Universität St.Gallen

Institut für Finanzwissenschaft, Finanzrecht und Law and Economics

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Melanie Häner / Michele Salvi / Christoph A. Schaltegger

Institute of Public Finance,
Fiscal Law and Law & Economics (IFF-HSG)

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Melanie Häner[*][1], Michele Salvi[1], and Christoph A. Schaltegger[1,2]

[1]University of Lucerne
[2]University of St. Gallen

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Abstract

This paper examines the relationship between marital sorting and income inequality in Switzerland using individual tax data. We find that assortative mating intensifies at the tails of the income distribution. High and low earners specifically tend to marry alike. This pattern is exacerbating household income inequality – the Gini coefficient increases by more than 10% and the top 1% share by around 5% compared to random matching. By comparison, we show that the redistributive impact of marital sorting offsets the effect induced by taxation for most of the top income quintile. However, tax dominates the opposing mating redistribution from the top 5% income share.

Keywords: assortative mating, income, education, inequality
JEL Classification: D31, I24, J12

1 Introduction

'Opposites attract' is a famous saying that does not apply to spouses' financial resources. The proportion of couples sharing similar incomes and educational backgrounds has increased over the past few decades (e.g., Schwartz and Mare, 2005). Regardless of the causes for this secular trend studied by different academic disciplines, mating behavior has significant economic consequences. Studies show that the increase in homogamy exacerbates income inequality (e.g., Eika et al., 2019). Income would be more evenly spread if couples were less keen to marry similar sorts. At the same time, tax systems play a crucial role in income redistribution and aim at reducing inequality. Hence, opposing distributional effects coincide. Therefore, the question arises: Does the marital impact on inequality offset the redistributive effect of taxes?

Our paper addresses this question by studying the distributional consequences of marital sorting in Switzerland using a comprehensive dataset that combines individual tax information with survey data. Our main contribution is twofold. On the one hand, we provide evidence on the effect of assortative mating at the tails of the income distribution. On the other hand, this paves the way for more sophisticated distributive analysis. In particular, we consider after-tax income what allows us to compare the marital impact on inequality to the redistributive effects of taxes.

Previous literature has examined marital sorting concerning household income. The available evidence for the United States and European countries points to a sizable correlation of up to 0.5 (e.g., Schwartz, 2010). However, evidence on inequality effects is relatively sparse. US studies estimate the contribution of assortative mating to inequality is around 5 % (Eika et al., 2019)[1]. A recent study for France even finds a mating-induced increase in the Gini coefficient of up to 20% (Frémeaux and Lefranc, 2020).

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[1]i.e. leads to an increase in inequality of 5%

The existing literature suffers from empirical limitations. First, they mostly measure the extent of marital sorting within married couples. However, individual earnings are affected by marriage (e.g., Chiappori et al., 2009; Chiappori, 2020). Our paper addresses this issue by focusing on couples one year before their wedding when they are still taxed as singles. Second, previous studies relied on survey data, which usually limit the analysis to considering medium effects, without accurately assessing the effects across the income distribution (Atkinson et al., 2011). In contrast, our data's coverage and detailed nature allow us to identify tax data of all spouses in the respective jurisdictions and time period. Third, prior analyses have focused on labor earnings, leaving aside other sources of income (Frémeaux and Lefranc, 2020). We base our analysis on total income, including capital income.

Our paper offers two sets of results. First, we show that assortative mating in Switzerland occurs throughout the income distribution. Most importantly, we provide evidence that marital sorting is particularly pronounced at the distribution tails. For instance, a woman in the top income quintile is twice as likely to marry a man from the same quintile as expected under random mating. In addition, we find an increase in assortative mating as the level of income rises. For example, the probability of marriages among spouses from the top income percentile is almost 15 times higher.

Second, we provide evidence that the measured marital sorting has significant effects on economic inequality. Assortative mating increases the income Gini coefficient by 10.7%. Additionally, we measure a mating-induced increase in the top 1% income share of 5%. In other words, the share in total income of top earners increases by 5% due to marital decisions. Simultaneously, we determine the adverse tax redistribution effect for the respective income groups. By comparing those two effects in the top quintile, we find that the mating effect offsets the tax redistribution effect up to the top 5% income share. After that, the mating effect is dominated by the tax effect. Our findings are robust to employing different

income measures and accounting for sensitivities concerning age, children, and nationality.

The remainder of the paper is structured as follows: Section 2 presents the dataset at hand. Section 3 contains the main results on the extent of assortative mating. In Section 4, we show the mating-induced inequality effect. Furthermore, we compare it to the inequality-reducing effect of income taxation. Moreover, we perform several specification checks to examine the sensitivity of our results. Finally, we conclude in Section 5.

2   Data

We analyze comprehensive administrative data of permanent residents in Switzerland between 2011–2015. The dataset combines harmonized cantonal tax data with several administrative registers (linked at the individual level via personal identification numbers) and contains annual income, educational attainment, and many other variables. Extensive tax data are available for 7 out of 26 cantons, namely Aargau, Basel-Landschaft, Basel-City, Bern, Lucerne, St. Gallen, and Valais. Survey data are representative of Switzerland and, therefore, an excellent complement to verify the external validity of the effects measured in the seven cantons.

2.1   Identification

We measure the extent of assortative mating for couples one year before marriage. In contrast to studies related to educational mating (e.g., Eika et al., 2019), the measurement of income assortative mating among married couples is subject to an endogeneity problem. Observed economic outcomes, such as income, are based on joint household decisions after marriage. By analyzing couples one year prior to marriage, we address this potential measurement error. For the same reason, we also omit remarriages, i.e., marriages in which one spouse is divorced or widowed at the time of marriage because they might have made

joint decisions with their previous spouses, which influenced their current social status. As a result, we consider all couples of which both spouses married for the first time between 2012 and 2015.

It is noteworthy that we cannot capture spouses that did not live in the respective tax jurisdictions before their union formation. We have detailed information about all spouses in the year of their wedding. Nonetheless, they might have been taxed in another canton not included in our dataset or another country the year before. Consequently, we were not able to obtain information about those people. This concerns roughly 20% of future spouses.[2] Therefore, it is worthwhile to additionally measure the extent of assortative mating based on educational data stemming from a survey that is representative for overall Switzerland.

2.2 Descriptive statistics

Table 1 provides core information on the main variables. The tax dataset covers 32,112 couples. The average age of future spouses is 32 for men and 29 for women. The mean annual income is substantially lower for women (CHF 55,000) than for men (CHF 74,000). The annual income consists of the sum of all financial inputs of an individual, including capital income (Wanner, 2019). The share of negative or null annual income values amounts to 1.7% for women and 1.6% for men. In general, while gender differences in income levels might have important reasons and implications, those differences are not part of our research question.[3]

While our analysis' primary focus is on the tax data, we also look at the mating preferences concerning education in order to relate to prior studies (e.g., Eika et al., 2019). The respective survey dataset entails 3,883 couples. Again, the age difference between men and

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[2]To address a potential identification issue related to foreigners, we perform sensitivity tests restricting nationality in the robustness section.

[3]Unfortunately, we cannot adjust for hours worked due to the unavailability of data. However, a higher share of part-time employment among women could account for some of the differences.

women is, on average, three years. As depicted in Table 1, we distinguish five educational levels according to the groups of the International Standard Classification of Education (ISCED). The proportion with a university degree is 32% for men and 31% for women. In general, educational levels do not differ considerably between genders. The share of people with vocational training exceeds the share of university-trained people. It amounts to 36% for both men and women.[4]

Table 1: Descriptive statistics of main variables.

	Women		Men	
	Mean	Std. Dev.	Mean	Std. Dev.
Tax data (N=64,224)				
Age	29	5	32	6
Income (x 1,000 CHF)	55	48	74	200
– share ≤ 0 (%)	1.7		1.6	
Structural survey (N=7,766)				
Age	29	5	32	6
Up to Secondary I (ISCED 1-2)	0.07	0.25	0.06	0.23
Vocational (ISCED 3)	0.36	0.48	0.36	0.48
High school (ISCED 4)	0.11	0.32	0.07	0.25
Tertiary (ISCED 5-6)	0.14	0.35	0.19	0.39
University (ISCED 7-8)	0.31	0.46	0.32	0.47

Notes: The table above presents descriptive statistics for the sample with individual information one year before marriage formation.

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[4]While the share of university degrees is comparably low in Switzerland, the vocational education and training (VET) system is rather popular. As a result, for example, intergenerational income mobility is much higher than university education mobility because high wages can be earned even without university education (Chuard and Grassi, 2020).

3 Assortative mating

3.1 Measuring marital sorting

Marital sorting is the subject of a growing literature in economics, but there is no standard measure empirically describing mating behavior. While the empirical approach depends on the variable under investigation, rank measures are increasingly popular in social mobility research (Chetty et al., 2014). However, income measures in survey data are typically imprecise at the distribution's tails, leading to different estimates when using rank-based measures than those obtained in administrative data sets such as the one used here. Therefore, previous studies on the effect of marital income sorting often waived rank measures. We use two different rank-related sets of statistics.

Contingency tables Assortative mating can be quantified by the contingency table for the wife's and husband's (relative) status levels to a contingency table generated by random matching for husbands and wives (Eika et al., 2019). Based on these contingency tables, it is possible to measure marital sorting as the likelihood of a particular match compared to the probability under random matching:

$$e(y_f, y_m) = \frac{P(Y_f = y_f, Y_m = y_m)}{P(Y_f = y_f)P(Y_m = y_m)}, \tag{1}$$

where Y_f (Y_m) denotes the relative position in a chosen status distribution (e.g., the respective individual income quintile) of the woman (man) and $e(y_f, y_m)$ the assortative mating parameter. An assortative mating parameter above (below) one means that the respective match is more (less) likely to occur than under random matching (i.e., expresses the degree of excess probability). The joint distribution of the spouses is fully described by this parameter and the marginal distributions of wives and husbands.

Rank-Rank Slope (RRS) As alternative measures, we complement those rank-based contingency tables by rank-rank linear regressions. Let M_i denote men's and F_i women's percentile rank, respectively, whereby ranks are computed separately for both genders. The regression of women's rank F_i on men's rank M_i yields the rank-rank-slope (RRS):

$$RRS = \beta = \rho_{mf} \tag{2}$$

The regression coefficient ρ_{mf} complements the probability findings in the diagonal of the contingency tables. The diagonal of a contingency table shows the probability that the man and the woman are in the same income quintile compared to the probability under random mating. If assortative mating parameters are above one on the diagonal status distribution, ρ_{mf} is assumed to be significantly above zero.

3.2 Income sorting

Conditional probabilities. Figure 1 shows income quintiles and education groups of men on the x-axis and those of their female partners on the y-axis. If people married independently of their economic situation, one would expect marrying to be relatively homogeneously distributed across quintiles. Men and women in each quintile should form couples with approximately 20% of each quintile of the opposite sex. This would manifest itself in a value of 1 in Figure 1. Correspondingly, a value of 2 indicates a relative frequency that is twice as big as expected. A value of 0.5 corresponds to a relative frequency that is half of what one would expect with random partnering.

The respective numbers on the diagonals in both graphs of Figure 1 are all above one. This pattern implies that spouses in the same income group are more likely to match than under random matching. Consistently, a marriage between people in more distant groups is relatively unlikely. Assortative mating seems to be particularly pronounced at

the distributions' tails. One statistic of particular interest in this matrix is the conditional probability of marrying from the bottom quintile into the top quintile. For example, a match between a man of the highest and a woman of the lowest income quintile is only half as likely as expected under random matching. Another interesting measure is the conditional probability of marrying from within the top quintile, which allows a perception of status preservation through marriage. For instance, we find that a couple's match with both spouses in the top quintile of the income distribution is twice as likely as expected under random matching.

In addition to marital sorting, the figure provides evidence for income hypergamy. Hypergamy describes a woman's marriage with a man of higher social status. We find a consistent excess probability of marriages between men from a certain quintile and women from the one just below, while we do not observe this pattern the other way around. We do not further analyze the reasons nor the impact of income hypergamy. However, hypergamy is an important subject of current research (e.g., Almås et al., 2020).

Figure 1: Income and educational marital sorting
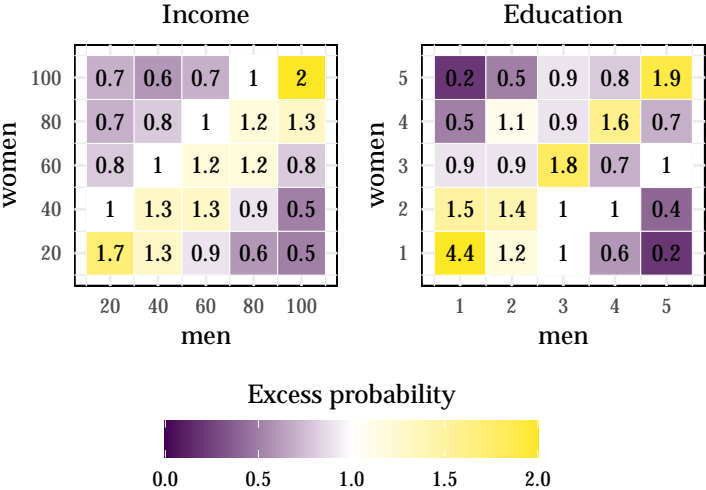
Notes: The Figure shows the assortative mating parameters with regard to income and education. The assortative mating parameter expresses for each income quintile or educational group combination how frequent a marriage is, compared to its frequency under random mating.

To investigate the tails of the distributions, we also calculate 1%-, 5%- and 10%-shares (see Figures O1 to O3). Analogously, we find an increase in assortative mating as the level of income increases above the 90th and decreases below the 10th percentile, respectively. For example, the excess mating probability for marriages within the top income percentile is 14.5. For marriages within the bottom income percentile, it amounts to 33.5, meaning that the occurrence of a marriage within the bottom 1% is 33.5 times more likely than under random matching.

The existing literature is often based on educational data (e.g., Eika et al., 2019). Therefore, it is worthwhile to replicate our analysis for education. Furthermore it serves as an external validity test to see whether the marital sorting is observable with regard to other status indicators besides income. As the right part of Figure 1 shows, the pattern is very similar for education: A clear marital sorting which is particularly pronounced within the top and the bottom educational groups.

Rank-Rank estimates Next we present estimates of the rank-rank slope, our second measure of assortative mating. We measure the percentile rank of men based on their positions in the distribution of men's incomes in the core sample. Similarly, we define women's percentile ranks based on their positions in the distribution of women's incomes[5].

Figure 2 presents a scatter plot of the mean percentile rank of wives against their husbands' percentile rank. The conditional expectation of a wife's rank given her husband's rank is quite linear. Applying an OLS regression, we show that a 1 percentage point increase in the husbands rank is associated with a 0.337 percentage point increase in the wife's mean rank (see Table A1 in the Appendix).

Previous studies measure the extent of assortative mating mainly by linear log-log

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[5]It is noteworthy that the rank-based measure allows us to include zeros. Moreover, as Figure 2 shows, the rank-based relationship is linear. Therefore, rank-based analyses are often preferred over log-log regressions in the literature on intergenerational social mobility (e.g., Chetty et al., 2014). However, as Table A1 in the Appendix shows, the two approaches yield similar results in our analysis.

regressions. The existing estimates with regard to income are in general lower, but with an extensive range from 0.12 to 0.49 (Ciscato and Weber, 2019; Holmlund, 2020; Frémeaux and Lefranc, 2020).

Figure 2: Association between women's and men's percentile ranks.

Mean woman income rank vs. man income rank
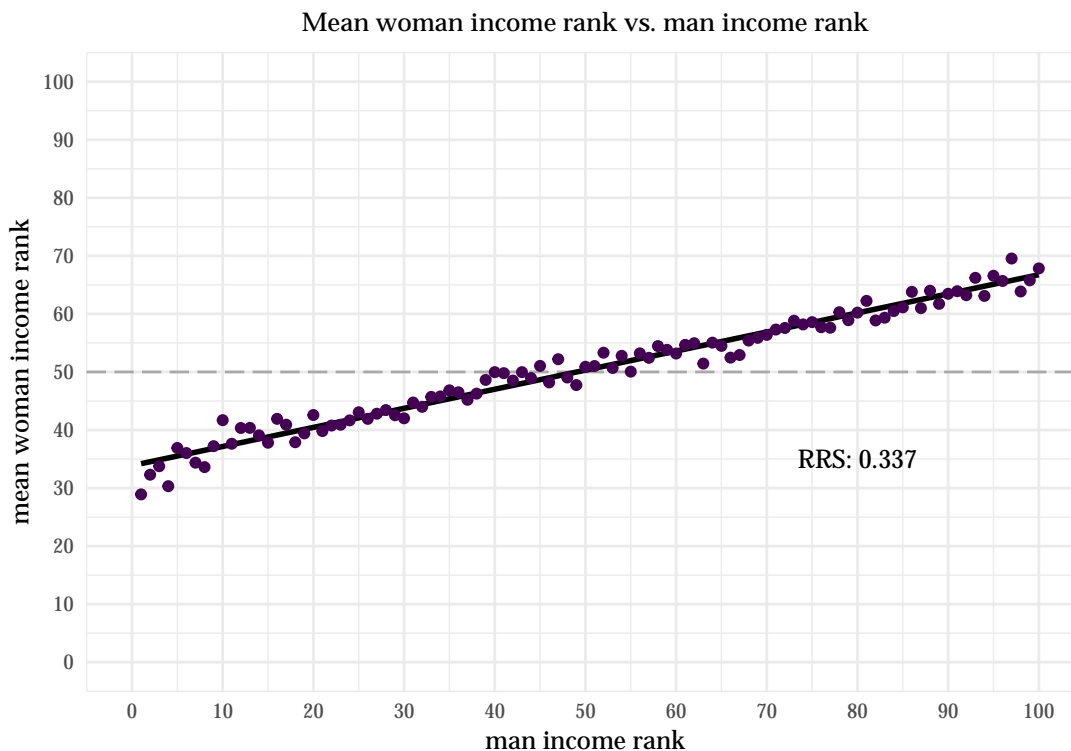
Notes: The Figure presents a nonparametric binned scatter plot of the relationship between women's and men's percentile income ranks. The figure is based on the core sample and annual income.

4 Inequality effects of marital decisions

4.1 Assessing the impact on the income distribution

To examine the impact of assortative mating on economic inequality on the household level, we assess the difference between the measured and theoretical income distribution under random matching. To derive the theoretical distribution under random matching,

we replicate the same analyses for the random couples, i.e., we randomly match all couples in our sample. In other words, we additionally calculate the Gini coefficient and the top shares for randomly composed households.[6] To derive the mating-induced inequality effect, we follow equation 3:

$$ME_p = 1 - \frac{I_{p,r}}{I_p},\tag{3}$$

whereas I_p is the actual distributional measure p and $I_{p,r}$ describes the respective measure under random mating.

We focus on couples before their marriage and thus apply the addition approach to the couples covered in our core sample. Randomly matching individuals that are one year prior to marriage — and thus not over all individuals in the society — is further deemed sufficient as we do not intend to explain overall inequality developments causally.

4.2 Results

Gini coefficient We find a relative distributional change of 10.7% in the Gini index of income (see Table 2). By comparison, a 10% increase in the Gini coefficient corresponds to introducing an equal-sized lump sum tax of 10% of the mean income and redistributing the collected tax as proportional transfers in which each household receives 10% of its income (Aaberge, 1997).

Top income shares Thanks to the full coverage of our administrative data, we are able to shed light on the distributional effect at the top of the income distribution. The top 1% income share is 0.3 percentage points higher due to assortative mating at the couple's

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[6]The measurement of the effect of assortative mating on income inequality has been the subject of debate. There are two different approaches to randomizing couples: either individual incomes are kept constant (addition approach) or household incomes are kept constant (imputation approach) – the latter aims at addressing the endogeneity of labor supply decisions (for an overview, see Frémeaux and Lefranc, 2020).

level than expected under random matching. This difference corresponds to a relative change of 5.2%. We find similar effects on the top 5% and top 10% income shares. Table 2 summarizes the distributional impact of marital sorting.

Table 2: Impact of marital sorting on the income distribution.

	Actual	Random (Std. Dev.)	Mating-induced effect (%)
Distribution			
Gini	0.224	0.202	0.022
		(0.000)	(10.725)
Income shares (in %)			
Top 10%	20.177	19.173	1.002
		(0.025)	(5.224)
Top 5%	12.732	12.021	0.711
		(0.020)	(5.915)
Top 1%	5.275	5.014	0.261
		(0.011)	(5.200)

Notes: The Table above presents the observed Gini coefficients and top income shares. Furthermore, it depicts the same measures and their standard deviations for the random mating scenario, deducted by applying 1'000 sample bootstrapping. Reading guide: As the last line of the table shows, the top 1% of the income distribution have 5.28% of all incomes. Under random mating this share is lower (5.01%). Consequently, the mating-induced inequality effect amounts to 0.26 percentage points or 5.2%.

4.3 International comparison

While evidence on top incomes is sparse, effects on the Gini coefficient are comparable internationally. Whereas most previous studies analyzed labor income based on survey data, we find a similar impact analyzing annual income including capital income. Figure 3 puts the inequality estimates of Switzerland in context to other countries.

In an international comparison, the U.S. exhibits the lowest marital sorting. According to Greenwood et al. (2014a), the Gini coefficient is only 2.33 percent higher compared

to random matching.[7] In a more recent study, Eika et al. (2019) find a slightly higher Gini increase of 5 percent for the US. Also comparing to the random matching situation, Fiorio and Verzillo (2018) measure a 6.6 percent Gini increase for Italy. For Switzerland, Kuhn and Ravazzini (2017) find a similar inequality increase for hourly wages and a lower increase in realised earnings. As they consider couples after their marriage, they cannot disentangle the pure mating effect from the incentive effects of being taxed jointly after marriage. For France, studies find significantly higher values. However, the effect size also depends on the respective income concept. Whereas for annual earnings, the effect amounts to an increase of about 4%, the effect on household potential earnings is up to 20% (Frémeaux and Lefranc, 2020).

Our estimates for Switzerland are substantial compared to most other Western countries. It is important to note that the results depend strongly on the time of observation (i.e., before or after marriage), on the type of income, and other variables. From an empirical perspective, our effect is best comparable to the one obtained by Frémeaux and Lefranc (2020) for France, where they account for full-time equivalents.

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[7]Note that this is the value from the corrigendum. In the original study, the authors found a significantly larger inequality increase of 20.9 percent (Greenwood et al., 2014b).

Figure 3: International comparison of the effect of marital sorting on the income distribution.

Effect of marital sorting on the Gini

Change in Gini (in %)
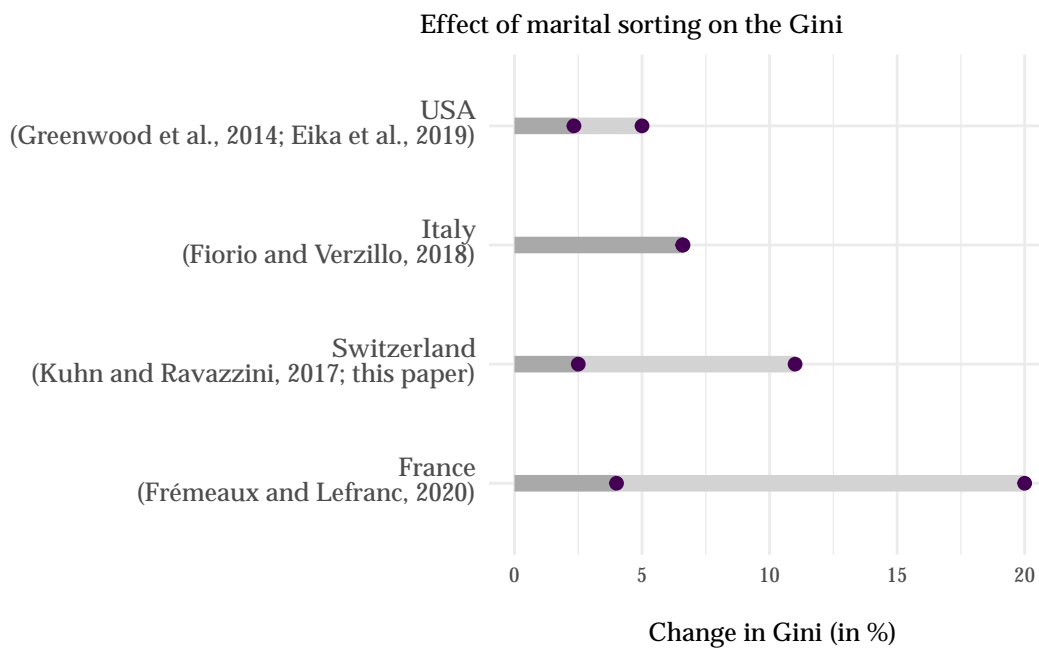
Notes: The Figure compares results of recent studies regarding the effect of assortative mating on income inequality that use high quality data and are thus likely to provide reliable results. It displays the range of mating-induced effects on the Gini coefficient measured for the indicated countries. It is important to note that our paper uses administrative tax data and focuses on couples one year before their wedding. Existing papers measure the extent of marital sorting within married couples. However, individual earnings are affected by marriage (e.g., Chiappori et al., 2009; Chiappori, 2020). Our effect is best comparable to the one obtained by Frémeaux and Lefranc (2020), where they account for full-time equivalents. They measure a mating-induced increase in the Gini coefficient of up to 20% when focusing on couples' potential earnings.

4.4 Comparison with tax redistribution

To interpret the magnitude of the inequality implications, we suggest a comparison with the tax redistribution effects.

Measuring the redistributive impact of taxation Various studies evaluate the effect of tax policy on pre-tax top income shares (e.g., Piketty et al., 2014). To assess the full redistributive impact of tax policy, it is necessary to assess inequality in post-tax income. Thereby, the difference in inequality between pre- and post-tax incomes can be attributed to the redistributive effect of income taxes (Musgrave and Thin, 1948).[8] We apply this concept to income concentration and measure redistribution based on the difference between the pre-tax income share $I_{p,pre}$ of the top income group p and their respective post-tax income share $I_{p,post}$ in our sample:

$$RE_p = 1 - \frac{I_{p,post}}{I_{p,pre}} \tag{4}$$

The main advantage of this measure is that it includes information about both the share of income and the tax burden of top earners, relative to the general population. It is important to note that spouses are taxed individually at the time of observation.[9]

Estimates of redistribution. Table 3 presents the redistribution effect of income taxes for our sample of couples. The first column expresses the resulting redistributive effect as relative change. The second column presents the mating-induced inequality effect for comparison. We find a relative redistribution effect on top 1% income shares of 9%. Due to the the progressivity of the tax schedule the redistributive effect is smaller for the top

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[8]Morger and Schaltegger (2018) apply this method to asses the redistributive effect of personal income taxes in Switzerland.

[9]For a theoretical discussion on the interplay between taxation of couples and assortative mating see, e.g., Frankel (2014).

5% and top 10% income shares.[10] These results are in line with other analyses on the effect of taxation on income shares for Switzerland (e.g., Frey and Schaltegger, 2016).

When we contrast tax redistribution with our mating-induced effects working in the opposite direction, we find that current marriage behavior offsets the tax redistribution effect in the top quintile up to the top 5% income shares. For the top 1%, on the other hand, the tax redistribution effect clearly exceeds the mating effect. Marital sorting increases the top 1% income share by 5.20%, while the tax effects reduces the respective share by 8.96%.

Table 3: Distributional effects of taxation vs. mating (in %).

	Tax redistribution effect	Mating-induced effect	Tax offset
Income shares (in %)			
Top 10 %	-3.82	5.22	✓
Top 5 %	-5.26	5.92	✓
Top 1 %	-8.96	5.20	✗

Notes: The Table above presents the redistribution effect of income taxes for our sample of couples. The income after taxes is calculated by subtracting the federal, cantonal, and municipal taxes from the taxable income.

Given the progressive design of the Swiss income tax system, it is worthwhile to take a closer look at the relationship between the two counteracting effects. Figure 4 compares the mating-induced effect to the tax-induced effect for each percentile within the top 20%.[11] The graph shows that at the top of the distribution, the mating-induced effect offsets the tax effect up to the 95th percentile. Thereafter, the mating effect is significantly smaller than the progressive tax effect. This is consistent with our results in Table 3.

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[10]The tax redistribution effect on the Gini coefficient is 2.81%. It is important to note that we limit our analysis to the opposite tax redistribution effect and do not adjust for transfers. Therefore, the redistribution effect on the Gini coefficient is comparably low and not suitable for a cross-country comparison.

[11]Note that the figure depicts smoothed effects.

Figure 4: Comparison between mating effects on income inequality and tax redistribution.

Mating effect vs. tax effect
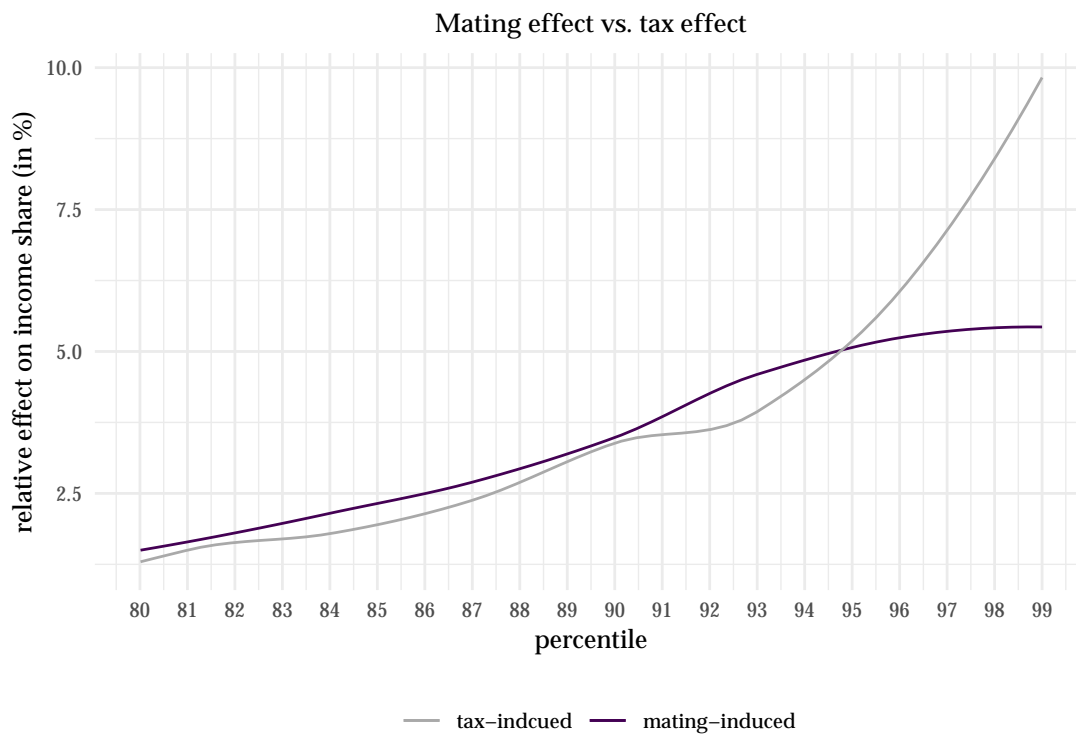
Notes: The Figure compares the smoothed mating-induced and tax-induced effects on income shares per percentile. The mating effect represents the relative increase in the respective income share due to marital sorting compared to a random scenario. The tax effect shows the relative decrease of the respective income share due to taxation. If both effects amount to the same value, we consider this is an offsetting situation.

4.5 Sensitivity analysis

We perform several specification checks to examine the sensitivity of our results. For each sensitivity analysis, we depict measure the extent of assortative mating and the distributional consequences.[12]

Alternative income measures First, we base our analysis on labour income instead of annual income. Compared to the more broadly defined annual income, this measure is limited to the professional income of the couple. We find a similar matting pattern as in the baseline model. Second, we run a sensitivity analysis based on net income. The test shows that the income-based assortative mating is more prominent than in the baseline model. The kind of income influences the size of the assortative mating parameter and ultimately the size of the inequality effect. This is hardly surprising, given that, e.g., net income – in contrast to gross income – already takes deductions into account, whereas labour income neither considers deductions nor includes capital income.

Age Second, we consider specific subgroups in our sample. For instance, we limit the age of the couples to 25 to 44 years to see whether the distributional effect differ between younger and older spouses. We find that the assortative mating patterns with respect to income and education remain similar to the baseline model. The effect on inequality also remains stable. As might be expected, the impact on inequality is slightly smaller than in the baseline model.

Children Another interesting distinction to make is between couples having children and childless couples. For example, couples with children are already more likely to make joint economic decisions. Consequently, we expect the mating-induced inequality effect to be

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[12]Details are presented in the Online Appendix.

smaller than for couples without children. Overall, the effects are similar. Again, the mating-induced inequality effect offsets more than half of the distributional effect of taxes in the respective sub-sample.

Nationality Furthermore, it is worthwhile to analyze whether the couple's nationality and background (given by their familial parents' nationality) affect the inequality consequences. As our next sensitivity analysis shows, the distributional effects also remain similar when we restrict the sample to couples with Swiss nationality. At this point, however, it is important to note that our dataset only includes permanent residents, which might explain the small differences between the overall effects and the effects for couples and parents with Swiss nationality. Again, the mating-induced inequality effect is substantial compared to the redistributive effect of taxes.

5   Conclusion

This paper examines the relationship between marital sorting and income inequality in Switzerland. Our analysis shows that assortative mating occurs throughout the income distribution. Sorting intensifies as the level of income rises and is more pronounced at the distribution tails. In other words, high and low earners specifically tend to marry alike. Moreover, we provide evidence that this pattern is exacerbating household income inequality. By comparison, the redistributive effect of marital sorting at the top of the distribution offsets the tax redistribution effect up to the top 5 percentile. After that, the tax effect dominates.

In the light of ongoing public debates on rising inequality and the redistribution of income, our results further stress the economic significance of assortative mating. Our paper is first to provide transparency about the relationship between the two counteracting effects. While the tax system aims at reducing, assortative mating exacerbates income inequality. As such, our analysis sheds light on the interaction between collective and individual behavior. The concentration of household income, amongst others, follows from individual mating preference. At the same time, the collectively determined tax system aims at redistributing this income. Progressively designed tax systems redistribute most where marital sorting is most pronounced: at the tails of the income distribution. Thus, we observe a tipping point where the tax effect exceeds the mating effect.

Future empirical research should focus on the dynamic interplay between martial sorting and redistributive policies. On the one hand, it would be particularly interesting to compare countries with regard to these two opposite distributional effects. On the other hand, the design of couples' income taxation matters, e.g., for partners' labor supply decisions (Bredemeier and Juessen, 2013). Therefore, future studies should also analyze the impact of tax system design on inequality driven by assortative mating.

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Appendix

Table A1: OLS regression

	Dependent variable: Status of women	
	Income	Education
	(1)	(2)
Log-log-regression:		
Status of men	0.303***	0.484***
	(0.005)	(0.014)
Constant	7.720***	4.417***
	(0.056)	(0.123)
Observations	31,800	3,883
Rank-rank-regression:		
Status of men	0.337***	0.476***
	(0.005)	(0.014)
Constant	10,644.100***	1,016.811***
	(97.410)	(31.299)
Observations	32,112	3,883

Notes: *p<0.1; **p<0.05; ***p<0.01

Notes: The table presents the regression results from log-log regressions (upper part of the table) and rank-rank regressions (lower part of the table) both for education and income. This serves as a comparison to existing research and complements the contingency tables by average effects.

Online Appendix

OA Marital sorting at the distribution tails

Figure O1: Marital income sorting in top and bottom 1%
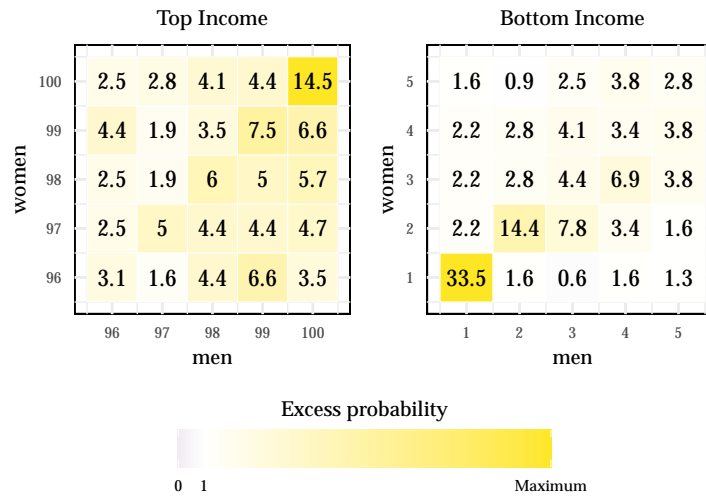
Notes: The Figure shows the assortative mating parameters with regard to income in the top and bottom 1%. The assortative mating parameter expresses for each income percentile how frequent a marriage is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.

Figure O2: Marital income sorting in top and bottom 5%
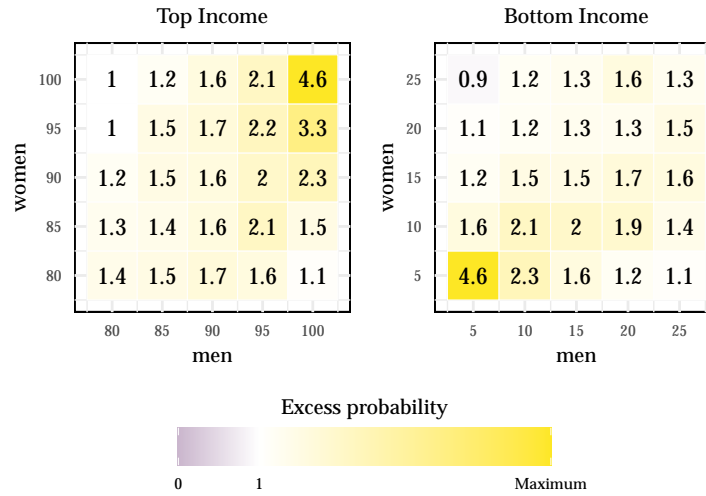
Top Income

women \ men	80	85	90	95	100
100	1	1.2	1.6	2.1	4.6
95	1	1.5	1.7	2.2	3.3
90	1.2	1.5	1.6	2	2.3
85	1.3	1.4	1.6	2.1	1.5
80	1.4	1.5	1.7	1.6	1.1

Bottom Income

women \ men	5	10	15	20	25
25	0.9	1.2	1.3	1.6	1.3
20	1.1	1.2	1.3	1.3	1.5
15	1.2	1.5	1.5	1.7	1.6
10	1.6	2.1	2	1.9	1.4
5	4.6	2.3	1.6	1.2	1.1

Excess probability

0   1   Maximum

Notes: The Figure shows the assortative mating parameters with regard to income in the top and bottom 5%. The assortative mating parameter expresses for each income percentile how frequent a marriage is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.

Figure O3: Marital income sorting in top and bottom 10%

Top Income

women \ men	60	70	80	90	100
100	0.6	0.8	1	1.5	3
90	0.9	1	1.3	1.5	2
80	1	1.2	1.3	1.6	1.4
70	1.1	1.2	1.3	1.4	0.8
60	1.2	1.3	1.3	1	0.7

Bottom Income

women \ men	10	20	30	40	50
50	0.7	0.9	1	1.1	1.1
40	0.9	1	1.2	1.4	1.3
30	1	1.3	1.4	1.5	1.4
20	1.2	1.4	1.5	1.5	1.2
10	2.6	1.7	1.2	0.9	0.7

Excess probability

0   1   Maximum

Notes: The Figure shows the assortative mating parameters with regard to income in the top and bottom 10%. The assortative mating parameter expresses for each income percentile how frequent a marriage is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.

OB   Details of Sensitivity analyses

Table O1: Distributional effects of taxation vs. mating (in %).

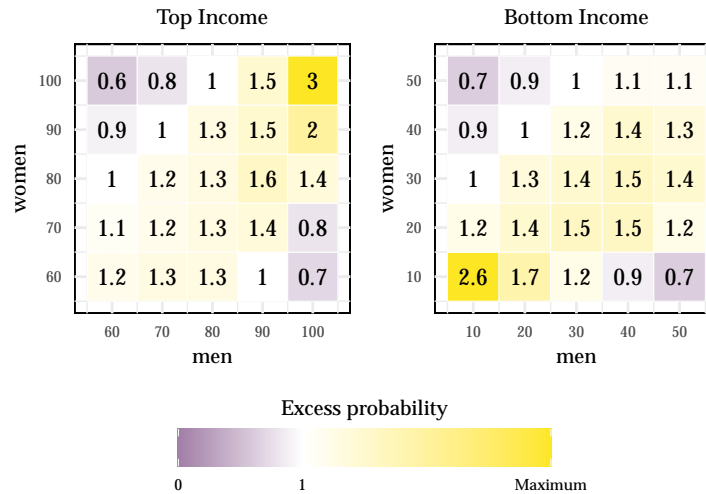|	Redistributive effect (top 1)	Mating-induced effect (Gini)	Mating-induced effect (top 1)
baseline model	8.96	10.73	5.20
Sensitivity analyses			
labour income	n/a	12.45	8.14
net income	n/a	16.20	5.21
age	7.48	9.58	4.91
children	6.13	12.41	4.94
nationality	9.48	10.57	4.65

Notes: The table presents the relative distributional effects of both taxes (column 1) and mating patterns (columns 2 and 3) for the baseline model and for the different sensitivity analyses. As our tax redistributive effect is based on taxable income, we cannot derive a redistributive effect for labour or net income.

Figure O4: Sorting based on labour income

Income

	20	40	60	80	100
100	0.7	0.6	0.7	1	2
80	0.8	0.8	1	1.2	1.3
60	0.8	1	1.2	1.2	0.8
40	1	1.3	1.3	0.9	0.5
20	1.8	1.2	0.8	0.7	0.5

Education

	1	2	3	4	5
5	0.2	0.5	0.9	0.8	1.9
4	0.5	1.1	0.9	1.6	0.7
3	0.9	0.9	1.8	0.7	1
2	1.5	1.4	1	1	0.4
1	4.4	1.2	1	0.5	0.2

Excess probability

0.0   0.5   1.0   1.5   2.0

Notes: The Figure shows the assortative mating parameters based on labour income. The assortative mating parameter expresses for each income percentile how frequent a match is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.
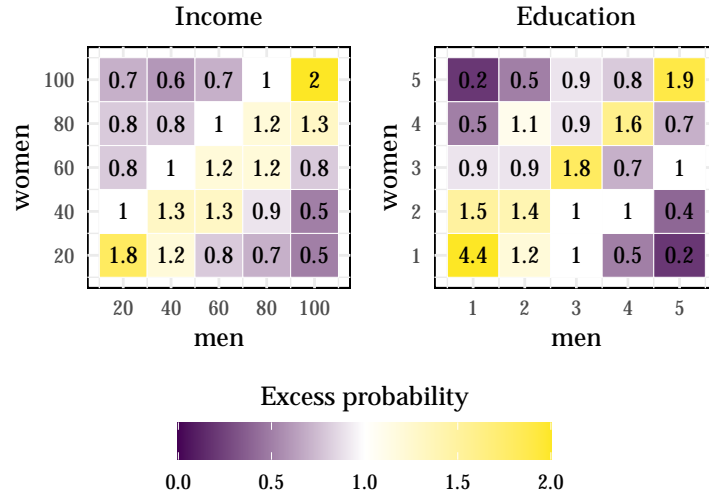
Figure O5: Sorting based on net income

Income

women \ men	20	40	60	80	100
100	0.5	0.7	0.8	1	2
80	0.5	0.9	1.1	1.2	1.3
60	0.6	1.2	1.2	1.3	0.8
40	0.7	1.4	1.3	0.9	0.6
20	2.7	0.8	0.6	0.5	0.4

Education

women \ men	1	2	3	4	5
5	0.2	0.5	0.9	0.8	1.9
4	0.5	1.1	0.9	1.6	0.7
3	0.9	0.9	1.8	0.7	1
2	1.5	1.4	1	1	0.4
1	4.4	1.2	1	0.6	0.2

Excess probability

0.0   0.5   1.0   1.5   2.0
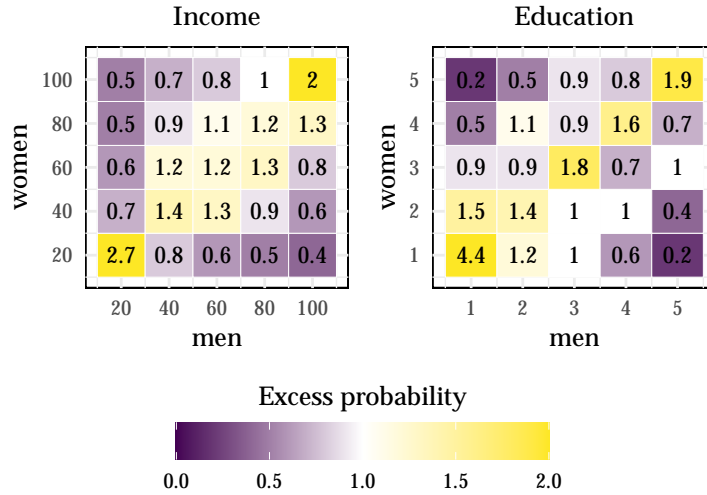
Notes: The Figure shows the assortative mating parameters based on net income. The assortative mating parameter expresses for each income percentile how frequent a match is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.
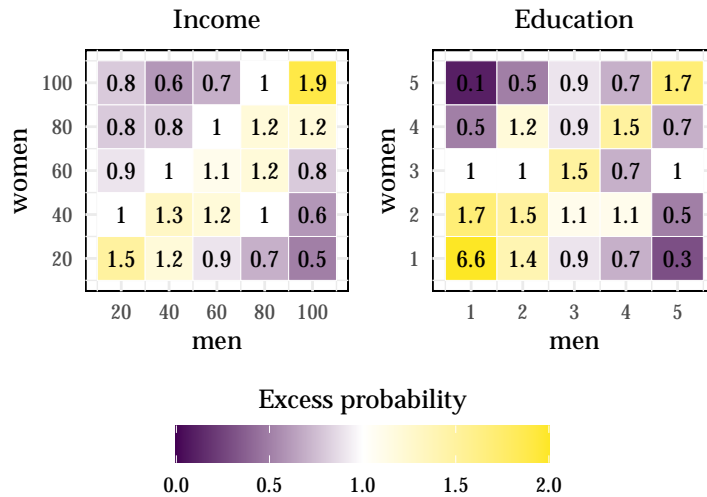
Figure O6: Sorting among 25-44 years old couples

Income

women \ men	20	40	60	80	100
100	0.8	0.6	0.7	1	1.9
80	0.8	0.8	1	1.2	1.2
60	0.9	1	1.1	1.2	0.8
40	1	1.3	1.2	1	0.6
20	1.5	1.2	0.9	0.7	0.5

Education

women \ men	1	2	3	4	5
5	0.1	0.5	0.9	0.7	1.7
4	0.5	1.2	0.9	1.5	0.7
3	1	1	1.5	0.7	1
2	1.7	1.5	1.1	1.1	0.5
1	6.6	1.4	0.9	0.7	0.3

Excess probability

0.0   0.5   1.0   1.5   2.0

Notes: The Figure shows the assortative mating parameters with regard to income and education for couples that are between 25 and 44 years old. The assortative mating parameter expresses for each income percentile how frequent a match is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.
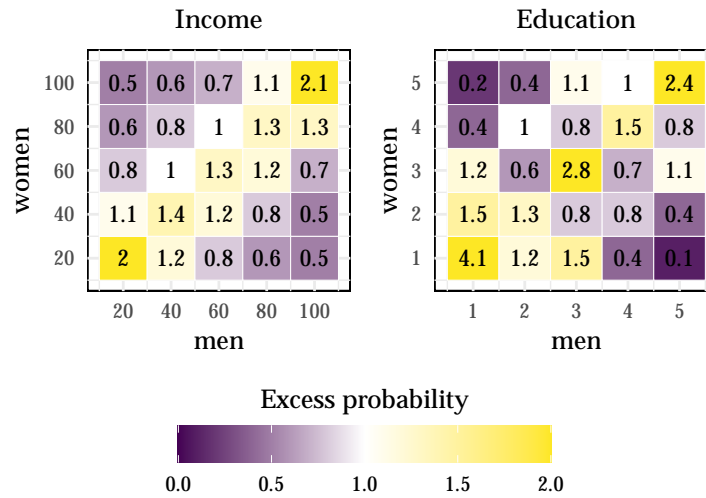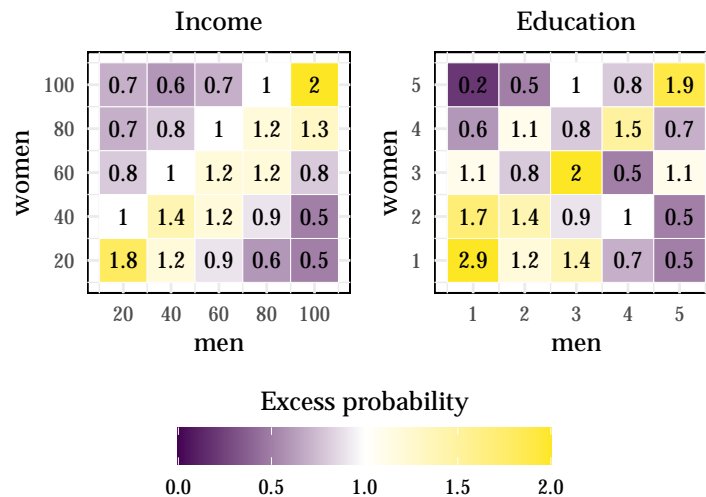
Figure O7: Sorting among childless couples

Income

women \ men	20	40	60	80	100
100	0.5	0.6	0.7	1.1	2.1
80	0.6	0.8	1	1.3	1.3
60	0.8	1	1.3	1.2	0.7
40	1.1	1.4	1.2	0.8	0.5
20	2	1.2	0.8	0.6	0.5

Education

women \ men	1	2	3	4	5
5	0.2	0.4	1.1	1	2.4
4	0.4	1	0.8	1.5	0.8
3	1.2	0.6	2.8	0.7	1.1
2	1.5	1.3	0.8	0.8	0.4
1	4.1	1.2	1.5	0.4	0.1

Excess probability

0.0   0.5   1.0   1.5   2.0

Notes: The Figure shows the assortative mating parameters with regard to income and education for couples that do not have children (yet). The assortative mating parameter expresses for each income percentile how frequent a match is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.

Figure O8: Sorting among couples with Swiss nationality

Income

women \ men	20	40	60	80	100
100	0.7	0.6	0.7	1	2
80	0.7	0.8	1	1.2	1.3
60	0.8	1	1.2	1.2	0.8
40	1	1.4	1.2	0.9	0.5
20	1.8	1.2	0.9	0.6	0.5

Education

women \ men	1	2	3	4	5
5	0.2	0.5	1	0.8	1.9
4	0.6	1.1	0.8	1.5	0.7
3	1.1	0.8	2	0.5	1.1
2	1.7	1.4	0.9	1	0.5
1	2.9	1.2	1.4	0.7	0.5

Excess probability

0.0   0.5   1.0   1.5   2.0

Notes: The Figure shows the assortative mating parameters with regard to income and education for couples with Swiss nationality and Swiss family background. The assortative mating parameter expresses for each income percentile how frequent a match is, compared to its frequency under random mating. The random mating is simulated by bootstrapping with a sample of 1000.