Online Appendix of:

Transitory Earnings Opportunities and Educational Scarring of Men

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Table A.1: Education Classification in Statistics Iceland's Education Register

Level	Description	Broad Category	Nr. of sub-categories
0	Less than primary education		1
1	Primary education	Compulsory education	1
2	Lower secondary education	Compulsory education	8
3	Upper secondary education	Junior college and vocational education	8
4	Post-secondary non-tertiary education	Junior college and vocational education	5
5	Short-cycle tertiary education	Higher education	2
6	Bachelor's or equivalent level	Higher education	3
7	Master's or equivalent level	Higher education	2
8	Doctoral or equivalent level		1
			31

A Data Appendix

A.1 Educational Attainment

Data on educational attainment is drawn from Statistics Iceland's *Education Register*. This register is based largely on Statistics Iceland's *Degree Register*. For this register data on completed education is collected twice a year from all schools in the formal education system, in May-June and December after graduations, and in some cases directly from the Ministry of Education, as in the case of the journeyman's examination. The Education Register also builds on various other additional sources, including university graduates back to 1912, certified masters' of trades (some without attending the masters' school) back to 1937, graduations from upper secondary schools before the start of regular data collection, information on licenses for particular occupations, information from Statistics Iceland's census, records from the Immigration office, and information from various surveys conducted by Statistics Iceland.

In the Education Register, educational attainment is classified according to the *ÍSMENNT* standard, which is based on the international standard classification of education (*ISCED*), while taking into account the education attained by Icelandic students from early 20th century. As summarized in Table A.1, the standard divides attained education into nine levels, out of which six are further subdivided. In all, educational attainment is classified into 31 educational classes. The Register records completed education. Education is considered completed once the student can transition to next level, as is the case at lower levels, or completed with sufficient qualification and degree.

In my analysis, my main measure of educational attainment is education measured as years of school. One year refers to the school year, is normally 8-10 months (2-3 terms). For university education there are two semesters, where each semester refers to 30 credits according to the European Credit Transfer and Accumulation System (ECTS) or equivalent before introduction of the ECTS system. I translate education attained into years of school based on the time required to complete a given level or degree. For example, a junior college degree translates to 4 years of school and a bachelor's degree (180 ECTS) translates to 3 years.

A.2 Occupation and Sector Classification

The pay slip data records occupation according to a two-digit classification. There are 74 separate occupation classes recorded. The occupation classification is an Icelandic version of the International Labor Organization's (ILO) International Standard Classification of Occupations (ISCO), version ISCO-88. More details on the classification are provided in documentation on ILO's website. Table A.2 documents the structure of the classification and lists the broader occupation groups. Subcategories within the broader occupation categories generally refer to sector specific groups. For example, within *Elementary occupations* there are manufacturing laborers and construction laborers.

The pay slip data also record the sector for each firm. In total there are 189 separate sector classes recorded. The sector classification is based on the United Nations' International Standard Industrial Classification of All Economic Activities (ISIC). Details about the classification are provided in documentation on UN's website. Table A.3 documents the structure of the sector classification.

Table A.2: Occupation Classification

Group	Occupation category	No. of subcategories
1	Legislators, senior officials and managers	17
2.	Professionals	5
3.	Technicians and associate professionals	8
4.	Clerks	7
5.	Service workers and shop and market sales workers	9
6.	Plant and machine operators and assemblers	1
7.	Skilled agriculture and fishery workers	7
8.	Craft and related trades workers	11
9.	Elementary occupations	9
0.	Armed Forces	0
		74

Notes: The occupation classification is based on the International Labor Organization's (ILO) International Standard Classification of Occupations (ISCO), version ISCO-88. For a detailed description of the classification, see ILO's website.

Table A.3: Sector Classification

Group	Sector category	No. of subcategories
1	Activities of extraterritorial organizations and bodies	2
2	Agriculture and forestry	10
3	Fishing	6
4	Manufacturing	64
5	Mining and quarrying	2
6	Construction	16
7	Other service activities	6
8	Electricity, gas, steam, and air conditioning supply	2
9	Water supply; sewage, waste management and remediation activities	2
10	Wholesale and retail trade; repairs of motor vehicles and motorcycles	19
11	Financial and insurance activities	5
12	Real estate activities	2
13	Rental and leasing activities	2
14	Transportation and storage	10
15	Public administration and defense; compulsory social security	6
16	Education	4
17	Human health and social work activities	11
18	Arts, entertainment and recreation	8
19	Professional, scientific and technical activities	9
20	Activities of households as employers	1
21	Accommodation and food service activities	2
		189

Notes: The sector classification is based on the United Nations' International Standard Industrial Classification of All Economic Activities (ISIC). For a detailed description of the classification, see UN's website.

B A Model of Aggregate Production with Cohort Specific Supplies

In this section, I outline the theoretical framework developed by Card and Lemieux (2001) and derive equation (2) presented in the main text. For a more comprehensive description of the model and its estimation, refer to the original paper.

The model relaxes the assumption of perfect substitution across cohorts assumed in conventional models of educated-related wage differentials, extending the model of Katz and Murphy (1992) which allows for imperfect substitution of workers depending on level of education. In the model, aggregate output depends on a nested CES aggregate with two-levels. The upper-level is identical to the model of Katz and Murphy (1992), where output is a function of labor with high (L_t) and low (H_t) education. In the context of the current paper, these are workers with only compulsory education (dropouts) and workers with post-compulsory education (high-school graduates). Card and Lemieux (2001) add a lower level where supplies of each education group are themselves two CES subaggregates of the labor supply of different age groups (j). Aggregate education supplies therefore depend on age-group specific supplies. Education supplies of each group are:

$$H_t = \left(\sum_j \alpha_j H_{ij}^{\eta} \right)^{\frac{1}{\eta}} \qquad L_t = \left(\sum_j \beta_j L_{ij}^{\eta} \right)^{\frac{1}{\eta}} \tag{1}$$

where $\sigma_A = 1/(1-\eta)$ is the elasticity of substitution across age groups j with the same education. As $\eta \to 1, \sigma_A \to \infty$ and groups are perfect substitutes. α_j and β_j are efficiency parameters, assumed fixed by cohort and over time.

Aggregate output in period t is also a CES:

$$Y_t = (A_{Ht}H_t^{\rho} + A_{Lt}L_t^{\rho})^{\frac{1}{\rho}} \tag{2}$$

where $\sigma_E = 1/(1-\rho)$ is the elasticity of substitution between education groups, as in Katz and Murphy (1992). A_H, A_L are time-varying efficiency parameters.

The marginal product of labor for a given education-cohort group is determined by two factors: the labor supply of that specific education-cohort group and the aggregate labor supply of workers with the same education level. Under the assumption of competitive wage setting, wages are equal to marginal products. Accordingly, the wages for low-educated workers in cohort j are given by:

$$\begin{aligned} w_{jt}^L &= \frac{\partial Y_t}{\partial L_{jt}} = \frac{\partial Y_t}{\partial L_t} \times \frac{\partial L_t}{\partial L_{jt}} \\ &= A_{Lt}L_t^{\rho-\eta}\Psi \times \beta_j L_{jt}^{\eta-1} \end{aligned} \tag{3}$$

where

$$\Psi = (A_{Ht}H_t^{\rho} + A_{Lt}L_t^{\rho})^{\frac{1}{\rho}-1}$$

Similarly, the wages for high-educated workers in cohort j are

$$w_{jt}^H = A_{Ht}H_t^{\rho-\eta}\Psi \times \beta_j H_{jt}^{\eta-1} \tag{4}$$

Provided that $\eta < 1$, the age-specific wage by education group is declining in age-specific labor supply for that education group.

Using equations (3) and (4), we get that the relative wage of low-educated workers in cohort j, w_{jt}^L, to the wage of high-educated workers in the same cohort, w_{jt}^H, is

$$\ln\left(\frac{w_{jt}^L}{w_{jt}^H}\right) = \ln\left(\frac{A_{Lt}}{A_{Ht}}\right) + \ln\left(\frac{\beta_j}{\alpha_j}\right) + \left[\frac{1}{\sigma_A} - \frac{1}{\sigma_E}\right]\ln\left(\frac{L_t}{H_t}\right) - \frac{1}{\sigma_A}\ln\left(\frac{L_{jt}}{H_{jt}}\right) \tag{5}$$

In the context of this paper, the focus is on quantifying how changes in the relative supply of low-educated and high-educated workers within a cohort influence the relative wages of these two education groups. To align with the empirical setting, consider two adjacent birth cohorts, j and j', where cohort j is affected by the tax reform, and cohort j' is not. Equation (5) describes the relative wages in cohort j, with an analogous equation for cohort j'. Taking the difference between the two equations yields:

$$\Delta\ln\left(\frac{w_{jt}^L}{w_{jt}^H}\right) = -\frac{1}{\sigma_A}\Delta\ln\left(\frac{L_{jt}}{H_{jt}}\right)$$

assuming that the relative efficiency parameters are the same for the two cohorts. This is equation (2) in the main text.

Using empirical estimates of the effect of the tax-free year on educational attainment in the affected cohorts, along with estimates of σ_A from the literature, particularly from Card and Lemieux (2001), we can quantify the effect on the relative wages of education groups. In Section 3, I estimate an 8 percent increase in the dropout rate. Card and Lemieux (2001) estimate σ_A for five-year birth cohorts using data from the U.S. (1959-1996), the U.K. (1974-1996), and Canada (1980-1995). Their estimates of σ_A range from 3.8 to 4.9 for the U.S., 3.8 to 4.3 for the U.K., and 6.1 to 6.2 for Canada (see Table 3 in Card and Lemieux (2001)). Acemoglu and Autor (2011) estimate a comparable elasticity of 3.7 using U.S. data from 1963-2008. Combining these estimates with the calculated effect on educational attainment, we find that the relative wage of low-educated workers decreases by between 1.3 and 2.1 percent. This general equilibrium effect accounts for 25 to 40 percent of the total estimated earnings effect for the affected cohorts, as discussed in Section 4. Moreover, using equation (2), we can calibrate the value of σ_A that would equate the estimated effects on education and earnings, which yields $\sigma_A = 1.57$. As noted in the main text, this would imply that similarly educated workers from adjacent birth cohorts are as poor substitutes as high school-educated and college-educated workers (Katz and Murphy, 1992; Acemoglu and Autor, 2011).

C Effects on Marriage and Fertility as an Income Effect

The findings in Section 4 reveal that dropouts suffer large income losses in adulthood as well as reduced marriage and fertility. This effect might run through two alternative channels. On the one hand, dropping out of school may directly affect marriage and fertility. For example, much prior work has documented educational assortative mating (Mare, 1991; Pencavel, 1998) and recent studies document how schools act as marriage markets (Blossfeld, 2009; Kirkebøen, Leuven, and Mogstad, 2021). On the other hand, reduced socioeconomic success might reflect an income effect where earnings loss leads to reduced marriage and fertility. For example, as first emphasized by Becker (1960), if children are "normal goods" a fall in income will lead to less fertility.

To evaluate the latter alternative, Table A.4 summarizes estimates from prior studies of the effect of windfall income on marriage and fertility. Cesarini, Lindqvist, Östling, and Terskaya (2021) study the impact of winning a lottery on marital and fertility outcomes among Swedish male and female lottery players. Evaluating outcomes several years after winning a lottery, they find that winning $100,000 increases men's propensity to marry by 30 percent. Exploiting similar variation, Golosovy, Graberz, Mogstad, and Novgorodsky (2021) estimate a smaller but significant average increase in marriage rates among US lottery winners of both genders.[1] Indeed, Cesarini, Lindqvist, Östling, and Terskaya (2021) find that lottery wealth does not significantly alter women's propensity to marry, which may partly explain the difference. Cesarini, Lindqvist, Östling, and Terskaya (2021) also estimate that winning the lottery increases the likelihood of having a child by roughly

[1] Chu, Lin, and Tsay (2020) estimate the marriage response to an increase in housing wealth and find that a 10% increase in housing wealth induces a 4% increase in marriage rates. In contrast to the other studies, Hankins and Hoekstra (2011) find no effect on marriage among male winners in the Florida Lottery, but a reduction among female winners.

Table A.4: Comparison of Effects on Marriage and Fertility to Prior Studies

	Marriage (1)	Has children (2)	Number of children (3)
Windfall Income: $100,000 ↑			
Cesarini et al. (2021)	29.9%	13.4%	17.0%
Golosovy et al. (2021)	5.5%*	—	—
Chu et al. (2020)	3.9%**	—	—
Hankins and Hoekstra (2011)	No effect	—	—
Lovenheim and Mumford (2013)	—	16.4%	18.8%
School Dropout: $100,000 ↓	-13.5%	-16.0%	-42.4%

Notes: The table reports the effects of $100,000 increase/decrease in income or wealth on the outcome specified in the row heading. The table presents estimates for men unless otherwise indicated. Estimates for the impact of school dropout are the coefficient estimates for marriage and fertility reported in Figure 8 but scaled by the estimated effect on lifetime earnings (Figure A.18) such that -1% means that a $100,000 reduction in earnings reduces the outcome by 1% compared to the below-threshold average. Cesarini, Lindqvist, Östling, and Terskaya (2021), Golosovy, Graberz, Mogstad, and Novgorodsky (2021), and Hankins and Hoekstra (2011) report responses to windfall income from lottery winnings, and estimates in Lovenheim and Mumford (2013) and Chu, Lin, and Tsay (2020) responses to housing wealth increase.
* The estimates are for both men and women.
** The estimates are in measured as response to a 10% increase in wealth.

13% and the number of children by 17%. Exploiting increases in housing wealth, Lovenheim and Mumford (2013) find even stronger effects of wealth on fertility.

To compare my estimates to those in these studies, I present the estimated effect on marriage and fertility scaled by the estimated effect on lifetime earnings such that -1% means that a $100,000 reduction in earnings following school dropout reduces the outcome by 1% compared to the below-threshold average. A comparison of my estimates to prior studies demonstrates that my estimates are qualitatively and quantitatively in line with their estimates. While substantially smaller than estimates in Cesarini, Lindqvist, Östling, and Terskaya (2021), the effect on marriage is similar but somewhat larger than those in Golosovy, Graberz, Mogstad, and Novgorodsky (2021) and Chu, Lin, and Tsay (2020). The effect on fertility is broadly in line with prior estimates. For example, a $100,000 loss in lifetime earnings due to dropout is associated with as much reduction in fertility as Cesarini, Lindqvist, Östling, and Terskaya (2021) estimate that winning $100,000 increases fertility. This indicates that income effects from large losses in earnings may explain the estimated effects on marriage and fertility.

D Supplementary Figures

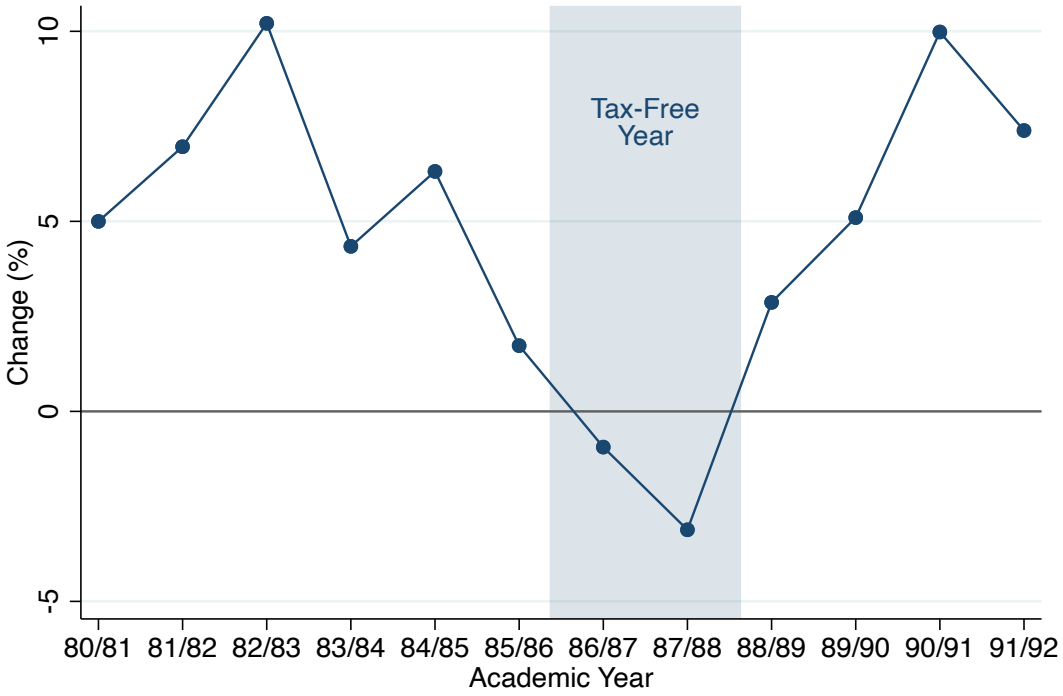
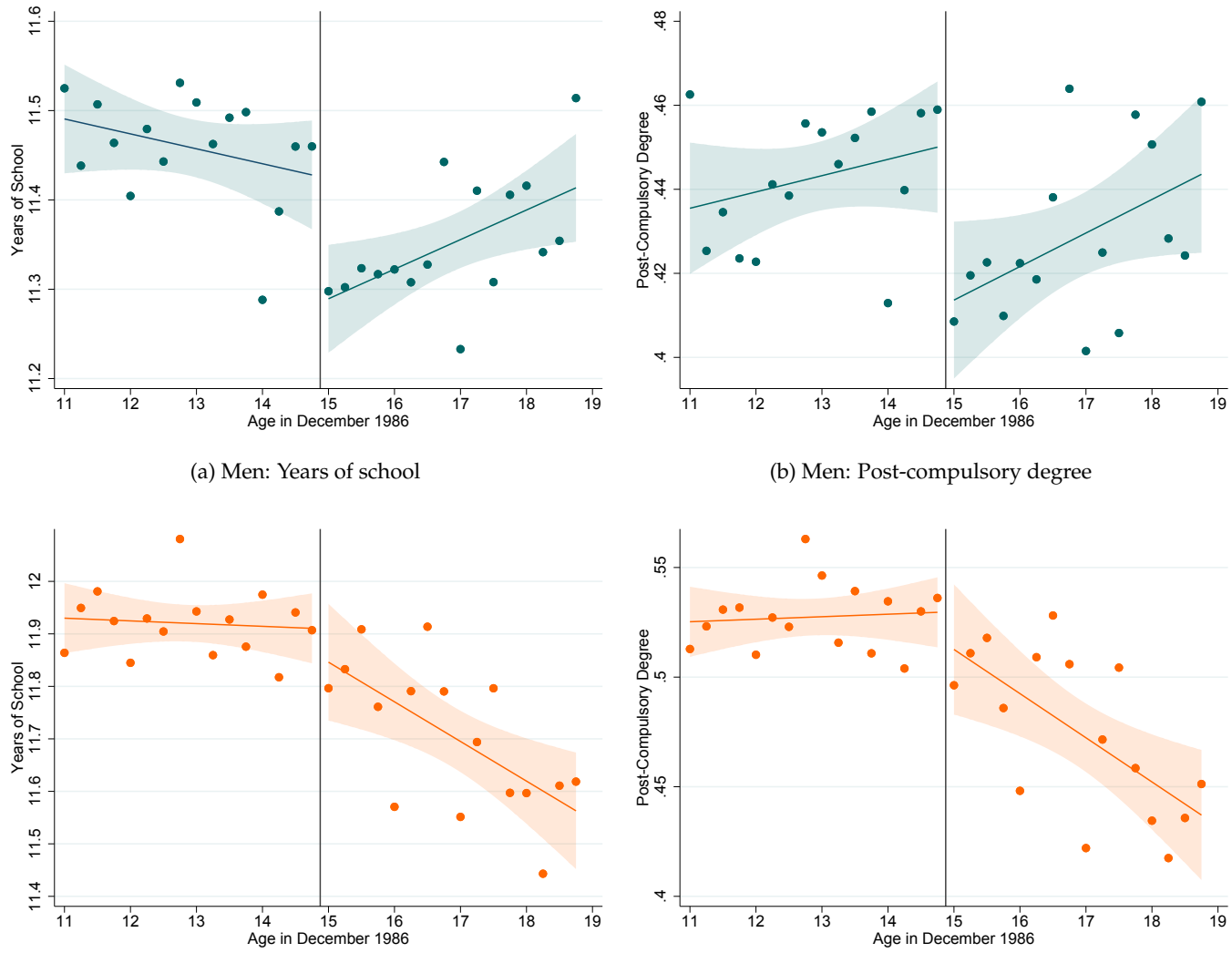


Figure A.1: Change in University Enrollment

Notes: This figure plots the percentage change in the number of students enrolled in University education each academic year. The shaded area covers the two academic years that the tax-free year influenced.



(a) Men: Years of school

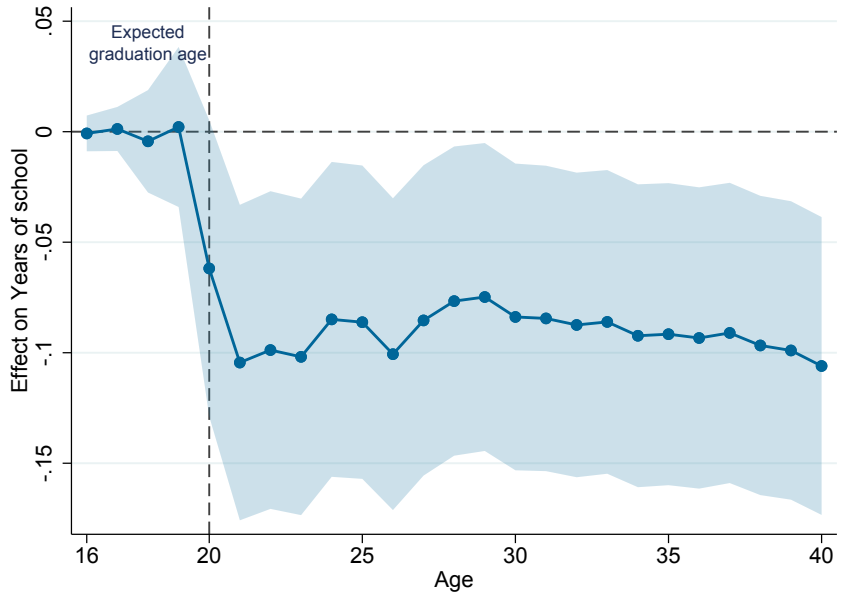
(b) Men: Post-compulsory degree

(c) Women: Years of school

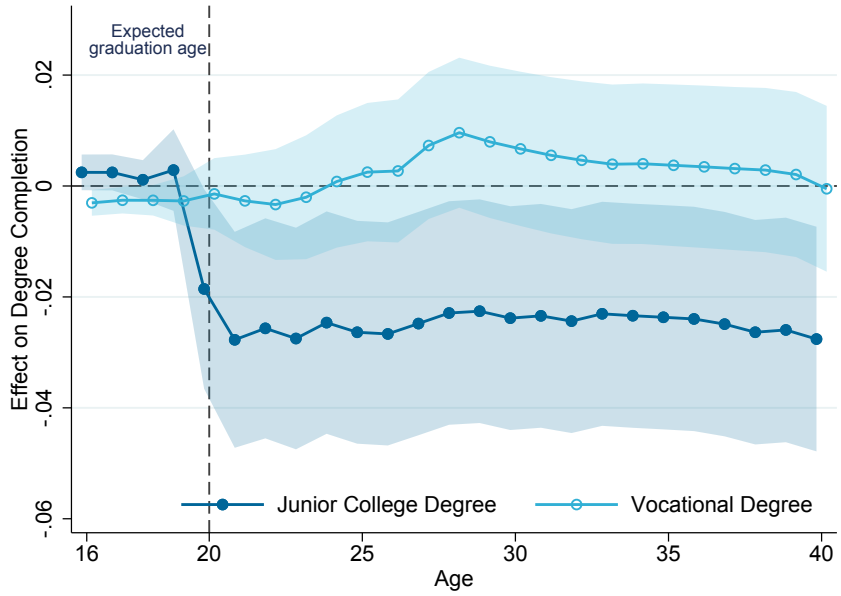
(d) Women: Post-compulsory degree

Figure A.2: Educational Attainment — Men and Women

Notes: This figure is a plot of average educational attainment at age 21 for four years on each side of the age threshold. Panels (a) and (c) plot the average number of pre-university years of school completed by men and women, respectively. Panels (b) and (d) plot the average share with a post-compulsory degree by men and women, respectively. The vertical line denotes the compulsory schooling age threshold. Dots are four-month age bins through which linear trends are fitted and their 95% confidence intervals.



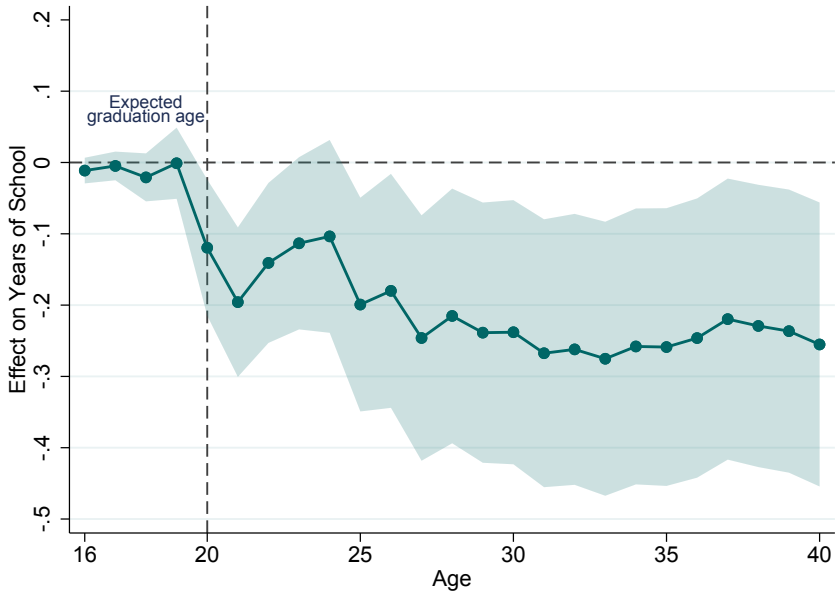
(a) Years of schooling



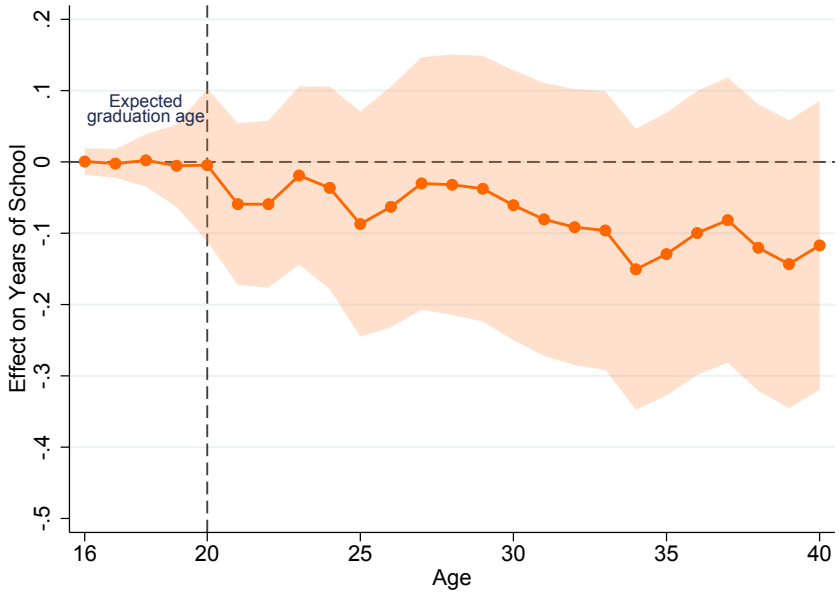
(b) Junior college and vocational degree

Figure A.3: Dynamics of the Effect of Tax-Free Year on Educational Attainment

Notes: This figure plots estimates using an RD-based event study design, where each coefficient corresponds to an RD estimate at a given age of 16-40. Vertical lines mark the expected—or normal—graduation age from upper secondary school, which is 20. Panel (a) plots the estimated effects of the tax-free year on years of schooling completed. Panel (b) plots the estimated effect on completing junior college and vocational degrees. Regressions control for pre-reform characteristics at age 16 including the region of residence, an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and an indicator for receiving disability benefits. The shaded areas show 95% confidence intervals, where the standard errors are clustered at the individual level.



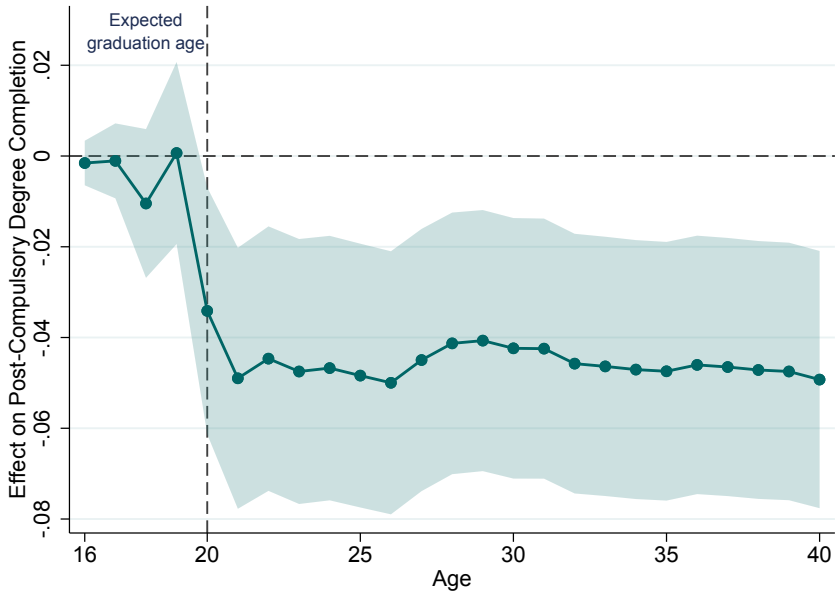
(a) Men: Years of school



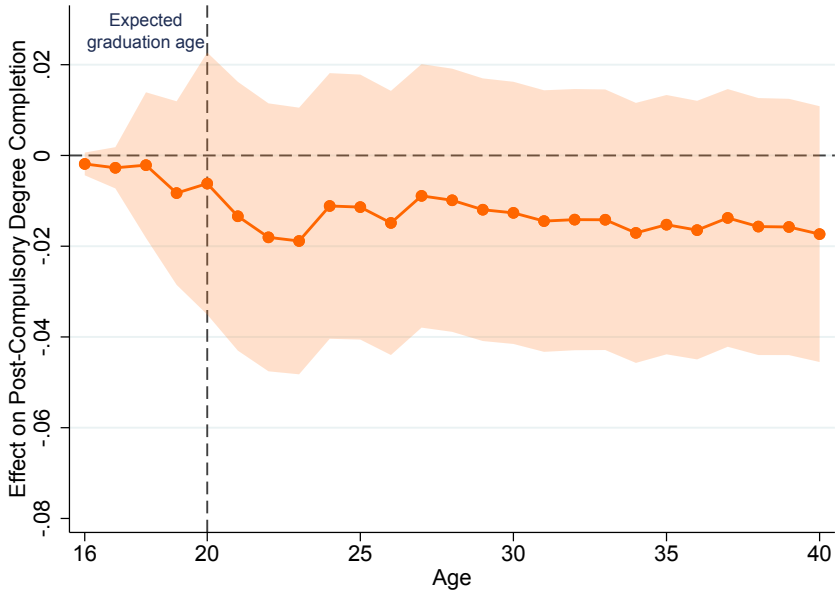
(b) Women: Years of school

Figure A.4: Years of Schooling

Notes: This figure is a plot of estimates using an RD-based event study design, where each coefficient corresponds to an RD estimate at a given age of 16-40. Vertical lines mark the expected—or normal—graduation age from upper secondary school, which is 20. Panel (a) plots estimated effects on years of schooling, including university education, for men, and Panel (b) does the same for women. Regressions control for pre-reform characteristics at age 16 including the region of residence, an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and an indicator for receiving disability benefits. The shaded areas show 95% confidence intervals.



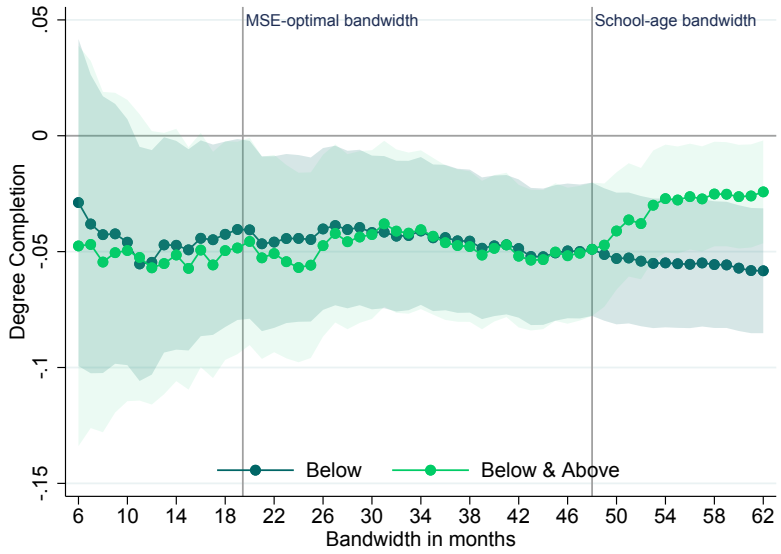
(a) Men: Post-Compulsory Degree



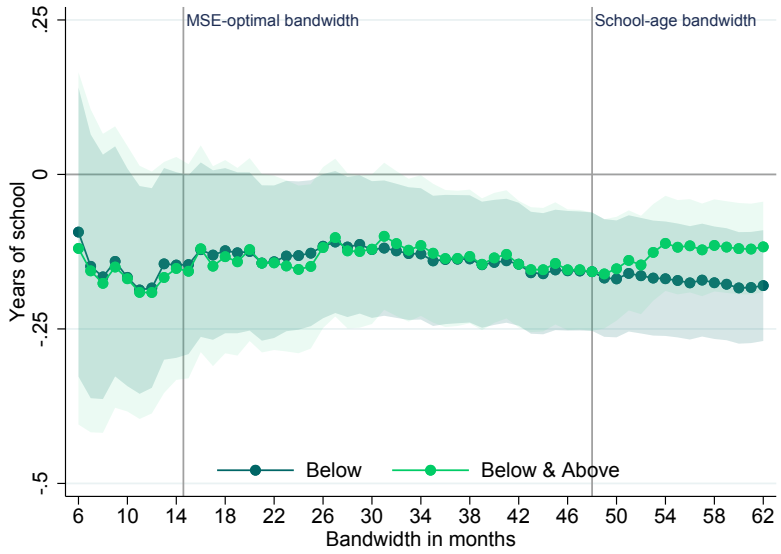
(b) Women: Post-Compulsory Degree

Figure A.5: Post-Compulsory Education

Notes: This figure plots estimates using an RD-based event study design, where each coefficient corresponds to an RD estimate at a given age of 16-40. Vertical lines mark the expected—or normal—graduation age from upper secondary school, which is 20. Panel (a) plots estimated effects on completion of a post-compulsory degree, i.e. of not dropping out, for men, and Panel (b) does the same for women. Regressions control for pre-reform characteristics at age 16 including the region of residence, an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and an indicator for receiving disability benefits. The shaded areas show 95% confidence intervals.



(a) Post-Compulsory Degree



(b) Years of school

Figure A.6: Effect on Educational Attainment: Sensitivity to the Choice of Bandwidth

Notes: This figure plots effects on the educational attainment of men, measured in panel (a) with an indicator for completing a post-compulsory degree and, in panel (b), by years of school using equation (1) for different bandwidths. Each dot is a separate regression estimate. Both figures plot coefficients from two sets of regressions. In one I vary the bandwidth below the schooling age threshold (i.e. the control group) while maintaining a 48-month bandwidth above (i.e. the treatment group). This way the treatment group includes everyone at normal upper-secondary schooling age. In the other set of regressions, I vary the bandwidth both below and above the threshold. Vertical lines mark the estimated MSE-optimal bandwidth and the school-age bandwidth, i.e. the bandwidth that includes those at normal upper-secondary schooling age during the tax-free year. Regressions control for pre-reform characteristics at age 16 including the region of residence, an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and an indicator for receiving disability benefits. The shaded areas show 95% confidence intervals.

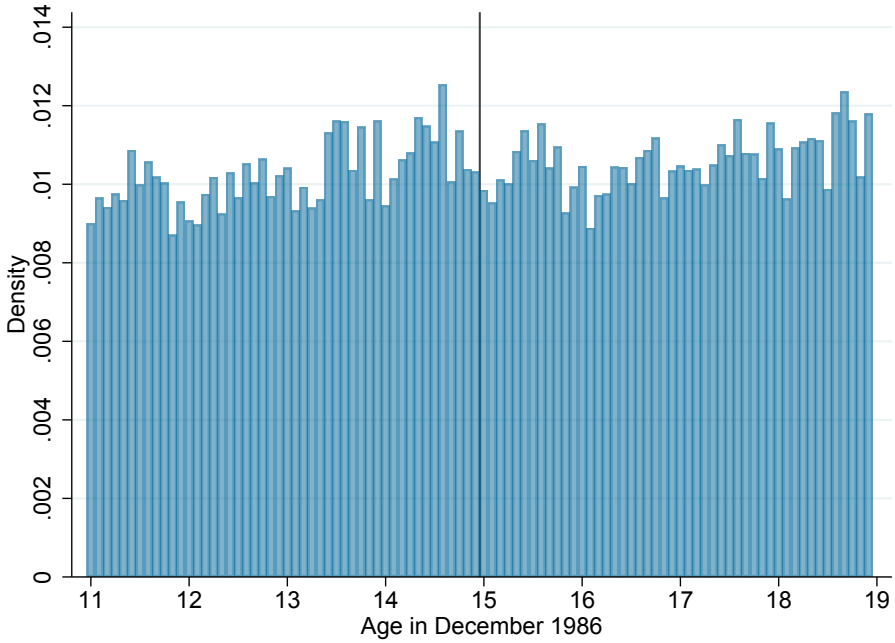
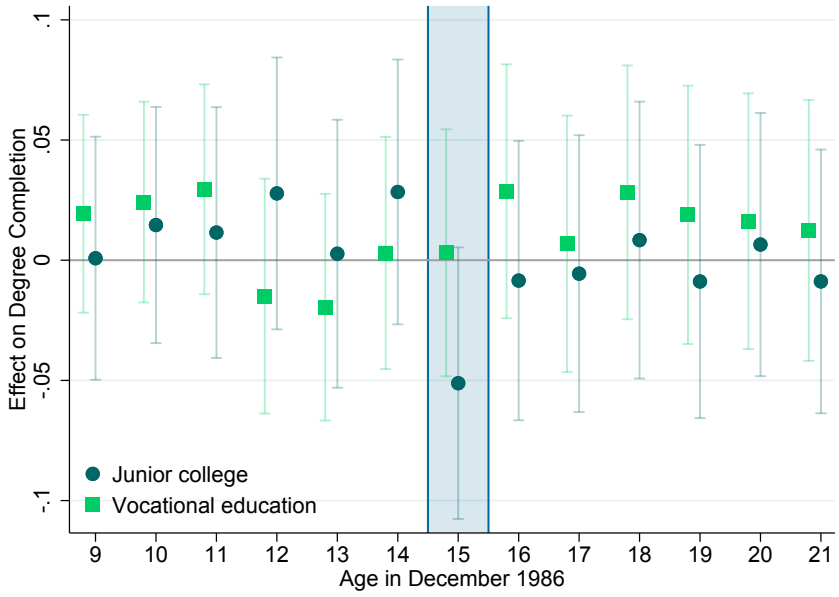
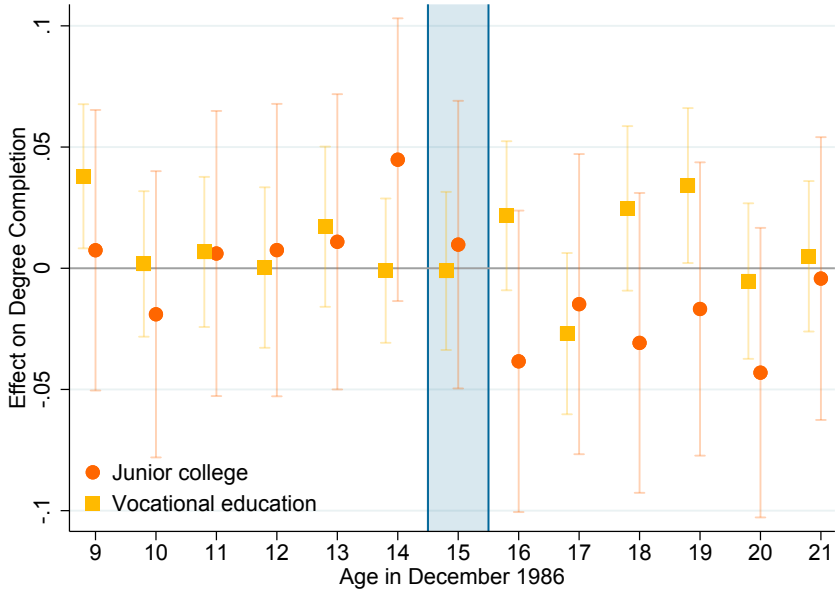


Figure A.7: Distribution of Births by Birth-Month Cohorts

Notes: This figure plots the distribution of births by birth-month cohorts of Icelanders who are between ages of 11 and 19 in December 1986. That is, cohorts born between January 1968 and December 1975.



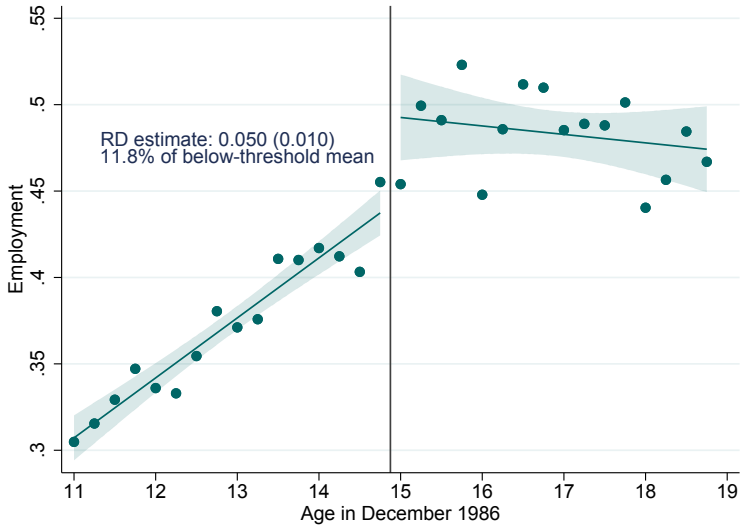
(a) Men



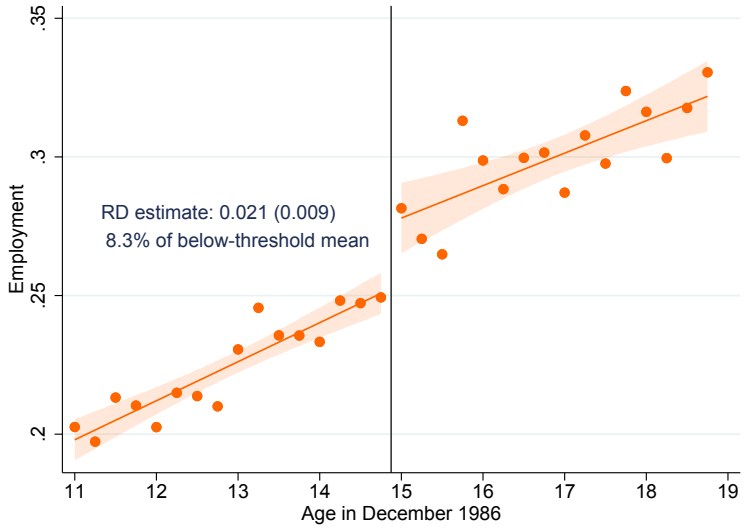
(b) Women

Figure A.8: Placebo Tests of Effects on Educational Attainment

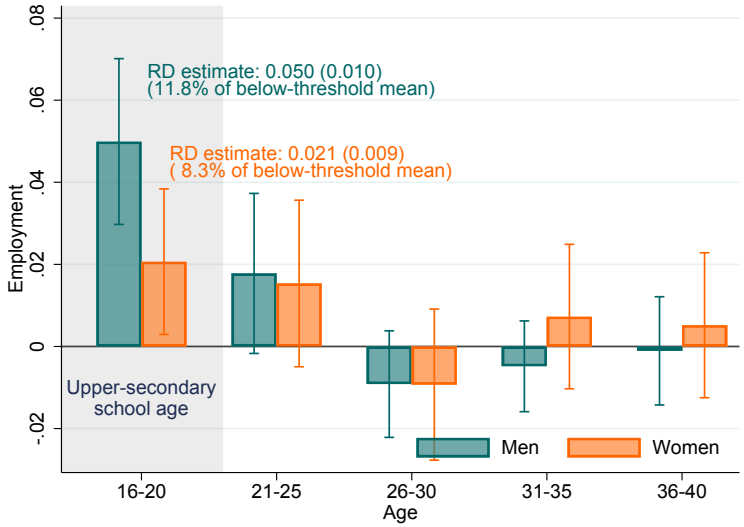
Notes: This figure plots tests of discontinuities in the educational attainment of men (panel a) and women (panel b) at the actual compulsory schooling age threshold in the tax-free year and at placebo thresholds. Educational attainment is measured as the completion of post-compulsory education, either junior college or vocational education. The bandwidth around the threshold is 12 months on each side. The figure plots the coefficient on an indicator for being above the relevant (actual or placebo) age threshold. The coefficient at age 14, for example, tests for discontinuities in the hypothetical tax-free year of 1989 but around the relevant age threshold (turning 16 by December 31, 1988). The students just above the school-age threshold in 1989 were 14 years old in 1987, which is the age used to label the x-axis. Regressions control linearly for date of birth in months and for pre-reform characteristics at age 16 including the region of residence, an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and an indicator for receiving disability benefits.



(a) Men: Employment



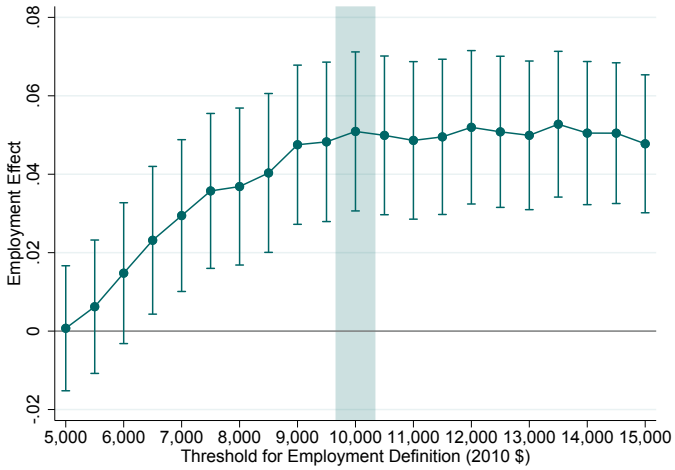
(b) Women: Employment



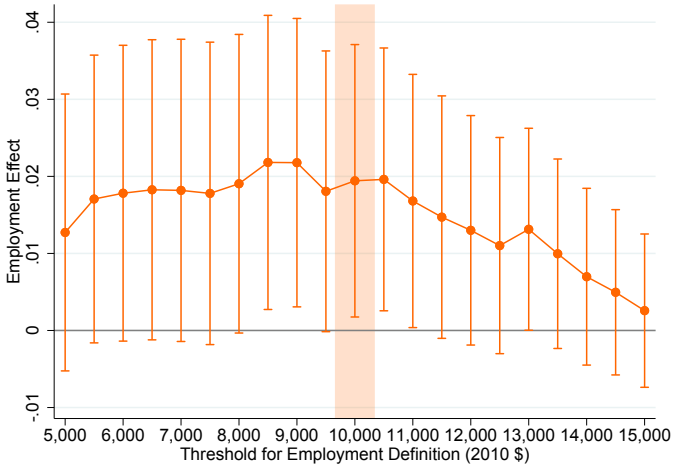
(c) Effect on Employment

Figure A.9: Effects of Tax-Free Year on Employment

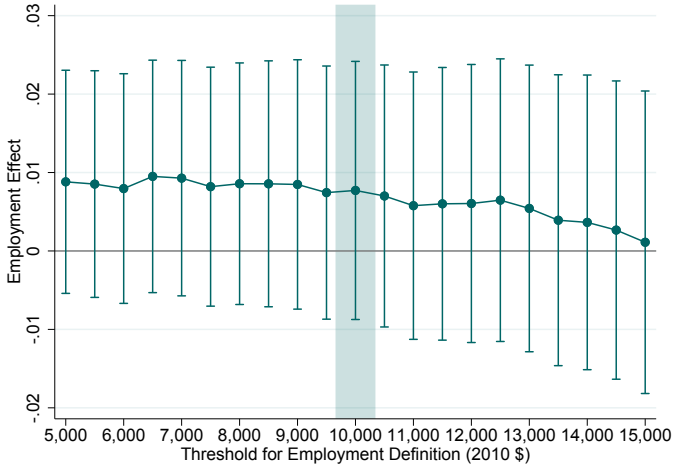
Notes: This figure studies the effect of the tax-free year on employment. Panels (a) and (b) plot the average employment at ages 16-20 around the compulsory schooling age threshold for men and women, respectively. Employment is defined as earning at least $10,000. Panel (c) plots RD estimates using equation (1) of the effect of the tax-free year on employment. The bars correspond to average effects at each age interval. Regressions control for year and region fixed effects and pre-reform characteristics at age 16 including an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and disability status. The whiskers display the 95% confidence intervals based on robust standard errors clustered at the individual level.



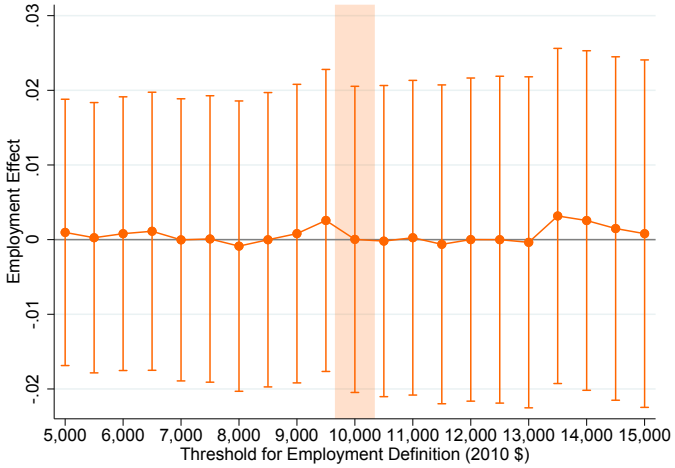
(a) Men: Effect on Employment at School Age



(b) Women: Effect on Employment at School Age



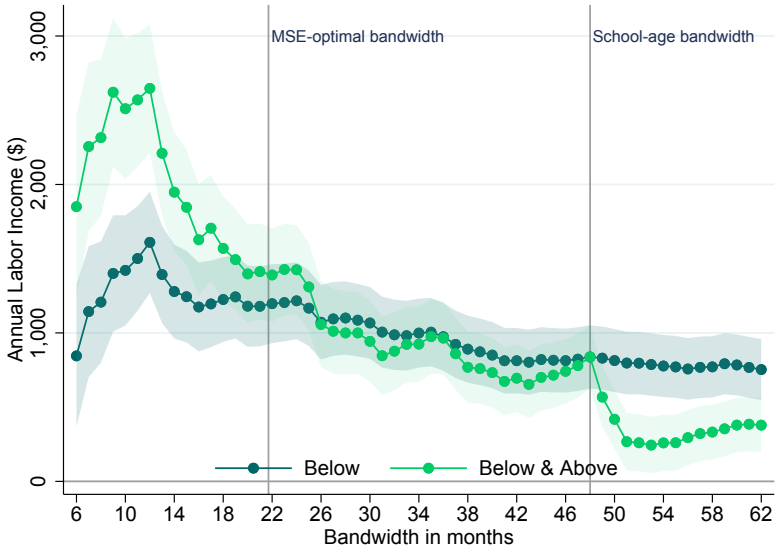
(c) Men: Effect on Employment at Prime Age



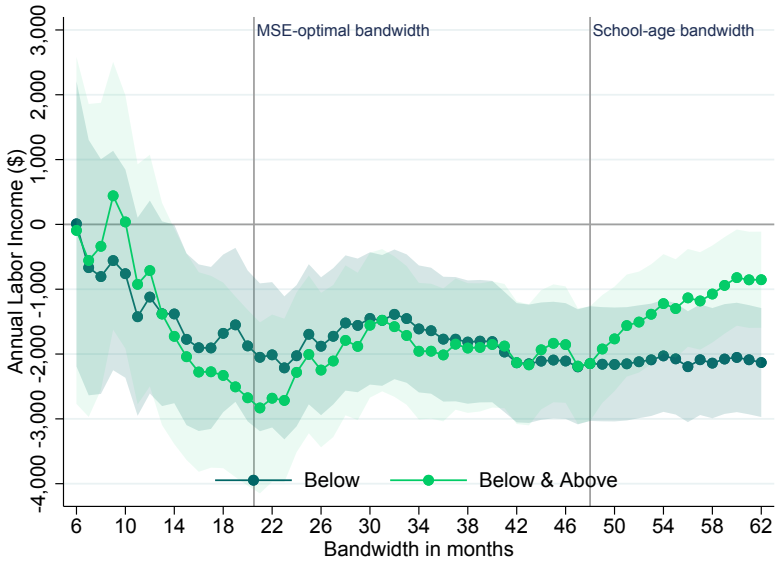
(d) Women: Effect on Employment at Prime Age

Figure A.10: Robustness to Varying the Earnings Threshold to Define Employment

Notes: This figure plots estimates of (1) where the outcome variable is employment defined as labor earnings exceeding a certain threshold. Panels (a) and (b) plot estimates at upper-secondary school age (16-20) for men and women, respectively. Panels (c) and (d) plot estimates at prime age (36-40) for men and women, respectively. Each point reflects one estimate, where the earnings threshold, defined in real terms (2010 US dollars) is varied from 5,000 to 15,000. Estimates in the main text are based on a threshold of $10,000, which is highlighted in the figure. The figure shows that the employment effects I obtain are robust to this definition.



(a) Labor Income at Schooling Age



(b) Labor Income at Prime Age

Figure A.11: Effect on Labor Market Outcomes: Sensitivity to the Choice of Bandwidth

Notes: This figure plots the estimated effects on labor income using equation (1) for different bandwidths around the compulsory schooling age threshold. Panel (a) plots estimates at upper-secondary schooling age, i.e. 16-20, and panel (b) at prime age, i.e. 36-40. Each dot is a separate regression estimate. Both figures plot coefficients from two sets of regressions. In one I vary the bandwidth below the schooling age threshold (i.e. the control group) while maintaining a 48-month bandwidth above (i.e. the treatment group). This way the treatment group includes everyone at normal upper-secondary schooling age. In the other set of regressions, I vary the bandwidth both below and above the threshold. Vertical lines mark the estimated MSE-optimal bandwidth and the school-age bandwidth, i.e. the bandwidth that includes those at normal upper-secondary schooling age during the tax-free year. Regressions control for year and region fixed effects and pre-reform characteristics at age 16 including an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and disability status. The shaded areas show 95% confidence intervals.

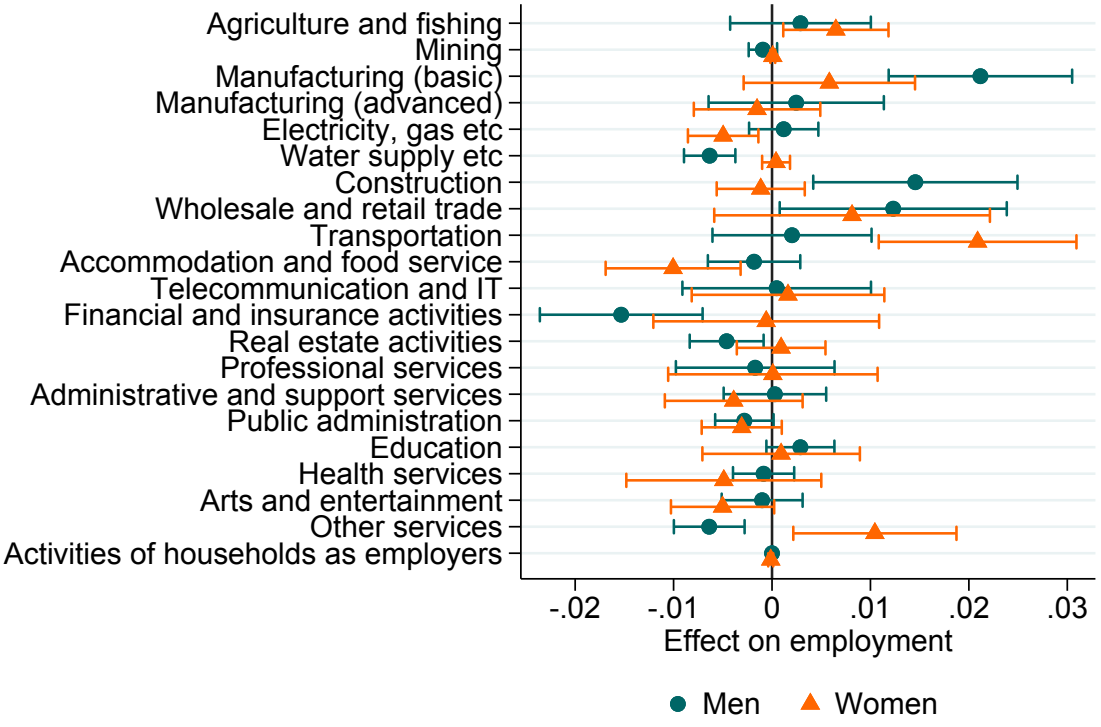


Figure A.12: Jobs at Prime Age

Notes: This figure plots the estimated effects on the sector of employment at prime age. The points are estimates of equation (1) where the outcome is an indicator of employment in a given sector at ages 36-40. The whiskers display the 95% confidence interval based on robust standard errors clustered at the individual level.

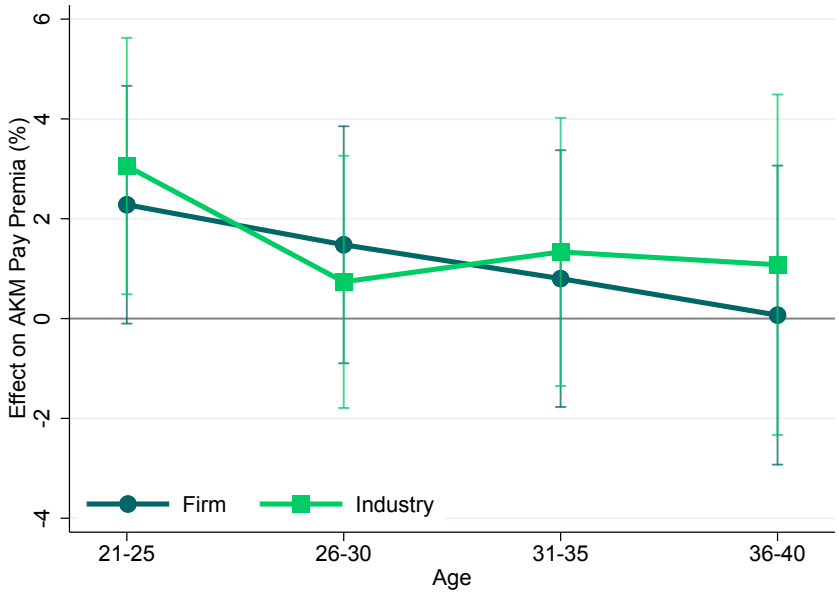


Figure A.13: Effect on Pay Premia in Firms and Industries

*Notes:*The figure plots the estimated treatment effects on the firm and industry pay premia at the worker's employer. Pay premia are measured by AKM firm or industry fixed effects estimated in the population of firms and industries in a regression on individual fixed effect, firm or industry fixed effects, and a polynomial in age. The dots/squares correspond to estimates of equation (1) on earnings rank, which I divide by the mean rank for the control group to measure the percentage change in ranks. Regressions control for year and region fixed effects and pre-reform characteristics at age 16 including an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and disability status. The whiskers display the 95% confidence interval based on robust standard errors clustered at the individual level.

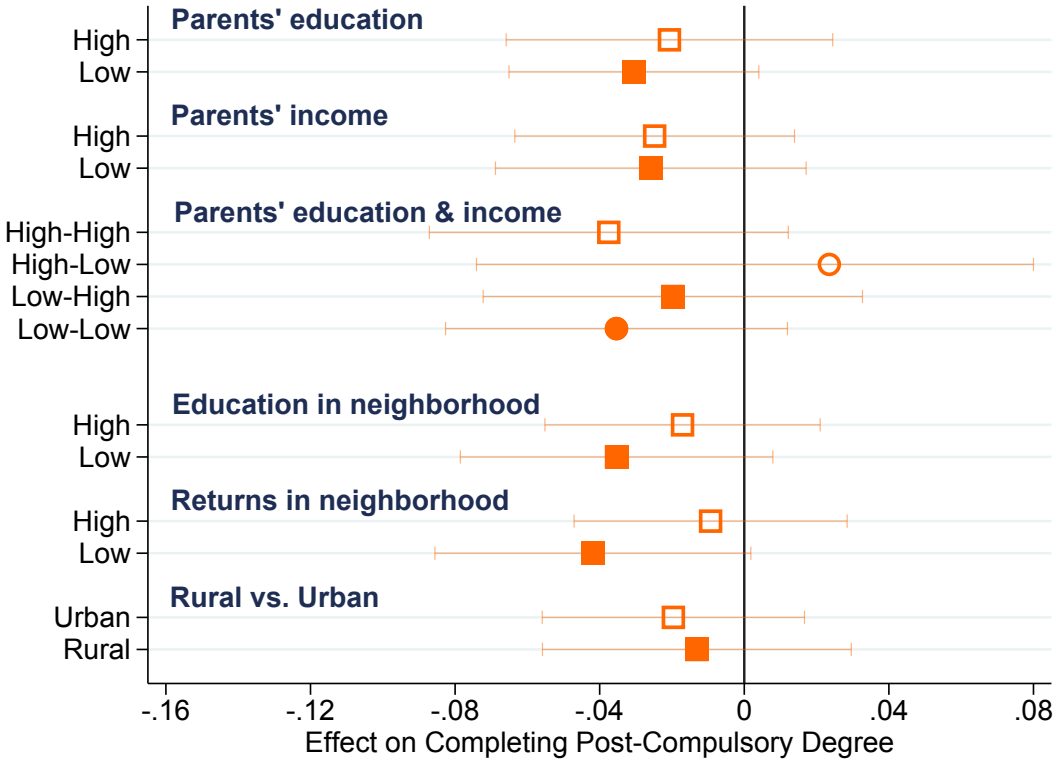


Figure A.14: School Dropout by Parental Background and Neighborhood — Women

Notes: The figure plots the estimated effects of the tax-free year on school dropout of women by parental background and neighborhood. For each characteristic, students are divided into two groups, and I estimate equation (1) interacting group indicators with the discontinuity and age polynomials. For parental education, the sample is split according to whether at least one parent (father or mother) has completed an upper-secondary degree (junior college or higher). For parental income, I first rank all individuals in the population by labor income within each birth cohort, gender, and calendar year. I then calculate the median income rank for parents at ages 40-55. For each student, the parental income rank is assigned based on the higher-earning parent's rank, and the student population is divided at the median parental income rank. When splitting by both parental education and income, I use the indicators described above, i.e., having at least one parent with an upper-secondary degree and having parental income above the median. To split the sample by neighborhood education levels, I first compute, for each municipality, the share of adults aged 25-64 with at least an upper-secondary degree in the year preceding the tax-free year (1986). I then divide students at the median of this share. To split by neighborhood returns to education, I calculate for each municipality the average labor income in 1986 for men aged 40-55 separately by education level (at least upper-secondary vs. less education). The returns to education are then defined as the ratio of average incomes between the educated and less educated groups. Students are divided at the median of these returns. Lastly, I classify municipalities into urban and rural areas using municipality codes. All regressions control for individual characteristics measured before the reform, and estimations by parental background further include municipality fixed effects. Whiskers in the figure represent 95% confidence intervals.

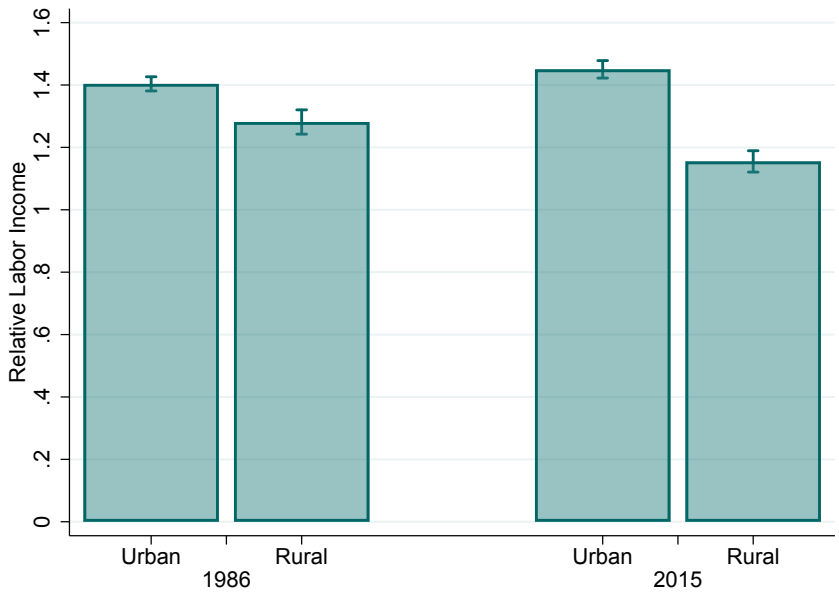


Figure A.15: Returns to Education

Notes: The figure plots the average labor earnings of men at ages 30-60 with upper-secondary education relative to men at the same age without upper-secondary education, separately by those living in urban and rural areas.

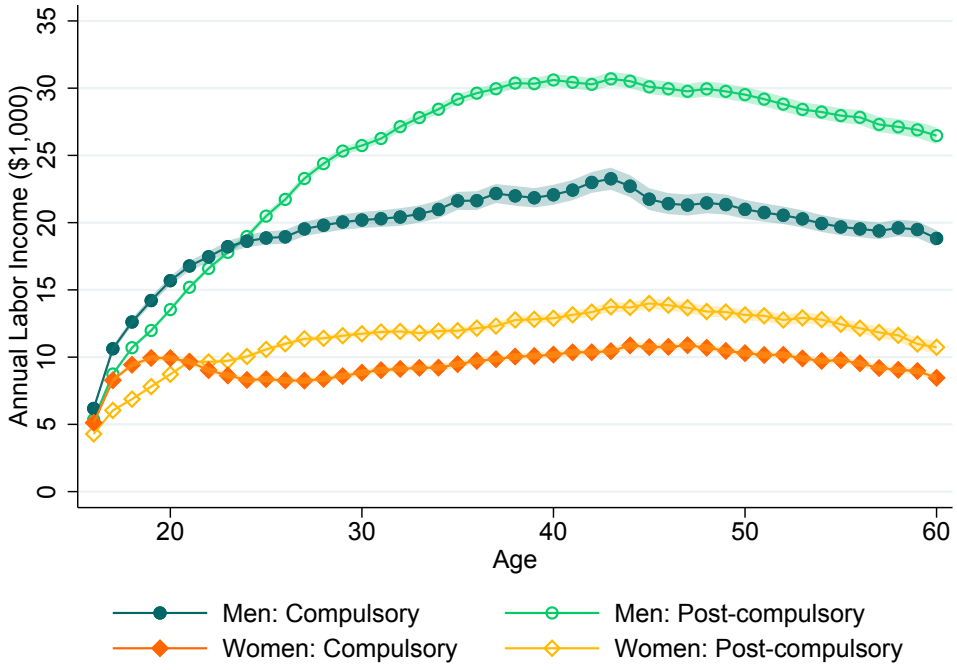


Figure A.16: Lifecycle Earnings Profiles by Education

Notes: The figure plots earnings profiles by education for men and women, separately for those who complete a post-compulsory degree compared to those who only complete compulsory education. The sample consists of those aged 16 to 60 and averages are computed for the 5 years before the tax-free year, 1982-1986. The shaded areas around each series display the 95% confidence intervals.

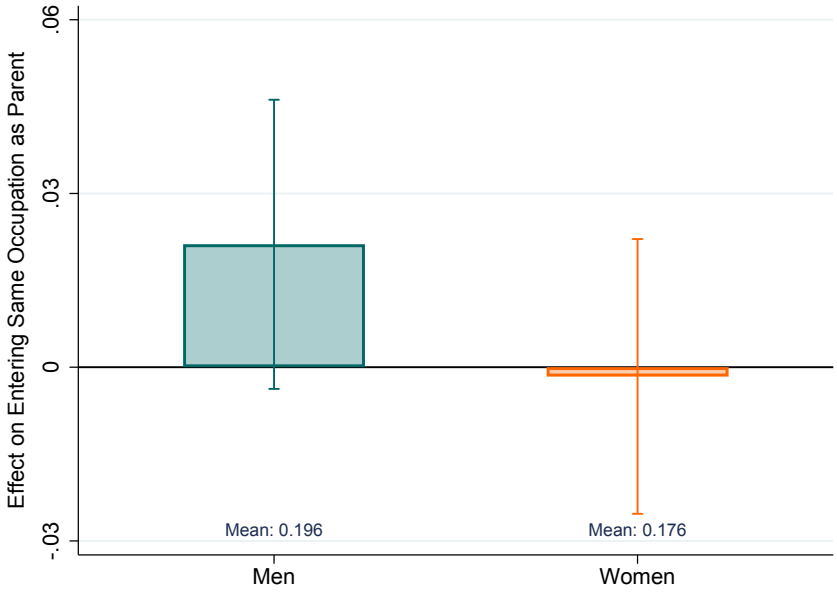


Figure A.17: Occupational Following

Notes: The figure plots the estimated effects of the tax-free year on children entering the same occupation as their parents. Estimates are based on equation (1) where the outcome is an indicator for a child holding the same occupation as either its father or mother during ages 16-19. Occupations are classified based on the Icelandic version of the ISCO-88 code, where occupations are organized within industry. I group together managers and foremen (occupations exclusively held by adults) with elementary or manual workers, which is the occupation primarily held by adolescents. That is, I assign children as working in the same occupation as their parents if they are elementary or manual workers within the industry where their parents are managers or foremen. Regressions control for pre-reform individual characteristics, occupation fixed effect, and municipality fixed effects. Below-threshold means of the outcome are reported in the graph. The whiskers display the 95% confidence interval.

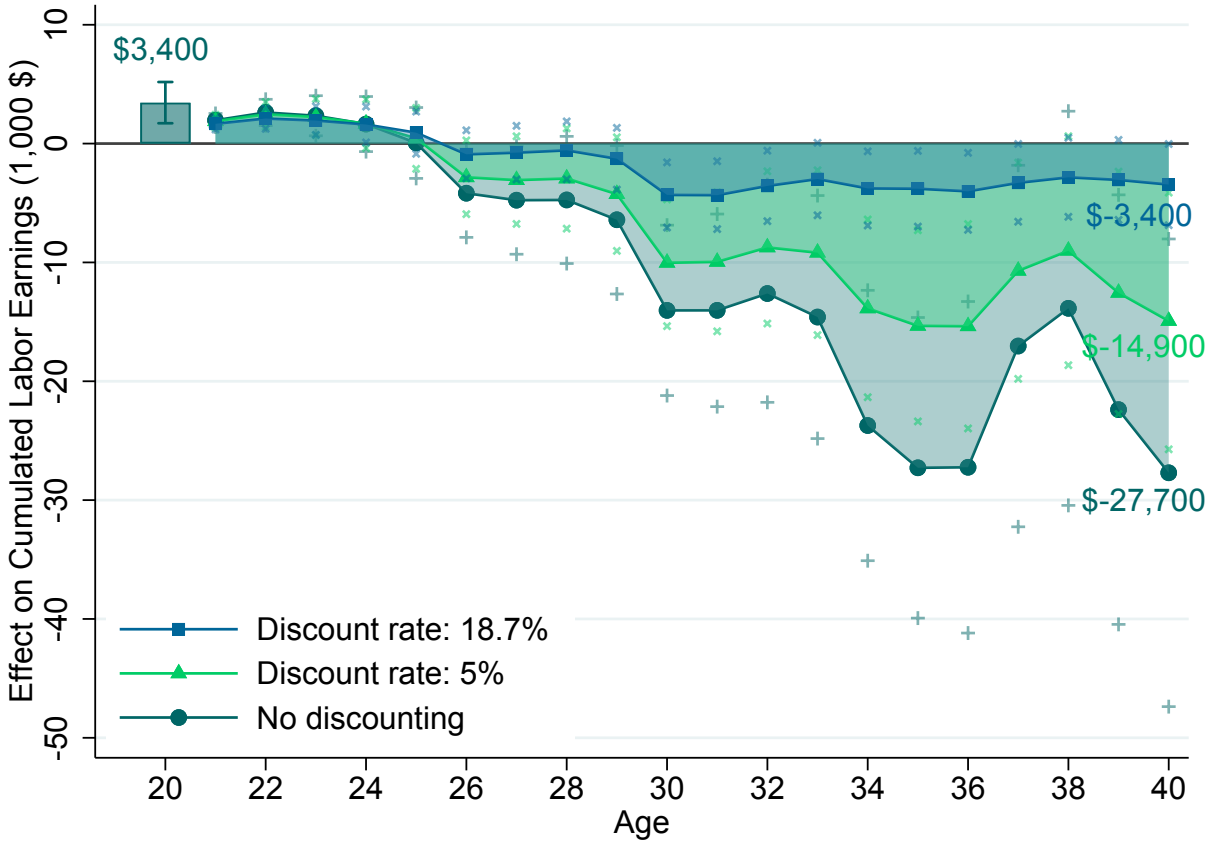


Figure A.18: Cumulative Labor Earnings and Implied Discount Rate

Notes: The figure plots the estimated treatment effect on cumulative labor earnings of men. The bar correspond to estimates of equation (1) on cumulative labor earnings over upper-secondary school age 16-20. The dots correspond to estimates of equation (1) on cumulative labor earnings over time from age 21 to 40. The triangles are present discounted values of estimated effects on accumulated labor earnings, discounted to age 21 using a discount rate of 5%. The squares are present discounted values of estimated effects on on accumulated labor earnings, discounted to age 21 using a discount rate that solves equation (9). Regressions control for region fixed effects and pre-reform characteristics at age 16 including an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and disability status. The crosses display the 95% confidence interval where robust standard errors are clustered at the individual level.

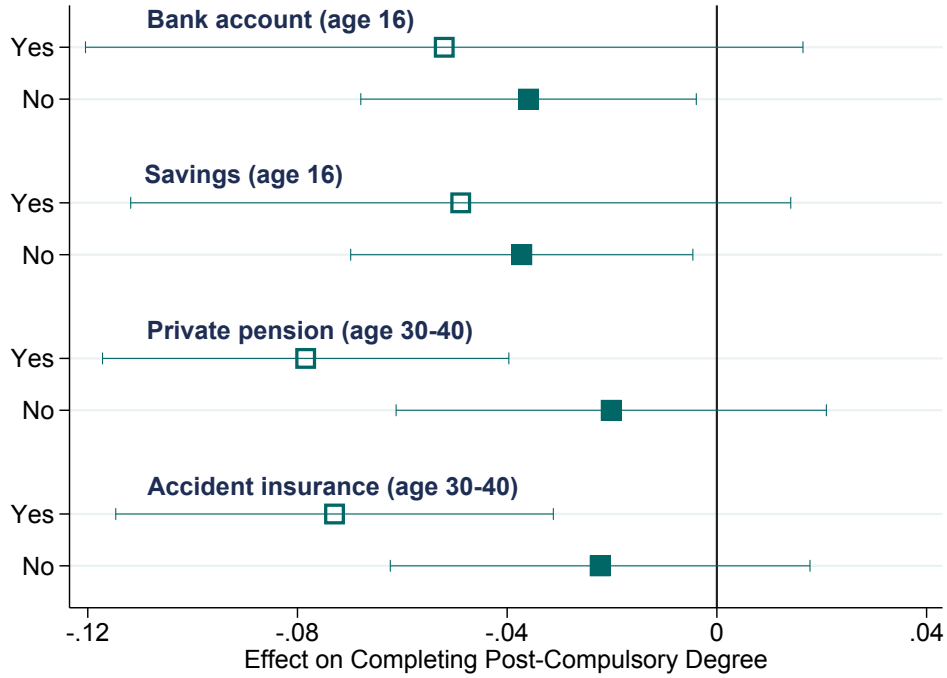


Figure A.19: School Dropout by Characteristics

Notes: The figure plots the estimated effects of the tax-free year on school dropout of men by characteristics associated with myopia. The characteristics are: (1) indicator for owning a bank account at the age of 16, (2) indicator for having some savings at the age of 16, (3) indicator for contributing to a private-pension plan at some point at age 30-40, and (4) indicator for purchasing accident insurance at some point at age 30-40. For each characteristic, students are split into two groups and equation (1) estimated separately for each group. Regressions control for pre-reform individual characteristics and municipality fixed effects. The whiskers display the 95% confidence interval.

E Supplementary Tables

Table A.5: Effect on Educational Attainment — Robustness

	Post compulsory degree					Years of school				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A. All									
Treatment effect	-0.031***	-0.024	-0.028**	-0.024*	-0.025**	-0.128***	-0.068	-0.120***	-0.090*	-0.091**
	(0.011)	(0.016)	(0.011)	(0.013)	(0.012)	(0.039)	(0.059)	(0.042)	(0.048)	(0.046)
Outcome mean	0.462	0.462	0.462	0.462	0.462	11.77	11.77	11.77	11.77	11.77
	B. Men									
Treatment effect	-0.049***	-0.047**	-0.047***	-0.045**	-0.046***	-0.193***	-0.111	-0.190***	-0.154**	-0.158**
	(0.015)	(0.022)	(0.016)	(0.018)	(0.017)	(0.053)	(0.081)	(0.057)	(0.065)	(0.062)
Outcome mean	0.420	0.420	0.420	0.420	0.420	11.52	11.52	11.52	11.52	11.52
	C. Women									
Treatment effect	-0.013	-0.001	-0.009	-0.002	-0.002	-0.061	-0.024	-0.046	-0.021	-0.020
	(0.015)	(0.023)	(0.016)	(0.019)	(0.018)	(0.058)	(0.087)	(0.062)	(0.071)	(0.068)
Outcome mean	0.503	0.503	0.503	0.503	0.503	12.00	12.00	12.00	12.00	12.00
Specification	Linear Uniform	Quadratic Uniform	CCT Triangular	CCT Epanechnikov	CCT Uniform	Linear Uniform	Quadratic Uniform	CCT Triangular	CCT Epanechnikov	CCT Uniform

Notes: This table reports the coefficient of the treatment indicator (age above compulsory-schooling age threshold) according to the regression equation (1). The specification in columns (1) and (6) corresponds to my benchmark specification reported in Table 2. "Quadratic" refers to a specification with a second-degree polynomial in age. "CCT" refers to estimates based on the biased correction method of Calonico et al. (2014), using uniform, triangular, or Epanechnikov kernel weights. Each cell represents a single regression estimate for the education outcome specified in the row heading. The estimates are based on local-linear regressions for individuals at age 21 and allow for different coefficients on each side of the cutoff. Outcome mean refers to the averages of the dependent variable for 12 months below the threshold (control group). Regressions control for pre-reform characteristics at age 16 including the region of residence, an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and an indicator for receiving disability benefits. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.6: Effect on Labor Market Outcomes — Robustness

	Labor Earnings ($)					Employment				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	A. Men — 16-20									
Treatment effect	838***	1,008***	751***	805***	711***	0.050***	0.050***	0.048***	0.047***	0.043***
	(109)	(159)	(111)	(129)	(122)	(0.007)	(0.010)	(0.007)	(0.008)	(0.008)
Outcome mean	10,487	10,487	10,487	10,487	10,487	0.425	0.425	0.425	0.425	0.425
	B. Women — 16-20									
Treatment effect	96	314***	0	54	5	0.021***	0.013**	0.035***	0.018**	0.014*
	(65)	(93)	(68)	(77)	(73)	(0.007)	(0.009)	(0.006)	(0.008)	(0.007)
Outcome mean	7,342	7,342	7,342	7,342	7,342	0.425	0.425	0.425	0.425	0.425
	C. Men — 36-40									
Treatment effect	-2,147***	-1,673**	-1,891***	-1,560***	-1,621***	-0.001	-0.014**	0.001	-0.003	-0.003
	(451)	(664)	(466)	(537)	(509)	(0.004)	(0.006)	(0.005)	(0.005)	(0.005)
Outcome mean	41,927	41,927	41,927	41,927	41,927	0.863	0.863	0.863	0.863	0.863
	D. Women — 36-40									
Treatment effect	-262	-536	-92	-148	-195	0.005	-0.003	-0.001	-0.008	-0.006
	(279)	(405)	(294)	(341)	(322)	(0.006)	(0.008)	(0.006)	(0.007)	(0.006)
Outcome mean	26,247	26,247	26,247	26,247	26,247	0.796	0.796	0.796	0.796	0.796
Specification	Linear Uniform	Quadratic Uniform	CCT Uniform	CCT Triangular	CCT Epanechnikov	Linear Uniform	Quadratic Uniform	CCT Uniform	CCT Triangular	CCT Epanechnikov

Notes: This table reports the coefficient of the treatment indicator according to the regression equation (1). The specification is either "Benchmark" which refers to my main estimate, or "CCT" which refers to estimates based on the biased correction method of Calonico et al. (2014), using uniform, triangular, or Epanechnikov kernel weights. Each cell represents a single regression estimate for the outcome specified in the row heading. The estimates are based on local-linear regressions and allow for different coefficients on each side of the cutoff. Outcome mean refers to the averages of the dependent variable for 12 months below the threshold (control group). Regressions control for year and region fixed effects and pre-reform characteristics at age 16 including an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and disability status. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.7: Effects of School Dropout on Earnings

	Prime Age		Lifetime	
	Degree	Years	Degree	Years
	(1)	(2)	(3)	(4)
2SLS Estimate	42,214**	7,598**	461,409**	78,066**
	(20,795)	(3,737)	(190,401)	(33,906)
Implied Return	1.007	0.181	0.703	0.119
F-statistic	9.8	6.6	14.3	10.5
Outcome mean	41,927	41,927	656,154	656,154
Observations	76,269	76,269	15,026	15,026

Notes: This table reports estimates of reduced educational attainment due to school dropout on labor income of men. Educational attainment is measured either by the propensity of completing a post-compulsory degree (*Degree*), i.e. to not drop out, or by years of school completed (*Years*). The effect is estimated using a two-stage least squares (2SLS) version of RD regression equation (1) where the compulsory schooling age threshold indicator is used as an instrumental variable for the two schooling outcomes. Earnings are measured either as labor earnings at *prime-age* (average at ages 36-40) and *lifetime* earnings (cumulative from age 21 until age 40). *Implied Return* is measured by $\frac{\text{2SLS Estimate}}{\text{Outcome mean}}$, where outcome mean refers to 12-month below-threshold averages in the outcome variable. Therefore, this gives an estimate of the implied return in earnings to completing post-compulsory education or one additional year of schooling. Regressions control for year and region fixed effects and pre-reform characteristics at age 16 including an indicator for having a child, an indicator for receiving social insurance, an indicator for being fatherless or motherless, and disability status. Robust standard errors, clustered at the individual level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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