

Who Is a Top Earner And For How Long? Top Income Mobility in Switzerland

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Abstract

Many countries have witnessed an increase in income shares going to the top 1%, yet little is known about the prevalence of these households at the top. This paper aims at addressing this question in the case of Switzerland, where previous research by Föllmi and Martínez (2017) has found that top income shares have been rising since the mid-1990s, and have become more volatile. Using full-population social security data, I document labor income mobility patterns within the top decile and the rest of the distribution over the period 1981-2010. In addition, I shed light on gender inequality at the top, and the share of foreign-born and self-employed among top earners in Switzerland. I find that persistence has been slightly decreasing. With a share of only 5%, women are strongly under-represented among the top 0.1% of earners. The share of foreign-born among the top 0.1% rose from 20% to 40% in the 2000–2010 period.

JEL-Classification:

Key words: income mobility; income inequality; top incomes; administrative data

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1 Introduction

There is now a well developed literature on top income inequality across developed and emerging economies (many of them collected in Atkinson *et al.*, 2011; Atkinson and Piketty, 2007, 2010, and accessible on the World Wealth and Income Database (Alvaredo *et al.*, 2017)). Many countries have witnessed an increase in income shares going to the top 1%, which has led to concern among both, scholars and policy makers (see for example the newly launched OECD series on inequality: OECD, 2008, 2012, 2015). These inequality measures, however, remain cross-sectional snapshots and say little about the persistence of top earners at the top or changes in life-time inequality. If at the same time that we observe cross-sectional inequality rising also income mobility over the life-cycle has increased, life-time income inequality may not have increased. Yet so far, still little is known about the prevalence of top earners at the top.

This paper addresses this question in the case of Switzerland. Previous research by Föllmi and Martínez (2017) has found that top income shares in Switzerland have been rising since the mid-1990s, and that top income shares have become more volatile over the past decades. These two facts observed at the macro level may have different implications at the individual level. It could be that the extended use of incentive-compatible, variable compensation schemes has led to fluctuations in incomes of top earners observed in the aggregate over the business cycle, as well as to increased earnings risk of the best-paid workers in the economy. Such practices could therefore have led to an increase in income mobility at the individual level. Alternatively, aggregate top income fluctuations may have increased, but top earners keep their ranks for a long time and are like sailors in rough sea, rolling up and down in the waves. In the latter case, the recent increase in top income shares would not have been counteracted by increased income mobility, therefore implying an increase in life-time inequality. Using full-population social security data, I document labor income mobility patterns within the top decile and the rest of the distribution over the period 1981-2010. This is one of the still few studies on top income mobility and the first using Swiss data.

In addition, I shed light on gender inequality at the top as well as the share of foreign-born and self-employed among top earners in Switzerland. These aspects have rarely been discussed in earlier research on top earners. They are, however, informative to understand how well different subgroups are represented at the top of the labor income distribution and hence characterize the labor market itself.

I find that mobility has increased over the period 1981–2010, yet the increase took

place during the 1980s and therefore before the observed surge in inequality. After 3 years, about 40% of those formerly in the top 1% are not in this group anymore, after 10 years about 60% of top earners have left the top. These figures were about 10 percentage points higher in 1981. Mobility has increased over the whole income distribution and especially in the middle. This was nevertheless not enough to counteract the increase in inequality. Both the Gini index and top percentile-to-median ratios of permanent income averaged over 5 years have been increasing since the mid 1990s.

Women are highly underrepresented among top groups. Their share at the top is 4 times lower than in the total labor force. At the same time they exhibit higher mobility rates than the total labor force, implying that women are less likely to remain at the top over an extended period of time than for men. Foreigners, on the other hand, were represented only slightly below their total share in the labor force within all fractiles of the top decile until the late 1990s. Since the 2000s their share has been increasing, especially at the very top. In 2010 (the last year of data availability) 40% of those in the top 0.1% of the labor income distribution were foreign-born, compared to 27% in the total labor force. The timing of the increase coincides with the introduction of the agreement on free movement of persons between Switzerland and the European Union, suggesting that the policy change increased the share of well-paid, highly mobile international professionals in the Swiss labor market. The share of self-employed among top earners, although still high, has been decreasing since the mid-1990s, especially among the top 1% and top 0.1%.

This paper contributes to the large, recent literature on top incomes by going beyond the annual cross-sectional view on inequality. My results show that inequality in Switzerland has been on the rise in recent years and that this was not compensated by increasing mobility in and out of top income groups. My results highlight the importance of taking on a more dynamic view to gain a better understanding of processes driving income inequality. Much has been discussed about the importance of capital incomes of the very rich who can also claim large parts of national wealth their own. This study's focus lies on labor incomes, which allows to understand recent dynamics in the Swiss labor market. Given that most individuals generate their income in the labor market, understanding labor income inequality is of particular interest. By further shedding light on gender differences and the role of foreigners in the labor market, I add another, new and seldom studied aspect to the analysis of top incomes.

The remainder of the paper is organized as follows. The next two sections give a brief overview of the literature on top income inequality and mobility and the different ways mobility is measured in the literature. Section 4 describes the data. Results on

income mobility at the top and the importance of different subgroups among top earners are reported in 5. Section 6 gives first conclusions and maps out future research of this ongoing project.

2 Previous Research on Income Mobility at the Top

Reflecting the large literature on top income shares that emerged over the past two decades, several studies have measured persistence of top earners within top groups, especially for the U.S. Auten *et al.* (2013); Auten and Gee (2009) present estimates based on tax data covering years 1987 and 1997 (1996) through 2007 (2005). They find that there is mobility at the top, however 42% of the top 1% in 1996 are still in the same group in 2005. 82% of them remained in the top 10% (Auten and Gee, 2009). Kopczuk *et al.* (2010) use Social Security Administration longitudinal earnings micro data on male earners in the U.S. covering the period 1937–2004. They find that “virtually all of the increase in the variance in annual (log) earnings since 1970 is due to increase in the variance of permanent earnings (as opposed to transitory earnings).” More importantly, mobility at the top of the earnings distribution has not mitigated the dramatic increase in annual earnings concentration since the 1970s. Similarly, Landais (2008) finds for France that mobility is low at the top of the income distribution as well as among top wage earners, and that it has remained stable in a context of increasing income concentration. The paper uses a sample of income taxpayers over the period 1990–2007. The estimates are in a range similar to those found for Canada, where the likelihood of remaining in the top 1% is around 60%, 50% and 40% after 1, 2, or 3 years respectively (Saez and Veall, 2005). Jenderny (2016) finds for the 2001–2006 period top income mobility in Germany to be low and stable. Mobility at the very top is even lower than among the less rich tax units. All of these studies find very stable patterns in income mobility, suggesting that mobility may be uncorrelated to (top) income inequality and changes therein. A notable exception are the findings for Norway in (Aaberge *et al.*, 2013), where (despite being low) top income mobility has increased at the same time as the income shares of the top income receivers started to increase around 1990. More recent studies on top income mobility include Moffitt and Gottschalk (2002); Guvenen *et al.* (2012); Grubel (2015); Carroll (2010); Larrimore *et al.* (2015).

For Switzerland, there exists only one study on income mobility. Based on tax data from the canton of Zurich, Moser (2013) analyzes transition probabilities between 2001 and 2010 and persistence at the top. He finds that after 10 years 47% can be found

again within that same group. However, 25% of them form part of the top 1% in each of the 10 years. Among these, retirees are strongly overrepresented. Due to the strong fiscal federalism in Switzerland, tax registers do not allow to follow individuals across cantons. Therefore, the sample in Moser (2013) includes only individuals living in the canton of Zurich. If income mobility is positively correlated with geographical mobility, his estimates underestimate true income mobility in Switzerland. On the other hand, income mobility in the economically thriving, dynamic area of Zurich may be larger than in other areas. Finally, estimates based on cantonal tax data may further be biased due to the well-documented phenomenon of income sorting of rich households into low-tax cantons (see for example Roller and Schmidheiny, 2016; Liebig *et al.*, 2007; Schaltegger *et al.*, 2011). As I show in Section 5.5, Figure 18, there is substantial variation in total income mobility when measured within cantons.

3 Measuring Income Mobility

There are different ways to measure mobility at the top of the income distribution, and conclusions may differ depending on the measure used. Jenderny (2016); Aaberge *et al.* (2013); Auten and Gee (2009), among others, discuss the implications of using different mobility measures and provide different approaches to measuring income mobility. For a broader overview, see Jäntti and Jenkins (2015).

Percentile rank changes: persistence and rank correlations

As research on top incomes has developed focusing on top income percentiles, such as the top 10% or top percentile of the income distribution, a straight forward measure of income mobility is how households move in and out of these top groups. Such movements are summarized by the correlation of ranks over time. In the context of top income inequality, the share of topearners remaining at the top after several years is of special interest as a measure of persistence at the top of the income distribution. Several studies have applied this measure, including Auten and Gee (2009), Auten *et al.* (2013), Jenderny (2016), Moser (2013), and Saez and Veall (2005). These approaches are however not limited to top income earners and therefore allow comparisons of mobility for different income groups throughout the income distribution.

Absolute income changes: income growth by percentile and Top Mobility Curve

Ultimately, concerns about income inequality are not about differences in ranks but differences in incomes. Even with a very egalitarian income distribution, some ranking

will arise, but only when differences between ranks in absolute terms of income are large equality concerns will typically arise. Auten and Gee (2009) analyze the distribution of growth in real income by quintile and top percentile groups. For the period 1996–2005 they find income growth to be largest for those in the bottom quintile, and smallest for the top 1%. Aaberge *et al.* (2013) (based on Aaberge and Mogstad, 2013) develop the Top Mobility Curve, a measure which takes into account absolute changes in income when measuring income mobility at the top.

Permanent vs. transitory income: the effect on inequality In the presence of mobility, annual income is an inadequate measure of life-time income and resulting inequality measures over-estimate inequality in life-time incomes. The difference between measured inequality based on annual vs. permanent income captures the effect of income mobility on inequality. Permanent income is measured as average income over a time frame of 3–5 years. Aaberge *et al.* (2013) base their mobility curve measure on 3-year averages. Jenderny (2016) recomputes top income shares for Germany averaging incomes over 6 years. Kopczuk *et al.* (2010) compare top earnings shares and Gini indexes based on annual vs. permanent income averaged over 5 years.

Correlation between incomes in one year and another Correlation measures and elasticity estimates are conventionally used in studies on intergenerational income mobility, but their application to intragenerational mobility is straight forward (e.g., in Kopczuk *et al.*, 2010, who use annual rank correlations). In the context of intergenerational mobility, however, Nybom and Stuhler (2017) show that these measures are biased when there is measurement error in parental and offspring incomes due to life-cycle bias. Using German data they show that the bias is less problematic in case of the Spearman rank correlation than in the case of the linear Person correlation and that it is most severe for the elasticity estimates. Transition probabilities, on the other hand, are hardly affected at all.

Income variance over time Closely related to measures of income mobility are variance in earnings estimates and decompositions into permanent and transitory incomes. Kopczuk *et al.* (2010), for instance, estimate the variance of (log) annual earnings, the variance of (log) 5-year average earnings (permanent variance), and the transitory variance, which is defined as the variance of the difference between (log) annual earnings and (log) 5-year average earnings.

4 Data

4.1 Matched Social Security - Census Data

The main data set merges the register-based 2010 population census of Switzerland with longitudinal social security annual earnings records (Old Age and Survivor Insurance - OASI) covering the period 1981–2010. Both data sets cover the full population. In the OASI data, employed or self-employed individuals generate one record per job per year that details the starting and ending month of an employment relationship along with the total earnings over that time period. Matching OASI data to the census further allows to obtain geographical and marital information.

Because virtually everybody generates a record at some point in their life, this matched data set contains 92% of the resident population aged 20–64 in 2010. Moving back in time the sample coverage of persons aged 20–64 gets slightly smaller in earlier years because certain individuals that lived in Switzerland in these earlier years died or emigrated and are hence not in the 2010 census. Appendix Figure A1 shows that the matched raw data contain 59% of all individuals aged 20–64 living in Switzerland in 1981 and 74% in 1990. The issue of potential non-random selection is a risk mobility studies may generally face, since only individuals who can be observed over long time spans can be included in the analysis. Similar issues arise for instance in Auten *et al.* (2013), who match tax data from 1987 with social security data from 2007.

The matched data set has some drawbacks that should be noted. First, the earnings records in 1998 are incomplete. The share of wage earners for whom records are missing is about 5–6% due recording errors at some of the local social security offices. The missing records have to be taken into account when estimating mobility patterns over time. In the analysis, I accordingly drop affected years from the analysis. Second, the register-based census 2010 does not contain information on some variables of interest normally available in census data such as schooling/education, occupation, or number of children. Third, family characteristics of individuals are only observed as of 2010. Characteristics that can change over time, especially an individual's place of residence, marital status or citizenship will therefore be prone to errors. The census provides information on how these characteristics changed in the past, allowing to reconstruct the information for years prior to 2010. Accuracy of these variables will nevertheless decrease the further back one goes in time.

Sample selection

The analysis is based on those individuals who are above age 19 and are active in the labor market. This includes registered unemployed and working individuals, but excludes those with no entry in the OASI data in a given year. The interest lies in understanding how individuals move up and down the labor income distribution conditional on participating in the labor market. Including the non-working population as having zero income may lead to a misleading picture of labor income mobility. These may be individuals who for instance retired early, live off their capital incomes, (women) who live together with a working spouse, or workers who work abroad for some time and are not in the Swiss data. Mobility is therefore measured at the intensive margin. Reductions in labor earnings due to human capital decisions will typically be captured in the data, since even those with very small incomes from, e.g., a student summer job or an occasional part-time job, are included.

The way the data set is constructed, one concern is that the sample becomes less representative of the total population the further one goes back in time. The sample is selected conditional on being present in 2010, hence groups with higher mortality or higher likelihood to emigrate are not present in the sample. As a consequence, in earlier years one would expect the average age in the sample to be lower. This may affect the comparability of mobility measures over time due to life-cycle effects, as well as the computation percentiles. Figure A2 shows that the age distribution is stable over time. It is further possible that the construction of the sample affects the income distribution. In Figure A3 I show the top percentile cutoffs for the top 1% and top 10%, respectively, together with the same cutoffs for the complete population in each year. These cutoffs were calculated on the full data by the social security administration (Zentrale Ausgleichsstelle ZAS). The graphs show that the cutoffs are extremely close and that my sample is representative of the full population.

4.2 Cantonal Income Tax Data

In addition to the earnings data, for the period 1989 to 2010 it is possible to use cantonal tax data made available by the Federal Tax Administration in Bern.¹ The panel structure of this data, varies over time and across cantons and has not been exploited so far. Since tax ids are set at the cantonal level, it is unfortunately not possible to follow taxpayers over time once they move to another canton. Furthermore, data collection changed at

¹These data are made accessible within the SNSF Sinergia Project No. 130648 “The Swiss Confederation: A Natural Laboratory for Research on Fiscal and Political Decentralization”.

different points in time. However, for 17 out of the 26 cantons, data is available for the full period 2001–2010. For another 11 cantons data runs (additionally) from 1989 to 1999, and for 7 cantons the panel structure runs through from 1989 to 2010. Besides net and taxable income, these data contain information on occupation type (employee, self-employed, retiree, others), marital status (married, single parents, others), number of dependent children, double earner deductions, and some information about special types of taxation, especially expenditure-based taxation.

5 Results

Income inequality at the top has been rising since the mid-1990s in Switzerland, as documented in earlier research by Föllmi and Martínez (2017). Figure 1 shows the increase in income shares happened for both, total income (measured with tax data) and labor income (measured with social security data). The increasing top inequality in the earnings distribution also becomes apparent when looking at different top-percentile-to-median ratios (Fig. 2). The observed increase is robust to averaging incomes over 5 years, a way to account for short-term volatility in income. Throughout the period 1981–2010, growth in permanent incomes (i.e., 5-year centered averages) has been strongest at the very top. Over time, income growth has shifted from lower to upper parts of the distribution (Fig. 3). As a result, 5-year permanent earnings of the top 1% grew 58% between 1981 and 2010, compared to 5% at the median.

5.1 Rising top inequality in Switzerland

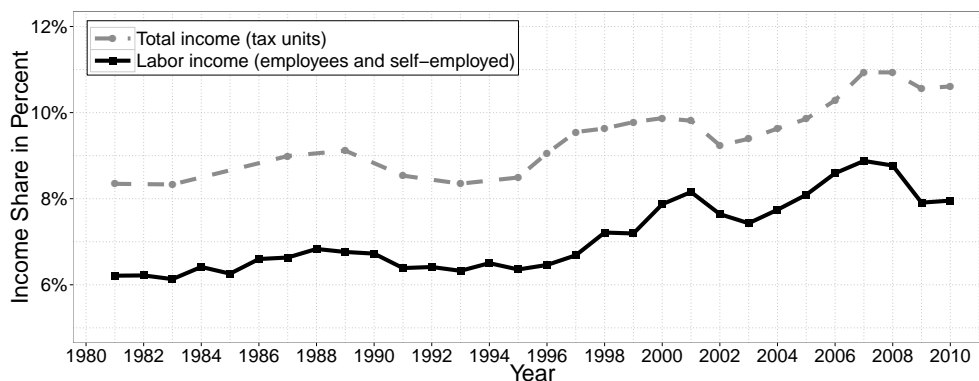


Figure 1: Top 1% labor and total income shares

Note: Income shares of the top 1% within the total income distribution (based on tax data), and the top 1% within the labor income distribution (based on social security data). The upperSource: Föllmi and Martínez (2017)

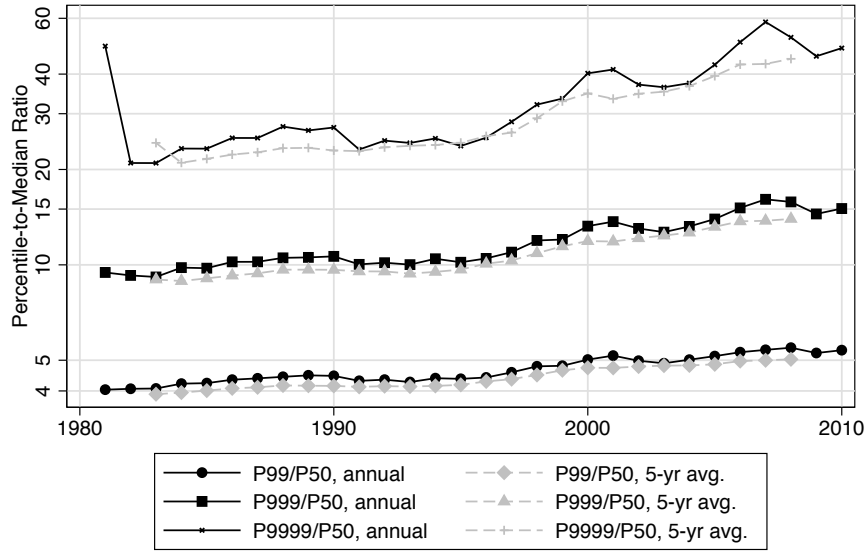


Figure 2: Percentile-to-median ratios

Note: Percentile-to-median ratios of annual labor earnings (black lines) and 5-year average earnings centered around year t (grey lines). Source: OASI individual data, 1981–2010.

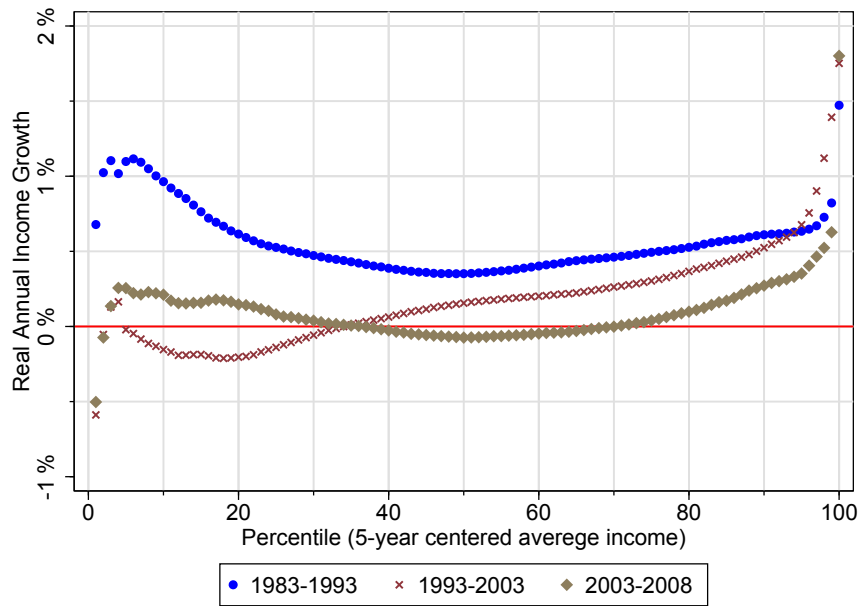


Figure 3: Real annual income growth by percentile in different time periods

Note: Average annual growth rate of 5-year average earnings (centered around year t), by percentile of average income. Source: OASI individual data, 1981–2010.

5.2 Share of different subgroups among top earners

An advantage of using individual earnings data over tax data is the possibility to look at different subgroups among the top income percentiles. Figures 4–6 show the share of women, foreign-born and self-employed, respectively, among different top groups and in the total population. It becomes apparent how strongly women are underrepresented among top earners. Even if they have seen their shares rising, in 2010 still only 14.4% among the top 10% were women—while they made up 46% of the total labor force. The situation becomes worse further at the top: among the top 0.1%, the 4300 best earning individuals, only 4.2% are women.

The opposite is true for foreign-born workers (Fig 5). While they have always been well represented among top-earners compared to their total share in the labor force, their share has been rising strongly especially at the very top since the early 2000s. This coincides with the introduction of free movement of persons between Switzerland and the European Union in 2002. It becomes evident that foreigners are overrepresented at the very top in the Swiss labor market. While their total share in the Swiss labor force in 2010 was 25.9%, they made up 40% of the top 0.1%.²

The increasing share of foreigners at the very top coincides with an increase in workers aged in the late 1990s and early 2000s (Figure 7). Due to the way the sample was constructed, one would expect the top 1% to grow older over time (and indeed, those aged 65 years and more enter the group only starting in the early 1990s). This increase in younger cohorts among the top 1% is likely due to the immigration of mobile high-skilled workers who found well-paying employment opportunities in Switzerland. In addition it may reflect an increase in the skill premium paid to high-skill professionals.

Figure 6 finally shows how the share of self-employed within top groups has been declining since the mid 1990s. While their overall share has remained remarkably stable around 10% of the labor force, they used to be strongly overrepresented at the top. While self-employed still fare well within top groups, their share among the top 0.1% was cut in half, from over 50% in the 1980s to mere 27% in 2010. One possible explanation for this decline is that very successful entrepreneurs have become more likely to change the legal status of their business or that their business is bought by a large firm, hence they become employees.

²Note that these are not the infamous foreigners who reside in Switzerland based on a preferential tax treatment. Those taxpayers benefit from expenditure-based taxation, but they are not allowed to work or engage directly in any economic activity in Switzerland and are therefore not included in the OASI data.

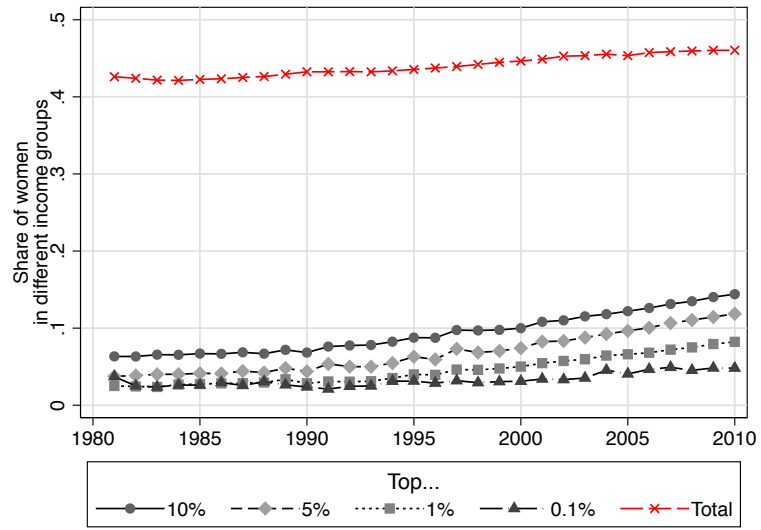


Figure 4: Share of women in top income groups and in the total labor force

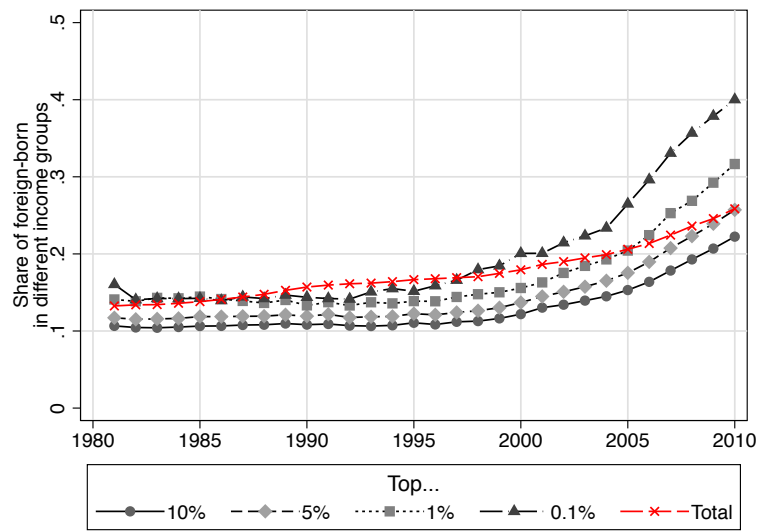


Figure 5: Share of foreign-born in top income groups and in the total labor force

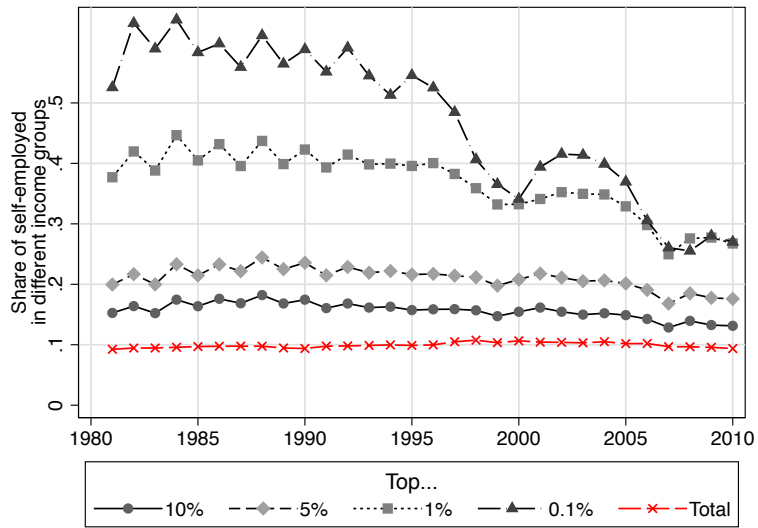


Figure 6: Share of self-employed in top income groups and in the total labor force

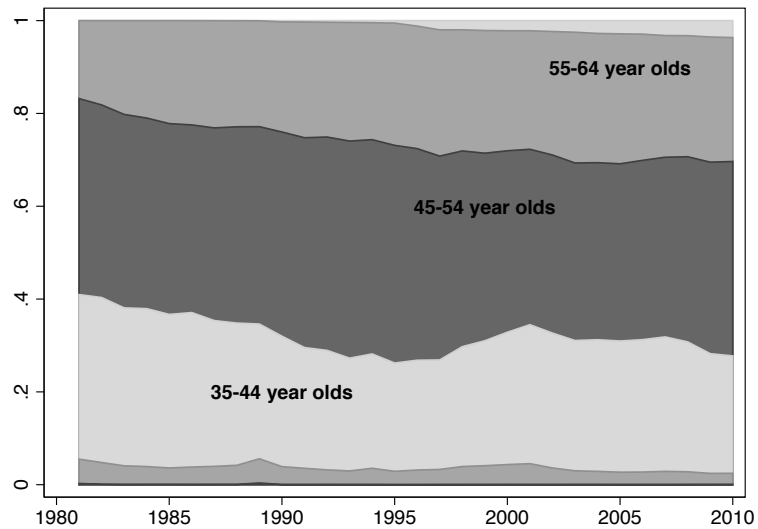


Figure 7: Age shares within the top 1% over time

5.3 Top income mobility

The two panels in Figure 8 show the persistence of top 1% and top 10% earners, in their respective group after time spans of 1–15 years. While there clearly is movement in-and out of the top 1% group over time, after 10 years still around 40% of the members are found in that group again (unconditional on being at the top throughout the whole time span though). After 15 years, a third of a working life, more than 20% still make it into

that group.

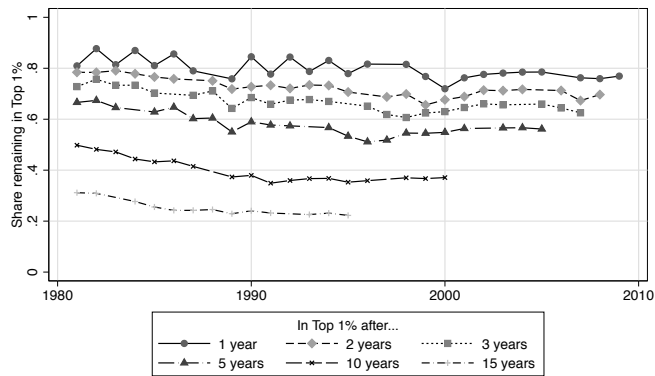
During the 1980s mobility was increasing, yet it has remained stable since the 1990s, the period when observed top income inequality has increased. This is confirmed by Figure 17, which plots the persistence across income deciles after 10 years (i.e., the diagonal of a mobility matrix). During the three observed decades, mobility was lowest in the 1980s and highest in the 1990s. Between 2001 and 2010, mobility seems to have decreased again. Figure 15 confirms this image. The correlation in permanent income ranks decreased slightly during the 1980s, but started increasing again in the early 2000s.

When looking at mobility in different subgroups (Figure 9), two things become apparent. First, throughout the period, women have a higher earnings mobility at the top. This is likely due to gender-specific career patterns, where women have more often interrupted labor careers as they take up family responsibilities. It is also possible that women select into different types of high-paying jobs, e.g., jobs with a determined contract. Related to this, it is further possible that women are less likely to be part of large networks, sometimes dubbed as “old boys’ clubs”. These social and business connections are sometimes claimed to play an important role in access to prestigious, well-paid positions and the observed underrepresentation of women (Marini and Fan, 1997). Second, overall mobility and mobility among foreign-born and self-employed has increased, approaching the level of mobility of women at the top. Despite the different representation of these groups at the top, it suggests that once someone has reached the top, the chances to remain or drop out again are similar for workers with different backgrounds.

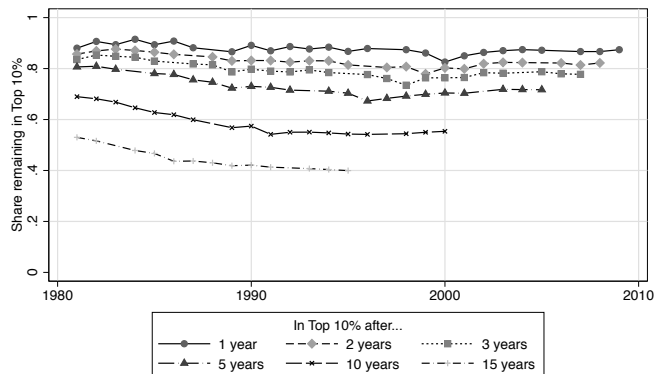
There is no consensus in the literature on whether persistence within a top group should be measured conditional on being present every year or not. Data availability sometimes only allows for the latter (e.g, in Auten and Gee, 2009). In the Swiss case, the difference between the two methods is about 10 percentage points for the top 1% as shown in Figure 10. The conditional presence among the top 1% has fallen mainly among men, approaching the persistence rates at the top of women. The gap has not closed, however. After 5 years, men are about 10 percentage points more likely to still be among the top 1% than women (Fig. 11). Not surprisingly, persistence among the top 1% of the labor earnings distribution is strongly correlated with age. Younger workers and those in their prime working age (35-54 years old) are about 4 times more likely to still be among the top 1% 10 years later than those who are approaching retirement age (Fig. 12).

Due to differences in the underlying data and sample definitions, time periods, and conditional vs. unconditional measurement of persistence, comparisons of mobility es-

estimates across studies call for caution. Table 1 provides an overview of the estimated persistence of the top 1% in different studies and points out the most important differences. Persistence in Switzerland is in range with similar estimates for the U.S. This picture is confirmed by Figure 13. Persistence used to be higher in Switzerland than in the U.S., but has been falling throughout the 1990s. Canada in contrast seems to exhibit higher mobility of the top 1%.



(a) Top 1%



(b) Top 10%

Figure 8: Persistence in top income groups

Note: Persistence within the same group unconditional on presence in that group in every year. *Source:* OASI individual data, 1981–2010.

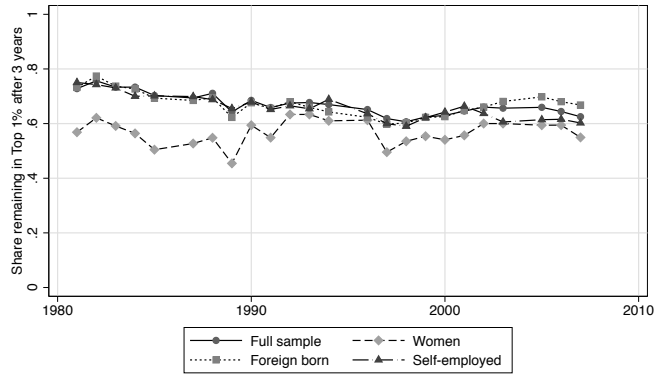


Figure 9: Persistence in the top 1% after 3 years, different subgroups

Note: Persistence within the top 1% unconditional on presence among top 1% in every year. *Source:* OASI individual data, 1981–2010.

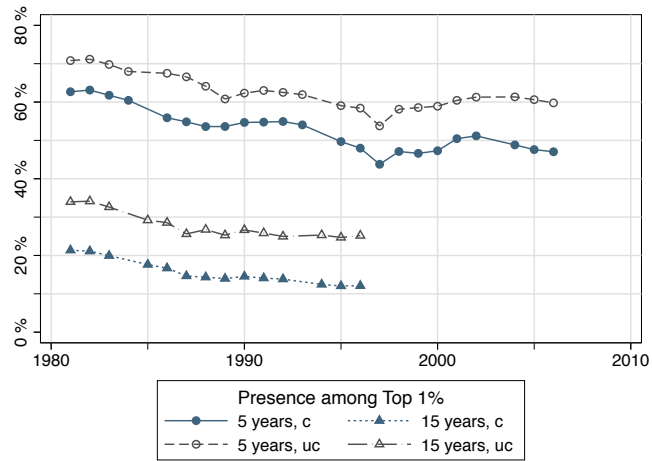


Figure 10: Persistence in the top 1% , conditional and unconditional on repeated presence

Note: Persistence within the top 1% conditional and unconditional on presence among top 1% in every year. *Source:* OASI individual data, 1981–2010.

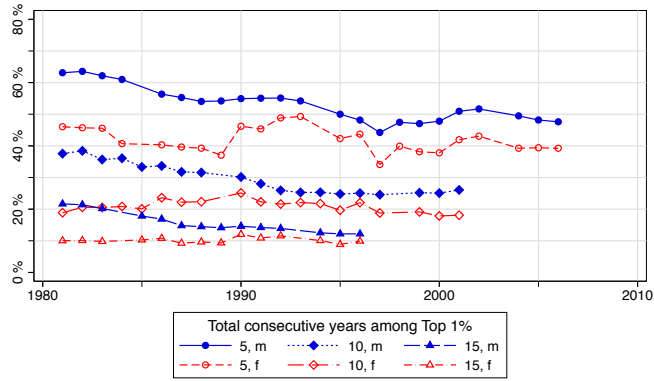


Figure 11: Conditional persistence in the top 1% , men and women

Note: Persistence within the top 1% conditional on presence among top 1% in every year for men (m) and women (f). *Source:* OASI individual data, 1981–2010.

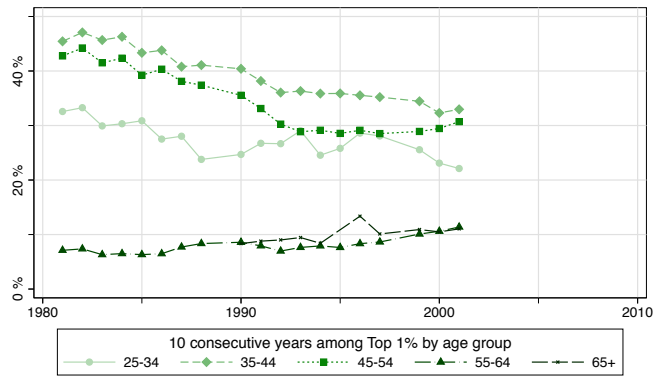
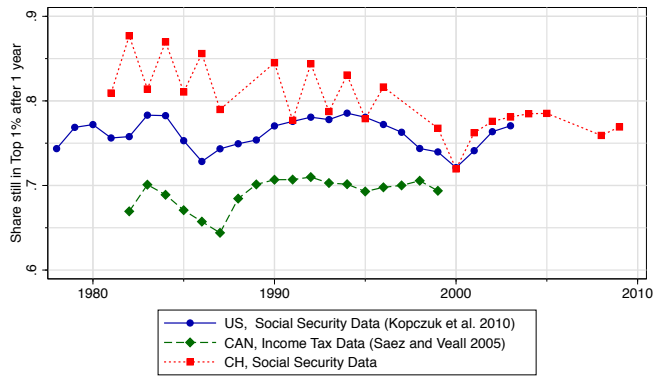
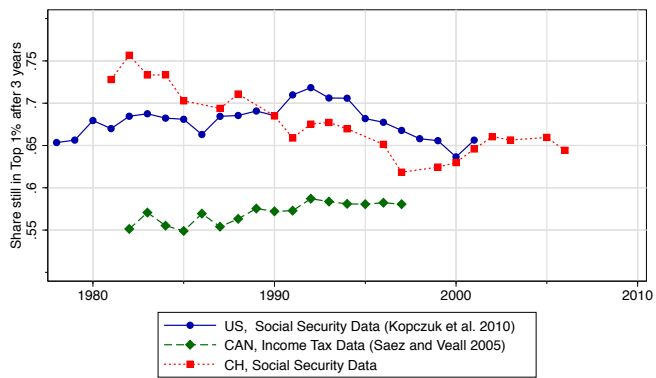


Figure 12: Conditional persistence in the top 1% by age group

Note: Persistence within the top 1% conditional on presence among top 1% in every year for different age groups. Age group defined in start-year t . *Source:* OASI individual data, 1981–2010.



(a) After 1 year



(b) After 3 years

Figure 13: Persistence in the top 1% in Switzerland, the U.S., and Canada

Note: Persistence within the top 1% unconditional on presence among top 1% in every year.

Table 1: Overview of Top 1% Mobility Estimates

Study (1)	Data (2)	Country (3)	Years T + ... (4)	Still in Top 1% (5)	Period (6)	Conditional (7)	Age in base-year (8)
1. Saez and Veall (2005)	Longitudinal Administrative Database	CAN	1	69.08%	1982-2000	–	> 20
		CAN	2	62.14%	1982-2000	?	> 20
		CAN	3	57.05%	1982-2000	?	> 20
2. Auten and Gee (2009)	IRS Individual Income Tax Files, years 1996 and 2005	US	9	41.5%	1996-2005	no	> 20
3. Carroll (2010)	IRS: 1999-2007 SOI Individual Tax Panel	US	8	44.6%	1999-2007	no*	–
4. Kopczuk et al. (2010)	Social Security Administration longitudinal earnings micro data	US	1	76.07%	1978-2004	–	25-60
		US	3	67.82%	1978-2004	no	25-60
		US	5	63.60%	1978-2004	no	25-60
5. Auten et al. (2013)	Statistics of Income (SOI) 1987 subsample, matched with 2007 tax returns	US	20	24.1%	1987-2007	no	35-40
		US	1	65%	1991-2010	–	25-60
		US	2	49%	1991-2010	yes	25-60
		US	3	40%	1991-2010	yes	25-60
		US	4	35%	1991-2010	yes	25-60
		US	5	30%	1991-2010	yes	25-60
6. Moser (2013)	Cantonal income tax data, canton of Zurich (ZH)	ZH (CH)	9	47.0%	2001-2010	no*	25-64
		ZH (CH)	9	25.0%	2001-2010	yes	25-64
		ZH (CH)	5	36.0%	2001-2006	yes	25-64
7. Jenderny (2016)	German income tax data, 5% sample	DE	1	77.0%	2001-2006	–	–
8. This paper	Social Security Data	CH	1	79.41%	1981-2010	–	20-65
		CH	2	72.15%	1981-2011	no	20-65
		CH	3	66.77%	1981-2012	no	20-65
		CH	5	57.99%	1981-2013	no	20-65
		CH	10	39.58%	1981-2014	no	20-65
		CH	15	25.02%	1981-2015	no	20-65

* Persistence not conditional, but only taxpayers who filed a return in all years inbetween are included in the analysis.

5.4 Mobility over the full income distribution

Mobility matrices (Fig. 16) show mobility patterns over the whole distribution in each decade. The diagonal shows persistence in each decile, the off-diagonal fields show where people move when they leave their decile. Persistence is strongest at the bottom and at the top. In 1990, 64% of those in the top 1% in 1981 were still there, another 12% moved down 1 decile, and 8% had moved all the way down to the bottom. From decile 1 to 8, about 1% had moved all the way to the top.

Figure 17 compares the diagonals of Figures 16a-16c. Overall mobility did increase somewhat despite rising inequality. Especially in the middle of the distribution, mobility over 10 years has increased since the 1980s. Mobility in and out of the top decile did increase as well, however to a smaller extent than mobility in lower parts of the distribution. What raises some concern is the fact that persistence in the bottom decile has increased. This suggests that these individuals are captured in a low-income trap—at least when looking at labor incomes only (and without controlling for hours worked).

To assess the effect of annual variations in income on overall inequality, I compare the Gini index of annual vs. permanent incomes. I measure permanent income as 3- and 5-year averages, respectively, of annual income. Figure 14 shows how overall inequality is substantially reduced when measured by permanent rather than annual income. Yet mobility has not been large enough to counteract the observed trend in increasing labor income inequality. Similarly, rank correlations of incomes averaged over 5 years depicted in Figure 15 indicate that long-term mobility in permanent income has increased slightly during the 1990s.



Figure 14: Gini index in annual and permanent income

Note: Annual labor incomes, 3-, and 5-year centered averages. Source: OASI individual data, 1981–2010.

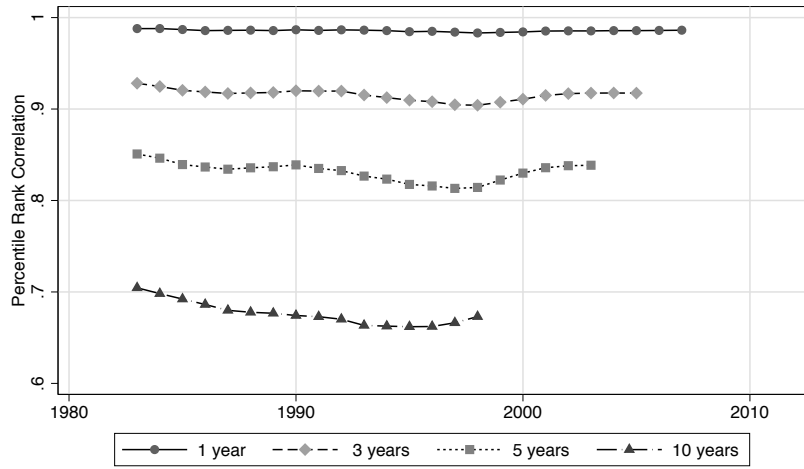
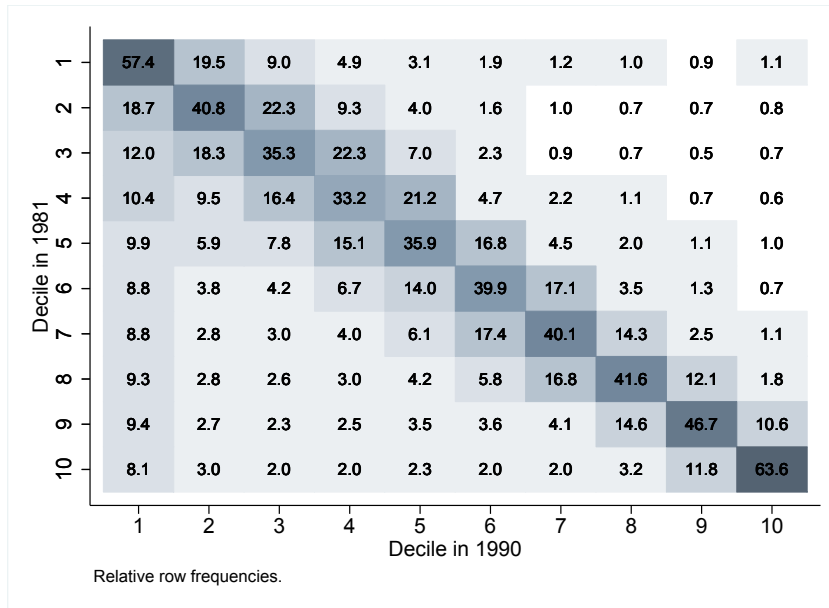
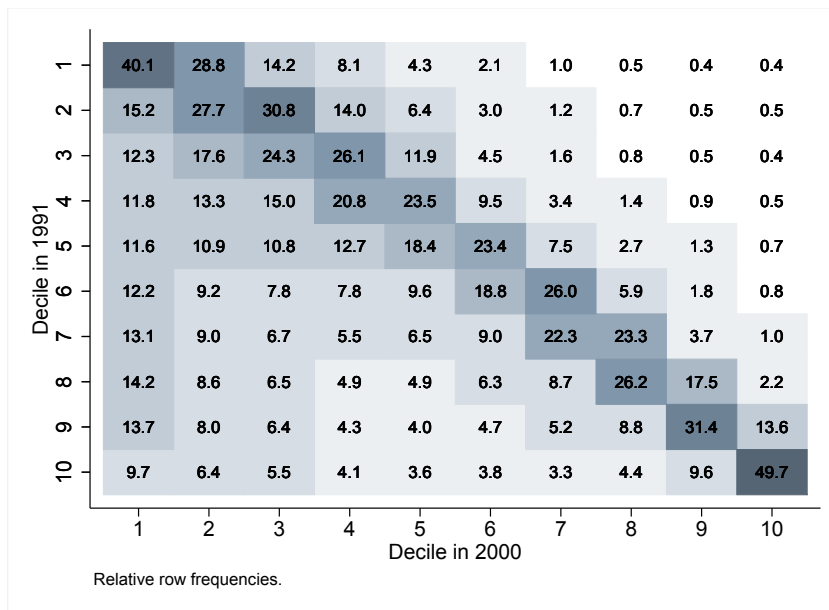


Figure 15: Percentile Rank Correlation

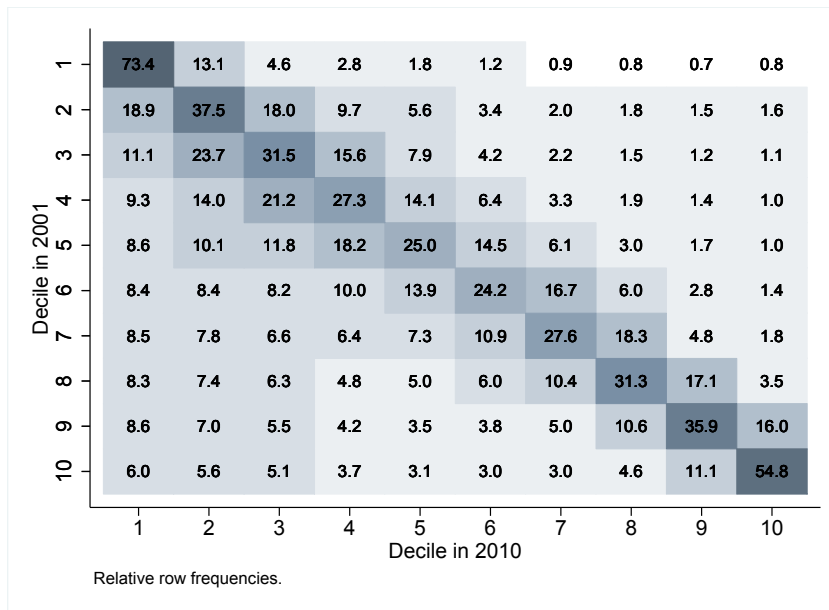
Note: Correlation in percentile ranks of 5-year centered average income. Source: OASI individual data, 1981–2010.



(a) 1981-1990



(b) 1991-2000



(c) 2001-2010

Figure 16: Mobility Matrices

Note: Mobility matrices over different decades. The y-axis shows the start decile, the x-axis the end decile a decade later. The diagonal measures persistence: the share of those who are in the same decile as 10 years earlier (unconditional on presence in that decile in every year). The off-diagonal entries show where people came from and where they move to, respectively. *Source:* OASI individual data, 1981–2010.

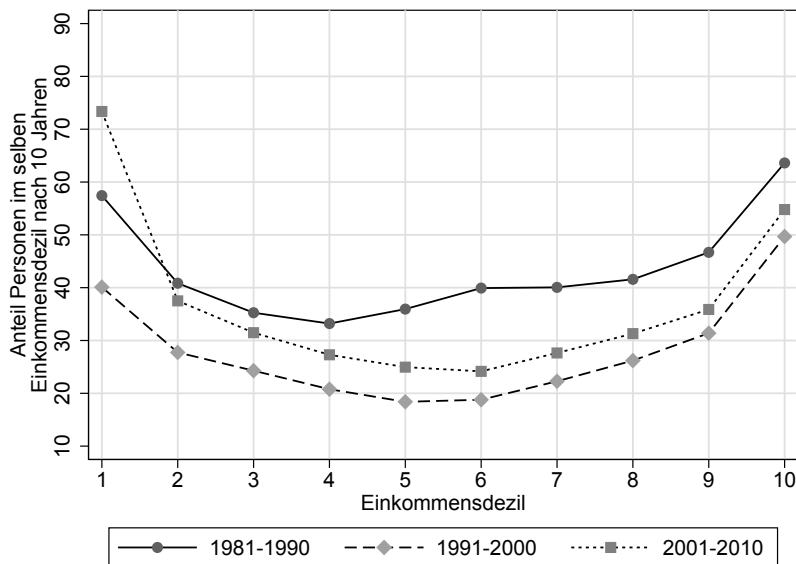


Figure 17: Share of taxpayers in the same decile as 10 years earlier

Note: The graph shows the diagonal of the mobility matrices in Figure 16. *Source:* OASI individual data, 1981–2010.

5.5 Total Income Mobility Based on Cantonal Income Tax Data

As described in Section 4, Swiss income tax data has its limitations to study income mobility, as taxpayers cannot be tracked over time in all cantons and they cannot be tracked if they move from one canton to another. For the 17 cantons where a panel is available from the period 2001-2010, Figure 18 shows the persistence in each income decile (i.e., the diagonal of a mobility matrix) on average (red line) and for each canton (gray lines). The pattern is very similar across cantons, with persistence at the top being higher than at the bottom. However, levels differ by about 10 percentage points throughout the distribution from the canton with the lowest to the canton with the highest mobility. Compared to the mobility in the labor earnings distribution based on OASI data, the level of persistence within each decile is very similar in the upper-middle of the distribution, between the fourth and the 9th decile. Persistence at the top is higher when measured with tax data, likely due to the concentration of capital incomes for the top decile of the total income distribution. For the bottom three deciles, the use of tax data leads to very high mobility for those at the very bottom, while for the third decile mobility rates are low, with 40% of taxpayers still being in this decile after 10 years. A possible explanation is that many of those at the very bottom of the total income distribution are out of the labor force, possibly living off social assistance or disability benefits. These situations may be of temporary nature, e.g., due to a recent divorce or an accident. In addition, self-employed may report negative incomes when business is going bad. Within 10 years, the situation may change and hence improve substantially, also through marriage. In the individual labor income distribution, on the other hand, it is possible that someone is working and earning little for an extended period of time while living together with a partner or receiving either social assistance or capital incomes.

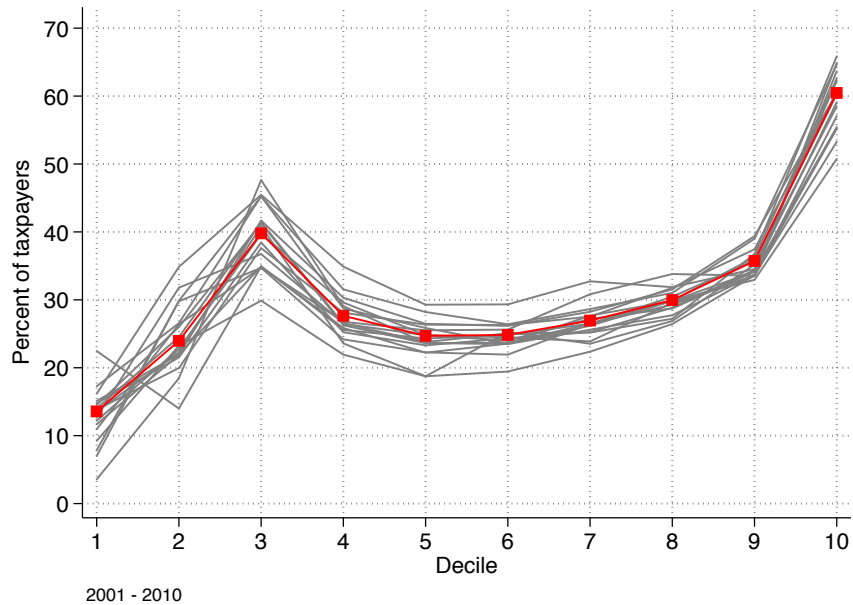
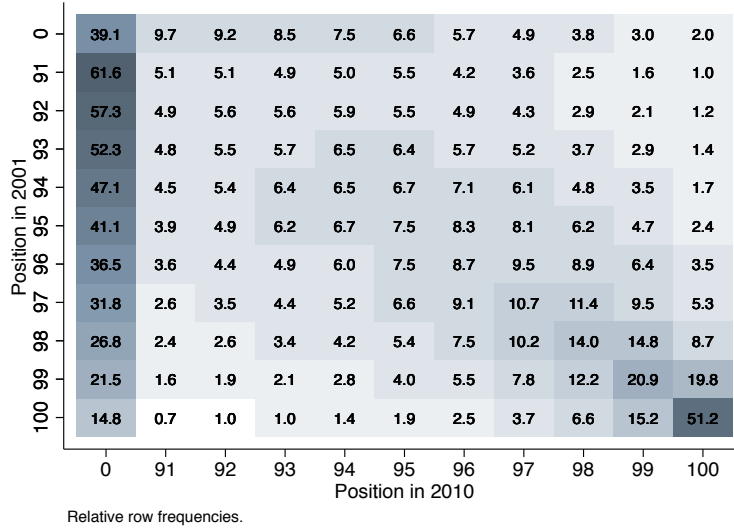


Figure 18: Regional heterogeneity in income mobility at the cantonal level

Note: Share of taxpayers in the same decile in 2010 as they were in 2001. Sample includes 17 cantons (LU, SZ, UR, OW, GL, ZG, FR, SO, BS, SH, AR, AI, SG, GR, AG, TG, GE). See text and Table A1 for details on data availability. Source: canton-level federal income tax data, own calculations.

The top 10% of tax payers

Next, I restrict the sample to taxpayers who were in the top 10% at least once in a given time period. Figure 19 presents the mobility matrix for the percentiles within the top decile based on the sample of those who were part of the top 10% at least once. The interpretation is what the chances are to move to the top 1% conditional on being in the top 10% group at least once at any point time up to (and including) 2010. In addition, the position “0” indicates all those taxpayers who moved into- or dropped out of the top 10%. The top left entry of Panel a) of Figure 19 indicates that 39.1% of taxpayers, who were part of the top 10% group at some point after 2001, were not there anymore in 2010. The first column of the matrix indicates quite large fractions of taxpayers who were in a top 10 decile in 2001, had dropped out by 2010. Unsurprisingly, this risk was by far smallest for the top 1%. Only 14.8% of those in the top 1% had dropped out of the top group 10 years later. More than half of the top 1% claimed this position again in 2010. Comparing the diagonal of this mobility matrix for different time periods shows again that mobility at the top has decreased in the 2000s compared to the 1990s (Fig. 20).



(a) 2001-2010

Figure 19: Percentage of taxpayers in the same top percentile after 10 or 20 years

Note: Sample 2001-2010 includes 17 cantons (LU, SZ, UR, OW, GL, ZG, FR, SO, BS, SH, AR, AI, SG, GR, AG, TG, GE). See text and Table A1 for details on data availability.

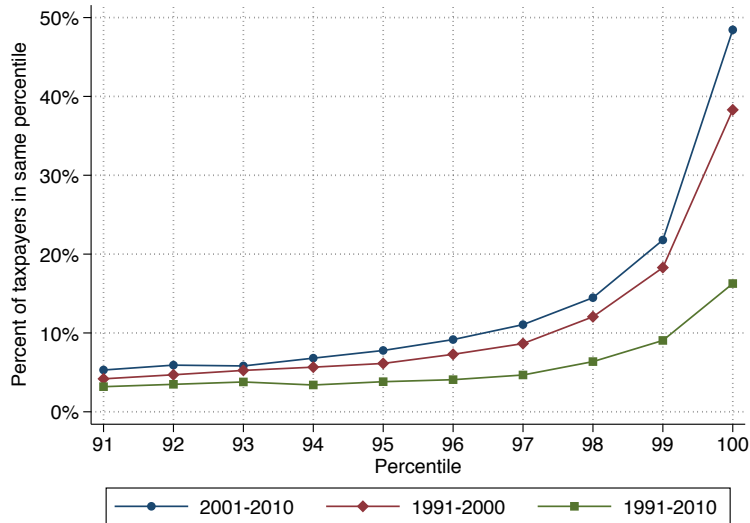


Figure 20: Percentage of taxpayers in the same top percentile after 10 or 20 years

Note: Lines represent the diagonal of the corresponding mobility matrix. Sample 1989-1999 includes 11 cantons (BE, FR, BS, BL, GR, AG, TI, VD, VS, GE, JU). Sample 2001-2010 includes 17 cantons (LU, SZ, UR, OW, GL, ZG, FR, SO, BS, SH, AR, AI, SG, GR, AG, TG, GE). Sample 1989-2010 includes 6 cantons (FR, GR, AG, TI, VD, VS). See text and Table A1 for details on data availability.

6 Conclusion

In this paper I shed light on the composition of top earners in Switzerland and how long top earners remain at the top. I find that women are strongly underrepresented among top earners and that they exhibit higher mobility. Women are therefore less likely to reach the top, and once they are there, they are more likely to move down the income distribution than men. Foreigners on the other hand are overrepresented at the top. This suggests that Swiss firms have been successful in the past decade in attracting high-skilled foreigners.

Even though overall mobility as well as top income mobility have increased, this was not enough to counteract the rise in income inequality observed in Switzerland over the past two decades. This study is based on full-population social security earnings data, hence the results imply that it has become harder to move to the top of the income distribution through work. Since also wealth is highly concentrated in Switzerland (see Föllmi and Martínez, 2017), this means that both, labor and capital incomes become more concentrated in the hands of a small elite.

The present work is still in progress. The mobility measures presented so far do not yet take into account life-cycle effects. I will present estimates on income mobility fixing cohorts. In the future I will further include top labor income shares of 5-year average incomes and compare them to annual top income shares. This will indicate to what extent this popular snapshot measure of inequality overestimates top income inequality and whether an increased variability in top incomes has driven top income shares. Furthermore I am currently computing income elasticity estimates controlling for gender and age. An interesting extension would also be to look further into regional differences in income mobility and how they correspond with top marginal tax rates in the different areas. With the Social Security data at hand, it may further be possible to include firm information in the future to study inequality and mobility within and between firms.

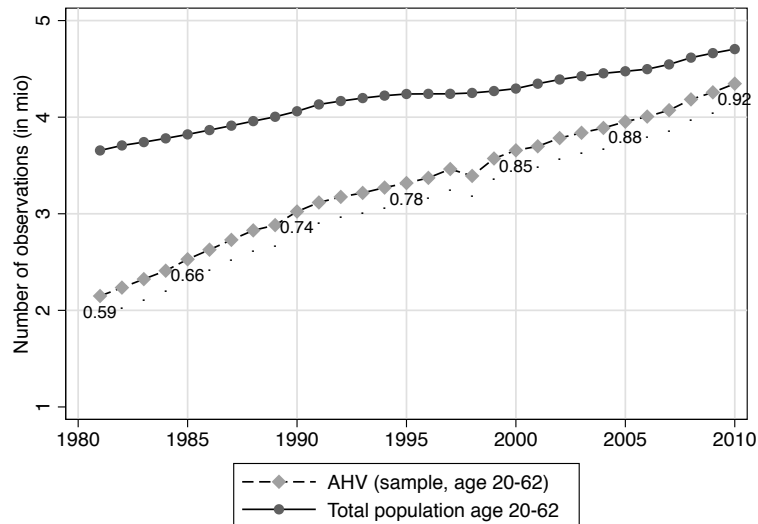
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Appendix A Data



Notes: This figure displays the total resident population of Switzerland aged 20-64 and the total population captured by our sample aged 20-64 (which are all individuals with a social security record in any year 1981-2010 and resident in Switzerland in 2010 so that they can be matched to the Census 2010). The numbers show the fraction of individuals in the sample vs. the full population. Coverage is closer to one in recent years due to deaths and migration.

Figure A1: Sample coverage of matched OASI-Census data

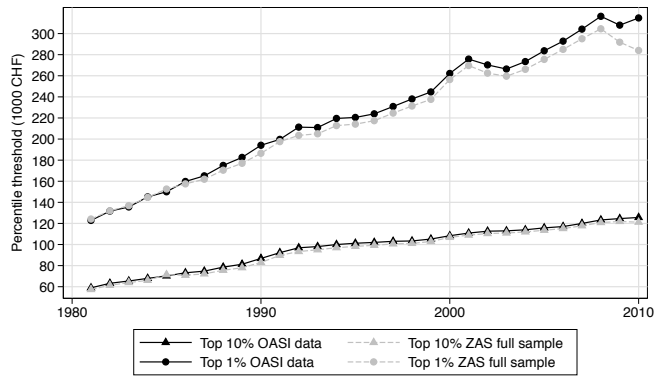


Figure A3: Cutoffs to belong to different top groups

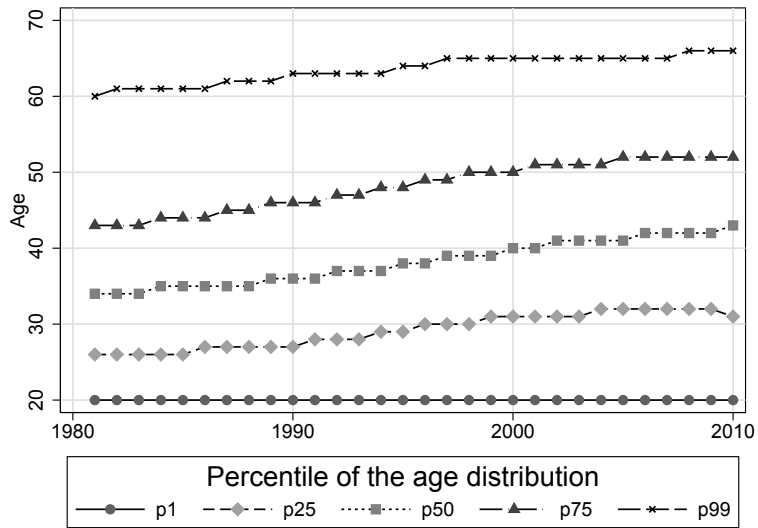


Figure A2: Age distribution in the raw data

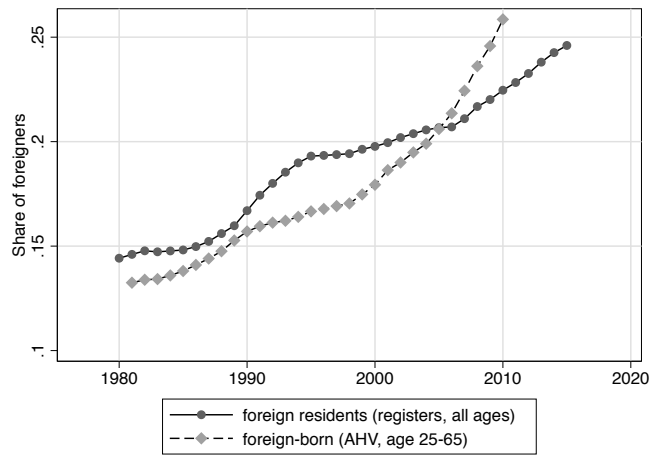
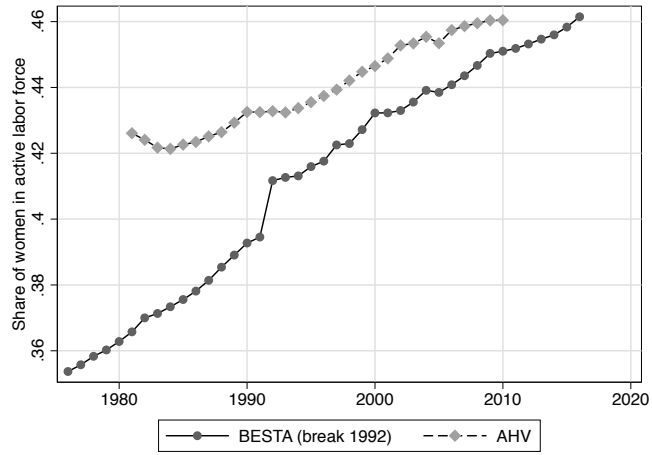


Table A1: Availability of Panel Income Tax Data in Different Cantons

Canton	Tax periods with panel structure						Population in 2000	
	Annual years	length	Biennial years	length	Combined years	length	Share (in %)	Absolute (in 1000)
ZH							16.73	1,199
BE	2001 - 2006	6	1989/90 - 1999/00	6	1989/90 - 2006	12	13.17	943
LU	2001 - 2010	10					4.82	345
UR	2001 - 2010	10					0.50	35
SZ	2001 - 2010	10	1995/96 - 1999/00	3	1995/96 - 2010	13	1.79	128
OW	2001 - 2010	10					0.45	32
NW	2001 - 2009	9	1995/96 - 1999/00	3	1995/96 - 2009	12	0.53	38
GL	2001 - 2010	10	1995/96 - 1999/00	3	1995/96 - 2010	13	0.54	39
ZG	2001 - 2010	10	1995/96 - 1999/00	3	1995/96 - 2010	13	1.36	98
FR	2001 - 2010	10	1989/90 - 1999/00	6	1989/90 - 2010	16	3.27	234
SO	2001 - 2010	10	1995/96 - 1999/00	3	1995/96 - 2010	13	3.40	244
BS	2001 - 2010	10	1989/90 - 1999/00	6			2.63	188
BL			1989/90 - 1999/00	6			3.61	259
SH	2001 - 2010	10					1.03	74
AR	2001 - 2010	10					0.75	54
AI	2001 - 2010	10					0.21	15
SG	2001 - 2010	10					6.25	448
GR	2001 - 2010	10	1989/90 - 1999/00	6	1989/90 - 2010	16	2.60	186
AG	2001 - 2010	10	1989/90 - 1999/00	6	1989/90 - 2010	16	7.55	541
TG	2001 - 2010	10	1995/96 - 1997/98	2	1995/96 - 2010	14	3.17	227
TI	2003 - 2010	8	1989/90 - 1999/00	6	1989/90 - 2010	14	4.31	308
VD	2003 - 2010	8	1989/90 - 1999/00	6	1989/90 - 2010	14	8.60	616
VS	2003 - 2010	8	1989/90 - 1999/00	6	1989/90 - 2010	14	3.85	276
NE							2.31	166
GE	2001 - 2010	10	1989/90 - 1999/00	6			5.63	403
JU	2001 - 2007	7	1989/90 - 1999/00	6	1989/90 - 2007	13	0.96	69
CH							100	7,164

Note: Population statistics from the Federal Statistics Office: *Bilanz der Ständigen Wohnbevölkerung nach Kanton.*