very top, as these people (and their talents) are assumed to be extremely scarce. An example of the working of Superstar theory is the following story (The Wall Street Journal, 2004):

Tom Glocer, the first American to run London-based Reuters, drew angry press attention for extracting a promise of a golden parachute of more than $3.5 million if he was fired. One tabloid featured him on its "Dirty Dozen" list of CEOs. "I just said, 'OK, look, I'm in London not New York....You're a guest in somebody's house,' "Mr. Glocer says." I guess I began with the assumption that there's a market for executive talent just like there's a market for electricity....But if you're in a country that doesn't like the market result, you've got to pay attention".'

In order to observe the existence of Superstar dynamics the international dimension of board managers of the largest firms was analyzed. A subsample was chosen, incorporating one or two countries from each region[29], whereby the five largest firms were analyzed. The selection of the five largest firms was based upon the market value of the firm regarding the year 2010. Companies that are the result of a merger of two companies from two different countries were not taken into account[30]. Reason hereof is the expected increase in 'foreign board members' due to these mergers, which does not stem from an internationalized labor market. The inclusion of merger companies could

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[29] Including the United States, the United Kingdom, Sweden, Germany, Italy and Japan.
[30] For example Shell (Dutch-British) or Nordea Bank (Finnish-Norwegian-Swedish-Danish).

therefore bias our results. Finally, the composition of the boards of the companies were analyzed annually for the period 1998-2010. Optimally, the period 1978-2010 would have been analyzed, but the absence of (digital) annual reports of these firms regarding the period prior to 1998 made this impossible. In total 390 annual reports were analyzed. The data was furthermore constructed as the percentage of foreign board members relative to the total number of board members[31].

Financial sector

It was already discussed in the theoretical part that it is expected that both the size and the risk-intensity of the financial sector have a positive impact on the share of income captured by the top 1%. There are various measures that give an indication of the size of the financial sector. One of the most well known in the field of Economics is 'the amount of domestic credit to private sector as a percentage of GDP' (World Bank, 2014b). Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, trade credits and other accounts receivable that establish a claim for repayment (Ibid, 2014). This measure will be the main indicator for the financial sector in this analysis. An alternative measure of the size of the financial sector used in this research is 'the output of the financial sector relative to total output', which is taken from the EU-KLEMS database (2014)[32].

Data regarding the risk-intensity of the financial sector is relatively new. One indicator provided by the World Bank, being 'non-bank financial institutions assets to GDP', is not available for most countries and can therefore not be used in this analysis. Optimally both the size and the risk-intensity of the financial sector would have been taken into account. However, due to the absence of accurate data regarding risk-intensity of the financial sector only its size will be taken into account. To conclude, the two measures taken into account are 'the amount of domestic credit to private sector as a percentage of GDP' (finsect1) from the World Bank Development Indicators (2014a) and 'the output of the financial sector relative to total output[33] (finsect2) from the EU-KLEMS database (2014). The variables will be used separately in the analysis.

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[31] Each board composition of the five companies was weighted 20% for that specific country.
[32] This database does not include New Zealand, Norway, Switzerland and Canada.
[33] Measured as output from 'Finance, Insurance, Real Estate and Business Services' divided by output from 'Total Industries', both measured at current basic prices.

Chapter VII - Analysis

Introduction

In this chapter the econometric analysis will be done. At first summary statistics will be given of the utilized variables. Subsequently it will be discussed which panel data techniques will be used and the main regressions will be presented and discussed.

Summary statistics

The characteristics of the dependent variable (top one percent income share) were already extensively described throughout the paper. However, some key information regarding the dependent and independent variables will be given in the table beneath (the graphs of these variables can be found in the appendix).

Variable	Obs.	Mean	S.D.	Min	Max	Years
Income	**534**	**8.58**	**3.18**	**3.49**	**23.5**	**1978-2010**
Globalization	**588**	**62.89**	**29.29**	**16.01**	**184.42**	**1978-2010**
TFP	**594**	**0.95**	**0.10**	**0.66**	**1.19**	**1978-2010**
TAX	**556**	**0.49**	**0.14**	**0.12**	**0.93**	**1978-2010**
Financialization	**407**	**74.71**	**51.28**	**8.66**	**309.45**	**1988-2010**
Superstar	**78**	**0.17**	**0.13**	**0**	**0.47**	**1998-2010**
Financial sector	**586**	**99.89**	**47.82**	**20.23**	**232.10**	**1978-2010**
Financial sector2	423	0.17	0.04	0.08	0.28	1978-2007
Income2[34]	527	7.89	2.76	3.49	18.33	1978-2010
Income3[35]	520	23.48	2.93	14.45	31.68	1978-2010

Table 7. Key statistics of the main variables (variables in bold text are the baseline variables).

We can observe that there is substantial variation in the independent variables. Globalization for example is relatively low in some countries (for example Japan and the United States) while more important for other countries (for example the Netherlands and Ireland). Regarding total factor productivity a similar variation in the observations is observed. TFP has been relatively important throughout the period 1978-2010 in Sweden, the United States and the United Kingdom, while it was only of modest importance in Canada, Germany and Spain. The TAX variable (top marginal tax rates) shows a similar substantial variation. Its highest value (0.93) was observed for Japan during the early 1980s and its lowest value (0.12) for Switzerland during the 1980s and early 1990s. More surprisingly, the top marginal tax rates were lower in all countries around 2010 in comparison with 1978. The observations for the variable financialization (stock market capitalization as percentage of GDP) differs substantially among the developed countries. Especially for the Anglo-Saxon countries stock market capitalization as percentage of GDP is important, as well as in Sweden and Switzerland. The maximum value (309.45) accrues to Switzerland for 2000 while the lowest value (8.66) accrues to Portugal (for 1992). The observations for Superstar (percentage of foreign members in the board) differs

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[34] Excluding capital gains.
[35] Share of income captured by the P90-99 (including capital gains).

substantially among the countries. Its percentage is lowest for Japan (a maximum of one foreign board member for all five companies) while highest for the United Kingdom (on average more than 36% of all board members were foreign during the 1998-2010 period for the largest companies). Regarding the size and importance of the financial sector some variation does exist. The first measure (amount of domestic credit to private sector as a percentage of GDP) is relatively low for some countries in 2010 (Norway and Finland) while above 200% for the UK, Ireland and the Netherlands around this period. However, comparing 1978 with 2010 unfolds that it has increased in all countries under analysis in this research. The alternative measure of the financial sector (output of the financial sector relative to total output) shows a similar picture. For all countries, the importance of the output of the financial sector relative to total output has increased throughout the period 1978-2007 (the only exception is Portugal). Furthermore, financial sector's output more than doubled in Ireland and the United Kingdom.

Panel estimation: econometric method

The data that is used in this research is panel data. For most variables one observation is provided for every year throughout the period 1978-2010 for all 18 countries under analysis. Through panel data unobservable time invariant factors are taken into account. Furthermore, it allows to control for both common and country specific trends (Roine et al., 2009, p. 980). The baseline regression for this analysis is as follows:

$INCOME_{it} = x_{it}'\beta + \alpha_i + u_{it}$ $\qquad$ i=1,…, N; t=1,…., T

Where α_i is the country-specific effect, u_{it} is the idiosyncratic error term, N=number of cross-section units (countries), T=number of time unites (years). Furthermore, $x_{it}'\beta$ is a vector notation for the effects of the explanatory variables ($x_{it}'\beta = \beta_1 GLOB_{1it} + \beta_2 TFP_{2it} + \beta_3 TAX_{3it} + \beta_4 FINANCIALIZATION_{4it} + \beta_5 FINSECT1_{5it}$)[36].

Some widely known panel data techniques are Fixed Effects, Random Effects and First Difference regressions. Choosing between First Differencing and Fixed Effects depends on the time series behavior of u_{it}. If it is a white noise error term the Fixed Effects procedure is preferable; if it follows a random walk the first-difference procedure should be preferred. Through the application of a Breusch-Godfrey test, on the baseline regression above, it comes to the forefront that u_{it} follows a random walk: which means that there is a very substantial, positive serial correlation (Wooldridge, 2009, p. 487). On the basis of this test the First-Differences method is preferred. However, the choice whether to choose FE or FD cannot be fully determined on the basis of the Breusch-Godfrey test and it is conceived best to try both (ibid., p. 487). Both the FE and FD will therefore be used in the analysis. Furthermore, the main difference between FE and RE is the assumption of the former that time-invariant characteristics are unique to the individual (state) and should not be correlated with other individual characteristics. Each entity is different and should not be correlated with the others. If the error terms are however correlated than FE is not suitable and the effects are need to be modeled (through RE). A test, to see whether the Random Effects model is more suitable than the Fixed Effects model is the Hausman test. The Hausman test shows that there is zero correlation between α_i and the explanatory variables and thus the Random Effects model is preferred. However, the Hausman test cannot be used as a final word on choosing between RE and FE. A failure to reject the Hausman test could for example mean that both the RE and FE estimates are sufficiently close (Wooldridge, 2009, p. 493). On the basis of the

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[36] In the first stage of the analysis the independent variable 'Superstar' is excluded due to its limited number of observations.

analysis above it is concluded that all three panel data estimation techniques (Random Effects, Fixed Effects and First Differences) are taken into account.

The estimated regressions for the three models are the following:

Random Effects (RE): INCOME$_{it}$ = x$_{it}$'ß + α$_i$ + u$_{it}$

Fixed Effects (FE): INCOME$_{it}$ = x$_{it}$'ß + α$_i$ + u$_{it}$

First Differences (FD): ΔINCOME$_{it}$ = Δx$_{it}$'ß + Δu$_{it}$ (where Δ means first differences)

Regressions

The (strongly balanced) panel regression results of the baseline regression are presented below. At first the effects of globalization, TFP, marginal taxes and the size of the financial sector on the share of income captured by the top one percent are estimated. Subsequently we add the variable financialization and the alternative measure of the size of the financial sector. Furthermore, the same process we be conducted for all the three panel data methods.

Table 8. The determinants of the top one percent income share.

Model **Random Effects** **Fixed Effects** **First Differences**	INCOME	INCOME	INCOME	INCOME	INCOME	INCOME	INCOME	INCOME	INCOME
Intercept	-5.55	-4.13	-3.27	-5.60	-4.23	-3.46	0.09	0.09	0.07
	(3.25)	(2.96)	(2.18)	(3.66)	(3.36)	(2.61)	(0.05)	(0.06)	(0.07)
GLOB	0.00	-0.01	-0.02	0.01	-0.00	-0.01	0.00	0.00	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
TFP	14.16***	11.08***	7.94***	14.06***	10.78**	7.54**	14.59***	14.78***	9.16**
	(3.64)	(3.59)	(2.72)	(3.84)	(3.74)	(2.98)	(3.07)	(4.16)	(3.94)
TAX	-2.29	1.18	0.04	-2.31	1.38	0.54	-1.11	-1.31	-2.08
	(1.37)	(1.95)	(1.05)	(1.38)	(2.07)	(1.28)	(1.17)	(1.77)	(1.27)
FINSECTOR 1	0.01**	0.012**	0.00	0.01*	0.01*	0.00	-0.01	-0.01	-0.01
	(0.01)	(0.01	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
FINANCIALIZATION		0.02***	0.02***		0.02***	0.02***		0.01***	0.01***
		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)
FINSECTOR 2			21.99***			22.57***			11.83
			(6.18)			(6.19)			(8.42)
Prob > chi2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-sq. (overall)	0.26	0.28	0.46	0.23	0.23	0.43	0.07	0.11	0.17
Obs.	491	358	255	491	358	255	434	327	234
N countries	18	18	14	18	18	14	n/a[37]	n/a	n/a

NOTES: * p<0.1, ** p<0.05, ***p<0.01. Robust standard errors in parentheses.

The regressions of the baseline estimate provide some interesting results. It can be observed in the table above that neither globalization nor marginal tax rates are significant determinants of the share of income going to the top one percent. The first measure of the financial sector (FINSECTOR1) is in both the FE and the RE model significant when the alternative measure is not included. However, when the alternative measure of the financial sector is included (FINSECTOR2) the standard measure for the financial sector becomes insignificant. The FD model however does not give a significant estimation of the first measure of the financial sector. The alternative measure of the financial sector (measuring its output to total output) is strongly significant in the RE and FE model and has the hypothesized positive sign, but is (surprisingly) not significant in the FD estimate. The two variables that are strongly significant in all three models are Total Factor Productivity (TFP) and financialization. Both have the

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[37] Not applicable.

hypothesized sign (both positively correlated with share of income captured by the top one percent). The coefficient of financialization is however rather small (between 0.01 and 0.02) meaning that, although the variable is significant, its effect is very small[38]. Another interesting result is the variation in the R-squared (indicating to what extent the variation in the dependent variable is explained by the independent variables). The R^2 is between 0.23 and 0.28 in the RE and FE model without the alternative measure of the size of financial sector but increases with about 20 percentage points when this variable is added. The output of the financial sector relative to total output therefore seems to have a strong effect on the share of income going to the top one percent. The explanatory power of the FD model is however far more limited in comparison with the RE and FE model. Furthermore, the simultaneous significance of the second measure of the variable 'financial sector' and the significance of the variable 'financialization' is not very surprising. Both theories (and variables) are closely linked. An increased size of the financial sector is assumed to have a positive influence on the process of financialization and vice versa. Now that we have interpreted the results for the baseline regression the variable 'superstar' will be analyzed.

Table 9. Is there a significant effect of superstar on the top one percent income share?

Model **Random Effects** **Fixed Effects** **First Differences**	INCOME	*INCOME*	INCOME	*INCOME*	INCOME	INCOME
Intercept	11.52 (1.42)	*-9.03* *(10.14)*	11.62 (0.38)	*-2.67* *(8.31)*	0.07 (0.15)	0.00 (0.16)
GLOB		*-0.07* *(0.05)*		*0.07* *(0.03)*		0.08 (0.06)
TFP		*25.71*** *(13.05)*		*10.17* *(7.40*		7.33 (8.88)
TAX		*-14.49* *(10.68)*		*-4.57* *(2.19)*		3.71 (4.44)
FINSECTOR 1		*0.01* *(0.02)*		*0.01* *(0.02)*		-0.00 (0.02)
FINANCIALIZATION		*0.04*** *(0.02)*		*0.02* *(0.01)*		0.01** (0.01)
SUPERSTAR	3.74 (2.37)	*6.18* *(7.96)*	3.68 (2.35)	*1.55* *(1.67)*	1.92 (3.30)	-0.32 (2.50)
Prob > chi2	0.11	*missing*	0.18	*missing*	0.56	0.00
R-sq. (overall)	0.03	*0.60*	0.03	*0.01*	0.00	0.22
Obs.	71	*69*	71	*69*	63	61
N countries	6	*6*	6	*6*	n/a	n/a

NOTES: * p<0.1, ** p<0.05, ***p<0.01. Robust standard errors in parentheses.

Adding the variable superstar, with only 78 observations, to the baseline regression leads to invalid results (invalid model). The only possibility to estimate the effect of superstar of the share of income going to the top one percent is therefore to include SUPERSTAR as the only independent variable. We can observe that all three models estimate the effect of superstar to be insignificant.

In the following table it will be analyzed if the obtained results are driven by the inclusion of certain groups of countries. We will both exclude the English-speaking countries (that had a strong increase in

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[38] One possible reason for the small coefficient is the appearance of a loop of causality between the share of income going to the top one percent and financialization. To test for endogeneity the reduced form for financialization is regressed on all exogenous variables. The obtained residuals are furthermore added to the structural equation to test for the significance of the residuals. The coefficient on the residual is however not statistically significant from zero and therefore, from this test, is financialization not identified as being endogenous (Wooldridge, 2009, p. 528).

the share of income going to the top one percent in the period 1978-2010) and the middle-European countries and Japan (that had no or only a small increase in the share of income going to the top one percent throughout the same period).

Table 10. Are the results driven by the inclusion of specific groups of countries?

Model **Random Effects** **Fixed Effects** **First Differences**	**INCOME** exc. English-speaking countries	**INCOME** (exc. English-speaking countries)	**INCOME** (exc. English-speaking countries)	**INCOME** (exc. English-speaking countries)	**INCOME** exc. Middle-European + Japan	**INCOME** (exc. Middle-European + Japan)	**INCOME** (exc. Middle-European + Japan)	**INCOME** (exc. Middle-European + Japan)
Intercept	-0.05	1.73	0.03	0.10	-4.42	-4.46	0.13	0.11
	(3.24)	(2.80)	(0.07)	(0.06)	(1.59)	(2.33)	(0.08)	(0.08)
GLOB	-0.00	0.03	0.02	0.00	-0.01	-0.01	0.02	0.00
	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
TFP	6.68**	3.81	9.68	13.47**	8.27***	8.19**	5.33	13.21***
	(2.74)	(2.21)	(5.54)	(6.14)	(2.51)	(2.81)	(3.07)	(4.95)
TAX	-1.41	-0.96	-2.30	-0.66	0.14	0.19	-1.76	-1.05
	(0.93)	(1.26)	(1.30)	(2.07)	(0.65)	(0.71)	(1.23)	(1.97)
FINSECTOR 1	-0.00	-0.00	-0.01	-0.01	0.01	0.01	-0.02	-0.01
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
FINANCIALIZATION	0.02***	0.02***	0.01***	0.00**	0.02***	0.02***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FINSECTOR 2	7.72	2.45	14.38		23.02***	22.71***	14.76	
	(7.11)	(11.26)	(10.03)		(5.52)	(6.10)	(10.76)	
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-sq. (overall)	0.35	0.00	0.22	0.10	0.59	0.59	0.22	0.11
Obs.	182	182	165	210	171	171	161	232
N countries	10	10	n/a	n/a	9	9	n/a	n/a

NOTES: * p<0.1, ** p<0.05, ***p<0.01. Robust standard errors in parentheses.

In the table above it can be observed that the three models give, to some extent, different results. Excluding the two groups of countries does not give different results regarding the variable financialization. The effect of this variable remains strongly significant, although its coefficient remains relatively small. The effect of TFP remains significant in the RE model but becomes insignificant in the FE model when the English-speaking countries are excluded. The significance of the effect of TFP in the FD model depends on the inclusion of the alternative measure of the size of the financial sector. Whenever this variable is excluded TFP is significant, when it's included TFP becomes insignificant. Excluding the countries where the share of income going to the top one percent did not (or relatively modest) increase does not lead to different results in the RE and FE model. However, in the FD model excluding the middle-European countries and Japan (again) makes the effect of TFP insignificant when the alternative measure of the financial sector size is included and significant when it's excluded. Additionally, all the independent variables together are found to be significant in all the regressions. In other words, the model does fit to the data.

To test the robustness of our baseline model we will estimate whether our baseline regression (that was specifically constructed to determine the share of income going to the top one percent) is as well useful in explaining the share of income going to the P90-99 of the personal income distribution. The results are presented in the table beneath.

Table 11. Can the model as well estimate the P90-99 income share?

Model **Random Effects** **Fixed Effects** **First Differences**	INCOME3	INCOME3	INCOME3
Intercept	19.91 (3.99)	19.56 (4.02)	0.10 (0.04)
GLOB	0.00 (0.01)	0.02 (0.03)	-0.02 (0.01)
TFP	2.62 (4.64)	1.19 (5.21)	-0.99 (2.41)
TAX	-1.04 (1.00)	-0.21 (1.43)	-1.35 (0.77)
FINSECTOR 1	-0.00 (0.01)	-0.01 (0.01)	-0.00 (0.00)
FINANCIALIZATION	-0.00 (0.00)	-0.01 (0.01)	0.00 (0.00)
FINSECTOR 2	14.55 (14.41)	19.04 (16.50	-1.86 (5.03)
Prob > F	0.55	0.79	0.08
R-sq.	0.00	0.13	0.07
Obs.	253	253	232
N countries	14	14	n/a

NOTES: * p<0.1, ** p<0.05, ***p<0.01. Robust standard errors in parentheses.

The results above show that the constructed model is a unique model for estimating the effect of the share of income going the top one percent. None of the independent variables are significantly determining the share of income going the top one percent. Additionally, all the independent variables together are as well found to be insignificant. In other words, the model does (as hypothesized) not fit to the data. The last regressions executed are meant to determine whether the results are biased due to the heterogeneous inclusion of capital gains in the income definition of the dependent variable[39].

Table 12. What if we exlude capital gains?

Model **Random Effects** **Fixed Effects** **First Differences**	INCOME2	INCOME2	INCOME2	INCOME2
Intercept	-2.74 (1.26)	-2.85 (1.57)	0.09 (0.03)	0.08 (0.05)
GLOB	-0.02 (0.01)	-0.02 (0.01)	0.01 (0.01)	-0.01 (0.01)
TFP	6.52*** (1.77)	6.31*** (1.84)	4.59** (1.89)	11.93*** (3.82)
TAX	0.08 (0.77)	0.30 (0.86)	-1.43** (0.58)	-0.92 (1.27)
FINSECTOR 1	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
FINANCIALIZATION	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.00* (0.00)
FINSECTOR 2	26.62*** (5.65)	27.14*** (5.54)	2.97 (5.56)	

[39] As stated before: The standard dependent variable (INCOME) includes capital gains in the definition of income for 6 out the 18 countries (optimally for all 18 capital gains would have been included, but this data is not available).

SUPERSTAR				
Prob > F	0.00	0.00	0.00	0.00
R-sq.	0.40	0.39	0.14	0.07
Obs.	248	248	228	321
N countries	14	14	n/a	n/a

NOTES: * p<0.1, ** p<0.05, ***p<0.01. Robust standard errors in parentheses.

In the table above it can be observed that the results are not biased due to the inclusion of capital gains for six countries regarding the RE and FE model. The independent variables TFP, financialization and the alternative measure of the financial sector size remain significant while the other variables remain insignificant. The results are different with regard to the FD model. Including the alternative measure of the financial sector makes, next to financialization and TFP, the effect of top marginal tax rates significant (on a 95% confidence level). The sign of the coefficent is also negative (as hypothesized). However, excluding this alternative measure of the financial sector leads to an insignificant effect of the level of the top marginal tax rates on the share of income captured by the top one percent (exluding capital gains).

Chapter VIII - Conclusions

Introduction

The main topic of this research is the heterogeneous evolution of the share of income captured by the top one percent of the personal income distribution in the developed countries over the period 1978-2010. It was observed that the share of income captured by the top one percent has risen strongly in the English-speaking countries, the North-European countries and the South-European countries over the past decades. However, this share of income received by the top one percent did not, or only modestly, increase in the middle-European countries and Japan. Furthermore, this rise in the share of income captured by the top one percent was found to be a unique phenomenon. The share of income captured by the rest of the top decile did not increase throughout this period for most countries under analysis. This share of income captured by the top one percent was furthermore related with general income inequality. It was observed that general income inequality (as measured by the GINI) has risen in most developed countries over the past decades. However, this rise in general income inequality did not stem from a rise of inequality between the upper middle (P90) and the median income groups (P50) but majorly from a widening of income inequality between the low-income groups (P10) and the median/upper middle income group. It was therefore concluded that the increase in income inequality, as observed in the developed countries throughout the period 1978-2010, is to be explained through an increase in the share of income going the upper part of the income distribution (>P50) relative to the low income groups (P10) as well as through the rise in the share of income going to the top one percent.

Research

There has been renewed academic interest in the characteristics of income development at the upper part of the income distribution. This interest has been driven predominantly through the recent construction of a dataset consisting of long-term data regarding the (pre-tax) shares of income captured by the top one percent (The World Top Income Database). However, most recent studies are highly descriptive in their attempts (solely collecting income data) or focus only on one country. This research differs as it focuses on a wider set of countries (18) over a long period of time (1978-2010). The research question that is of central focus in this research is the following:

What is the reason that the share of income captured by the one percent has increased substantially in some countries in the period 1978-2010 while it has remained stable in the other developed countries?

Theory

Three theories have been of central focus in this research. It was argued that financialization, superstar theory and the size of the financial sector were fundamental in determining the share of income going to the top one percent. Financialization was hypothesized to influence the share of income going to the top one percent due to the increase in pay-for-performance models. Shareholders increasingly try to overcome the principal-agent problem by designing short-term 'targets' for managers that are constructed to increase shareholders value. A greater influence of financialization was therefore hypothesized to lead to a greater share of income captured by the top one percent. The theory of Superstars argues that, due to technological progress, the scale of sectors increase. Supply and demand for top 'talent' therefore becomes more internationalized. Small differences in talent at the top are therefore extremely overvalued, creating very large rewards at the top. The more globalized the labor market for top talent, the higher will be the share of income going to the top one percent. The last explanatory theory is related with the size of the financial sector. It is mainly due to the

increased skill-intensity of the financial sector that rewards for top employees in the financial sector have increased substantially over the last few decades. A larger financial sector is than hypothesized to lead to a higher share of income going the top one percent. Globalization, skill-biased technological change and top marginal tax rates were added as control variables.

Results

Three panel data techniques were used in order to estimate the influence of the independent variables on the share of income captured by the top one percent. It came to the forefront that both skill-biased technological change and the degree of financialization were significant determinants of the share of income going the top one percent. The impact of financialization, however, was found to be small. The results regarding the influence of the size of the financial sector depended on the measure. One measure (domestic credit to private sector) did not yield significant results when another measure was included in the regression (being financial sector output to total output). This last measure was however strongly significant in both the Random Effects as the Fixed Effects model, but not in the First Differences model. The results regarding the effect of superstar were not conclusive as only a limited number of observations was obtained. Furthermore, globalization and top marginal tax rates were, as hypothesized, not found to be significant. Globalization could however be used in explaining the functional income distribution (Stockhammer, 2013). The Political Economy of Trade approach for example argues that globalization does benefit capital (the mobile factor) relative to labor (the immobile factor) (ibid, p. 7). The insignificance of the variable globalization is therefore not surprising as that variable is better linked with functional, instead of, personal income distribution.

The results were as well robust as the model was not fit to explain an alternative explanatory variable (share of income going to the rest of the top decile). Excluding the English-speaking countries from the dataset did change the results to some extent. This was to be expected as most variation in the dependent variable was obtained through the inclusion of the English-speaking countries. Excluding the middle-European countries did not change the results.

Contributions

This research should be regarded as a first attempt to quantitatively determine the factors influencing the share of income captured by the top one percent. The obtained results are therefore by no way conclusive. However, the results do give some interesting preliminary insights in the determinants of the share of income captured by the top one percent. The increased importance of finance (both in the entire economy and in the non-financial sector) seems to be an important driver of the increased share of income going to the top one percent. Especially the greater importance of shareholder value and the heavily deregulated financial sector in the Anglo-Saxon countries seems to explain why the top one percent share of income did rise more in those countries than in the Middle-European countries. However, a great deal remains unexplained (for example the variation among the European countries in the share of income captured by the top one percent).

Future research

Financialization was taken into account in this research. However, it was already suggested in the literature review that other elements of corporate governance could be important as well in explaining the share of income going the top one percent. Furthermore, the empirical power of Superstar theory in explaining the rise in the share of income going to the top one percent was deficiently studied in this research. Collecting more and better data on this variable may be fruitful. Another variable that needs to be studied in more depth is the financial sector. In this research only its size was (ultimately) estimated as potential determinant of the top one percent income share. However, other interesting

characteristics (for example its risk-intensity) need to be modeled as well. The last suggested variable for future top income research is the increased importance (in some developed countries) of 'general skills' relative to 'sector-specific skills' for top managers. It seems that managers are increasingly selected on the basis of other criteria than sector-specific knowledge in order to manage firms. It may thus be that top managers are not so much extremely overpaid due to the internationalization of the top labor market but due to the scarcity of managers with 'general skills'. An example of a general skill is knowledge of the modus operandi of the financial sector. This aspect needs to be further researched.

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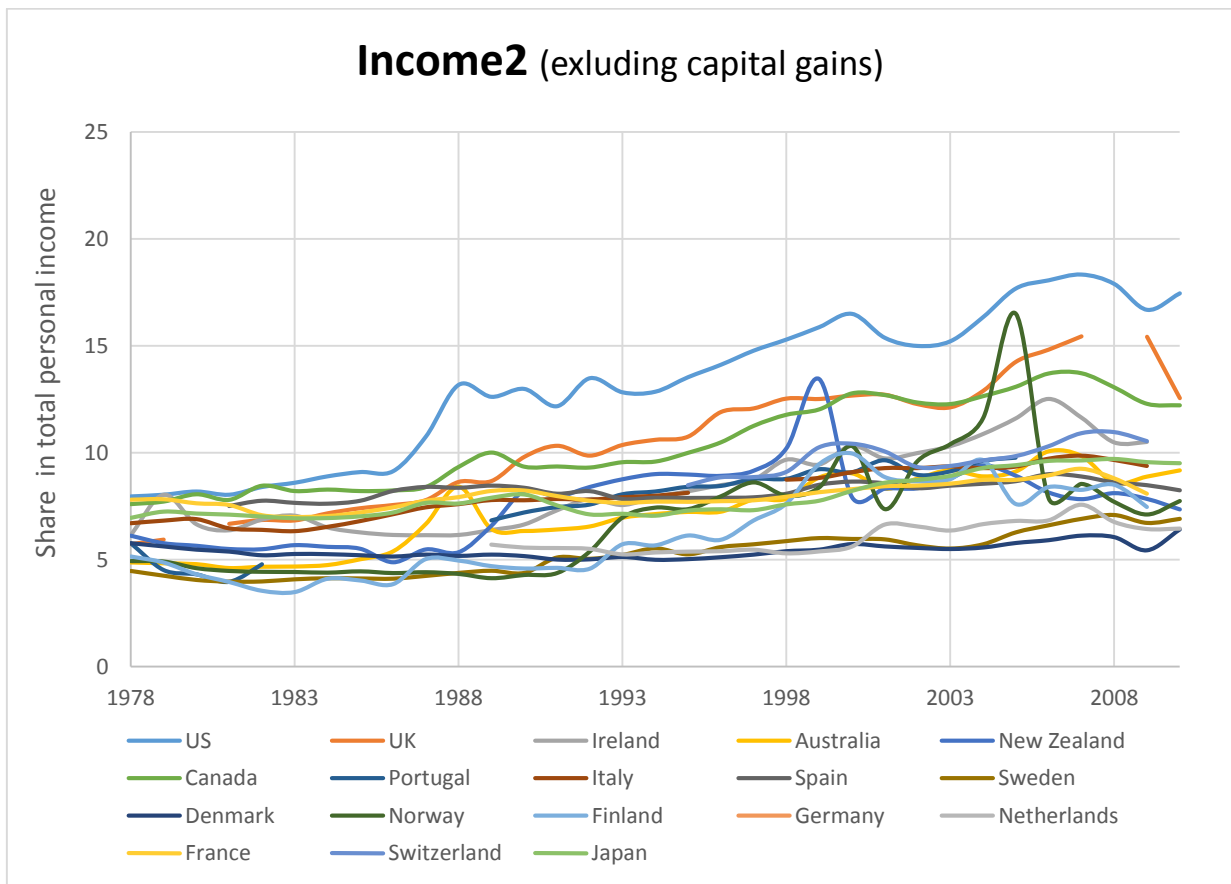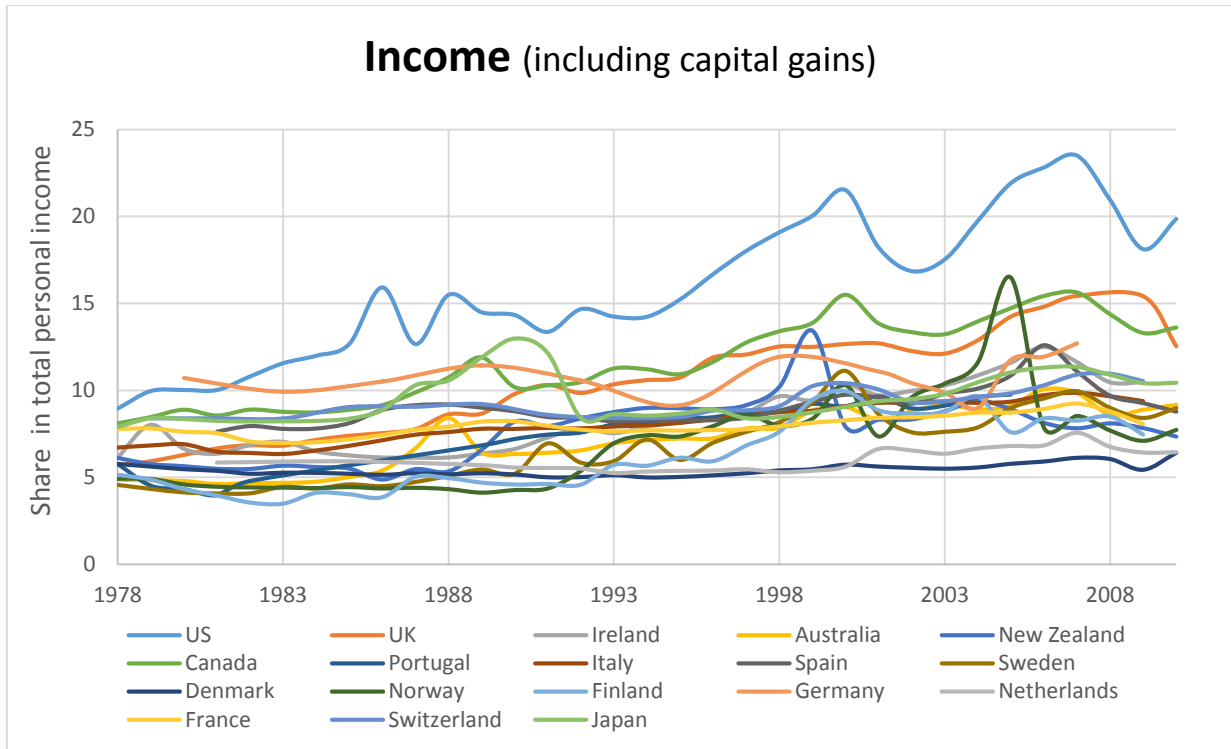
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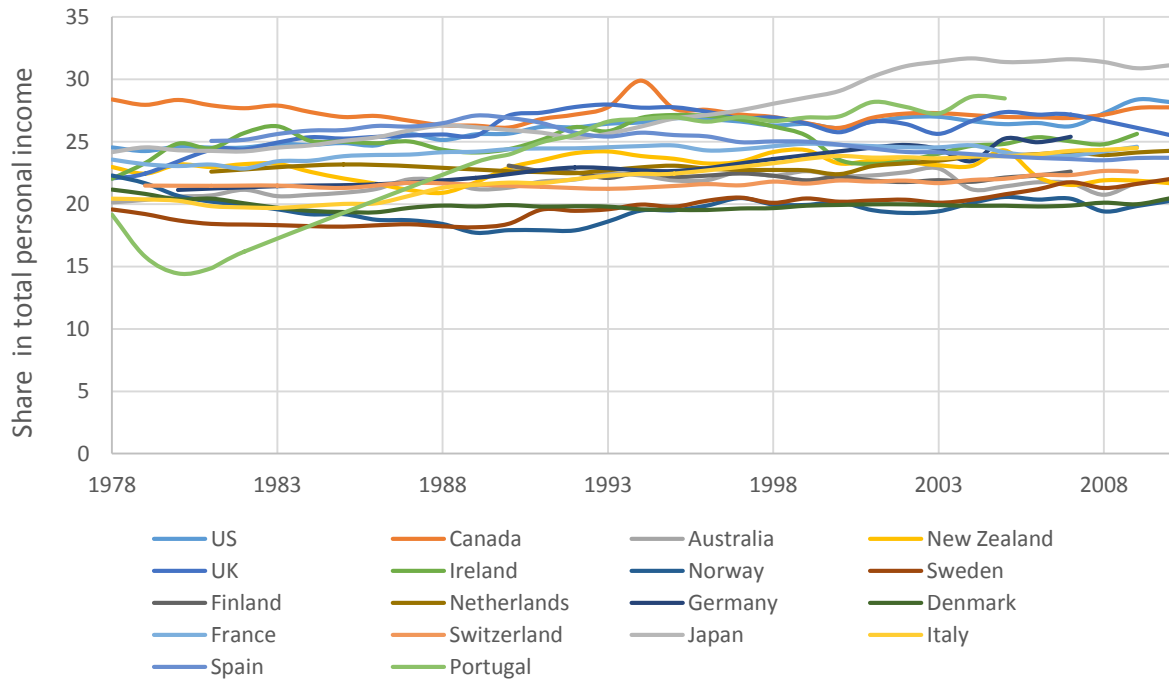World Bank (2013). Measuring Inequality. URL: http://go.worldbank.org/3SLYUTVY00.

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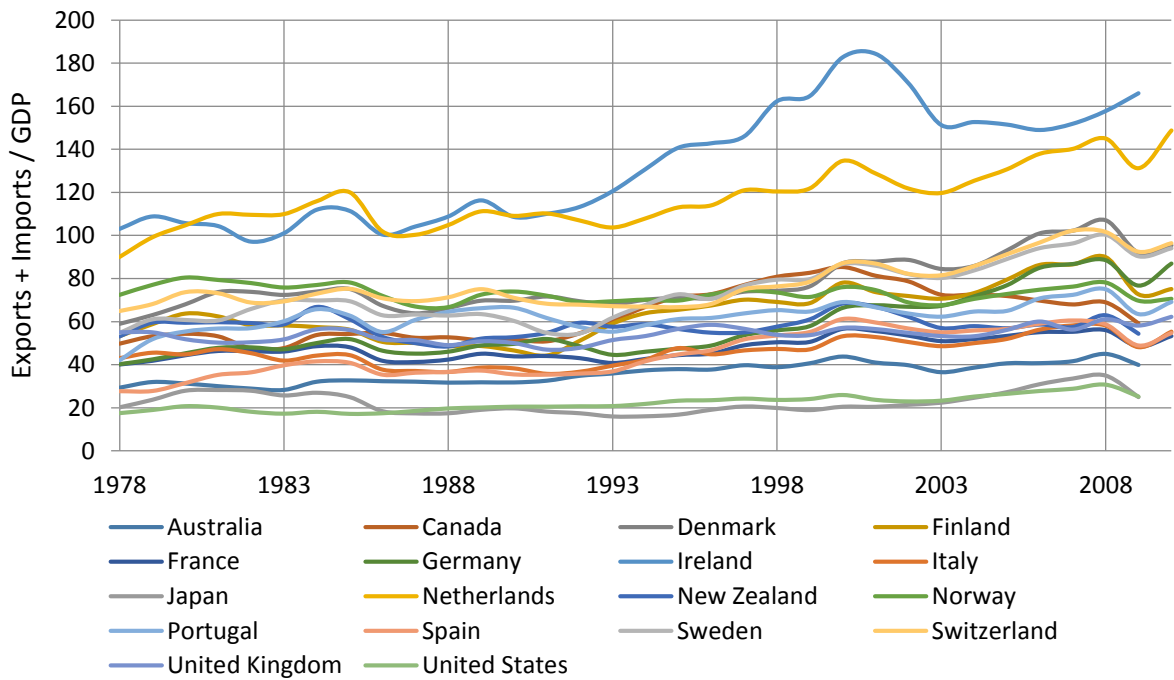World Bank (2014a). World Development Indicators. URL: http://data.worldbank.org/data-catalog/world-development-indicators.
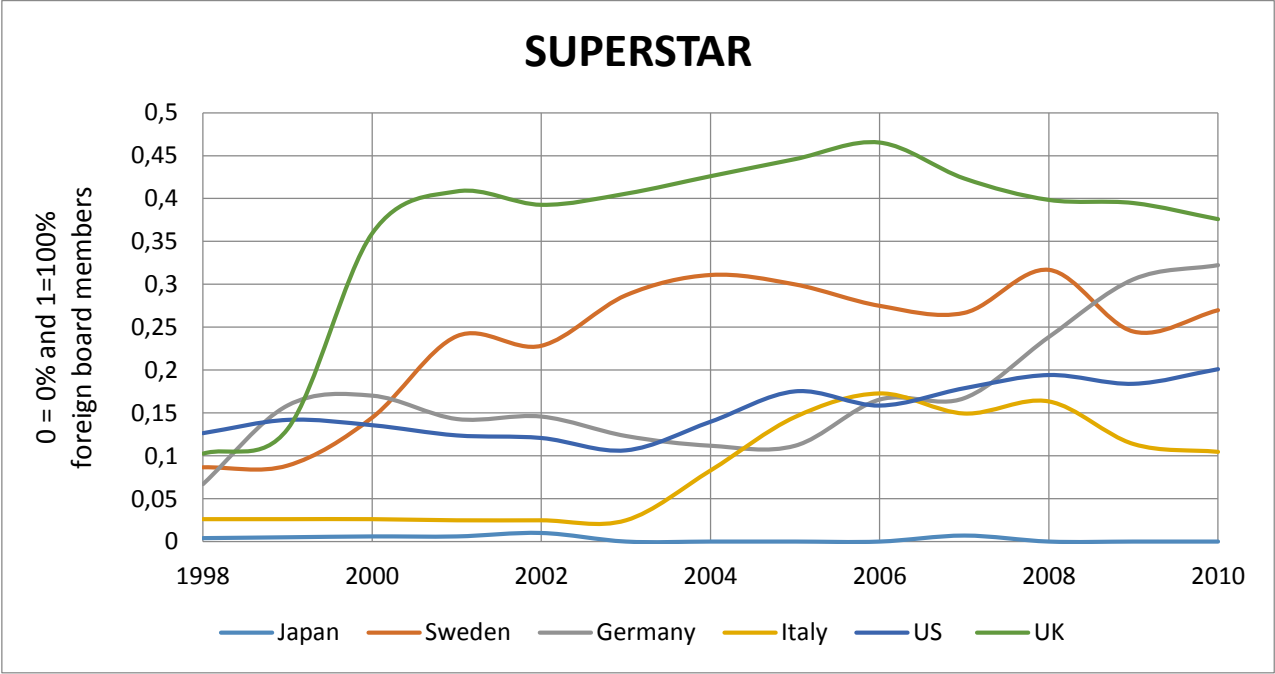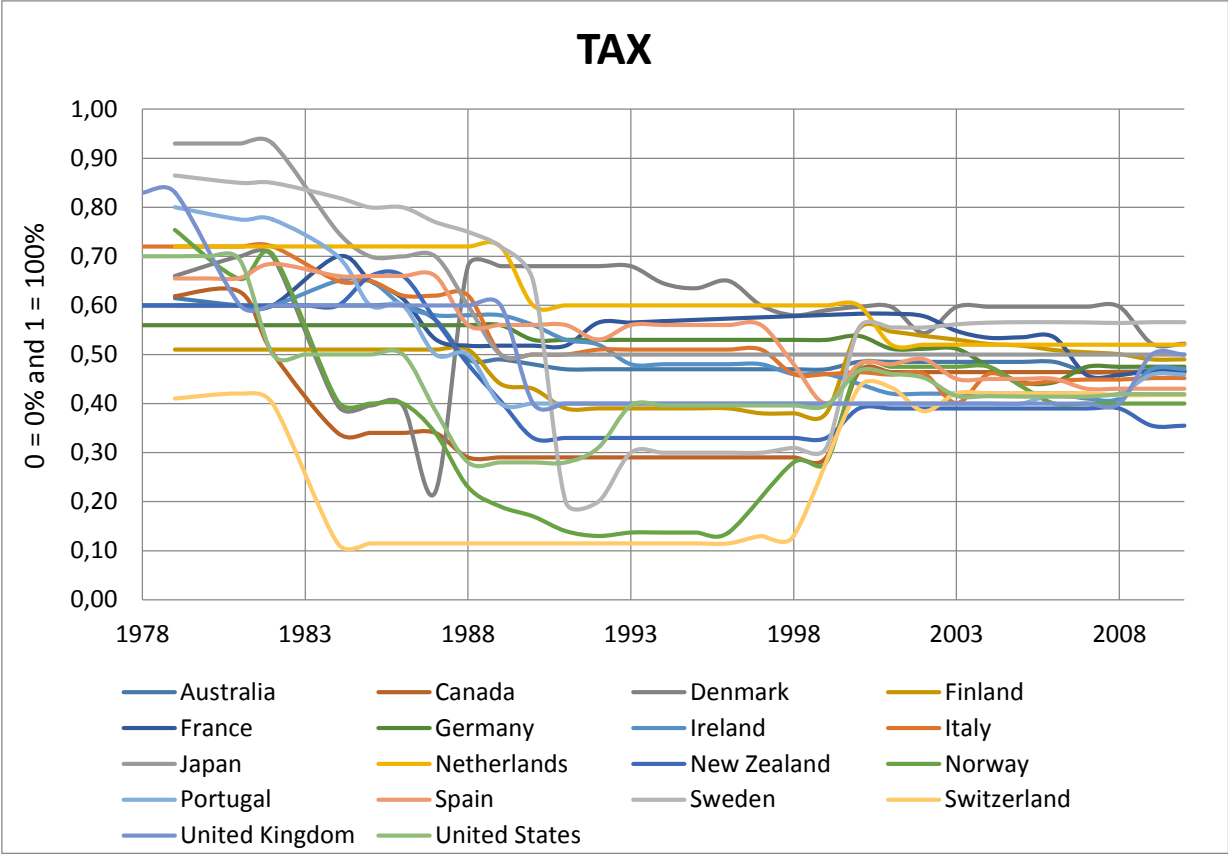
Income (including capital gains)

Income2 (exluding capital gains)

Income3 (P90-99 income share)

Globalization

TAX

0 = 0% and 1 = 100%

Legend: Australia, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States

SUPERSTAR

0 = 0% and 1=100% foreign board members

Legend: Japan, Sweden, Germany, Italy, US, UK

FIN SECTOR 1

Domestic credit to private sector as % GDP

Legend: Australia, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK, US

FIN SECTOR 2

Output of financial sector to total output

Legend: Denmark, Australia, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Portugal, Spain, Sweden, United Kingdom, United States

Total Factor Productivity (TFP)

Legend: Australia, Canada, New Zealand, Ireland, USA, UK, Germany, Denmark, Spain, Finland, France, Italy, Netherlands, Norway, Portugal, Sweden, Switzerland, Japan

Financialization

Legend: Australia, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, NZ, Norway, Portugal, Spain, Sweden, Switzerland, UK, US