Top incomes and the gender divide[1]

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Abstract

In the recent research on top incomes, there has been little discussion of gender. How many of the top 1 and 10 per cent are women? A great deal is known about gender differentials in earnings, but how far does this carry over to the distribution of total incomes, bringing self-employment and capital income into the picture? We investigate the gender divide at the top of the income distribution using tax record data for a sample of eight countries with individual taxation. We show that women are under-represented at the top of the distribution. They account for between a fifth and a third of those in the top 10 per cent. Higher up the income distribution, the proportion is lower, with women constituting between 14 and 22 per cent of the top 1 per cent. The presence of women in the top income groups has generally increased over time, but the rise becomes smaller at the very top. As a result, the gradient with income has become more marked: the under-representation of women today increases more sharply. Examination of the shape of the income distribution by fitting a Pareto distribution shows that at the end of the period women disappear faster than men as one moves up the income scale in all countries, with the exception of Norway. In this sense, there appears to be something of a "glass ceiling" for women. In the case of Canada, Denmark and New Zealand, there appears to have been a reversal over time, with the slope of the upper tail having been steeper for women in the past. In seeking to explain this, we highlight the role of income composition, where we show that there have been significant changes over time, underlining the fact that it is not sufficient to look only at earned income.

1. Introduction: Women and top incomes

The recent literature on top incomes, initiated by Thomas Piketty (2001), has shown how in many countries, there have been significant increases in recent decades in the shares of total income accruing to those at the top. Here we ask a simple question – how many of those in the top income groups are women? The gender composition of the top income group has been surprisingly little investigated. There is a strong suspicion that women are under-represented, but a shortage of hard evidence. Little too is known about whether the gender divide has been narrowing over time. Are there now more women in the top 1 per cent?

A rare exception to the lack of evidence is the 2013 release by Statistics Canada (2013), which reported that the proportion of women in the top 1 per cent of the income distribution in Canada had risen from 11 per cent in 1982 to 21 per cent in 2010. This study was updated in 2015, when it was reported that "women continue to increase their representation among high-income Canadians", the percentage in 2013 being 21.9 (Statistics Canada, 2015). This evidence is interesting in its own right, suggesting that the gender divide has narrowed but that it remains large: there were 3.6 men in the top 1 per cent for every woman in 2013. The evidence also points to the reason why the gender composition has been relatively little studied. The Canadian income tax system is based on the individual, so that individual incomes can be identified (with qualifications discussed below), whereas in the United States income tax is levied on the joint income of couples, so that individual incomes are not recorded in the tax data. Aggregation is also the case in France, where the top incomes literature commenced. Canada is not however alone, and in this paper we explore the evidence for a number of countries that have independent taxation: Australia, Canada, Denmark, Italy, New Zealand, Norway, Spain and the UK. These eight countries cover a range of those in the OECD and provide a number of potential contrasts.

The reader may ask why we are concerned with total income, when the largest component of income is made up by earnings, where there is an extensive literature on gender gaps in earnings (see, for example, Gregory, 2009, and Ponthieux and Meurs, 2015), which documents them and offers explanations for why they are there (Altonji and Black, 1999 and Bertrand 2011). This literature has also focused on the top of the pay distribution and has described the fact that women are under-represented at the top as a "glass ceiling". For instance, Albrecht, Björklund and Vroman (2003) in their study on Sweden describe a "phenomenon whereby women do quite well in the labour market up to a point after which there is an effective limit on their prospects". They add that "The existence of a glass ceiling would imply that women's wages fall behind men's more at the top of the wage distribution than at the middle or bottom". Albrecht, Thoursie and Vroman (2015) update that evidence, focusing on the role of parental leave in generating the higher gender wage gap at the top of the wage distribution. The presence of a glass ceiling is confirmed by Arulampalam, Booth and Bryan (2007) in their analysis on ten European countries. Recent

evidence on the relative absence of women at the top of the US earnings distribution is provided by Guvenen, Kaplan and Song (2014). Using data for the period 1981-2012, they show that over a thirty year period the share of females among top earners has increased by more than a factor of 3. In 2012, though, the earnings share of females was only 18% of the earnings of all individuals in the top 0.1 percent, and 11% of the earnings of the top 1 percent, with all of the increases in the top 0.1 percent taking place in the 1980s and 1990s, and almost no improvement in the last decade. Blau and Kahn (2016) provide evidence on the extent and trends of the gender wage gap in the US between 1980 and 2010 and highlight that the gender pay gap declined more slowly at the top rather than at the middle or the bottom of the wage distribution.

Earnings are however only part of the story. We have to take account of self-employment income in addition to wages and salaries, and capital income as well as earned income. At the top of the income distribution, these sources of income are important, and they may change the picture. Equal pay and laws outlawing discrimination in employment do not apply to the self-employed, where women may also be disadvantaged. According to Boden (1999) who focuses on the US, women's lower wage returns to observed worker characteristics have a positive and significant effect on women's decision to switch from wage employment to self-employment. Williams (2012), who looks at a set of European countries, reports similar results. When one looks at self-employed or entrepreneurial income, access to credit and its cost are crucial. Ongena and Popov (2015) find that in countries with high gender bias, female entrepreneurs are more likely to opt out of the loan application process. Alesina, Lotti and Mistrulli (2011) show that female entrepreneurs pay higher rates to obtain loans. These biases may limit the growth potential of female income. It is therefore important to understand how self-employment and entrepreneurial income contribute to the overall gender gaps. Is slow progress in terms of wages and salaries leading women to take up self-employment? Do biases in access to credit reinforce gender gaps in incomes compared to the ones observed in wages?

The role of women in wealth-holding – and hence capital income – has long been discussed in the literature on the distribution of wealth. There is evidence that in some countries women have in the past owned a significant fraction of total wealth and hence have received a significant share of capital income. For the UK, Atkinson and Harrison (1978) provide evidence that the share of wealth owned by women increased between the 1920s and the 1950s, and declined between the late 1950s and the early 1970s. In the US, Lampman reported in 1962 that "women top wealth-holders have gradually increased, both in numbers and in wealth, relative to men" (1962, page 18). However, Edlund and Kopczuk (2009) point out that the share of women at the top of the wealth distribution peaked in the US in the 1960s and then declined, especially in the top percentiles. We have therefore to ask what has happened to capital income. Has a narrowing gender divide for earnings been offset by losses in terms of capital income?

The next section (Section 2) describes the strengths and weaknesses of the income tax data as a source of evidence about the gender divide among top incomes. We then examine in Section 3 the gender composition of top incomes in the eight countries. How far are women under-represented in the top income groups, such as the top 10 per cent? How has this changed in recent decades? Are there marked differences between countries? The results demonstrate that women are indeed in all eight countries severely under-represented in the top 10 per cent, and at all higher percentiles.

Is the pattern of under-representation of women at the very top evidence of a "glass ceiling" for incomes? To investigate this, and as a way to understand and interpret our evidence, in Section 4 we describe the shape of the distribution in terms of a Pareto distribution, and see how the Pareto coefficients differ by gender. The Pareto coefficients give us a measure of the concentration of income at the very top of the distribution and provide us with an indicator of the extent of the glass ceiling. This analysis links our contribution to both the labour economics literature, which investigates the behaviour of gender wage gaps along the distribution, and the literature on income distribution, which gives predictions on the Pareto coefficients. This literature also highlights the importance of the different sources of income in the determination of the coefficients themselves. We thus consider in Section 5 the different sources of income for men and women, as a route into exploring the underlying causes of their different presence at the top, and as interesting evidence in its own right. We examine for a selection of our countries the breakdown of income into earnings, self-employment income and capital income. The main conclusions are summarised in Section 6.

2. Income tax data on the gender divide

The paper makes use of information from income tax records. As such, it is subject to evident limitations. The data are drawn from an administrative process and reflect the underlying tax legislation in their definitions of income and of the tax unit. The administrative process doubtless has many shortcomings, and tax data are affected by avoidance and evasion. The strengths and weaknesses of income tax data have been extensively discussed in the recent literature on top incomes (see, for example, Atkinson, Piketty, and Saez, 2011). Here we consider only the aspects that are likely to influence the conclusions regarding the gender dimension.

First, the form of the income tax may affect the selection of countries, and time periods, covered. The results relate only to countries, and to years, for which the income tax is operated on an independent basis, taxing husbands and wives separately. These countries may differ systematically in terms of the gender distribution of income from those that operate joint taxation. Pressure for independent taxation, and its ultimate introduction, may have reflected an increased importance of wives'

incomes. We may therefore be looking at countries, and periods, when there is less gender inequality.[3]

Secondly, in the case of couples, the attribution of income to the individuals depends on the practices of the tax authorities. They receive information from employers, banks, property registers, etc, and the taxpayers are obliged to check and if necessary provide additional information. In the case of Norway, "in some cases this may lead to capital income, such as bank interest, being allocated to the husband, and hence over-stating the male share. Inspection of the micro-data does however show that the receipt of large capital incomes for both spouses is not uncommon at the top end of the distribution**."**[4] The same may apply to other countries. It is also possible that a given total income for a couple from a particular source is automatically divided into two equal parts, in which case gender inequality may be under-stated.

Thirdly, the tax system may influence the decisions taken by spouses. With a progressive income tax system and individual taxation, there may be an incentive to allocate artificially some income components to spouses with lower income, generally women. This incentive may change over time – besides being different across countries -, with shifts in tax progressivity. In such cases, the tax records may over-state the real change in the gender distribution.

Finally, it is possible that the propensity for tax evasion differs by gender. If women were more tax compliant than men, our measure of the extent of the gender division may be underestimated. Kleven, Knudsen, Kreiner, Pedersen and Saez (2011) in their tax enforcement field experiment in Denmark show that the role of social variables such as age and gender is small compared to that of information in the decision to evade. However, their estimates reveal that being female is always negatively associated with the probability of evading taxes. Research based on survey evidence about attitudes towards tax evasion, i.e. tax morale, highlights that women are more willing to comply.[5] Torgler and and Valev (2012) using 3 waves of the WVS/EVS data show that women consider tax evasion less justifiable than men[6] and that the gender gap in attitudes towards tax evasion has not changed over time with the changing economic role of women in society. According to this evidence, though our measure of the gender division may

[3] One could also argue that the revenue cost of joint taxation is higher when incomes are more unequal by gender. It is therefore also possible that a revenue maximising government would be more willing to adopt individual taxation when inequality is more pronounced. In this case our estimates based on countries with individual taxation provide an upper bound.

[4] We are grateful to Jørgen Modalsli for this information.

[5] For a critical discussion of this literature, see Slemrod and Weber (2012) who point out that the absence of a direct measure of evasion in the surveys, makes it hard to infer how tax morale affects levels of tax evasion.

[6] Similar results are found by McGee (2012).

underestimate its real extent,[7] the changes over time we may observe should not be influenced.

3. How many women are in the top income groups: evidence for eight countries

We begin with a straightforward account of the gender composition of the top income groups. In each case, the income groups are defined as percentages of the total population aged 15 and over (20 and over in Canada and Spain), and relate to total gross income as defined for tax purposes excluding capital gains, whenever possible.[8] The data sources are summarised below (the appendix contains detailed information on the sources):

Australia: tabulated data provided by the Australian Tax Office

Canada: data from Statistics Canada, Longitudinal Administrative Database.

Denmark: micro-data analysed by Jakob Søgaard (see Atkinson and Søgaard, 2013).

Italy: tabulated data from the MEF-Department of Finance.

New Zealand: published tabulations (see Atkinson and Leigh, 2007a) and tabulated data supplied by the New Zealand Inland Revenue.

Norway: micro-data analysed by Jørgen Modalsli (see Aaberge and Atkinson, 2010).

Spain: micro-data analysed by Facundo Alvaredo (see Alvaredo and Saez, 2010).

United Kingdom: data for 1995/96 to 2010/11 drawn from micro dataset of the Survey of Personal Incomes (no data were released for 2008/9) which gives a representative sample of the UK population of taxpayers.[9] Figures from 2011/12 onwards are based on the published tabulations of the Survey of Personal Incomes – see Atkinson (2007).[10]

[7] Also laboratory experiments tend to find that women are more compliant than men (see Kastlunger, Dressler, Kirchler, Mittone and Voracek, 2010 and references cited therein).
[8] Results including capital gains are briefly discussed at the end of this section.
[9] Note that data points based on less than 20 (unweighted) individual observations were not considered in the analysis.
[10] The results from the tabulations are close to those from the micro-data: for example, for 2010/11, the share of women in the top 10 per cent is 28.3 per cent in the micro-data and 28.1 per cent from the tabulations, and the share of the top 1 per cent is 16.8 per cent in the micro-data and 16.9 per cent from the tabulations.

Results on the share of women in top income groups for the last data available are shown in Table 1.[11]

The first striking feature – one that we did not expect when we started collecting the data – is the relative similarity of the proportions in different countries. Looking at the most recent year (between 2010 and 2014), we see that for five of the eight countries, the proportion of women in the top 10 per cent lay between 28 and 31 per cent. Differences across countries are stronger, but still relatively small, when we look at the proportion of women in the top 1 per cent of the income distribution: it lay between 14 per cent in Norway and 22 per cent in Australia, Canada and Spain. For six of the eight countries, the proportion was between 18 and 22 per cent.

The second striking feature – and one that we did expect – is the decline in the proportion of women as one rises higher on the income scale. The share of women in the top 10 per cent is between 1.4 and 1.9 times the share of women in the top 1 per cent, except in Australia. There is a similar decline in moving from the top 1 per cent to the top 0.1 per cent, except in Norway. In most countries for which we have data, the proportion of women in the top 0.1 per cent is half or less that in the top 10 per cent. This decline is much less marked in Norway and in Australia. On the contrary, it is particularly strong for Italy and the UK.

Table 1 Proportion of women in top income groups in 2010-2014

	Top 10%	Top 1%	Top 0.1%
Spain 2010	32.6	22.1	16.6
Denmark 2013[12]	30.9	16.2	10.8
Canada 2013	29.8	21.9	15.8
New Zealand 2013	29.2	18.6	
Italy 2014	29.0	19.6	12.7
UK 2013	28.2	17.8	9.2
Australia 2012[13]	25.4	21.5	
Norway 2013	21.5	13.7	13.6

[11] Results based on tabulated data are obtained using linear interpolation to have the gender breakdown and, later, the income decomposition by sources. This does not apply to the three most recent years for the UK when they are based on the split histogram (which yields similar results).

[12] These figures are based on total income excluding capital gains and dividends. The share of women in top incomes including capital gains and dividends in 2013 reaches 30.5 per cent at the top 10 per cent, 16.0 per cent at the top 1 per cent, and 12.7 per cent at the top 0.1 per cent; see Figure A4 in the Appendix.

[13] These figures are based on total income excluding capital gains (only). For comparison, the proportion of women in top income groups when excluding capital gains and dividend imputation credits reaches 25.0 per cent at the top 10 per cent, 19.9 per cent at the top 1 per cent and 16.7 per cent at the top 0.1 per cent; see Figure A1 in the Appendix.

Changes over time

The series of graphs in Figure 1 show the evolution of the gender composition of top income groups in the different countries for the years for which we have data. In each case the vertical axis is the same, but the time period covered by the horizontal axis varies. In most cases the data commence in the 1990s. For example, independent taxation was introduced in the UK in 1990. For Denmark, the data go back to 1980. For two other countries (New Zealand and Canada), the data go back much earlier, respectively 1953 and 1943, but we examine the more recent years first.

The proportion of women in top income groups has, in general, been rising over time, but the experience is diverse and in Australia there is little sign of an upward trend (albeit over a relatively short period). Starting with the top 10 per cent, the proportions of women have increased since the 1990s at a rate around 0.5 percentage points per year in Canada, New Zealand, the UK and Spain (0.75 points per year). In the UK in 1995/96, women made up 20.0 per cent of the top 10 per cent, and this figure increased to 28.2 per cent in 2013/14. The rate of increase has been less marked in Italy and Norway. The fastest increase is instead observed in Denmark, where the share of women in the top 10 per cent was around 10 per cent in the 1980s and went above 30 per cent in 2013.

Examination of Figures 1a to 1h shows however that the rate of increase has been smaller at the higher ranks.[14] In Spain, there has been an increase in the share of women in the top 0.1 per cent, with the exception of the last year. In Canada, the increase began only after 1997. In Denmark, there has been little increase in the top 0.1 per cent during the last 10 years. In the case of Norway, there was an increase in the proportion of women in all percentiles examined, albeit dampened in the top 0.1 per cent. In the UK, for the top 0.1 per cent there is little sign of an increase in women's representation over the period 1995/96 to 2013/14. The same is true in Italy since 1999. As a result, the gradient with income has become more marked: the under-representation of women today increases more sharply as one moves up the income scale in most countries.

The historical record goes back furthest in the case of New Zealand and Canada.[15] In New Zealand, the data from 1953 show, first, the very low representation of women in the top income groups at the beginning of the period: around 7 per cent of the top 1 per cent, see Figure 2a. The

[14] This is consistent with the available evidence on earnings in several other countries. In the U.S., for instance, Guvenen, Kaplan and Son (2014) show that the improvement in women's position is visible in the bottom 99 percentiles but not in the top 1. From a different angle, Bertrand, Black, Jensen and Lleras-Muney (2014) - studying the effect of the law on gender quotas in Norway - show that the policy improved the representation of female employees at the very top of the earnings distribution (top 5 highest earners) within firms that were mandated to increase female participation on their board, but those gains did not trickle–down to the rest of the distribution.

[15] A comparison between the shares computed on historical and recent data sources for overlapping years is reported in Figures A6 and A7 in the Appendix.

proportion remained consistently low until the mid-1970s, when the percentage of women began to rise. The proportion of women in the top 1 per cent reached 16 per cent in 1989. Secondly, the mid-1970s saw an inversion of the ranking of the two curves. At the outset, in the 1950s, the proportion of women was higher for the top 1 per cent than for the 10 per cent. There was then a reversal in the mid-1970s, so that there are now more women in the top 10 per cent than in the top 1 per cent. The results for Canada for the period 1943-1990 are shown in Figure 2b. The proportion of women appears to have been falling in the 1940s and it began to rise at the end of the 1960s. In the 1960s, the proportion of women seems to have been similar across the top groups, from the top 10 per cent to the top 0.5 per cent, but in the 1940s the proportions were higher for the very top group. This is particularly marked for 1942, when women accounted for nearly 20 per cent of the top 0.01 per cent, but only 5 per cent of the top 10 per cent, with a pattern which resonates the one in New Zealand for the earlier period of observation.

Coming back to the immediate past, all of the series cover the first years of the recent economic crisis. There are some indications that the proportion of women fell in some countries (Australia, Canada, New Zealand and Spain) after 2009, suggesting that women at the top were hit more harshly compared to men in these countries. In Spain the proportion of women fell in all income groups from 2009 to 2010, see Figure 1g. The drop for the highest percentiles is more marked and started earlier.

The figures presented examined trends in the share of women in the top percentiles of the income distribution, where total income excludes capital gains whenever possible. In countries in which capital gains can be identified separately in the data (Australia, Canada and Spain), including capital gains in total gross income appears to have little effect on the share of women at the top 10 per cent or top 5 per cent, but tends to raise the share of women at higher percentiles. This increase is particularly marked for the years before the crisis (see Figures A2, A3 and A5 in the Appendix). A similar trend is observed in the data for Denmark where capital gains and dividends are identified jointly (see Figure A4 in the Appendix). In Norway the measure of total income used in the analysis includes some capital gains. Excluding these capital gains has little effect on the reported share of women in top income.

4. The shape of the distribution and the glass ceiling

In the labour economics literature, to prove the existence of a glass ceiling Albrecht, Björklund and Vroman (2003, 2015), Arulampalam, Booth and Bryan (2007) or Blau and Kahn (2016) demonstrate an increasing log wage gap between men (M) and women (W) in the upper tail of the earnings distribution. In other words, earnings rise less steeply for women than for men. We can investigate whether this also happens with income by fitting separate Pareto distributions for men and women in the upper tail of the distribution. Writing the cumulative distribution function of income y as

$$1 - F(y) = A_i y^{-\alpha_i} \quad (1)$$

where i = M or W, and taking logs we obtain

$$Ln\, y = C_i + (1/\alpha_i)\, Ln\left(1/\left(1-F\right)\right) \quad (2)$$

where C_i is a constant.

This shows the gradient in (log) income as one moves up the distribution, and the difference in the gradient can be taken as a measure of the extent to which there can be said to be a glass ceiling. Where $1/\alpha_w < 1/\alpha_m$, then the distribution of income dies away faster for women. Put differently, the ratio of women to men in the income group with *y* or more then falls with *y* according to $A_w / A_m \cdot y^{-(\alpha_w - \alpha_m)}$.

Applying the same approach in the current context, the Pareto curves and equations for the top 1 per cent in the UK are shown in Figure 3a for 1995/96 and Figure 3b for 2010/11.[16] The fact that the curve for women is on the right of the curve for men tells us that there are fewer women than men at each percentile, and the fact that the slope is flatter tells us that they are disappearing faster. In both cases, we find that the slope is less for women than for men, implying that the Pareto coefficient for women is greater. In this sense, the upper tail is less concentrated for women. The slope for women appears to be similar in 2010 to that in 1997/98, whereas that for men has become steeper. This suggests that the glass ceiling in terms of income in the UK has become more apparent. The earnings gradient has steepened for men leaving women further behind.

Is such a pattern found in other countries? The evolution of the estimated slopes for men and women in top income groups are reported in Figures 4a to 4g. As earlier, the vertical axis is the same but the time period covered by the horizontal axis varies. Whenever possible, the slopes were computed on the respective male and female populations in the top 1%. The sensitivity of these coefficients to a shift from the top 1% to the top 5% is reported as a note at the bottom of each Figure.

Figure 4a indicates that in Australia the gradient for men and women is almost constant over time, with the presence of women decreasing at a faster pace compared to men during the entire period. For Canada, Figure

[16] The Pareto coefficients are computed using equation (2). Regressing instead $Ln\left(1/(1-F)\right)$ on $Ln\, y$ gives the following coefficients, which are close to those in Figures 3a and 3b: for men 0.4767 in 1995 and 0.5582 in 2010; for women 0.4599 in 1995 and 0.4346 in 2010. Given the constraints imposed by the size of the samples in earlier years, Pareto coefficients for the UK are based on cumulative data points covering the top 0.1 down to the top 1 percent. This is to ensure that no data points are based on less than 20 (unweighted) individual observations.

4b shows that in 1942, the line was steeper for women but by 1946 it had become less steep and remained consistently so. We observe a similar reversal in New Zealand. Figure 4e shows the slope coefficients for men and women over the sixty year period from 1953 to 2012. In the middle 2000s, the values are close to those in Australia and Italy: the slope for men around 0.43 and that for women around 0.38. But in the 1970s and the 1980s, the slopes were much closer, falling together in the 1970s and then rising in the 1980s. There was no noticeable "glass ceiling". And before 1971, there was a reverse gap, with the slope being steeper for women than for men. The switch in the slopes therefore happened earlier in Canada than in New Zealand. Lines both for men and for women became less steep up to the end of the 1970s, and then tended upwards. Also Denmark displays a pattern in the Pareto coefficients which resembles the one of Canada and New Zealand in earlier years, with the coefficients for women being smaller than those of men until the early 2000s[17], when curves first overlap and then switch, with the one for women lying below that of men, indicating the appearance of a glass ceiling. The absence of a glass ceiling characterises Norway over the period 1993 to 2011. Figure 4d shows the data for Italy until 2014. Though to a lesser extent, Italy - like the UK - experiences a steepening of the gradient for men, indicating that the glass ceiling has become stronger.

In seeking to explain the changing slopes over time and the switch in the steepness of the male and female Pareto curves a natural first step is to consider the composition of income. The changing pattern may, for example, reflect what is happening to the distribution of earned incomes, which takes us back to the wage distribution literature. Or it may result from changes in the distribution of investment income and the underlying concentration of wealth. Or it may reflect a changing balance between earned income and investment income. It is the last of these that we explore in the next section.

5. Gender and the composition of top incomes

In this section, we consider the breakdown of total gross income into three main components: earned income, self-employment income and investment income. Earned income includes employment income, pension income and government transfers. Investment income includes income sources like interests, dividends and imputed rents, when taxed via personal income tax. Our goal is to analyse whether there are gender differences in the composition of top incomes. To this end, we look at at the income composition of men and women within the top 1 or top 5 percent, defined on the total population, and study whether there are gender differences over time and across countries on the sources of income for men and women at the top.

For New Zealand, we can make use of the separate distributions given according to the principal source of income. In the top 1 per cent in 1953

[17] This gap is particularly marked when dividends and capital gains are included (Figure A8 in the Appendix).

(those with incomes above $2,818 a year)[18], then we see that this contains 14,323 people, of whom 1,013 were women (7 per cent). The main source at this time was self-employment (78 per cent), with 18 per cent receiving salary or wages as the main source. Only 4 per cent had investment income as the main source. This is important, since women were poorly represented among the other two groups: they constituted 1.7 per cent of those with wages and salaries, and 5.5 per cent of the self-employed. In contrast, among those with investment income as the main source they constituted a majority (63 per cent). In fact, women made up more than 60 per cent of this group throughout the top 10 per cent of total income recipients, as is shown in Figure 5. As a result, a large proportion of the women in the top income ranges had investment income as their principal source: 71.4 per cent of the top 1 per cent in 1953.

The dominance of women among those with investment income was however declining over time, as is demonstrated by Figure 5. By the 1970s, the proportion of women was below 50 per cent. Nor was this compensated by a rise in representation among the other two groups. In 1975, when the top 1 per cent contained 21,960 people, the proportion with wages and salaries as the main source had risen to 49 per cent, but among these only 2.5 per cent were women. The low share of women in the top income population among those with earned incomes up to the mid-1970s is in line with other evidence that there was little change in the gender distribution over this period. Martin (1997, Table 6) calculated the median total incomes of women actively engaged in the labour market aged 15 to 59 in each of the quinquennial censuses. As a percentage of the male median, the median income of women were 51.2 per cent in 1951 and 52.0 per cent in 1970, but then increased to 56.2 per cent in 1981 and 67.1 per cent in 1991.

The importance of investment income as a source of income for women compared to men at the top is common to all the countries examined. For countries other than New Zealand, information on the source of income covers only more recent years. Figures 6A and 6B show for Australia the composition of income of the top 1 per cent by the three categories of income, and for men and women separately. The aforementioned dominance of investment income is particularly strong, with women in the top 1 per cent receiving more than 50 per cent of their income from investment from 2000 to 2012. The corresponding figure for men is around 20 per cent, with earned income covering more than 60 per cent of overall income[19]. Figures 7A and 7B show that self-employment

[18] Although at that time it would have been £1,409. New Zealand switched from pounds to dollars on 10 July 1967, at the ratio of £1 = $2.

[19] The distinction between self-employment income and investment income is not clear-cut as some income labels on the tax return may contain both types of income. One prominent example is income derived from partnerships and trusts. This distinction is important here, as income from partnerships and trusts can be appreciable. In 2012-13, for example, partnerships and trusts accounted for about 13% of total income of people in the top 5 per cent (excl. capital gains, figure computed using data from a 2% random sample of taxpayers). In this study, income from partnerships and trusts has been distributed between

income plays a more important role both for men and women in Denmark compared to Australia, with earned income starting to play a more important role also for women towards the end of the observation period. In Italy, the investment income share is smaller – around 15 per cent from 2004 onwards - compared to the other countries examined,[20] but is again higher for women than for men– see Figures 8A and 8B – whereas the share of self-employment income is relatively similar across gender. The share of employment income has risen considerably for women. Even larger changes in composition are shown for Spain in Figures 10A and 10B. Capital income is larger for women than for men, as is self-employment income. There has been a marked rise in the share of wage income for women, at the expense of the other two categories.

Figures 11A and 11B show the composition of income of the top 1 per cent for the UK for men and women separately. Taking the period 1995 to 2010 as a whole, the main conclusion is that women have rather more investment income and less earned income, with the proportion from self-employment being similar for men and women. In 2007, for example, women received a quarter of their income from investments, whereas for men the figure was around 15 per cent.

Data for Norway allow us to see how the different income components change as we move up the income distribution in 2013. We see that both for men and women the share of investment income increases and the importance of earned income declines, with self-employment income remaining almost constant. Women in the top 1 per cent receive 45 per cent of their income from investment, comparable to the share reported in the Australian data.

6. Conclusions

This paper provides new evidence on gender disparities adopting a measure of inequality between gender which has not been used before and which can complement, on the one side, the literature on top incomes which overlooks the gender dimension; on the other, the literature on earnings gaps which provides information on differences in wages but is silent on other income components that may well contribute to the overall picture of gender inequalities. In countries with independent taxation of couples, it is possible to investigate the proportion of women in the top income groups. In this paper we have focused on eight countries for which this information exists.

The paper casts light on four questions. The first is the existence of the gender divide, which we have seen to be marked and to exist to a

investment and self-employment based on information provided in the sub-labels of the tax form.

[20] This can partly be related to the fact that most investment income –non-qualified dividends, interests and non-qualified capital gains- in Italy is taxed via a withholding tax and does not enter personal income taxation.

similar extent in all countries. Women are seriously under-represented in the top income groups and the degree of under-representation increases as one approaches the top. Women account for under a quarter of those in the top 1 per cent of incomes. The second question concerns the changes over time. The female presence in the top of the distribution has increased in recent years - though at a different extent - in all the countries considered, (apart from in Australia), but less in the upper ranges. In Italy and the UK, there is little sign of an increase in women's representation in the top 0.1 per cent. As a result, the gradient with income has become more marked: the under-representation of women today increases more sharply as one moves up the income scale.

The third question concerns the slope of the upper tail, as represented by the Pareto coefficient, which we use as a measure of the glass ceiling at the very top of the income distribution. Norway shows no difference in gradients, indicating that the presence of women and men as we move up the income distribution changes in the same way. For Australia, there was little difference between the slopes for men and women. For Italy and – particularly the UK – there was a marked difference, with incomes for women rising less than for men, especially in the more recent years indicating a thickening of the glass ceiling. Canada and New Zealand, however, showed that this was a phenomenon of recent decades, with women having a steeper slope in the 1940s (in Canada) and in the 1950s (in New Zealand). This reflected the changing composition and ownership of income, which is the fourth question addressed in the paper. Over time, between the 1950s and 1970s, the investment share declined for women in New Zealand. The latter plays a very important role as a source of income for women compared to men at the top in all the countries examined. In several countries, the share of employment income has increased for both men and women. In Spain this is particularly evident for women.

Since the pattern we uncover for income composition across genders is rather similar across countries, one wonders whether this outcome reflects commonalities across countries in the way women (and men) at the top participate to economic activities and receive rewards for it, or whether it is essentially institution-driven: tax minimization efforts in the context of a progressive tax system may induce households in all countries to transfer some investment income from the higher income recipient to the lower income recipient, in most cases women. It could also be the result of positive assortative mating in the marriage market, whereby women at the top marry men with similar characteristics and are in a position to share assets and their return.

This discussion underlines why it is important to look at income as a whole when seeking to understand the sources of gender inequality.

Bibliography

Aaberge, R and Atkinson, A B, 2010, "Top Incomes in Norway" in A B Atkinson and T Piketty, editors, *Top Incomes over the Twentieth Century – A Global Perspective*, Oxford University Press, Oxford.

Aaberge, R, Atkinson, A B and Modalsli, J, 2013, "The Ins and Outs of Top Income Mobility". IZA Discussion Paper series no 7729.

Albrecht, J, Björklund, A and Vroman, S, 2003, "Is there a glass ceiling in Sweden?", *Journal of Labor Economics*, vol 21: 145-177.

Alesina, A, Lotti, F, and Mistrulli, P, 2013. "Do women pay more for credit? Evidence from Italy", *Journal of the European Economic Association,* vol 11: 45-66.

Altonji, J and Blank, R M, 1999, "Race and gender in the labor market" in O C Ashenfelter and D Card, editors, *Handbook of Labor Economics*, vol. 3: 3143-3259, Elsevier, Amsterdam.

Alvaredo F, and Saez, E, 2010, "Income and Wealth Concentration in Spain in a Historical and Fiscal Perspective" in A B Atkinson and T Piketty, editors, *Top Incomes over the Twentieth Century: A Global Perspective*, Oxford University Press, Oxford.

Arulampalam, W, Booth, A L and Bryan, M L, 2007, "Is there a glass ceiling over Europe? Exploring the gender pay gap across the wage distribution", *Industrial and Labor Relations Review*, vol 60: 163-186.

Atkinson, A B and Harrison A J, 1978, *Distribution of Personal Wealth in Britain*, Cambridge University Press, Cambridge, UK.

Atkinson, A B and Leigh, A, 2007, "The distribution of Top Incomes in Australia", *Economic Record*, vol 83: Issue 262, 247–261.

Atkinson, A B and Leigh, A, 2007a, "The distribution of top incomes in New Zealand" in A B Atkinson and T Piketty, editors, *Top incomes over the twentieth century,* Oxford University Press, Oxford.

Atkinson, A B, Piketty, T and Saez, E, 2011, "Top incomes in the long run of history", *Journal of Economic Literature*, vol 49: 3-71.

Atkinson, A B and Søgaard, J E, 2013, The Long-Run History of Income Inequality in Denmark, EPRU working paper series 2013-01, University of Copenhagen.

Australian Taxation Office, *Taxation Statistics,* individual sample file, 2003-04 to 2011-12 income years. Available at https://www.ato.gov.au/about-ato/research-and-statistics/in-detail/tax-statistics/taxation-statistics-2011-12/?page=41#The_2011_12_individuals_sample_file.

Bertrand M, 2011, "New Perspectives on Gender" in D Card and O C Ashenfelter, editors, *Handbook of Labor Economics,*vol. 4b: 1543-1590, Elsevier, Amsterdam..

Bertrand, M, Black, S.E, Jensen, S, and Lleras-Muney, A, 2014, "Breaking the Glass Ceiling? The Effect of Board Quotas on Female Labor Market Outcomes in Norway", NBER Working Paper No. 20256, June.

Boden, R J, 1999, "Gender inequality in wage earnings and female self-employment selection", *The Journal of Socio-Economics*, 28(3): 351-364.

Edlund, L and Kopczuk, W, 2009, "Women, wealth, and mobility", *American Economic Review*, vol 99: 146-178.

Erard, B, 1993, "Taxation with Representation, an Analysis of Tax Practitioners in Tax Compliance", *Journal of Public Economics*, vol 52: 163-197.

Gregory, M, 2009, "Gender and economic inequality" in W Salverda, B Nolan and T M Smeeding, editors, *The Oxford Handbook of Economic Inequality,* Oxford University Press, Oxford, 284-312.

Guvenen, F, Kaplan, G, and Son, J, 2014, "The Glass Ceiling and The Paper Floor: Gender Differences among Top Earners, 1981-2012", NBER Working Paper No. 20560, October.

HM Revenue and Customs. KAI Corporate Business Intelligence, Survey of Personal Incomes, 2004-2005: Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], June 2007. SN: 5661, http://dx.doi.org/10.5255/UKDA-SN-5661-1

HM Revenue and Customs. KAI Corporate Business Intelligence, Survey of Personal Incomes, 2005-2006: Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], August 2008. SN: 5996, http://dx.doi.org/10.5255/UKDA-SN-5996-1

HM Revenue and Customs. KAI Information Services, Survey of Personal Incomes, 2006-2007: Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], August 2009. SN: 6251, http://dx.doi.org/10.5255/UKDA-SN-6251-1

HM Revenue and Customs. KAI Information Services, Survey of Personal Incomes, 2007-2008: Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], June 2010. SN: 6502, http://dx.doi.org/10.5255/UKDA-SN-6502-1

HM Revenue and Customs. KAI Data, Policy and Co-Ordination, Survey of Personal Incomes, 2009-2010: Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], November 2012. SN: 7160, http://dx.doi.org/10.5255/UKDA-SN-7160-1

HM Revenue and Customs. KAI Data, Policy and Co-Ordination, Survey of Personal Incomes, 2010-2011: Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], November 2014. SN: 7569.

Inland Revenue. Statistics and Economics Division, Survey of Personal Incomes, 1995-1996 : Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], November 1998. SN: 3819, http://dx.doi.org/10.5255/UKDA-SN-3819-1

Inland Revenue. Statistics and Economics Division, Survey of Personal Incomes, 1996-1997 : Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], April 1999. SN: 3971, http://dx.doi.org/10.5255/UKDA-SN-3971-1

Inland Revenue. Statistics and Economics Division, Survey of Personal Incomes, 1997-1998 : Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], August 2000. SN: 4172, http://dx.doi.org/10.5255/UKDA-SN-4172-1

Inland Revenue. Statistics and Economics Division, Survey of Personal Incomes, 1998-1999 : Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], December 2001. SN: 4456, http://dx.doi.org/10.5255/UKDA-SN-4456-1

Inland Revenue. Analysis and Research, Survey of Personal Incomes, 1999-2000 : Public Use Tape [computer file]. 2nd Edition. Colchester, Essex: UK Data Archive [distributor], December 2004. SN: 4595, http://dx.doi.org/10.5255/UKDA-SN-4595-1

Inland Revenue. Analysis and Research, Survey of Personal Incomes, 2000-2001 : Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], May 2003. SN: 4680 , http://dx.doi.org/10.5255/UKDA-SN-4680-1

Inland Revenue. Analysis and Research, Survey of Personal Incomes, 2001-2002 : Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], July 2004. SN: 4983 , http://dx.doi.org/10.5255/UKDA-SN-4983-1

Inland Revenue. Analysis and Research, Survey of Personal Incomes, 2002-2003 : Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], June 2005. SN: 5174, http://dx.doi.org/10.5255/UKDA-SN-5174-1

Inland Revenue, Survey of Personal Incomes, 2003-2004: Public Use Tape [computer file]. Colchester, Essex: UK Data Archive [distributor], April 2006. SN: 5351 , http://dx.doi.org/10.5255/UKDA-SN-5351-1

Kastlunger, B, Dressler, S.G, Kirchler, E, Mittone, L, and Voracek, M, 2010, "Sex differences in tax compliance: Differentiating between demographic sex, gender-role orientation, and prenatal masculinization (2D:4D)", *Journal of Economic Psychology*, vol 31: 542-552.

Kleven, H J, Knudsen, M B, Kreiner, C T, Pedersen, S, and Saez, E, 2011, "Unwilling or Unable to Cheat? Evidence From a Tax Audit Experiment in Denmark", *Econometrica*, vol 79: 651-692.

Lampman, R J, 1962, *The share of top wealth-holders in national wealth 1922-56,* Princeton University Press, Princeton.

Lechmann, D S, and Schnabel, C, 2012, "Why is there a gender earnings gap in self-employment? A decomposition analysis with German data", *IZA Journal of European Labor Studies*, vol 1(1): 1-25.

Martin, B, 1997, "Away from equality: Change in personal incomes, 1951 to 1991", Population Studies Centre, Discussion Paper 20, University of Waikato, Hamilton.

McGee, R, 2012, "Gender and the Ethics of tax Evasion: an Empirical Study of 82 Countries" in R McGee, editor, *The Ethics of Tax Evasion: Perspectives in Theory and in Practice*, Springer.

Ministero delle Finanze, MEF, Distribuzione per genere dei redditi complessivi IRPEF, 2000-2014.

Ongena S, and Popov, A, 2015, "Gender Bias and Credit Access", ECB Working paper 1822, July.

Piketty, T, 2001, *Les hauts revenus en France au XXe siècle: Inégalités et redistributions 1901-1998,* Grasset, Paris.

Ponthieux S, and Meurs D, 2015, "Gender Inequality" in A B Atkinson and F Bourguignon, editors, Handbook of Income Distribution, vol 2A, Elsevier, Amsterdam.

Slemrod, J, and Weber, C, 2012, "Evidence of the Invisible: Toward a Credibility Revolution in the Empirical Analysis of Tax Evasion and the Informal Economy", *International Tax and Public Finance*, vol 19: 25-53.

Statistics Canada, 2013, "High-income trends among Canadian taxfilers, 1982 to 2010", Release 28 January 2013.

Statistics Canada, 2015, "High-income trends among Canadian taxfilers, 1982 to 2013", Release 3 November 2015.

Torgler, B, and Valev, N T, 2010, "Gender and Public Attitudes toward Corruption and tax Evasion"*, Contemporary Economic Policy*, Volume 28, Issue 4, pages 554–568, October.

Williams, D R, 2012, "Gender discrimination and self-employment dynamics in Europe", *The Journal of Socio-Economics* 41(2), 153-158.

Appendix: Detailed information on sources

Australia

Data source: Australian Tax Office (ATO)

Data format: tabulated data for 2001/02 to 2012/13, 200 income ranges per year.

Population coverage: whole population of individual taxpayers with positive net tax

Definition of total income: total individual income before tax excluding capital gains. See Figure A1 in the appendix for share of women in top incomes in Australia based on total individual income excluding capital gains and imputation credits.

Tax year: ends 30 June; labelled with the year of starting month

Other information: more than 70% of tax returns are filled with the help of a tax agent. The proportion is increasing with individual income, reaching 85 percent or more for the top 5% (top 5% figures based on 2003/4 to 2012/13, data from the 1-2% micro samples).

Canada

Data source: Statistics Canada

Data format: tabulated data from 1942 to 1990 and data from the Longitudinal Administrative database (LAD) from 1982 to 2013. LAD data were downloaded from the Statistics Canada website, http://www.statcan.gc.ca. A chart that highlights how the historical and LAD data series compare over time is reported in Figure A6 in the Appendix.

Population coverage: The LAD is a 20% random sample of Canadian tax filers.

Definition of total income in LAD: total individual income before tax (the market income plus government transfers and refundable tax credits) not including capital gains

Tax year: calendar year

Other information: Statistics from the LAD are based on the population of tax filers. From 1990, the population of tax filers represented more than 92 percent of the total Canadian population aged 20 and over and more than 96 percent from 1995 onwards.

Denmark

Data source: Statistics Denmark

Data format: micro data from 1980 to 2013

Population coverage: whole population of individual taxpayers, aged 15 and above

Definition of total income: total individual income before tax (market income+ government transfers) excluding dividends and capital gains. Dividends and capital gains could only be identified jointly. The treatment and coverage of capital gains changed over the years but is included the data from the mid-2000s. We are grateful to Jakob Søgaard for pointing this out. As a result, the series that excludes

capital gains is likely to provide a more reliable picture of the evolution of total income over 1980 to 2013. The series with capital gains should be more accurate regarding the level of total income at the end of the period.

Tax year: calendar year

Italy

Data source: MEF-Department of Finance

Data format: tabulated data from 1999 to 2014, 33-34 income ranges per year.

Population coverage: whole population of individual taxpayers

Definition of total income: total individual income before tax

Income sources not included or covered: Dividends and capital gains are not covered unless received from qualified participation in a listed firm. Interest income not included. Dividends distributed by non-listed companies are included via the fiscal declaration of firms.

Top coding or grouping: when frequency is less than 4 units, data are omitted for privacy reasons

Tax year: calendar year

Other information: in 2012 imputed rents pertaining to the house where the owner lives (redditi fondiari derivanti da beni non locati) are excluded from total income before taxation. From 2011, there was the option to pay a withholding tax on income derived from renting a house (rather than the progressive personal income tax). Starting from 2009 there is a 10% withholding tax on wages coming from extra-time. To subtract this income component from progressive taxation, there is a wage limit of 35000 increasing to 40000 euros.

New Zealand

Data source: New Zealand Inland Revenue

Data format: published tabulated data for most years between 1953 and 1989 (see Atkinson and Leigh, 2007a) and tabulated data provided by the Inland Revenue from 1980 to 2013, 52 to 172 income ranges per year. A chart that highlights how the historical and recent data series compare over time is reported in Figure A7 in the Appendix.

Population coverage: the recent tabulated data is based on a random sample of individual taxpayers, scaled up to population estimates. The sample is 2% of wage and salary earners and 10% of IR3 filers. Data from 1981 to 1993 only includes people who filed income tax returns. People were not required to file tax returns if their income was below a specified threshold unless they had income sources from which withholding taxes had not been deducted. The data from 1994 onwards also includes non-filers with PAYE income. The income data for such non-filers is sourced from employer-records, including taxable transfers.

Definition of total income: total taxable individual income. Note that there are very few allowances available.

Tax year: ends 31 March - labelled with year of starting month

Other information: Gender identification from the person's title, as a proxy variable (random allocation of people with titles like Dr, Reverend,

etc.). Structural break in 2000 when the top personal income tax rate was increased and the trust rate was not, resulting in many individuals channelling their income through trusts. The two rates were realigned in 2012, although ownership structures are likely to remain.

Norway

Data source: Statistics Norway

Data format: Micro data from 1993 to 2013. Files of taxpayers linked to population registry

Population coverage: entire population

Definition of total income: Total individual income before tax (includes some capital gains), see Aaberge and Atkinson (2010). Note that due to data constraints the definition of total income used in the time series is not exactly the same as the definition of total income used in the income composition figure for 2013.

Income sources not included or covered: income from owner-occupied houses and non-taxable capital gains

Tax year: calendar year

Other information: tax changes on dividends in 2001 and 2006 affected the income reporting behaviour of capital owners during the period from 2000 to 2013, see Aaberge, Atkinson and Modalsli (2013).

Spain

Data format: Data for 1999-2001 comes from the "Panel de Declarantes de IRPF 1999-2009" which is a stratified random sample (panel) covering 2% of taxpayers. Data for 2002-2010 comes from the "Muestra de Declarantes de IRPF", which is stratified random sample that includes 6% to 8% of individual taxpayers. From 2002 onwards, the Muestra is used as it performs better when reproducing tabulation-based top shares. The Panel loses precision with time. Panel sample size: 390,600 - 425,000; Muestra sample size: 907,300- 1,351,800

Definition of total income: total individual income before tax, excluding capital gains

Income sources not included or covered: Capital gains are covered at varying degrees

Tax year: calendar year

Other information: married couples can choose to file their tax return jointly. When there is joint filing, it is not possible to distinguish individuals' incomes. However, when both members of the couple have non zero incomes, the joint filing is clearly disadvantageous. We have followed the usual practice in Spain of considering that all files at the top of the distribution are individual.

United Kingdom

Data source: HMRC, Survey of Personal Incomes (SPI)

Data format, year and sample size: data for 1995/96 to 2010/11 are drawn from micro dataset of the Survey of Personal Incomes (no data were released for 2008/9). The figures from 2011/12 are based on the published tabulations of the Survey of Personal Incomes – see Atkinson

(2007). Sample size: 57,400 to 677,400 observations per year in the micro data, 14 to 15 income ranges for the tabulated data

Population coverage: representative sample collected from 3 different sources: (1) the National Insurance and PAYE Service, (2) the Computerised Environment for Self-Assessment system which covers people with self-employment, or people who receive rental or untaxed investment income, and (3) the Claims system, which covers people who are not generally taxpayers but who have had too much tax deducted at source and have made a claim for its return.

Definition of total income: total individual income before tax

Income sources not included or covered: some social security benefits and income from some tax efficient savings vehicles that are not taxed. Capital Gains arising from the disposal of assets are subject to Capital Gains Tax (CGT) and are not treated as income for income tax purposes, so gains from the disposal of assets are not included in the SPI. Some investment income is imputed.

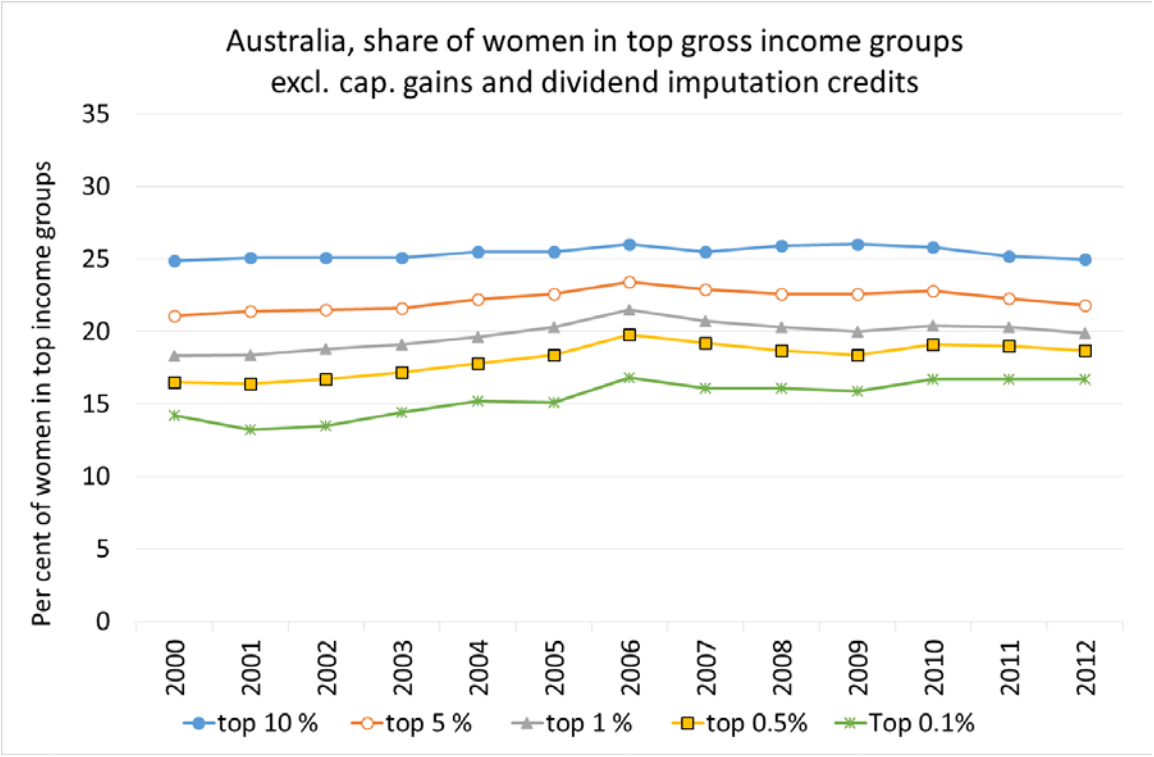
Top coding or grouping: in the micro datasets, the richest individuals are grouped into composite records

Tax year: ends 5th April - labelled with the year of the starting month

Other: “In March 2009, it was announced by the Labour Government that the top rate was to be raised from 40 to 50 per cent with effect from April 2010, and this led to “considerable fore-stalling” of income in 2009-10 (Seely, 2014). In March 2012, it was announced by the Conservative Government that the top rate was to be reduced to 45 per cent with effect from April 2013, which again provided an incentive for income to be moved between tax years, in that case from 2012-13 to 2013-14.” Atkinson and Ooms (2015)

Appendix: additional figures

Figure A1



Figures A2

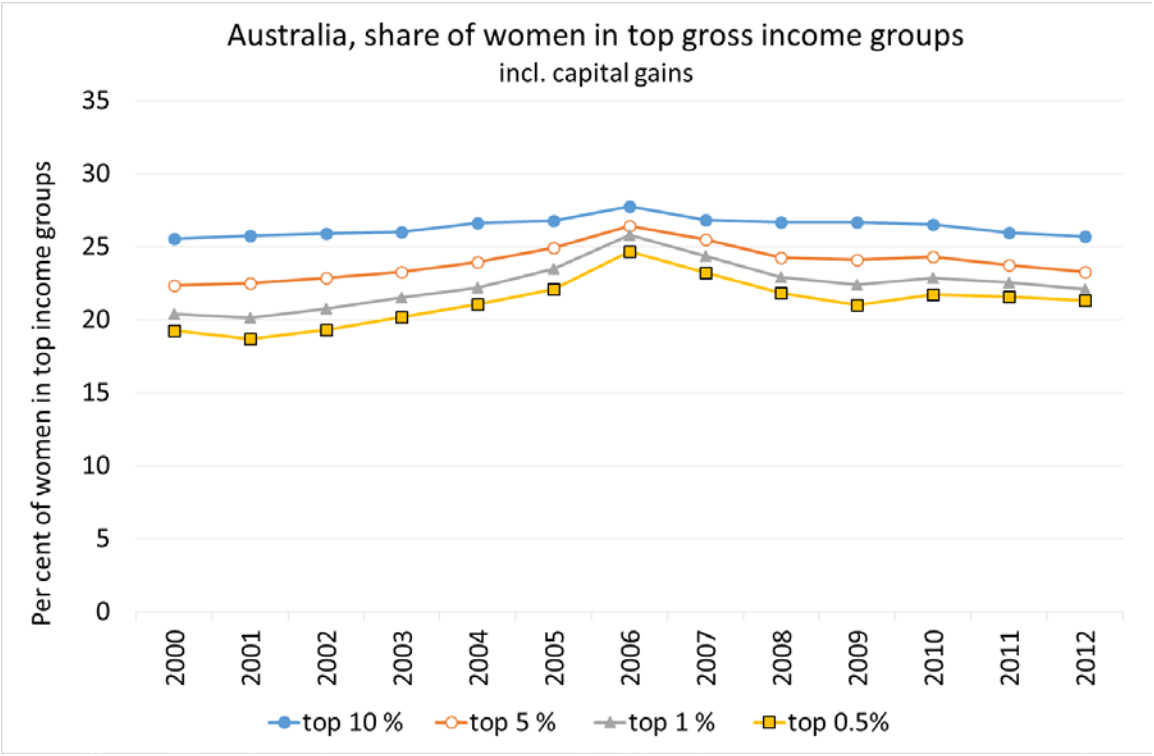


Figure A3

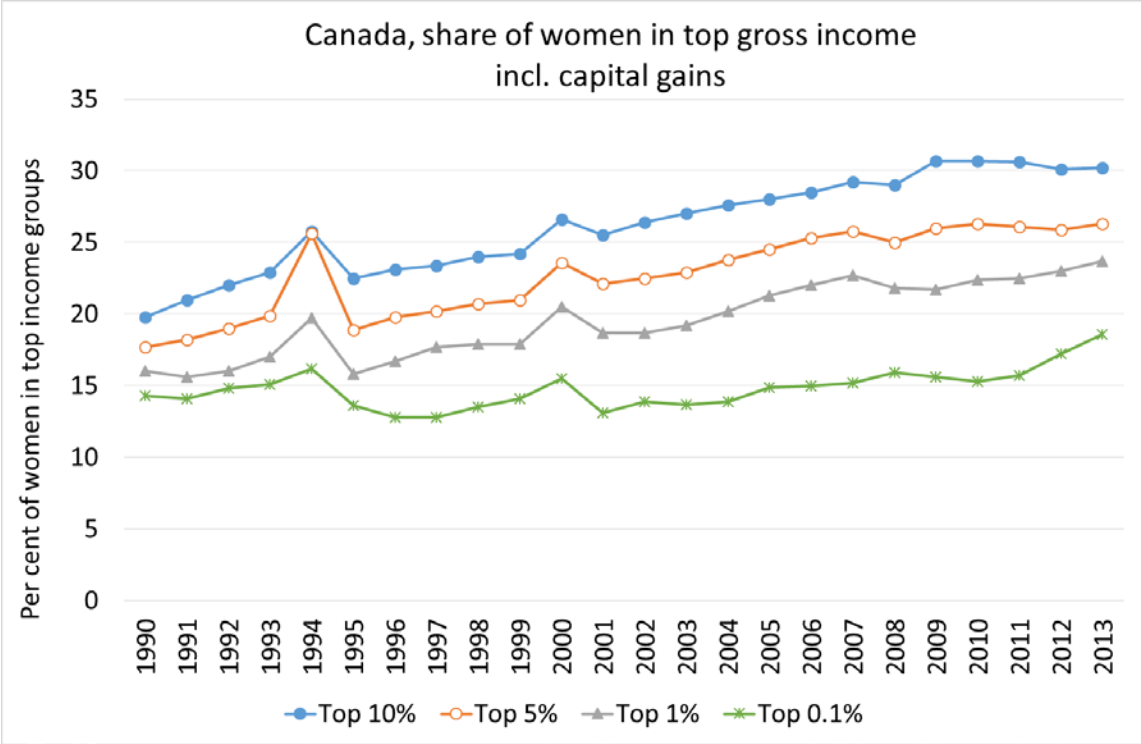


Figure A4

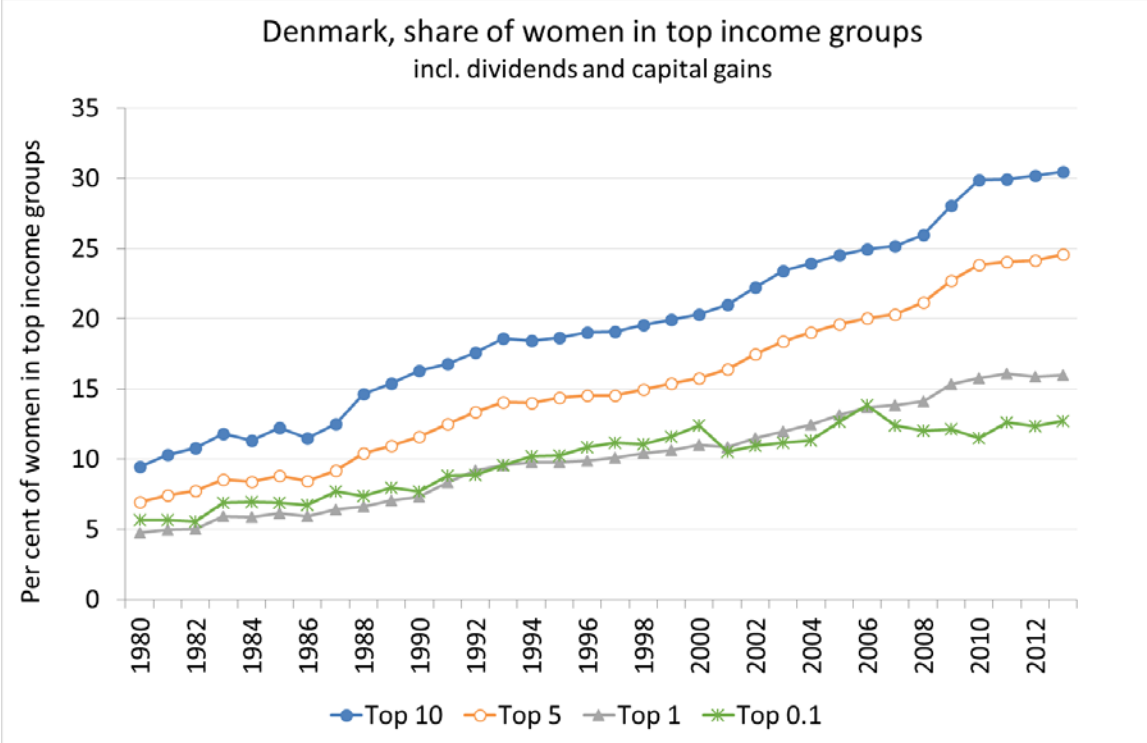


Figure A5

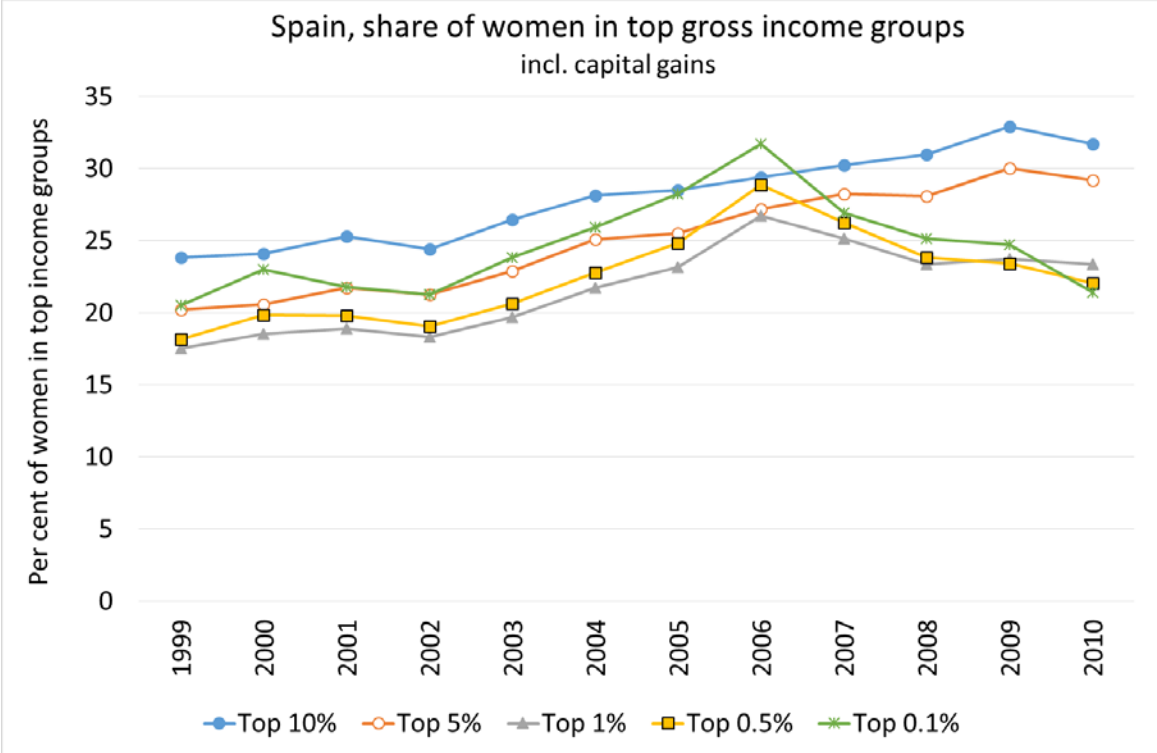


Figure A6

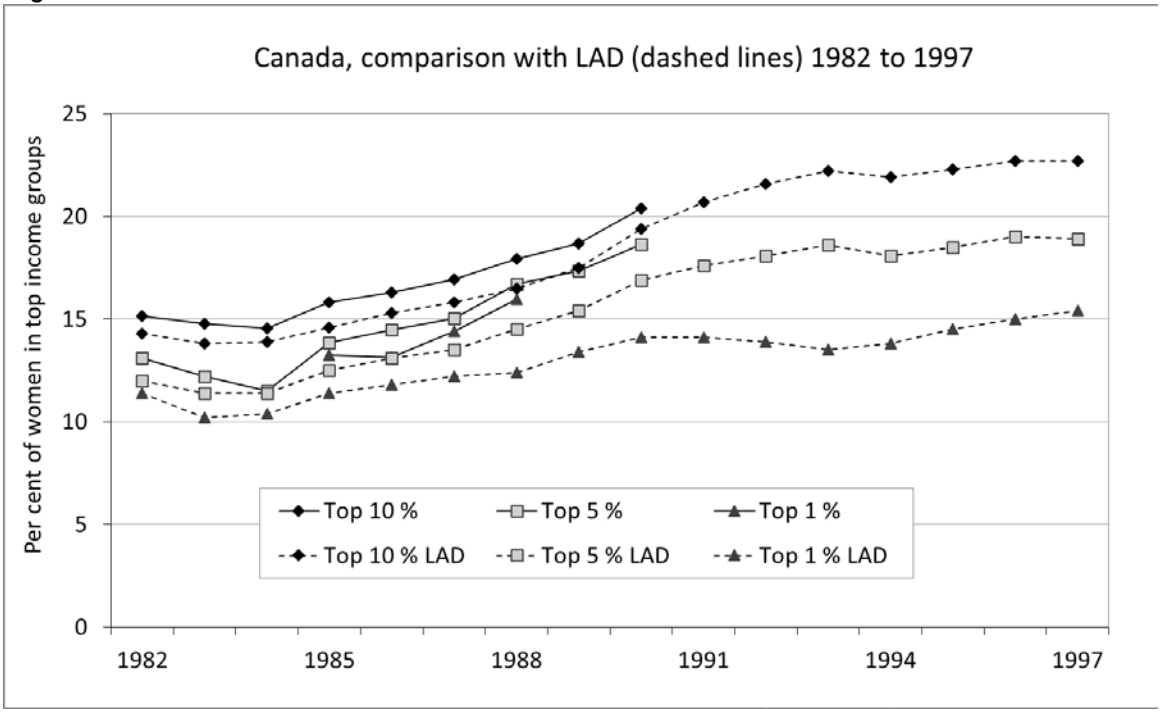


Figure A7

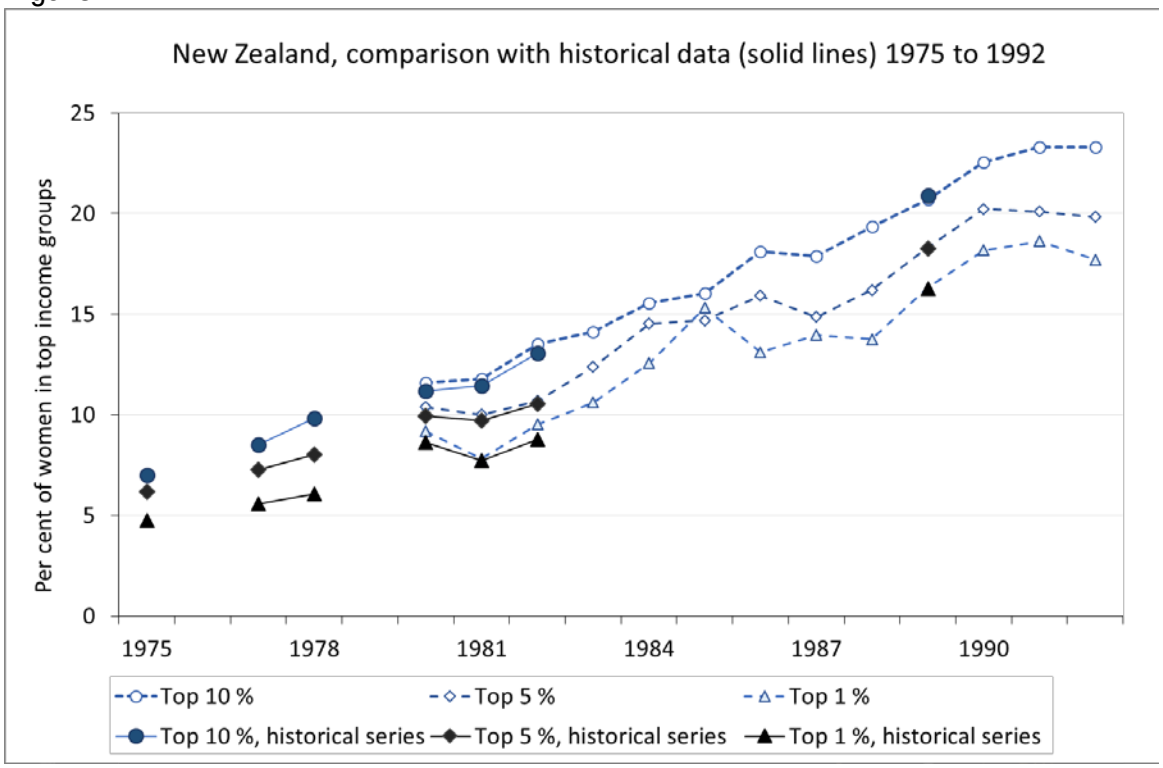
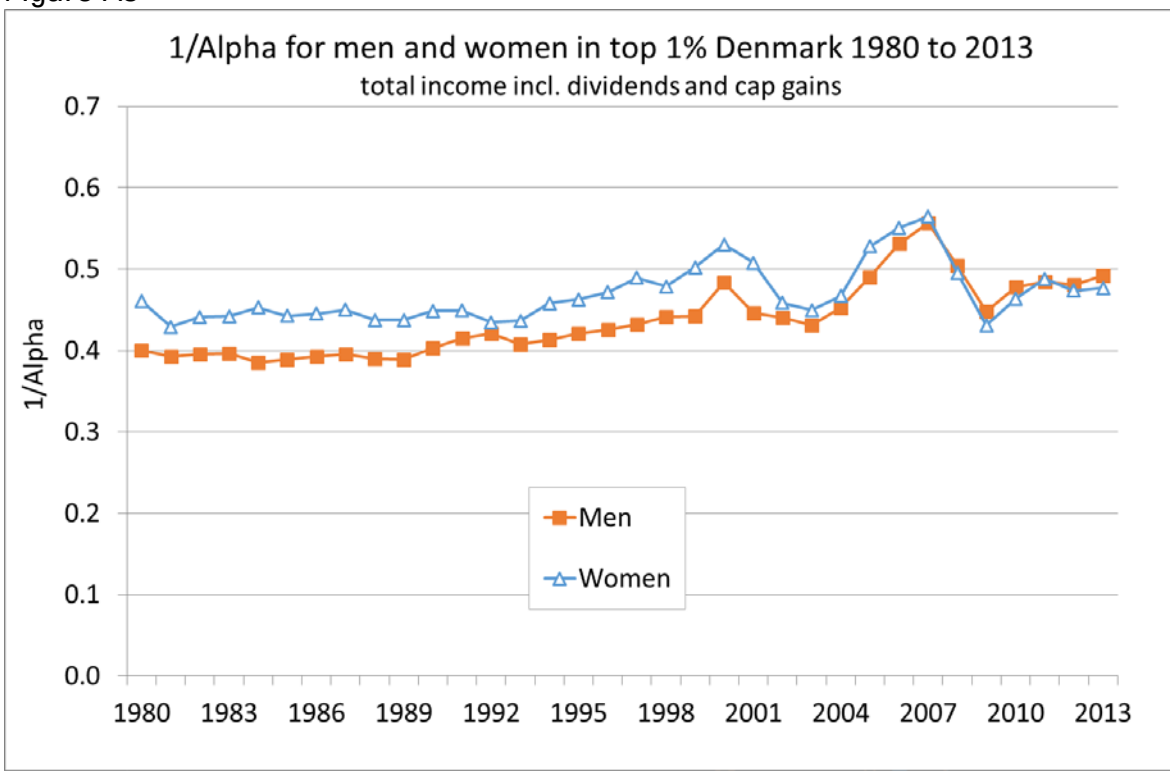


Figure A8



Note: curves for men and women are closer when computed on top 5%.

Figures

Figure 1a

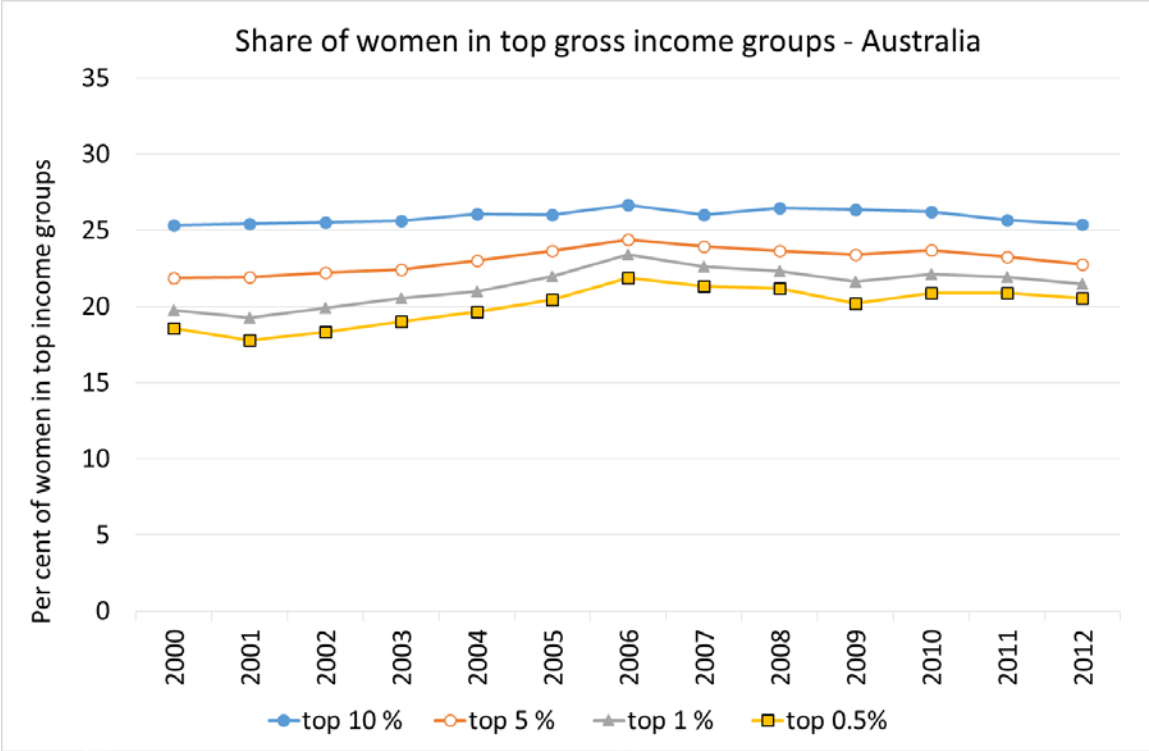


Figure 1b

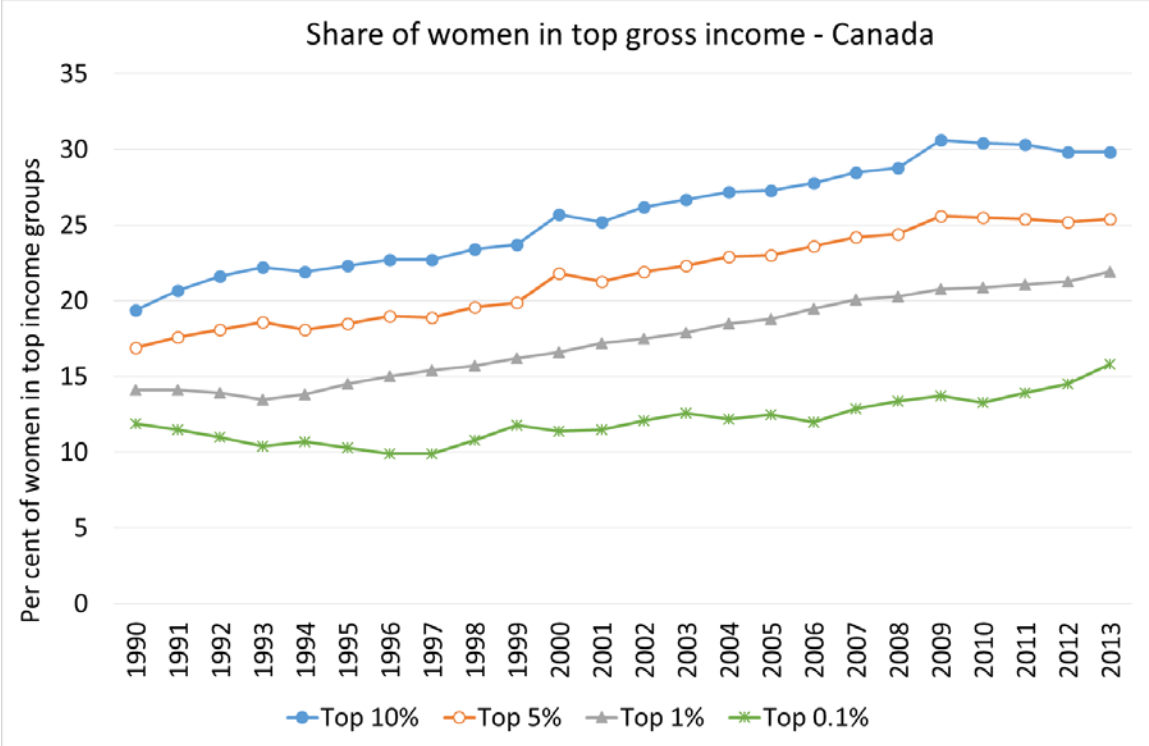


Figure 1c

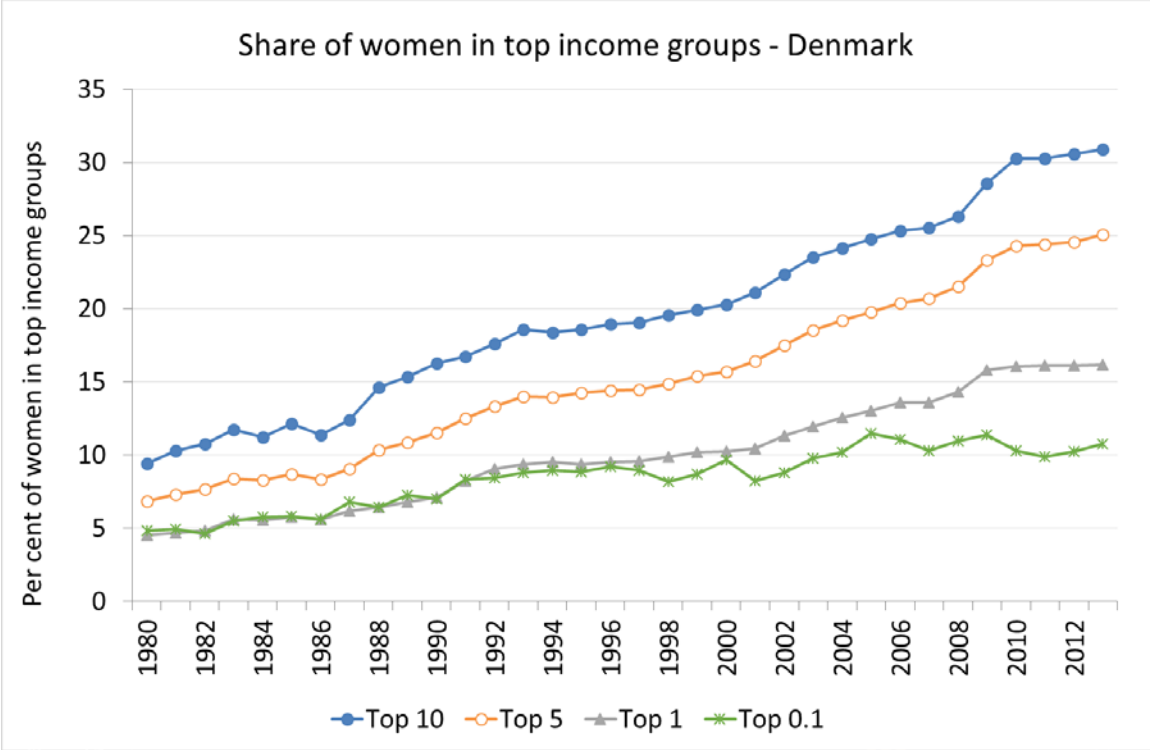


Figure 1d

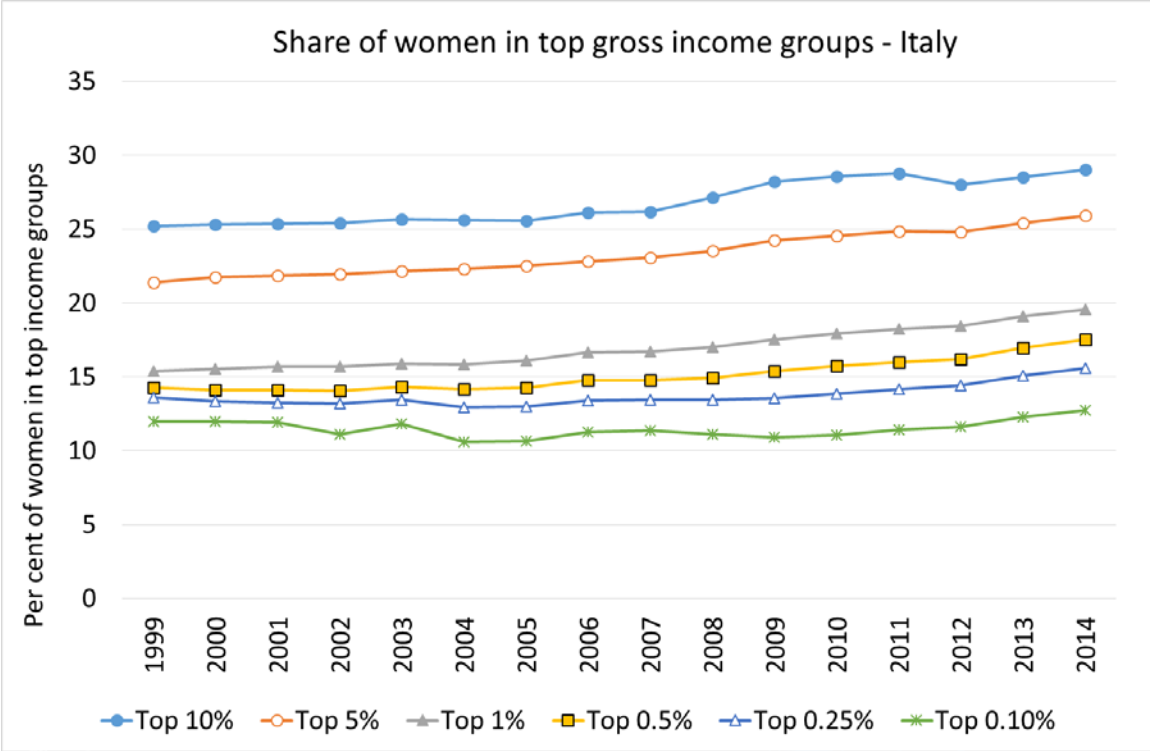
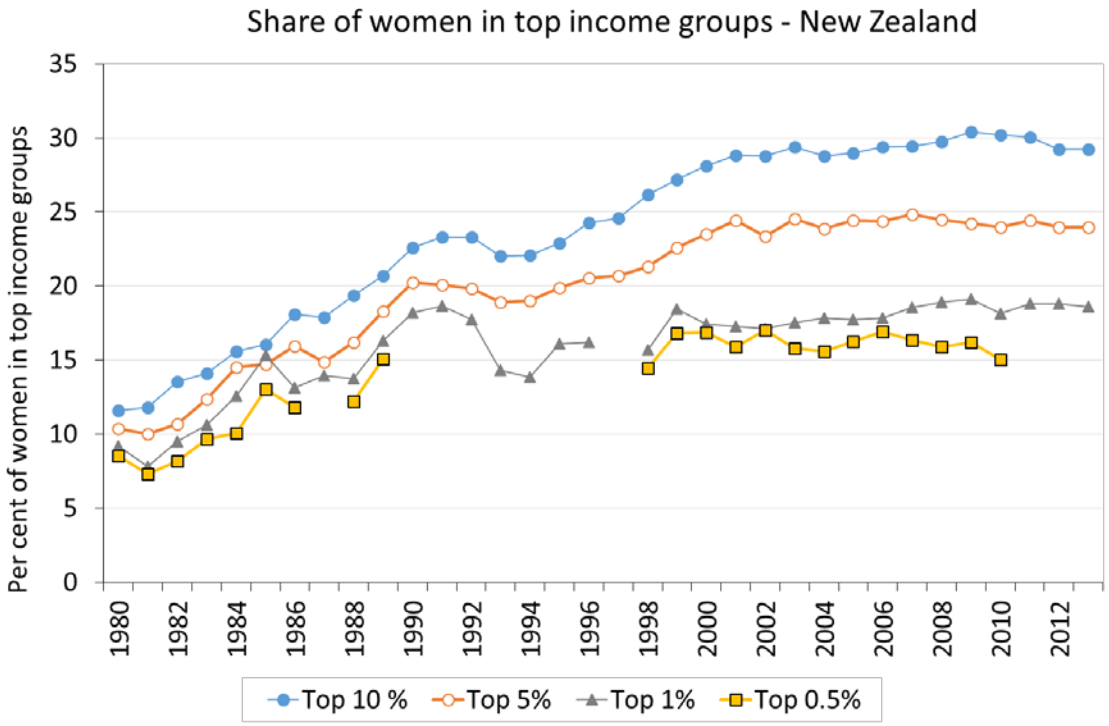


Figure 1e



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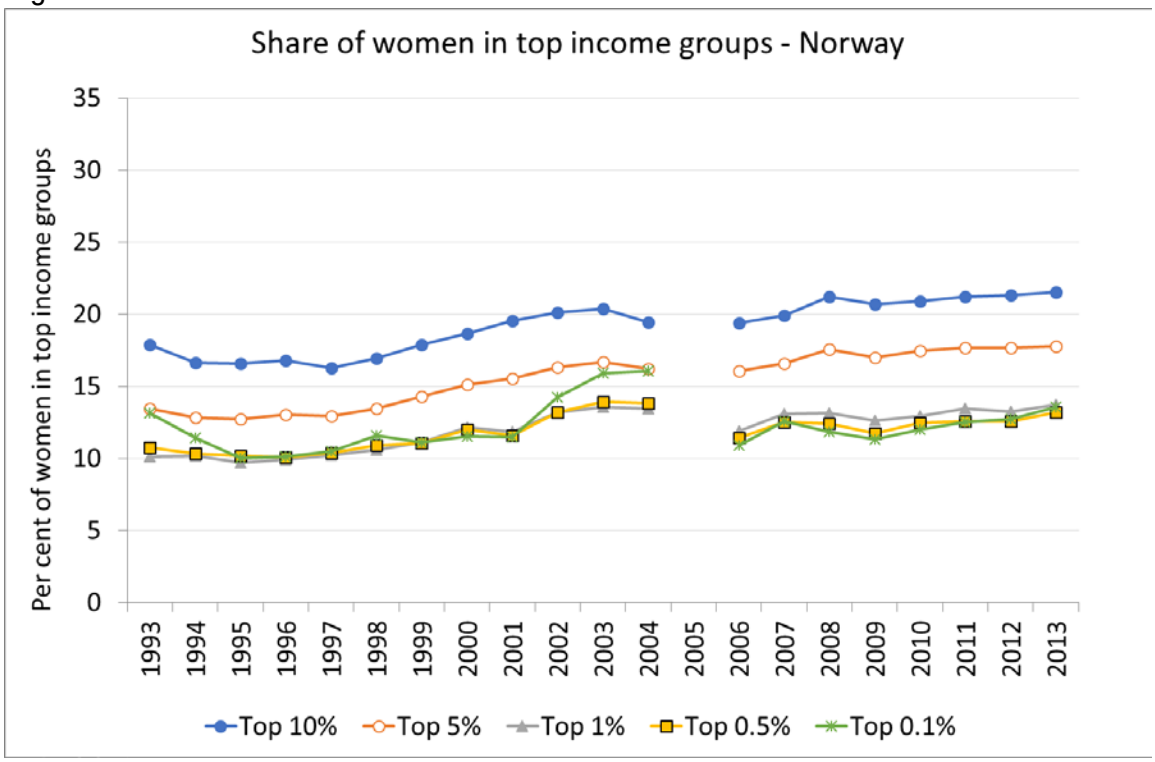


Figure 1g

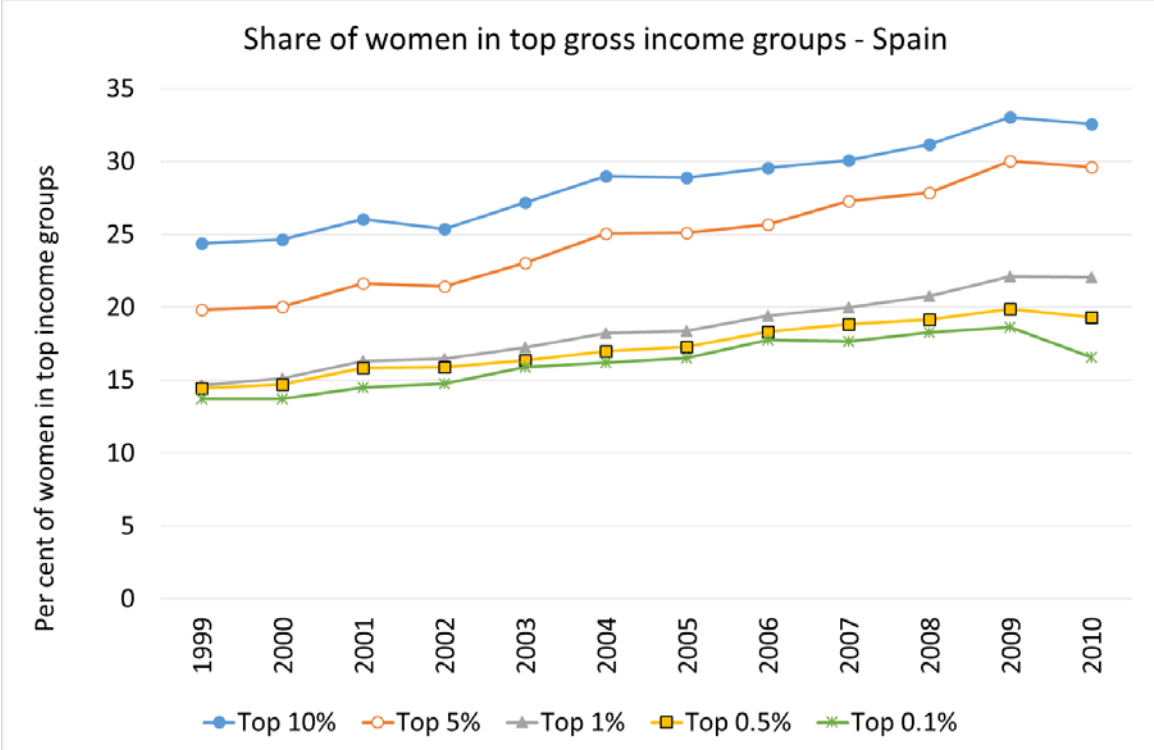


Figure 1h

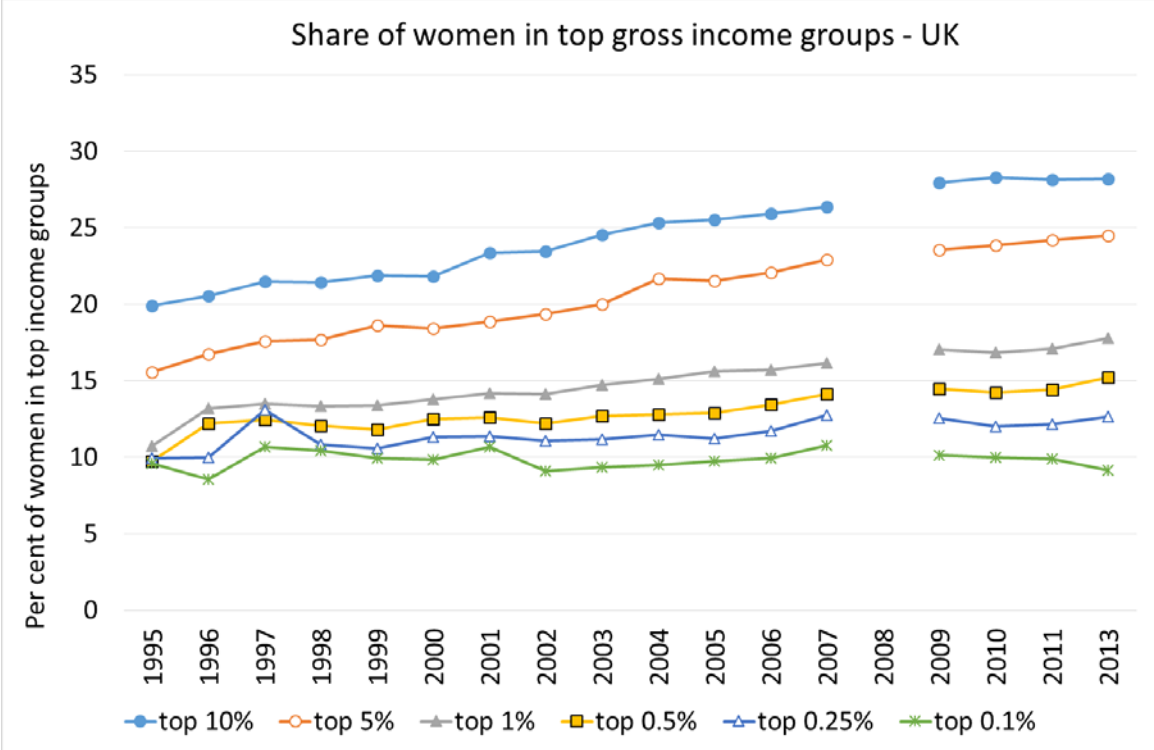


Figure 2a

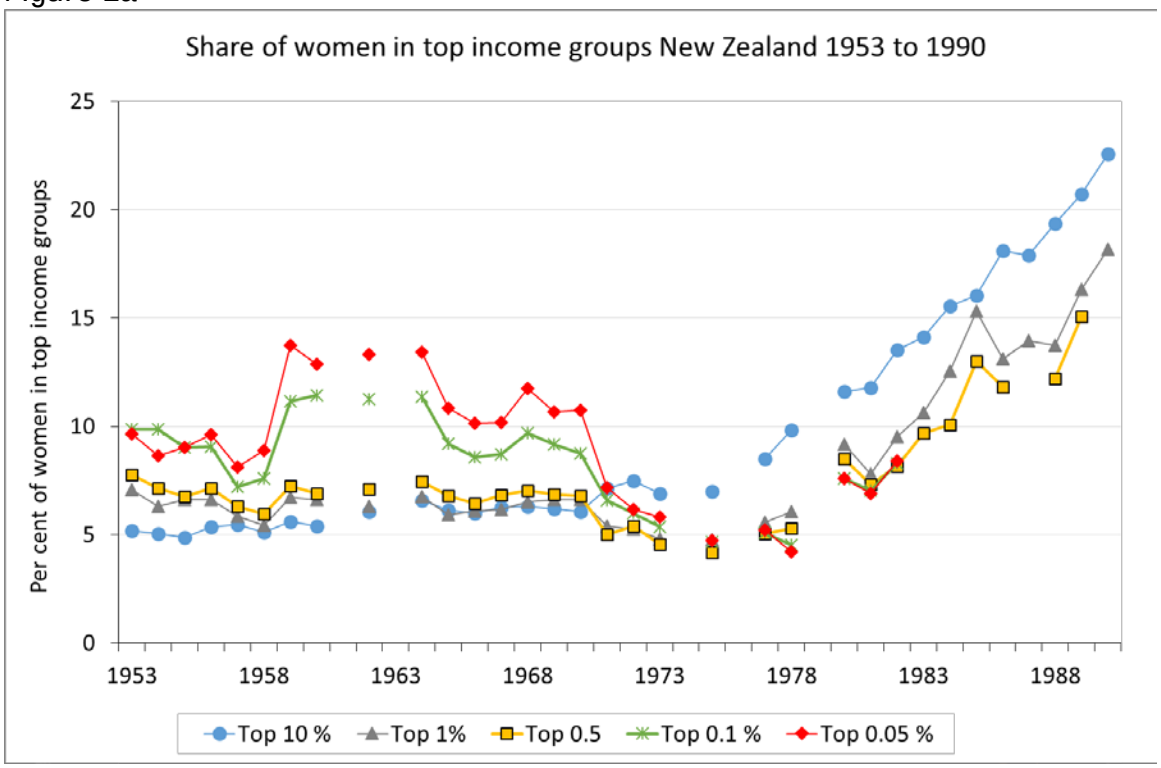


Figure 2b

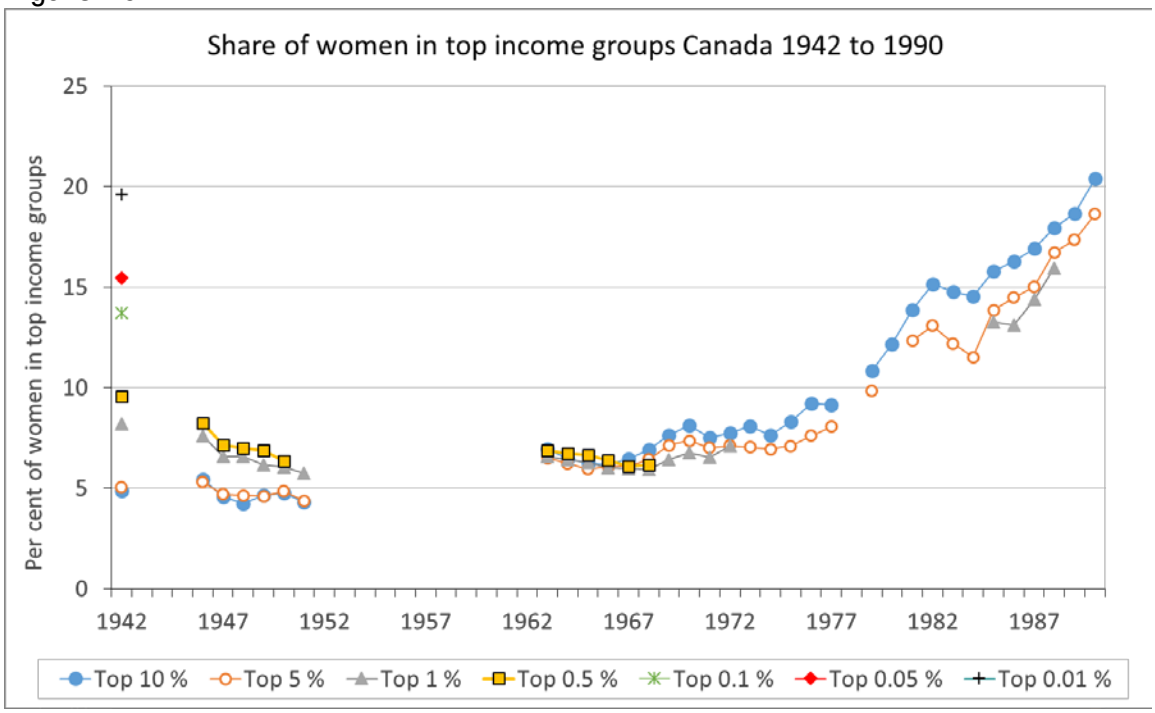


Figure 3a

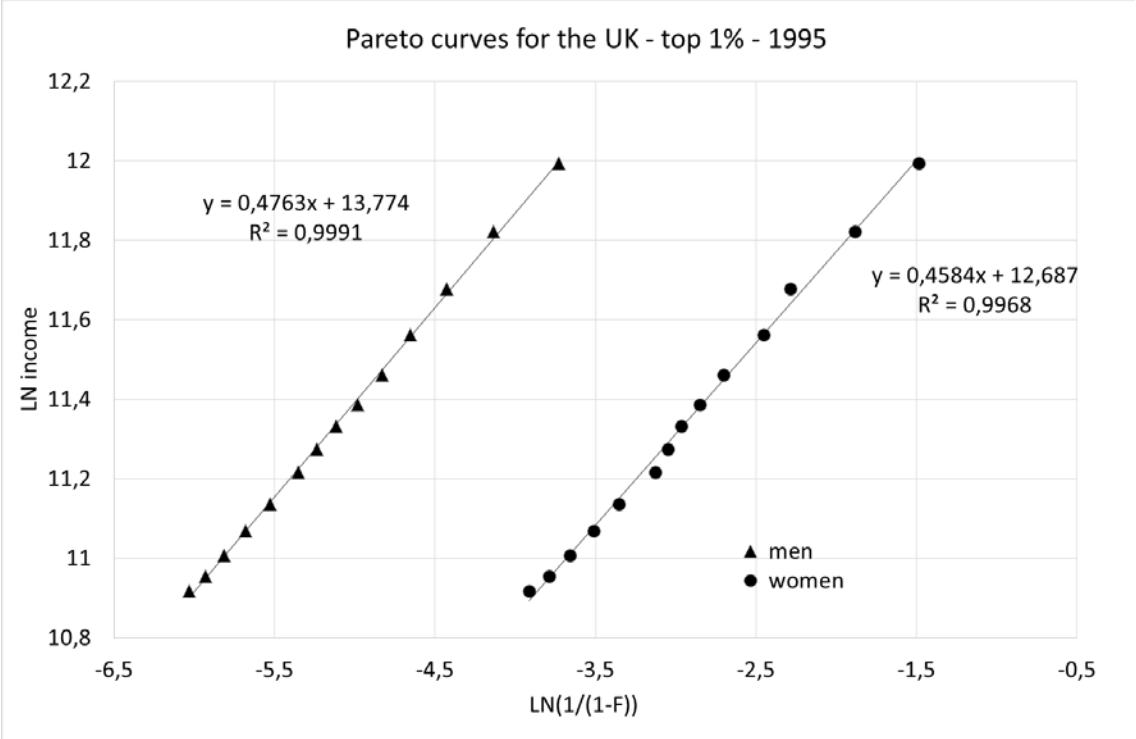


Figure 3b

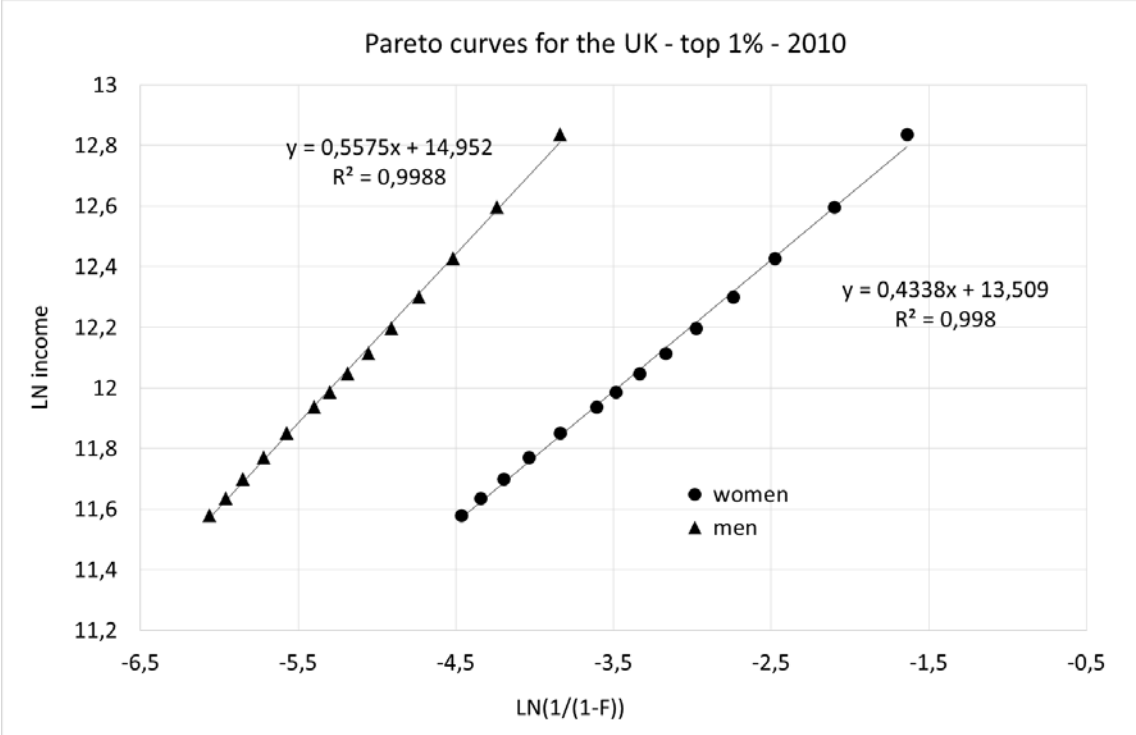


Figure 4a

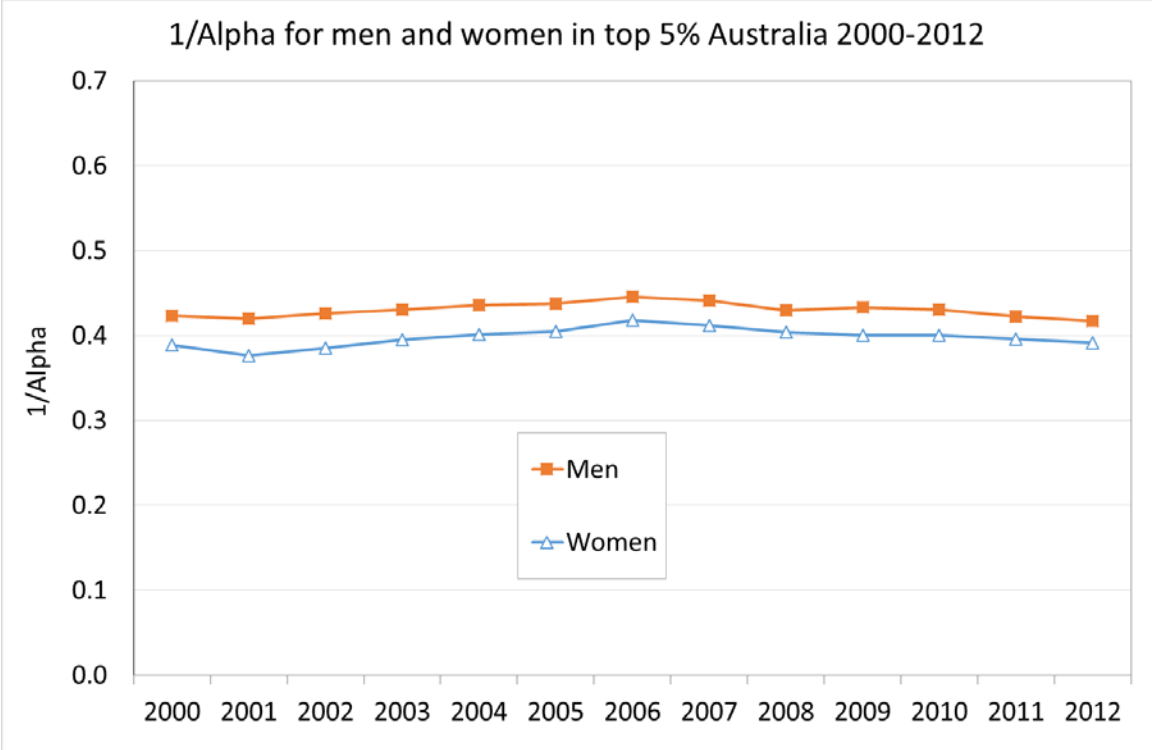


Figure 4b

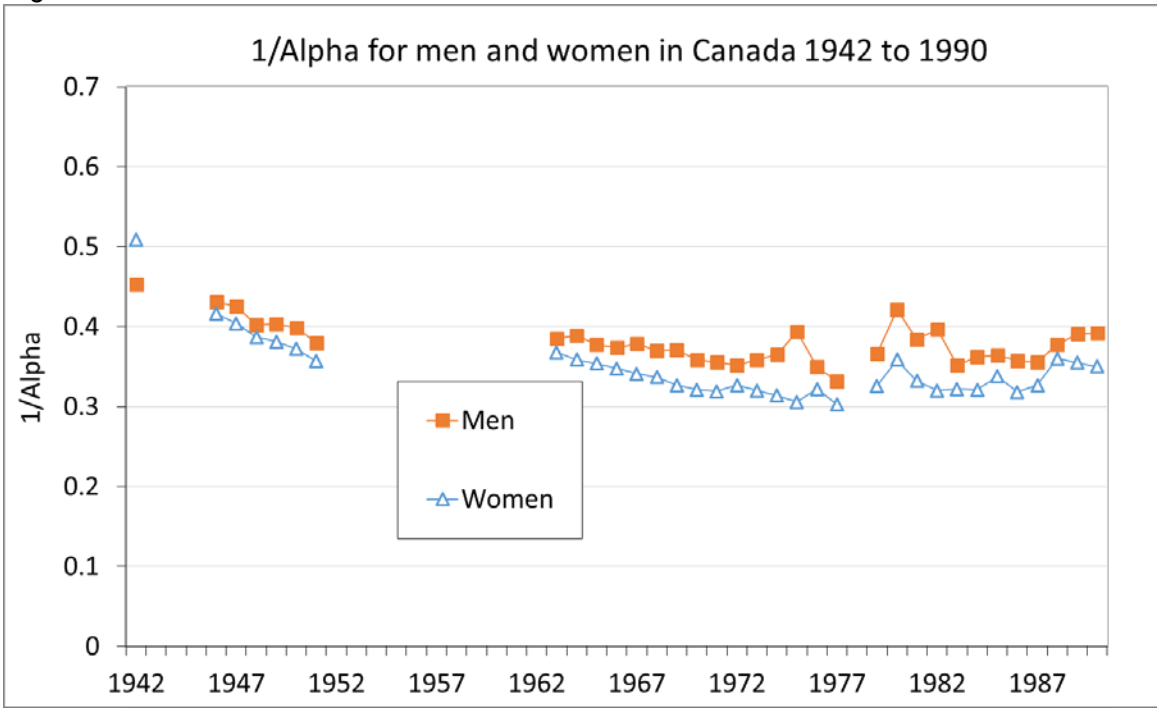
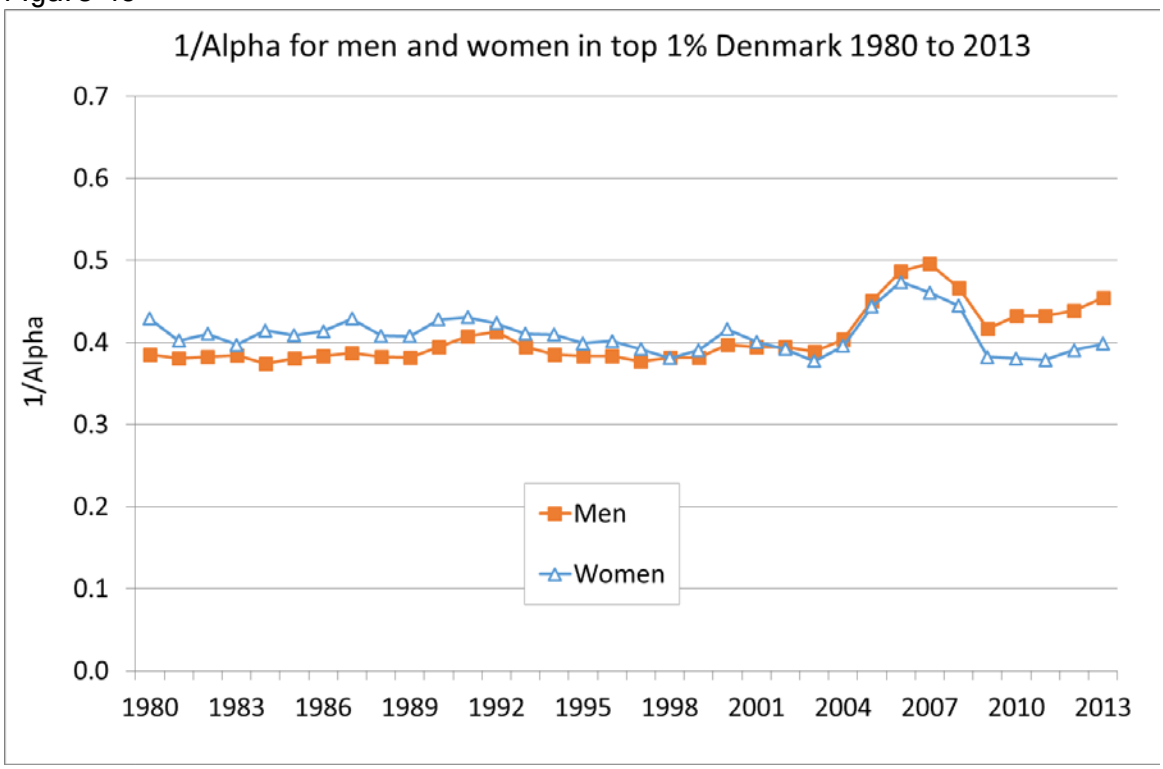
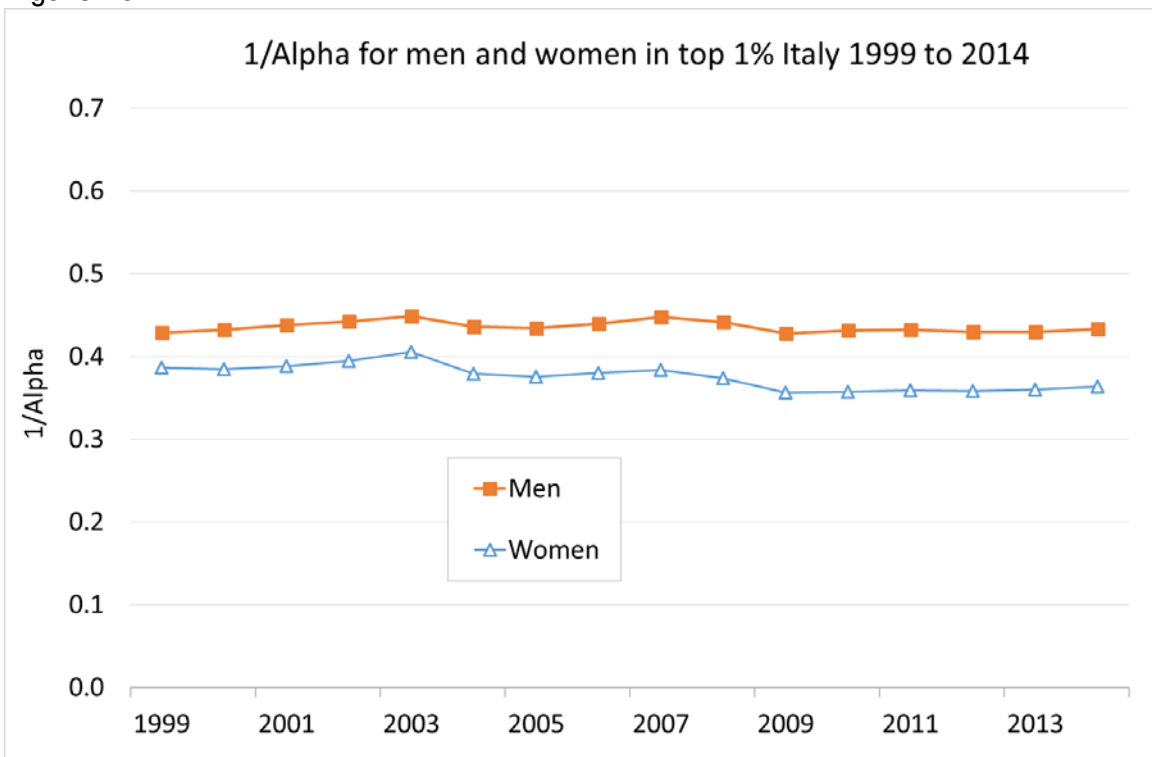


Figure 4c



Note: when computed on top 5%, the curve for women is below the curve for men but very close up to the late 1980s. The gap between the curves widens over time from the early 1990s.

Figure 4d



Note: similar pattern when computed on the top 5%

Figure 4e

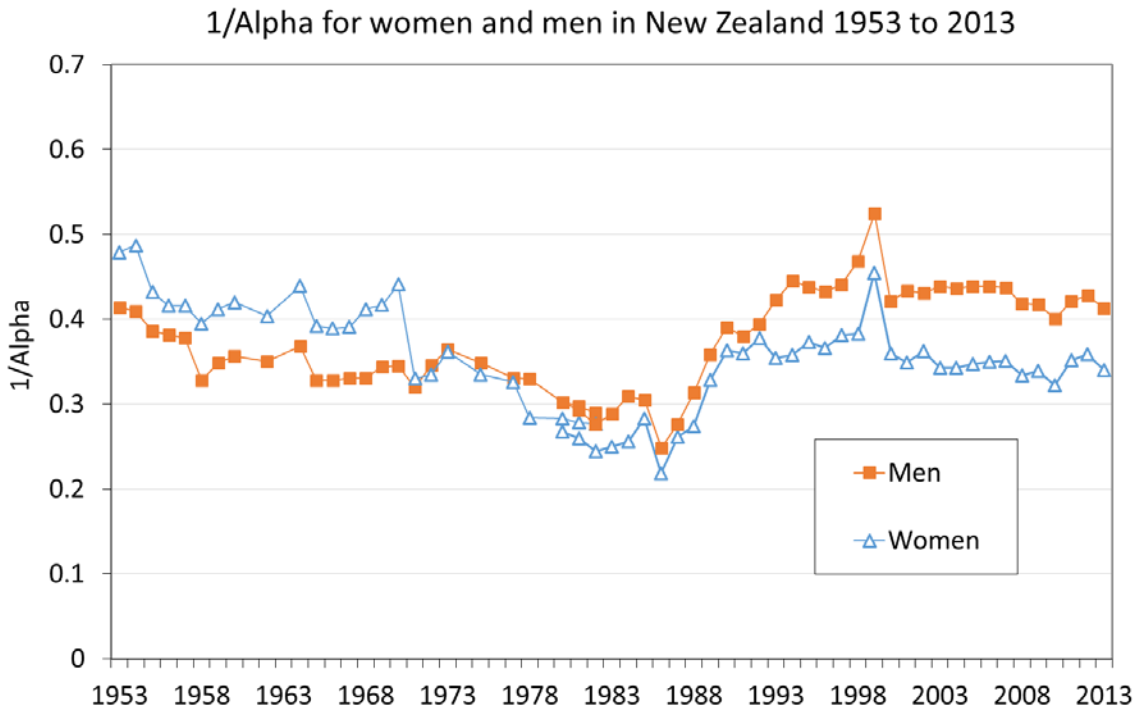
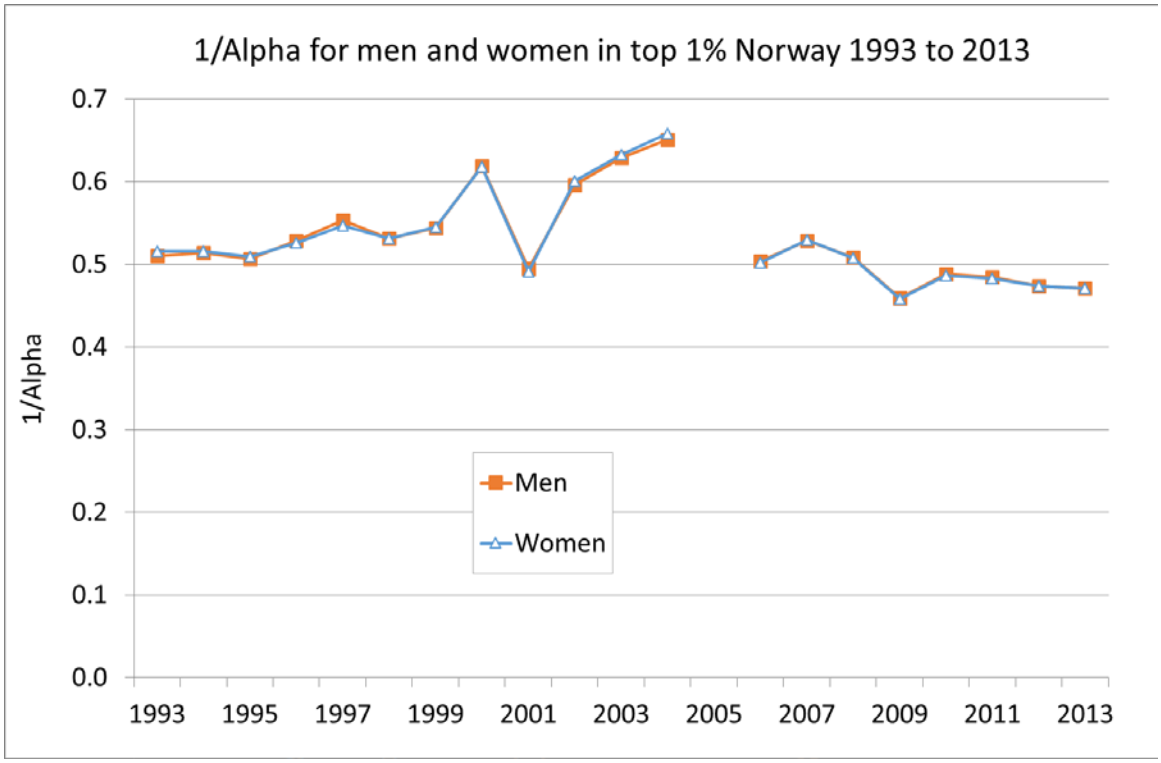


Figure 4f



Note: lower values, but curves are similarly close when computed on top 5%.

Figure 4g

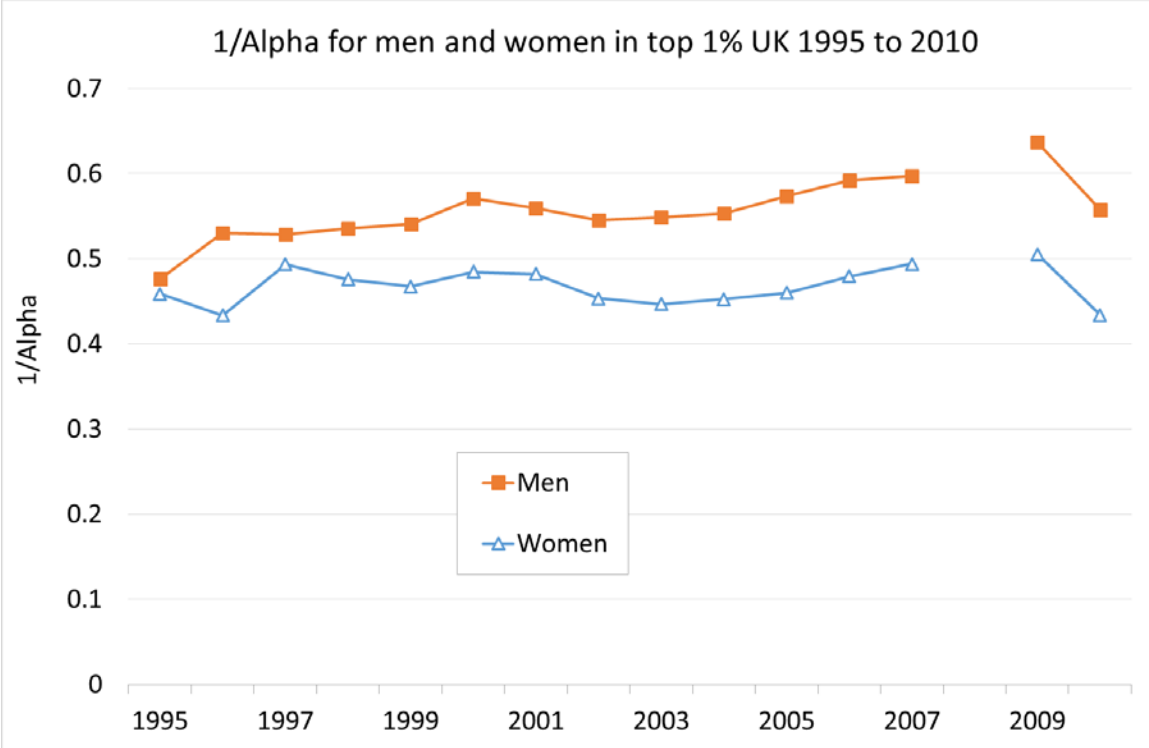


Figure 5

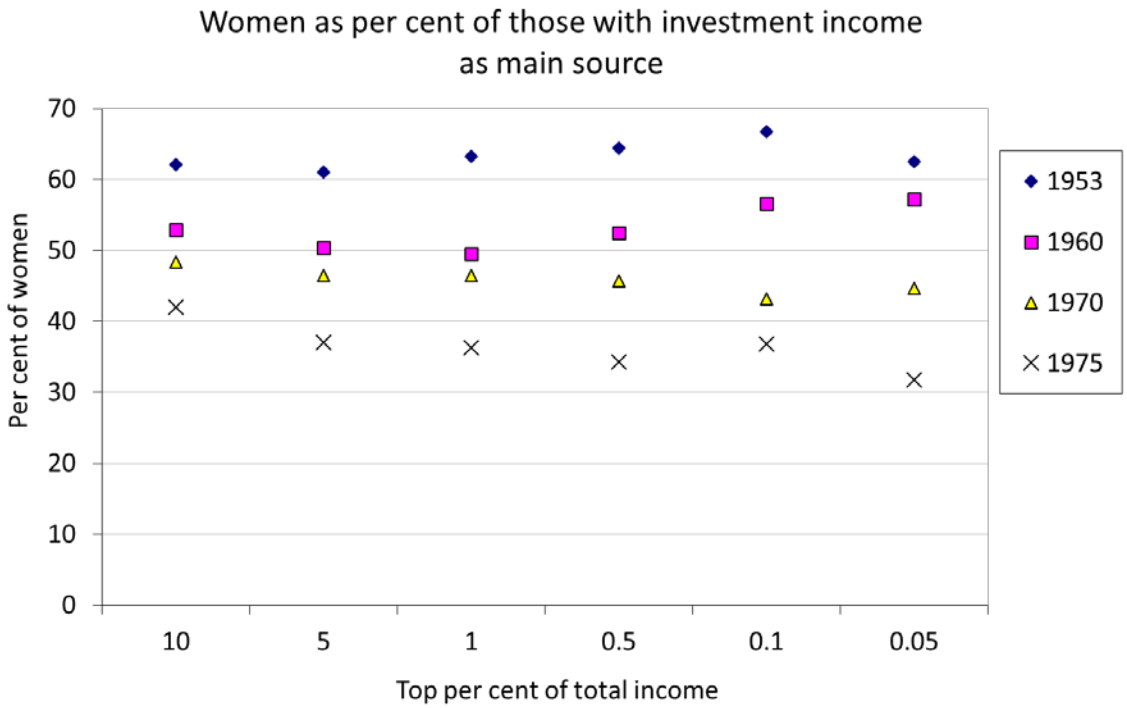


Figure 6A

Figure 6B

Figure 7A

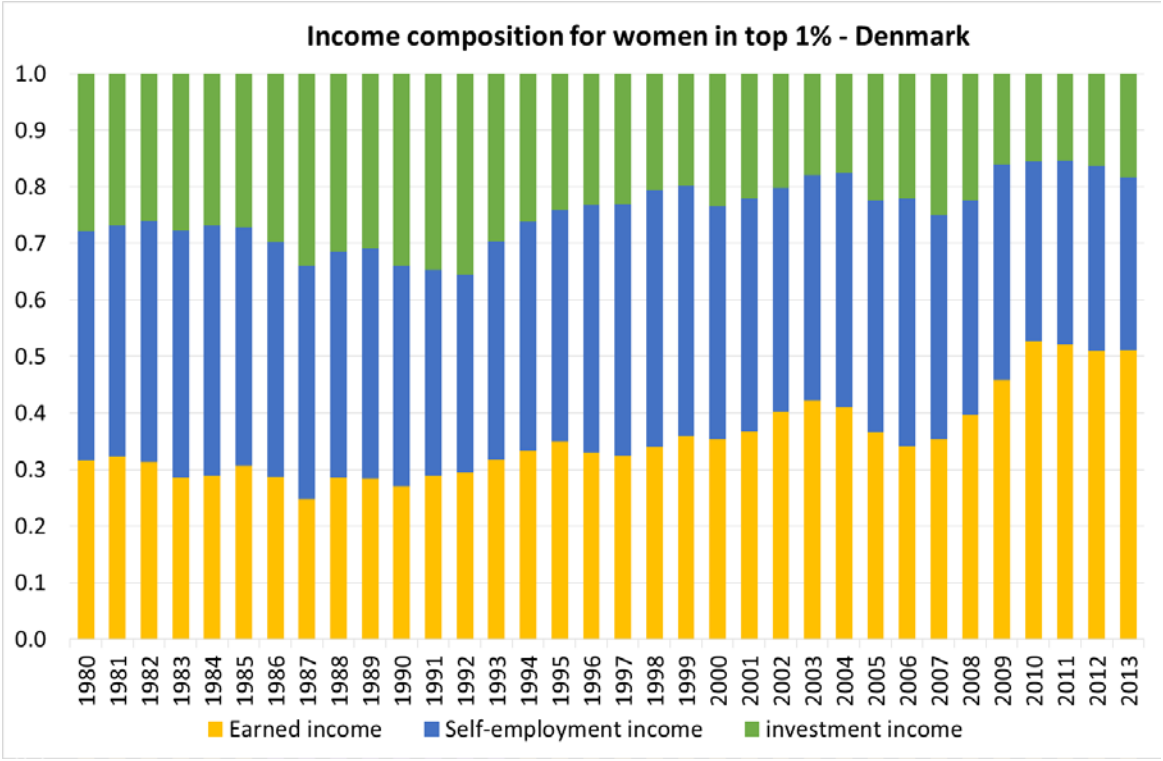


Figure 7B

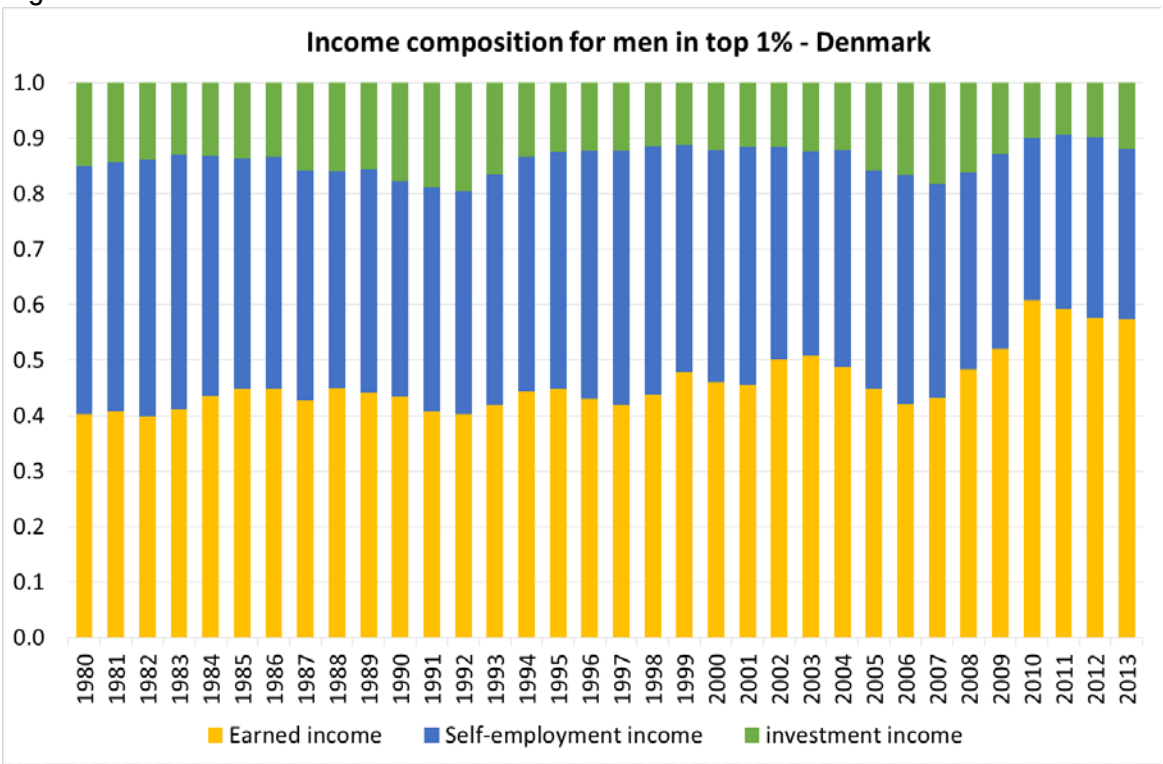


Figure 8A

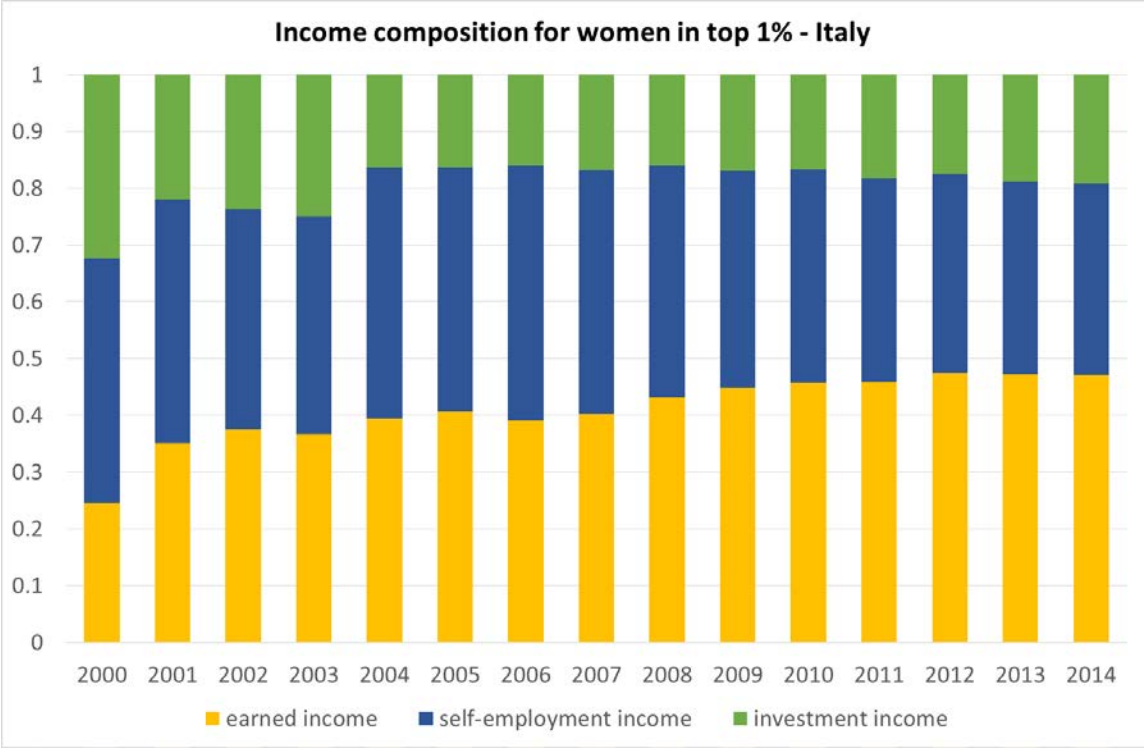


Figure 8B

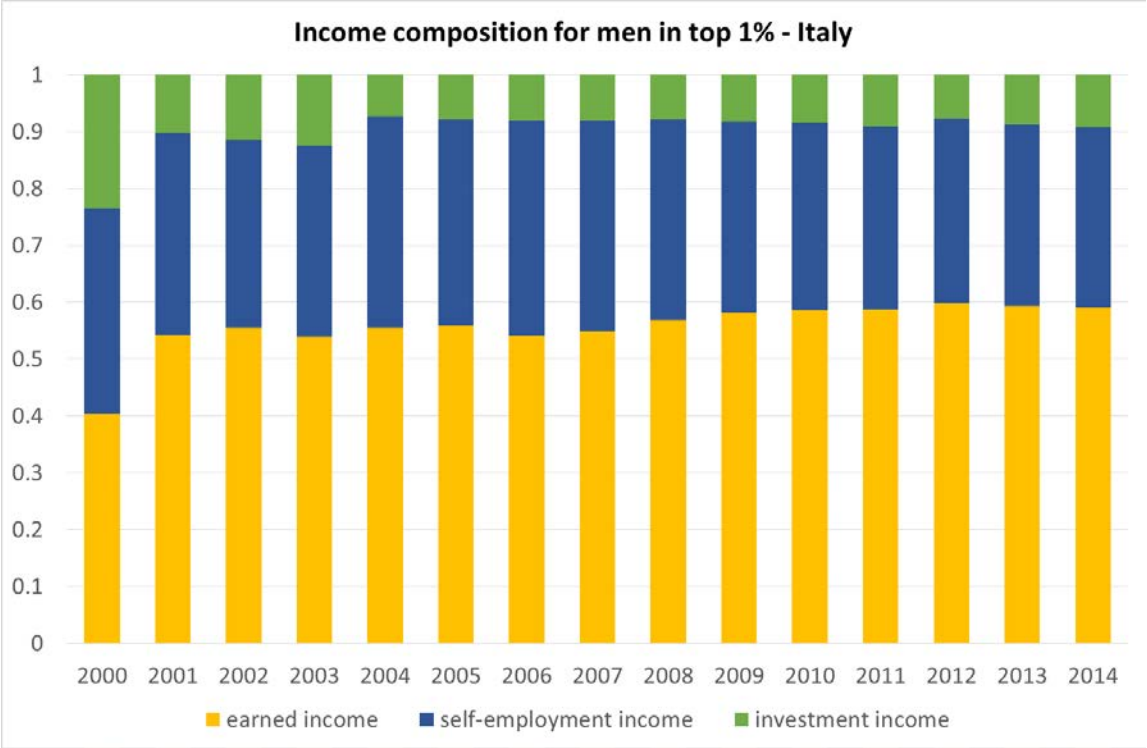


Figure 9


Income composition for men and women, 2013 - Norway
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
men top 5%
women top 5%
men top 1%
women top 1%
men top 0.5%
women top 0.5%
earned income
self-employment income
investment income

Figure 10A

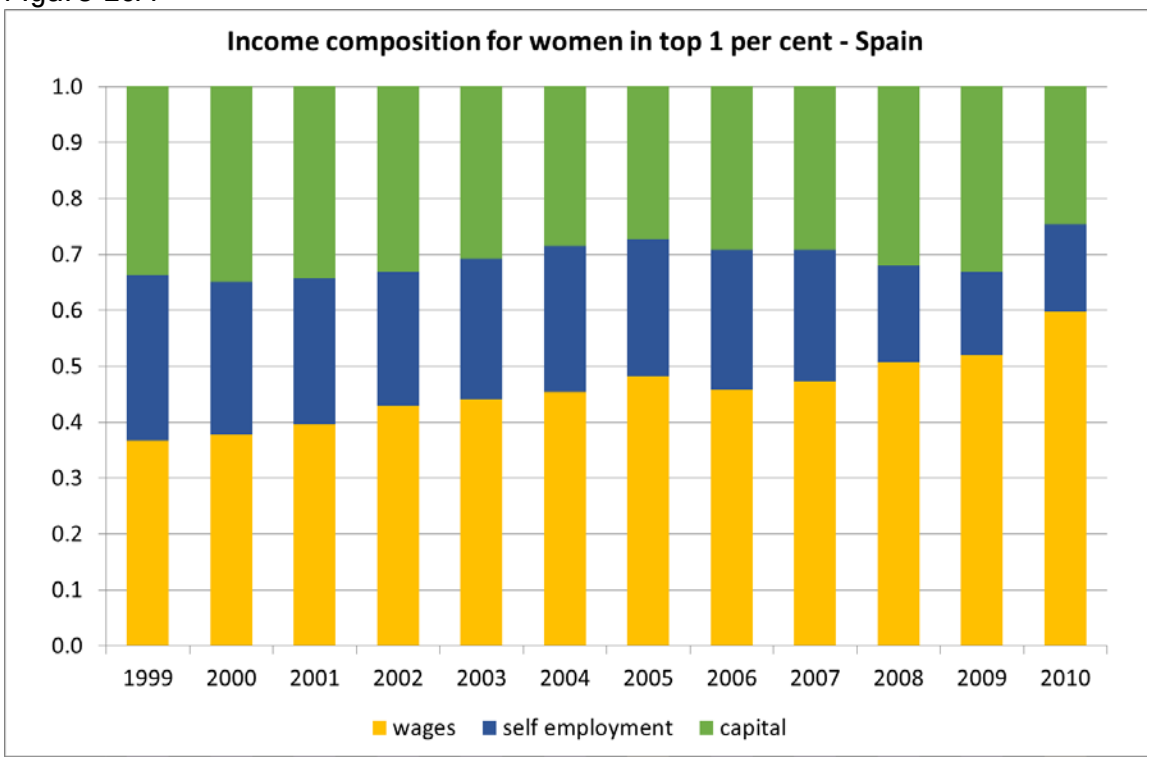


Figure 10B

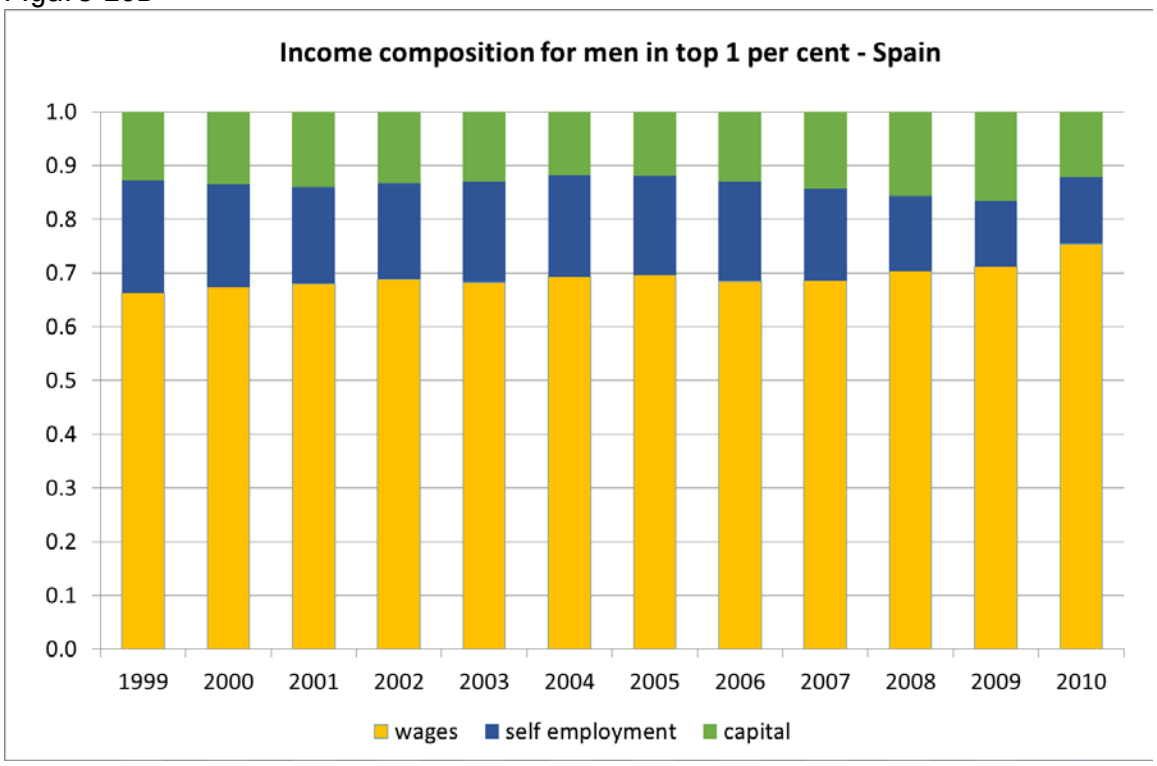


Figure 11A

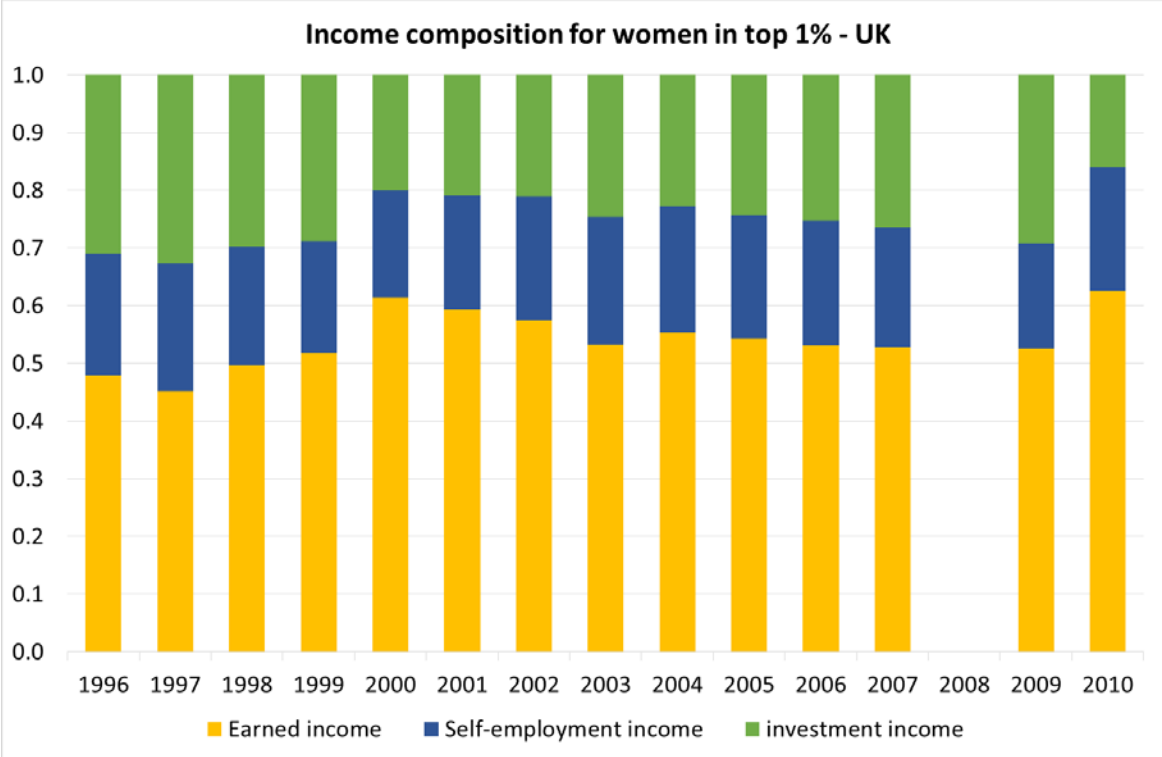


Figure 11B