Understanding the Effect of Parental Education and Financial Resources on the Intergenerational Transmission of Income*

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Abstract

There are two essential mechanisms in the canonical model of the transmission of income across generations – parents' financial resources and parental education. We provide novel empirical evidence to disentangle the significance of these two mechanisms in explaining the intergenerational transmission of income. Two reforms in Sweden provide us with natural experiments to separately identify the effects of parents' financial resources versus parental education: an educational reform that exogenously changed the level of compulsory schooling and quality of education of the parent generation and a tax reform that exogenously altered parents' net income. Using Swedish administrative data, we first find that a 1,000 SEK increase in parental income – as a result of changes to parental education – leads to a 280 SEK increase in children's income. Second, exploiting the tax reform, we show that a 1,000 SEK increase in parental income, resulting from changes in parents' financial resources, increases children's income by 74 SEK. The relative impacts of these two mechanisms thus suggest that parents' financial resources amount to about 25% of the effect of parental education on children's income. Third, we show that parents' financial resources matter less for sons. Overall, our findings suggest comparatively modest impact of parental financial resources on children's income.

JEL Codes: J62, I28, I24, J13, H24, H31.

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1 Introduction

Parents with higher income levels have children with higher income levels. It is not clear, however, how one should interpret the correlation between parental income and that of their children. Does parental income improve the outcomes of the next generation in a causal sense or does it capture causal impact of other factors like parental education? In this paper we aim to shed light on the mechanisms through which parental income affects that of their children. Specifically, we aim to quantify the *relative* importance of parental education and parents' financial resources on the intergenerational transmission of income.

Identifying the relative significance of parental education and parents' financial resources in explaining the intergenerational transmission of income is important from a policy perspective. Specifically, it can help us arbitrage between two types of policies aimed at improving equality of opportunities for children: an income transfer policy that increases financial resources available to children and an educational policy that affects children through changes in parents' education. When the costs of implementation of the two reforms are similar, if we find that the relative impact of parental education on children's outcomes is comparable to that of financial resources, it might be more desirable to consider an income transfer reform since it might be easier to implement. On the other hand, if we find the impact of education to be much larger, educational reform might be more desirable for reducing intergenerational income inequality.

Despite the importance of comparing the impacts of parental education and financial resources on children's income, there has not been much empirical work dedicated to this question. A key empirical challenge is that any shock to parental education will also affect financial resources of the parents. To be more specific, changes in parental education might affect children through two channels. First, obtaining more education makes one a different type of parent – with more educated parents spending more time with their children[1] – and thus leads to the children having higher income. Second, changes in education also affect parents' financial resources since more educated parents tend to earn and work more compared to their less educated counterparts (Guryan et al. 2008).

[1] Guryan et al. (2008) shows that higher-educated parents spend more time with their children.

This interdependency between the mechanisms therefore makes it difficult to *isolate* the causal impact of parental education and parents' financial resources on children's income.

Given this empirical challenge, we need exogenous shifters of parental education *and* parents' financial resources that affect the *same* set of parents. We address this challenge by using administrative data that covers the entire Swedish population for the period from 1960 to 2014. Parents in our analysis were born between 1943 and 1960 and were on average 39 years old in 1990 and their children were born between 1973 and 1984. Taking advantage of these data, we estimate the relative importance of parents' financial resources and parental education using two reforms.

The first reform is an educational reform in the 1960s in Sweden that affected the group of parents in our study when they were children and exogenously changed their education. Specifically, the reform was rolled out across the country between 1949 and 1960 and increased compulsory schooling from seven or eight years[2] to nine years as well as changed the quality of education both by abolishing placement based on academic achievement into an academic or nonacademic stream after grade six and by imposing a nationally unified curriculum. Thus, this reform influenced *every* child who attended school under the new system either by increasing the number of years of education or by changing the set of school peers/teachers each student was exposed to. In particular, the reform increased average gross income – between the ages of 30 and 40 – of parents in our sample by 0.7% (or 705 SEK) and their level of education by around 0.28 years on average.[3] Using this reform as a source of exogenous variation in parental education, we show that a 1,000 SEK increase in parental income, resulting from changes in parental education, increases children's income by 280 SEK. Income of an individual in our analysis was measured as his/her average gross income between the ages of 30 and 40.

The second reform is a tax reform of 1991 that had an impact on parents while they were working and exogenously altered their income. The Swedish tax reform of 1991 is known for dramatically reducing marginal income tax rates as well as eliminating various

[2]Compulsory schooling spanned eight years instead of seven in some large municipalities.

[3]It should be noted that the educational reform had a very small impact on parental labor force participation with the effect on parental decision to ever be employed being around 0.1% on average. Parents subject to the reform also experienced a minor increase in the number of years they were employed during the 30–40 age range with the magnitude being around 0.019 years. The latter roughly translates to an increase of less than 5 working days, on average, over the 11–year period.

tax shelters.[4] In particular, the reform increased net income of parents in our sample by 5% on average[5] and exogenously altered the relationship between their net[6] and gross income. Using this reform, we show that a 1,000 SEK increase in parental income – as a result of exogenous changes in parents' financial resources – leads to a 74 SEK increase in children's income.

In a nutshell, we first show that a 1,000 SEK increase in parental income – as a result of the educational reform – leads to a 280 SEK increase in children's income. Then we demonstrate that a 1,000 SEK increase in parental income – as a result of the tax reform – increases children's income by 74 SEK. Given the relative impacts of these two mechanisms on the intergenerational transmission of income, we can thus conclude that parents' financial resources amount to about 25% of the effect of parental education on children's income. It should be emphasized that we are capturing the effect of parental exposure to the educational reform – that increased *both* years of education and quality of education – on the intergenerational transmission of income when, throughout the paper, we refer to the impact of parental education on children. This additionally implies that the estimated impact of parental education might be specific to only this type of reform and may not necessarily extend to other settings when, for example, only compulsory schooling is increased. It should also be noted that when, throughout the paper, we refer to parental education as an outcome variable, we are only referring to years of schooling and are not estimating changes in quality of education.

Our findings of a relatively modest impact of parents' financial resources on children imply that non-pecuniary benefits associated with parental education account for the majority of the effect of parental education on children. One of the potential ways in which parents' education can impact children – other than income – is through the amount and quality of time parents spend with their children (Guryan et al. 2008). The neighborhood and school sorting have also been shown to be important factors in explaining higher income and lower educational mobility in Scandinavian countries (Landersø and Heckman 2017). We show that factors such as decision of parents to have

[4]Overall, the tax reform reduced the marginal tax rate by 24%–27% for most full-time employees (Agell et al. 1996).

[5]The average tax rate for families in our sample fell from 24% to around 19% following the reform.

[6]The net income measure can be thought of as the gross income excluding any taxes, alimony payments, and repayments of student loans.

children or the number of children they chose to have, on the other hand, did not seem to have played a significant role in our setting.

Exploring whether our estimates differ based on children's gender, we show that non-pecuniary benefits matter more for sons, with the effect being around 80%. Sons also tended to benefit more from an increase in maternal income – as a result of changes in maternal education – compared to daughters. Daughters, on the other hand, took more advantage of an increase in the mothers' financial resources. The timing of changes in parents' financial resources also mattered for children with an increase in parental income during a child's teenage years – between the ages of 11 and 16 – having the largest impact on his/her later-life income compared to a change earlier in his/her life.

Overall, in this paper we find comparatively modest impact of parental financial resources on children's income. This might, however, be due to generous social safety net that is present in Sweden. This interpretation of our results is also consistent with the findings in Landersø and Heckman (2017). Specifically, Landersø and Heckman (2017) shows that in Denmark – another Scandinavian country – higher income mobility combined with lower educational mobility can be mainly attributed to "redistributional tax, transfer, and wage compression policies."

One potential concern related to the estimation of the relative importance of parents' financial resources and parental education outlined above is that the effects might be driven by two different groups of parents, and as such may not be comparable. Specifically, the causal impact of parental education might be identified only for parents at the very low end of the education distribution — for parents who would have gotten seven or eight years of education and were instead forced to attend school for nine years. The causal impact of financial resources, on the other hand, might be identified only for high-income parents who potentially benefited the most from a decrease in the marginal tax rates. Given this concern, we re-estimate our findings for the sub-population of parents who got more than nine of years of education, i.e., the group that was less likely to be affected by the educational reform. Focusing on this group, that makes up around 73% of our parent sample, we find that a 1,000 SEK increase in parental income – as a result of the educational reform – increases children's income by 297 SEK and a 1,000 SEK increase in parental income increases children's income by 75 SEK. The relative importance of

these mechanisms implies that financial resources amount to about 25% of the impact of parental education on children. Similarity in the results for this group of parents and the overall population then suggests that the relative importance of parental income and education for the intergenerational transmission of income is *homogeneous* across different subgroups of parents.

Our paper relates to multiple strands of the literature. Our analysis using Swedish compulsory schooling laws relates to literature that studies how parental schooling affects children's outcomes using various educational reforms as instruments.[7] Our results highlighting the importance of the income channel are in line with a vast literature that considers how exogenous variations in parental income affect children's outcomes.[8] Our analysis that estimates the impact of parental education and financial resources separately for each parent-child pair, on the other hand, relates to literature that focuses on parent-child income and education links.[9] Our findings that reveal the significance of the timing of a change in parents' financial resources on children relates to broader literature that identifies how age of exposure to additional resources during one's childhood affects one's later-life outcomes.[10] Finally, our analysis of the relative importance of parental education and parents' financial resources on children's income relates to the large literature that aims to decompose the impact of various factors – such as of nature and nurture – on children's outcomes (Björklund et al. 2006; Lefgren et al. 2012; Chevalier et al. 2013). Among this vast amount of literature, our paper is closest to Lefgren et al. (2012). In

[7]Using the educational reform in Sweden, Holmlund (2006), for instance, finds a significant effect parental education on children's income. *See also* Chevalier (2004); Black et al. (2005); Oreopoulos et al. (2006); Pekkarinen et al. (2009); Björklund and Salvanes (2011); Black and Devereux (2011); Holmlund et al. (2011); Lundborg et al. (2014); Dickson et al. (2016).

[8]Our estimates of the impact of parents' financial resources on cognitive IQ scores of boys are, for example, consistent with those obtained by Løken et al. (2012) using the initial discovery of oil in Norway as a source of exogenous variation in family income. *See also* Milligan and Stabile (2011); Dahl and Lochner (2012); Cesarini et al. (2016); Bastian and Michelmore (2018).

[9]Similar to the results in Black et al. (2005) and Lundborg et al. (2014) that utilize educational reforms in Scandinavian countries, we find a larger impact of an increase in maternal income – resulting from changes in maternal education – on sons. Our findings of stronger mother-daughter and father-son income links are also consistent with the broader literature that focuses on parent-child income mobility pairs in Sweden (Österberg 2000; Hirvonen 2008) and the U.S. (Chadwick and Solon 2002; Raaum et al. 2008). *See also* Bertrand and Pan (2013); Fan et al. (2015).

[10]Consistent with a growing body of research that finds that additional resources during one's teenage years have the largest impact on his/her later-life outcomes both in Scandinavian countries (Humlum 2011; Carneiro et al. 2021) and the U.S. (Bastian and Michelmore 2018; Manoli and Turner 2018), our estimates indicate that an increase in parental income during one's teenage years has a larger impact on his/her income during adulthood compared to a change earlier in one's life.

particular, Lefgren et al. (2012) decomposes the intergenerational income elasticity into the causal effect of financial resources and the mechanistic transmission of human capital using data that covers about a third of Swedish father-son population. The paper instruments for father's human capital using years of schooling, level of education, and occupation, and for father's financial resources using their employment status. Using these two sets of instruments, the paper then shows that only about 37% of the intergenerational income elasticity can be attributed to the causal effect of fathers' financial resources.

There are four contributions that our paper makes to the literature on intergenerational mobility compared to Lefgren et al. (2012). First, our data covers the entire Swedish population. Second, and most importantly, we decompose the intergenerational income elasticity into the *causal* impact of parents' financial resources and parental education using *exogenous* variations in parents' financial resources and education. Being able to quantify the *relative* importance of parents' financial resources and parental education in driving the intergenerational transmission of income is central to policy design. The importance of each mechanism can inform us what type of policy one should consider if one aims to increase income of the next generation, given a limited amount of resources. In particular, it can help us evaluate if an income transfer policy for parents with children increases equality of opportunity more than an educational policy that changes parental education. Analysis of the benefits of an educational and tax reforms in our work suggests that an educational reform might have a bigger long-term effect on intergenerational income mobility compared to an income transfer reform.[11] Third, in line with the previous literature, we also show that non-pecuniary benefits – such as increased parental time and input – associated with increased parental education have a larger impact on the income of boys compared to that of girls. Boys also tended to benefit more from an increase in maternal income – as a result of changes in maternal education. Girls, on the other hand, gained more from an increase in the mothers' financial resources. Fourth, similar to the previous literature on the impact of age of exposure to additional resources on children's outcomes, we show that an increase in parental income during teenage years

[11]Unfortunately, we were not able to collect data on the cost of the educational reform for full policy implications given its lengthy implementation as well as various administrative costs it involved.

benefits children more compared to a change earlier in their lives.

The rest of the paper is organized as follows. Section 2 describes the model that helps us identify the relative importance of financial resources and parental education on children's income. Section 3 provides institutional background on the educational reform and the tax reform of 1991; then Section 4 describes the dataset used in the paper. Section 5 outlines the causal impact of parental education on children's outcomes. Section 6 describes the tax reform that took place in Sweden in 1991 and also shows how an unexpected increase in parental income affects outcomes of the children. Section 7 presents a set of robustness checks. Finally, Section 8 concludes. Additional materials can be found in Appendices.

2 Theoretical Model

In this section we aim to show how the educational and tax reforms help us identify the relative importance of parents' financial resources and parental education for the intergenerational transmission of income.

We focus on parental education and financial resources as two mechanisms, through which intergenerational transmission of income takes place, since any general income production function for children can be reduced to a function of only these two factors. To show this, let's start with an income production function for children where a child's income, Y^K, is a function of his/her initial endowment H_0^K, his/her parent's income Y^P, and investment of the parents X^K:

$$Y^K = l(H_0^K, X^K, Y^P, \cdot)$$

where $(\cdot)$ throughout this subsection will contain shocks to a child and/or his/her parents for ease of notation. Since investments by parents in the equation above are themselves a function of a child's endowment H_0^K, parent's income Y^P, and their education E^P, we further have:

$$X^K = m(H_0^K, Y^P, E^P, \cdot)$$

where children's initial endowments H_0^K can be viewed as a function of parental education E^P:

$$H_0^K = n(E^P, \cdot)$$

Thus, children's income can be reduced to a function of parental education, parental income as well as shocks:

$$Y^K = f(Y^P, E^P, \cdot)$$

Hence, a parent's impact on a child's income can be considered to be transmitting only through parental income and parental education. Assuming a linear relationship for expositional purposes yields:

$$Y^K = \alpha_0 + \alpha_1 Y^P + \alpha_2 E^P + \xi^K$$

Since parental income is a function of parental education, E^P, and of exogenous shocks to income, η^P:

$$Y^P = \beta_0 + E^P + \eta^P$$

we further have

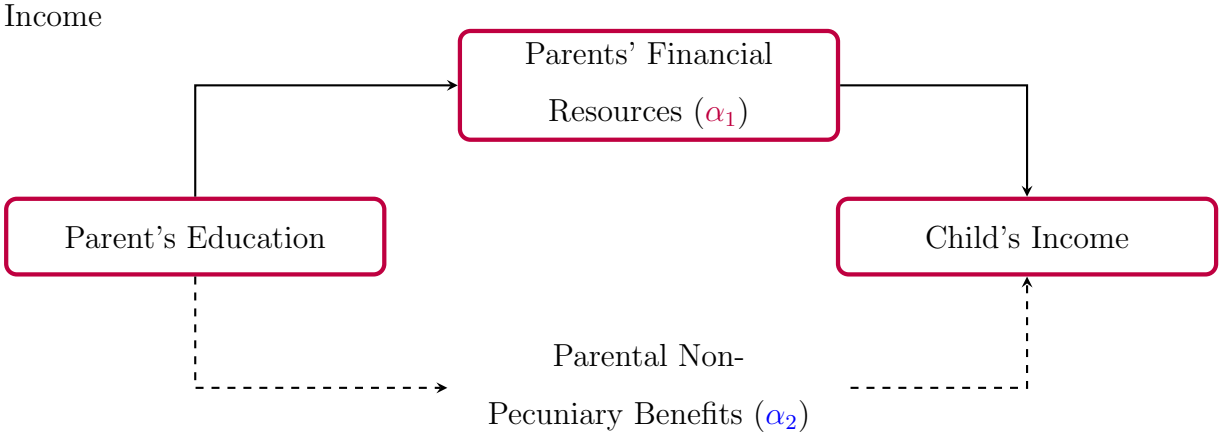
$$Y^K = \gamma_0 + \underbrace{(\alpha_1 + \alpha_2)}_{\text{education}} E^P + \underbrace{\alpha_1}_{\text{financial resources}} \eta^P + \epsilon^K \tag{1}$$

where parental income affects that of their children through the causal impact of parental education, captured by $(\alpha_1 + \alpha_2)$ in the equation 1 above and in Figure 1 below, and through the causal impact of parents' financial resources, α_1. The *relative* importance of these two mechanisms on the intergenerational transmission of income is then identified by the sign and size of α_2 that captures non-pecuniary benefits associated with parental education. Specifically, the finding of $\alpha_2 = 0$ would indicate that the significance of parental education on children's income is mainly driven through the education's effect on parents' financial resources. As such, an income transfer reform will have the same impact on children's income as an educational reform and might be preferable due to ease of implementation. On the other hand, if we find that $\alpha_2 >> 0$, an educational reform might have a larger impact on reduction of intergenerational income inequality compared to an income transfer reform.

Using this theoretical framework, in this paper we want to *separately* identify the impact of parental education and financial resources on the intergenerational transmission of income. In particular, using the educational reform, we want to identify how changes in parental education affect income of children, i.e., $(\alpha_1 + \alpha_2)$ in the equation 1 above. Using the tax reform, we can quantify the impact of exogenous changes in parents' financial

resources on children's income, i.e., α_1. By comparing our estimates of $(\alpha_1 + \alpha_2)$ and α_1 from these reforms, we can then quantify the *relative* importance of these mechanisms for the intergenerational transmission of income.

Figure 1: The Impact of Parental Education and Financial Resources on Children's Income



It should be noted that our identification strategy relies on a few assumptions. Specifically, first, we are assuming linearity in the effects of parental education and financial resources on children. Second, we are assuming that the instruments satisfy the monotonicity condition. In particular, we are assuming that parental income increases in both parental education and parents' financial resources. Finally, we are assuming that the impacts of parents' financial resources and non-pecuniary benefits on children are additively separable. The assumption will be violated if there are, for example, complementarities between the effects. Homogeneity of the effects of the parental education and financial resources across various sub-populations presented in sections 5.2 and 6.2, however, shows that the impacts are plausibly additively separable.

3 Institutional Background of the Reforms

3.1 *Institutional Background of the Swedish Compulsory School Reform*

This subsection briefly discusses the Swedish compulsory school reform that was gradually rolled-out across the country's municipalities during the 1960s and 1970s.[12] In

[12] A more detailed discussion of the reform is provided by Marklund (1981); Meghir and Palme (2005); Holmlund (2008); Hjalmarsson et al. (2015); and Lindgren et al. (2017) and the references cited therein.

the pre-reform school system, students went through grades one to four or one to six (depending on their municipality) in the *folkskolan* (common basic compulsory school). After grade four or six, high-performing students were selected based on their grades to attend *realskolan* (five-year or three- to four-year junior secondary school, which was a requirement for the upper secondary school and subsequent higher education at the university) and the remaining students stayed in the *folkskolan* until they completed their seven-year compulsory education.[13]

The prevailing system, based on directing more and less able students into different tracks, was extensively debated and criticized throughout the interwar period. Education started being viewed as the key to abolishing class-based society and promoting democratically minded citizens, especially within the ruling social democratic party (Husén 1986; Oftedal Telhaug et al. 2006). Consequently, a parliamentary committee was appointed in 1946 with the task of proposing guiding principles for the future compulsory school system. The final report was released two years later and had two main objectives: to increase equality of opportunity by postponing tracking and to meet the growing demand for education among the baby boom cohorts of the mid-1940s. The main recommendations were to increase compulsory schooling by two years and to postpone educational tracking so that children with different levels of skills or educational ambition would be kept in the same classroom until ninth grade. The committee also proposed important changes to the curriculum with particular focus being placed on the study of English and civics.

The committee proposal led to a large-scale nationwide evaluation between 1949 and 1962, during which the reform was implemented in various municipalities (Marklund 1981). A modest 14 municipalities in 12 different counties were selected for the first year of the evaluation (1949/1950).[14] The number of municipalities joining the evaluation program grew steadily in the subsequent years until 1962, when the parliament decided to implement the reform throughout the country. The municipalities then had until 1969 to implement the new system for all affected cohorts.

The way municipalities were selected to take part in the evaluation was as follows.

[13] In some municipalities, mainly the largest cities, compulsory schooling was extended to eight years before the comprehensive school reform.

[14] There is a total of 1,037 municipalities in our analysis during this period.

Municipalities that were interested in participating in the reform had to report on different characteristics – such as population growth, tax revenues, local demand for education, and availability of teachers and school premises – to the central authorities. After receiving the applications, the National Board of Education decided which municipalities would implement the reform in a given year. The main objective of the Board in their decision-making process was to obtain a certain amount of variation across municipality types in order to facilitate the ongoing assessment of the reform. Given the institutional details of the educational reform, the next subsection focuses on the details of the tax reform.

3.2 *Institutional Details of the Tax Reform*

The Swedish tax reform of 1991 is known for dramatically reducing marginal income tax rates as well as eliminating various tax shelters. Given that a substantial decrease in marginal tax rates[15] would lead to significant tax revenue losses, the reform also took measures to maintain tax revenue neutrality: it implemented a new system of taxing capital income; broadened the value added tax to include goods and services previously exempted or granted lower rates; and eliminated loopholes and preferential rules for taxing earned income. Some of the most notable changes brought about by the tax reform of 1991 are changes to the marginal taxation of labor, capital, and corporate income.[16] Specifically, in the case of income tax, if before the tax reform the countrywide average of the local income tax of 31% was accompanied by a national income tax of 20% for incomes exceeding 185,000 SEK,[17] the tax reform reduced the marginal rate by 24%-27% for most full-time employees (Agell et al. 1996).

Figure 2 below taken from Agell et al. (1996) compares how the income tax schedule affected full-time employees in Sweden in 1989 and 1991. In the case of the corporate income tax, the statutory tax rate was reduced from 57% to 30% whereas the new proportional capital income tax was set at 30%. The latter prevented capital tax avoidance through tax arbitrage when, for example, parents in high income tax brackets shifted

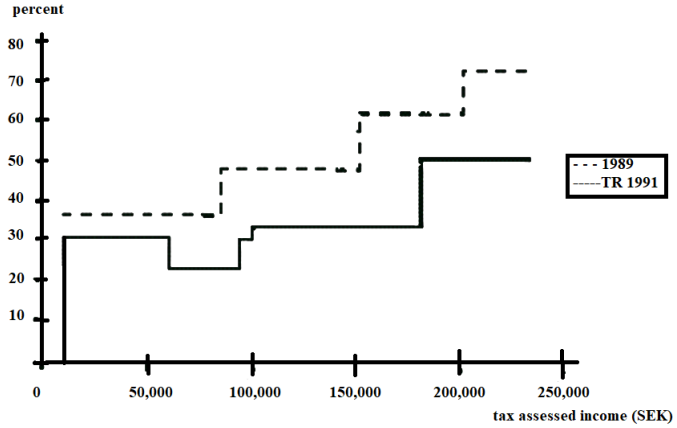
[15]For example, the top marginal tax rate decreased from over 70% to slightly above 50% as a result of the tax reform (Stenkula et al. 2014).

[16]The reader is referred to Agell et al. (1996) for a more in depth explanation of the tax reform and to Stenkula et al. (2014) for more information on changes to the marginal taxation of labor income in Sweden during the tax reform.

[17]This is equivalent to $33,500 using 1991 exchange rate.

their income to children with little or no earned income to decrease their capital income tax burden.

Figure 2: Marginal Tax Rate 1989-91 at Different Levels of Tax Assessed Income



Notes: Source: Agell et al. (1996). The figure above compares how the income tax schedule affected full-time employees in Sweden in 1989 and 1991. All income measures are presented in year 1991 prices.

Overall, the tax reform exogenously decreased the average tax rate for families in our sample from 24% to around 19%.[18] Figure B.1 in Appendix B shows that this change is equivalent to around 20,000 SEK increase, on average, in parental after-tax or net income.

4 Data and Sample Selection

4.1 *Data for Parents*

The educational reform started in 1949 and ended in 1969 when the compulsory schooling of nine years was permanently introduced throughout the country. As a general rule, for a given municipality, all students who were in grades one to five in the year the reform was implemented were exposed to the reform whereas those in grades six and up were not.[19] Hence, the first cohorts affected by this reform were born between 1938 and 1955, as Swedish children usually start school at the age of seven, and they make up our initial sample. For these individuals we have data from censuses for every 5 years between 1960

[18]This change in after-tax income for families in our sample is also consistent with a decrease in average tax rates from 25% to 17% for one-earner families with two children reported by OECD for Sweden between 1985 and 1991 (OECD 2000).

[19]The first graders were immediately exposed to the reform, whereas those in the second, third, and fourth grades were exposed from the fifth grade and up.

and 1990 and annually from 1990 until 2014 from Statistics Sweden. The data contains information on a range of demographic and socioeconomic characteristics from various administrative registers. Because we do not observe municipality of residence until 1960, we further limit our initial sample and drop cohorts born before 1943 – since by 1960 they were likely to have moved from the municipality in which they were born/attended compulsory school (Holmlund 2008). Moreover, given that we want to estimate the effect of the educational reform on the education and income of individuals, in each municipality we expand our initial dataset to include cohorts born 6 years before and 5 years after the first cohort affected by the reform. We use this time span instead of a longer one to exclude the effect of other macroeconomic shocks. Additionally, we exclude the cohort preceding the first cohort affected by the reform to avoid potential issues related to some children starting school a year later than usual or repeating a year and due to measurement error in the exact timing of the reform in some municipalities (Fredriksson and Öckert 2014). Thus, our final sample consists of all individuals born between 1943 and 1960.

For individuals in our main sample we have information on their municipality of residence, date of birth, place of birth, and the level of educational attainment as well as information on both gross and net income, professional status, employment status, and an indicator for whether an individual was subject to the educational reform.[20] From the military records, we also have information on the cognitive scores of boys for the cohorts born between 1952 and 1960, which was measured by written tests of logical, verbal, spatial, and technical skills. The cognitive score used in the paper is the overall cognitive score of individuals – a standardized version of the measures calculated by the military enlistment service – and ranges from one to nine.

Our main sample consists of 945,737 individuals, 525,734 of whom attended school in the new system. Table 1 below presents descriptive statistics for the sample and emphasizes that individuals in the old system were, on average, 5.41 years older than the individuals in the new system. This fact can be explained given the nature of the reform in which individuals born earlier attended school in the old system, with the slow roll-out of the reform affecting a younger generation of individuals. The Table also shows that

[20]We are deeply grateful to Helena Holmlund for sharing the code used to create the reform participation dummy.

a little over half of the population in both old and new systems were male. Moreover, the Table shows that 56% of our main sample was subject to the educational reform and went to school under the new system.

Table 1: Descriptive Statistics for Individuals Subject to the Educational Reform

	Total sample		Reform = 0		Reform = 1	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Reform (Dummy)	0.56	0.50	0.00	0.00	1.00	0.00
Male (Dummy)	0.52	0.50	0.52	0.50	0.51	0.50
Age in 1960	9.49	4.28	12.50	2.83	7.09	3.67
Observations	945,737		420,003		525,734	

Notes. The table above presents descriptive statistics for our main sample, which includes individuals born 6 years before and 5 years after the first cohort affected by the reform in each municipality (excluding the preceding cohort). Columns 3 and 4 reflect the results for those who went to school under the old system whereas columns 5 and 6 display results for individuals affected by the reform. Estimates that are statistically different from each other at 1% are highlighted in red. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

For individuals in our main sample, we next explore how the educational reform affected their outcomes. Specifically, consistent with the findings in Meghir and Palme (2005), Table 2 below demonstrates that the reform increased average years of education in Sweden by around 0.3 years.

Table 2: The Effect of the Reform on Individuals' Outcomes

	Years of Educ.	Log(Income)	Income	Ever Employed	Years Employed
Reform (Dummy)	0.284***	0.007***	705**	0.001	0.019***
	(0.016)	(0.003)	(322)	(0.001)	(0.005)
Male (Dummy)	-0.157***	0.506***	73,555***	0.040***	0.132***
	(0.021)	(0.005)	(757)	(0.001)	(0.005)
Observations	945,737	945,737	945,737	945,737	945,737
Adjusted R^2	0.046	0.172	0.239	0.033	0.815

Notes. The table above presents the effect of the reform on years of schooling, gross income, probability of ever being employed, and the number of years an individual was employed between the ages of 30 and 40. The table also controls for an indicator for being born in a Nordic country and birth cohort of individuals as well as municipality fixed effects. The results are displayed for individuals born between 1943 and 1960, i.e., born 6 years before and 5 years after the reform for each municipality (excluding the preceding cohort). All income measures are presented in year 2000 prices. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Analogous to findings in Lundborg et al. (2014), Column 2 of Table 2 above shows that in addition to having a significant impact on individuals' years of schooling, the reform increased their income – proxied using logarithm of their average gross income between the ages of 30 and 40 – by about 0.7%. The latter is equivalent to an increase of 705 SEK. The Table also shows that the reform had a very small impact on individuals' labor force participation with the effect on their decision to ever be employed being around

0.1%. Individuals, subject to the educational reform, additionally experienced a minor increase in the number of years they were employed during the 30–40 age range with the magnitude being around 0.019 years. The latter roughly translates to an increase of less than 5 working days over the 11–year period.[21] Table A.1 in Appendix A also shows that the findings above are robust to inclusion of municipality characteristics as dependent variables.

The educational reform affected parents in our sample by not only increasing the level of compulsory schooling, but also by abolishing tracking and introducing universal curriculum. This means that the reform exposure increased years of schooling of parents who would have gotten only the *old* level of compulsory schooling of 7 or 8 years. It *might* have also increased schooling, although likely to a lesser degree, of those who were attending school for at least 9 years even in the absence of the reform.[22] In addition to the direct impact of increased schooling, parents in the sample were affected by the abolishment of tracking and introduction of universal curriculum. Specifically, the abolishment of tracking resulted in changes to individuals' peers and teachers since students were no longer separated into an academic or nonacademic streams. This change in an individual's peers, in turn, might have had an impact on his/her long-term outcomes through a change in the gender composition of classmates and their socioeconomic characteristics – all of which have been shown to be important in the Scandinavian context for children aged 14–16 (Black et al. 2013) – among others.[23]

Since parents who would have gotten at least 9 years of schooling even in the absence of the reform were, most likely, less affected by increased schooling, in Table A.4 in Appendix A we explore how the impact of the reform on individuals' income differed by their education levels.[24] Specifically, limiting the sample to individuals with the

[21]Table A.2 in Appendix A shows that the impact of the reform on both the probability of being employed and the number of years a person was employed was not statistically significantly different between men and women in the sample.

[22]Limiting the sample to individuals with at least 12 years of education, for instance, we find that their education increased by 0.02 years as a result of the reform.

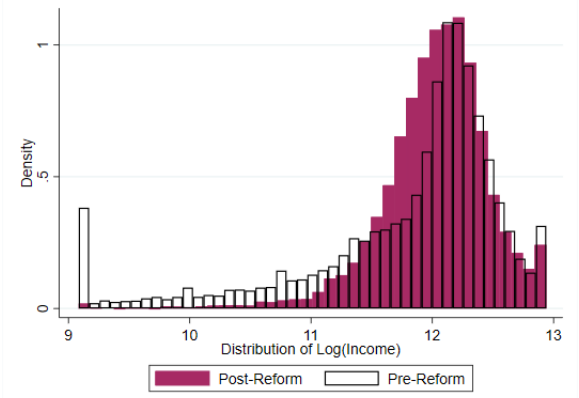
[23]Using data from the Add Health, Bifulco et al. (2011), for example, shows that the percentage of minorities and college-educated mothers in one's class has an impact on both his/her educational outcomes – such as the probability of dropping out of high school and attending college – and health outcomes (likelihood of smoking).

[24]As mentioned above, it should be noted that reform exposure might have shifted a subsample of parents to the "10 years or more" group from the "9 years" group.

compulsory schooling level, that comprise about a quarter of our sample, we find that the reform increased their income by 1.4%. Individuals who got more than the compulsory level of schooling, on the other hand, experienced a smaller increase of 0.6%. Altogether, these estimates indicate that the reform affected *every* individual who went to school under the new system through introduction of universal curriculum, increased schooling, and by changing the set of peers and teachers an individual was exposed to.

Since the educational reform influenced *every* individual who attended school under the new system, in Figure 3 below we depict how the reform participation affected income distribution in Sweden. In particular, using income of individuals born in 1943 (only 12% of individuals went to school in the new system) and in 1960 (everyone went to school in the reformed system), we highlight that the reform narrowed the distribution of income in Sweden. Specifically, it did so by increasing income in the bottom of the distribution. Thus, the reform was instrumental in decreasing income inequality in Sweden.

Figure 3: Income Distribution of Individuals Based on Their Reform Participation



Notes: The Figure above highlights changes in the income distribution in Sweden as a result of the educational reform. "Post-Reform" and "Pre-Reform" indicate income distribution of individuals born in 1960 (all individuals went to schools under the new system) and in 1943 (12% of individuals went to school in the new system), respectively. Income of individuals is measured by the logarithm of the average gross income when they are between 30 and 40 years old. All income measures are presented in year 2000 prices.

The individuals in our main sample comprise the sample of parents in our estimations. The next subsection presents data for children of these individuals.

4.2 *Data for Children*

We complement the data for parents with data on their children that is taken from the Multi-Generation Registry of Statistics Sweden. We have the same information for chil-

dren as we do for their parents: children's municipality of residence, date of birth, place of birth, cognitive and non-cognitive IQ scores, and the level of educational attainment as well as information on both gross and net income, occupation, and employment status. Moreover, for the children's generation, we have data on their grades at the end of ninth grade taken from the government authority for education, *Skolverket*.

In both our intergenerational and tax reform analyses we limit children to those born after 1972 and thus exclude some children who were born earlier. The main reason for this exclusion comes from the fact that we are limiting children to those who were 18 years old and younger during the tax reform of 1991, since we want to estimate the impact of an increase in parental income on children's outcomes such as cognitive IQ scores – that are measured when children are 18 years old. To ensure that this limitation is not driving the results, however, in Section 7 we compare our results of the causal effect of parental income on children using all children born after 1969[25] to those born after 1972.

Table 3: Descriptive Statistics for the Sample of Children

	Mean	St. dev.
Child's Age in 1990	9.87	4.70
Child is Male	0.51	0.50
Father's Age in 1990	39.76	3.63
Mother's Age in 1990	37.78	3.70
Father's Income Between Ages 30-40	214,874	77,803
Mother's Income Between Ages 30-40	131,189	56,194
Father's Education	11.47	2.73
Mother's Education	11.63	2.37
Father's Reform Participation	0.51	0.50
Mother's Reform Participation	0.69	0.46
Observations	378,572	

Notes. The table above presents descriptive statistics for children of individuals subject to the educational reform who were born after 1972. All income measures are presented in year 2000 prices.

Table 3 above presents descriptive statistics for children in our sample. There are data on 378,572 individuals, whose parents belong to the main sample described in the previous subsection. Children, on average, were 10 years old in 1990 with parents who were, on average, around 39. Slightly above half of the children in our sample are male. Fathers in the sample earned more with an average annual gross income of 214,874 SEK compared to mothers who, on average, made 131,189 SEK measured in year 2000 prices.[26]

[25] We excluded a small portion of children who were not subject to the educational reform.

[26] This is equivalent to $33,921 for fathers and $20,710 for mothers in 2021.

Outcome measures used for the sample of children are their level of educational attainment; income, calculated as the average gross income when a child is between 30 and 40 years old; grades at the end of ninth grade; and the cognitive IQ scores of boys. Grades at the end of ninth grade represent a standardized measure of the average of grades for all subjects taken in ninth grade whereas cognitive IQ scores are defined in a similar way to that of the parents. We specify all income measures in levels (unless mentioned otherwise) to be consistent with the literature. However, in Section 7 we also show how our results would change if we used logs instead.

5 The Impact of Parental Education on the Intergenerational Transmission of Income

In this section we quantify the effect of parental education on the intergenerational transmission of income.[27] In such a case, the returns to a policy that affects education of individuals in one generation would extend beyond the individual to also include all succeeding members of his/her family, resulting in long-lasting effects.

5.1 *The Empirical Model and Its Identification*

In this section we want to estimate the causal effect of parental education on transmission of income across generations. To do so, let $\boldsymbol{X}_i^K$ and $\boldsymbol{X}_i^P$ reflect observable permanent characteristics of a child in family i (whether the child was born in Sweden, the child's gender, and the child's birth year) and each of his parents (whether the parent was born in Sweden), respectively. Moreover, let α_c^P and α_m^P denote birth-cohort and municipality fixed effects for each parent, respectively. Additionally, let Y_i^K be income of a child in family i and let Y_i^P be that of his parents where an individual's income is estimated in our analysis using his/her average gross income between the ages of 30 and 40. Parental income is estimated using the sum of the mother's and father's income. Incomes of both parents are included in our estimations to prevent overestimation bias that results from

[27] As mentioned in Section 1, it should be noted that the impact of parental education on the intergenerational transmission of income in our setting is estimated using the educational reform that increased *both* years of education and quality of education. As such, we are capturing the effect of parental exposure to the educational reform on the intergenerational transmission of income when, throughout the paper, we refer to the impact of parental education on the intergenerational transmission of income.

omitting income of one of the parents. For instance, including the income of only fathers might lead to overestimation of the effect of parental income on that of the children if incomes of the parents are positively correlated. Finally, let ϵ_i reflect measurement error. Then a child's income, Y_i^K, can be represented as:

$$Y_i^K = \alpha_0 + \alpha_1 Y_i^P + \alpha_c^P + \alpha_m^P + \alpha_2 \boldsymbol{X}_i^K + \alpha_3 \boldsymbol{X}_i^P + \epsilon_i \tag{2}$$

where α_1 captures the impact of parental income on that of their children. To identify the *causal* impact of parental education on the intergenerational transmission of income given in equation (2) above, we take advantage of the educational reform that took place in Sweden in the 1960s. As mentioned in Section 3, the educational reform both increased the level of compulsory schooling and changed the quality of education of the parent generation. Moreover, the timing of the reform varied across municipalities which, in turn, resulted in variation in reform exposure, both within and between cohorts of parents. Exploiting an exogenous change in parental education as a result of the educational reform, we can thus estimate how a change in parental income, resulting from a change in parental education, affects children. To do so, we instrument for Y_i^P in equation (2) above as follows:

$$\hat{Y}_i^P = \beta_0^P + \beta_1^P R_i^P + \beta_c^P + \beta_m^P + \beta_2 \boldsymbol{X}_i^P + \upsilon_i^P \tag{3}$$

where R_i^P is a dummy for parental reform participation that takes a value of 1 if either the mother or the father went to school under the new system, a value of 2 if both parents went to school under the new system, and 0 otherwise.[28] β_c^P and β_m^P are parental cohort and municipality fixed effects, respectively. $\boldsymbol{X}_i^P$ represents permanent observable characteristics of parents. Both maternal and paternal variables are included in the first-stage of our estimations above since paternal income was defined as the sum of the mother's and father's income.

A crucial assumption of our identification strategy is that, conditional on birth cohort

[28] In Section 5.2, we also discuss whether the educational reform had the same impact on mothers and fathers. Moreover, we explore whether the effect of the mother's income on children's outcomes is the same as that of the father's.

and municipality fixed effects, parents' exposure to the reform is random. This condition would be violated if individuals responded to the reform by moving to or from reformed municipalities in a certain way. To address this issue we separately estimate the impact of the reform on individuals who did not change their municipality of residence as well as the full sample of individuals – that also includes individuals who moved to and from reformed municipalities. Given that the effect of the reform in these two samples is not statistically different from each other as can be seen in Table A.6 in Appendix A, we thus demonstrate that there was no selective mobility. This finding is also consistent with the results obtained in Meghir and Palme (2005) using data on individuals' municipality of birth as well as their municipality of residence in the sixth grade from the 1948 and 1953 cohorts of the Individual Statistics project. Thus, we believe that exposure of individuals to the educational reform was approximately random.

Another underlying assumption of our identification strategy is that there was no selection of municipalities, based on characteristics, that implemented the reform in a given year. As mentioned in Section 3, municipalities that were interested in participating in the reform had to report on different characteristics – such as population growth, tax revenues, local demand for education, and availability of teachers and school premises – to the National Board of Education. The main objective of the Board, when selecting municipalities for participation, was to obtain a certain amount of variation across municipality types in order to facilitate the ongoing assessment of the reform. Although the latter already suggests that there was no selection of municipalities based on characteristics, Table A.7 in Appendix A additionally shows that our results are robust to the inclusion of linear trends in municipality characteristics. Moreover, Table 1 in Section 4 shows that our sample of pre-reform and post-reform individuals is mostly balanced with the only caveat being that parents in the pre-reform system are a bit older. The age difference is unavoidable given the nature of the reform, in which individuals born earlier attended school in the old system, and the slow roll-out of the reform affected a younger generation of individuals. Hence, we believe that there was no trend in which municipalities with certain characteristics got to implement the new system earlier than other municipalities. Since municipalities were still uncertain if their application would be approved even after applying, we also believe that municipalities did not take any

preemptive action before they were assigned to the reformed system.

Given the plausibility of these two assumptions, we next turn to evaluating the causal impact of parental education on intergenerational transmission of income using the IV approach defined in equation (2) above.

5.2 *IV and OLS Estimates*

In this subsection we present our estimates of the causal effect of parental education on the intergenerational transmission of income using the empirical model outlined in the previous subsection.

Table 4: IV and OLS Estimates of the Effect of Parental Income on Children's Income

	IV	OLS
Panel A: Second-stage estimates:		
Parental Income (1,000 SEK)	280***	201***
	(87)	(3)
Child is Male	65,116***	65,094***
	(466)	(465)
Panel B: First-stage estimates:		
Reform Participation	5,386***	
	(8.66)	
Wald F Statistic	162	
Observations	270,452	270,452
Adjusted R^2	0.127	0.142

Notes. The table above demonstrates the effect of a change in parental income – as a result of the educational reform – on that of their children. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table 4 above presents our IV and OLS estimates along with the first-stage results. The IV results given in Column 1 demonstrate a strong positive relationship between income of parents and their children. Specifically, our results suggest that a 1,000 SEK increase in parental income, resulting from changes in parental education, increases children's income on average by 280 SEK. Our OLS findings in Column 2, on the other hand, predict that the impact of parental income is smaller in magnitude — with a 1,000 SEK increase in parental income being associated with around 201 SEK increase in children's income. The difference between IV and OLS estimates in Columns 1 and 2 suggests that the OLS estimates *understate* the positive impact of parental income on that of the children.

Although our estimates of intergenerational income mobility – given in Table 4 above – are smaller than the respective measures previously reported for the U.S., they are in line with literature that studies the impact of parental income on that of their children in Sweden. Using data for both the U.S. and Sweden, Björklund and Jäntti (1997), for example, finds the causal impact of fathers' income on that of sons to be in the 0.28–0.36 range for Sweden and in the 0.42–0.52 range for the U.S.[29] Analogous to Björklund and Jäntti (1997) and Lefgren et al. (2012), in Table A.11 of Appendix A, we find the intergenerational income correlation for parent–son pairs in our sample to be around 0.35. Moreover, our estimate of the impact of parental education on the transmission of income, measured in logarithm, in Table A.10 in Appendix A is consistent with the findings in Holmlund (2006). The latter also uses the Swedish educational reform to estimate the impact of parental income on that of the children.

Panel B of Table 4 above shows that reform participation is a strong instrument for parental income with a Wald F statistic of 162. Moreover, it shows that exposure to the reform had a significant impact on parental income with the reform participation increasing income of the parents in our sample by around 5,400 SEK.

One potential concern regarding the validity and interpretation of our IV estimates is that the impact of the educational reform on the transmission of income might not be homogeneous across different groups of parents. Specifically, since the reform increased the level of compulsory schooling, it is possible that the impact of the reform is driven by parents who would have chosen to get either 7 or 8 years of education and are now forced to attend school for 9 years. Indeed, as was previously mentioned in Section 4.1, the educational reform had a larger impact on individuals with only compulsory level of schooling compared to those who obtained more than 9 years of education. As such, in Table 5 we re-estimate our findings for the group of parents who benefited the *least* from the educational reform.

Table 5 below presents our estimates of the causal impact of parental education for highly educated parents – defined as parents who have more than the new level of com-

[29]Similarly, Österberg (2000), Jantti et al. (2006), and Hirvonen (2008) provide a comparison of intergenerational income mobility between Sweden and the U.S. and show that the estimates of mobility are lower in Sweden. *See also* Solon (1992, 2002); Mazumder (2005); Jantti et al. (2006); Black and Devereux (2010); Chetty et al. (2014); Landersø and Heckman (2017).

pulsory education of 9 years – that comprise around 73% of the parent sample.[30] Panel A of the Table shows that a 1,000 SEK increase in income of this selected group of parents – resulting from changes in their education – increases children's income by 297 SEK. The latter is not statistically different from the estimate of 280 SEK, that was obtained using the full sample of parents, in Table 4 above.

Table 5: The Effect of Parental Income on Children's Income for Parents with More Than 9 Years of Schooling

	IV	OLS
Panel A: Second-stage estimates:		
Parental Income (1,000 SEK)	297***	203***
	(102)	(3)
Child is Male	65,153***	65,122***
	(510)	(510)
Panel B: First-stage estimates:		
Reform Participation	5,659***	
	(7.98)	
Wald F Statistic	123	
Observations	198,261	198,261
Adjusted R^2	0.118	0.135

Notes. The table above presents the effect of parental income on that of children for parents who have more than the new compulsory level of schooling of 9 years. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Given homogeneity of the impact of parental education on income mobility across different groups of parents, next we explore whether the importance of parental education differs based on children's gender. Table 6 below presents our findings for the impact of parental education on the intergenerational transmission of income separately for sons and daughters. The Table shows that parental education has a relatively *smaller* impact on the income of daughters with the impact being in the magnitude of 208 SEK compared to 280 SEK for all children and 353 for sons.

This finding of a differential impact – that favors sons – of parental reform participation on the income of sons and daughters is consistent with findings in Holmlund (2006).[31]

[30] There are 198,261 highly educated parents in our sample of 270,452 parents.

[31] In Table A.9 of Appendix A we additionally explore whether the effects of parental education on the intergenerational transmission of income along with the larger effects on sons can be explained by changes in parental labor force participation (LFP). By comparing the estimates for the sample of employed parents as well as the full sample of parents we show that the impact of the educational reform on the intergenerational income mobility is unlikely to be driven by the LFP of parents. Our findings

Our estimates for sons given in Table A.11 in Appendix A that use a logarithm of income instead of a level are also consistent with those obtained in Lefgren et al. (2012). In sum, our results indicate that the causal impact of parental education tends to benefit sons more compared to daughters. This, in turn, also has implications for gender gap in children's income, favoring boys.

Table 6: The Effect of Parental Income on Children's Income by Child's Gender

	All	Sons	Daughters
Panel A: Second-stage estimates:			
Parental Income (1,000 SEK)	280***	353***	208*
	(87)	(135)	(108)
Child is Male	65,116***		
	(466)		
Panel B: First-stage estimates:			
Reform Participation	5,386***	5,679***	5,043***
	(8.66)	(6.75)	(7.16)
Wald F Statistic	162	93	36
Observations	270,452	139,063	131,388
Adjusted R^2	0.127	0.024	0.039

Notes. The table above presents the effect of parental income on that of children by child's gender. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

In addition to exploring heterogeneity in our estimates by children's gender, we analyze whether gender of the parent matters by identifying if an increase in maternal income has the same impact on children's outcomes as a change in paternal income.[32] Table A.8 in Appendix A presents our results for each parent–child pair. The Table shows that, compared to paternal income, maternal income has a larger impact on income of both sons and daughters. Specifically, our estimates indicate that a 1,000 SEK increase in paternal income increases income of sons and daughters by 291 SEK and 173 SEK, respectively. A 1,000 SEK increase in maternal income, on the other hand, increases sons' and daughters' income by 460 SEK and 248 SEK, respectively. Thus, consistent with the previous literature, we find that an increase in maternal income – resulting from changes

of a small impact of parental LFP on children's outcomes are also consistent with the findings by Mörk et al. (2020).

[32]This is especially important since the impact of the educational reform on individuals did differ by their gender. In particular, similar to Meghir and Palme (2005); Lundborg et al. (2014), in Table A.5 in Appendix A we find that the educational reform had a larger impact on both earnings and education of women compared to men.

in maternal education – has a larger impact on sons than on daughters.[33]

Overall, in this section we provide evidence on the substantial causal impact of parental education on the intergenerational transmission of income. Specifically, we first show that a 1,000 SEK increase in parental income, resulting from a change in parental education, leads to a 280 SEK increase in children's income. Second, we demonstrate that the results are homogeneous across various groups of parents with different levels of education. Third, we show that the impact of parental education on children's income varies by child's gender with sons benefiting more from an increase in parental education compared to daughters. Finally, we show that changes in parental education have the largest impact on the intergenerational income mobility of the mother–son pair.

6 The Impact of Parents' Financial Resources on the Intergenerational Transmission of Income

In this section we aim to quantify the impact of parents' financial resources on the intergenerational transmission of income using the tax reform of 1991.

6.1 *The Empirical Model and Its Identification*

This subsection presents our empirical model of how an individual's income depends on the availability of financial resources during his/her childhood and discusses how we identify it. Let $\boldsymbol{X}_i^K$ and $\boldsymbol{X}_i^P$ reflect observable permanent characteristics of a child (whether the child was born in Sweden, the child's gender, and the child's birth year) and his/her parents (whether each parent was born in Sweden, each parent's birth year, and the municipality of residence), respectively. Additionally, let I_i^P represent parents' financial resources, defined as the sum of maternal and paternal *net* income when children are between 0 and 16 years old. Net income can be thought of as the gross income excluding any taxes, alimony payments, and repayments of student loans. Since parents' financial resources are defined using parental net income, throughout the paper we will be using these two terms interchangeably. Moreover, let Y_i^K be income of a child in family

[33] Black et al. (2005) and Lundborg et al. (2014), for instance, find larger causal effect of maternal education on sons' outcomes using educational reforms in Scandinavian countries.

i where an individual's income is measured using his/her average *gross* income between the ages of 30 and 40. Finally, let η_i^K include unobservable characteristics of a child as well as an error term. Then income of a child, Y_i^K, can be represented as:

$$Y_i^K = \beta_1 I_i^P + \beta_2 \boldsymbol{X}_i^K + \beta_3 \boldsymbol{X}_i^P + \eta_i^K \tag{4}$$

where β_1 captures the impact of parents' financial resources on children's income. Accounting for the omitted variable bias, to get consistent estimates of parents' financial resources, we first assume that unobserved characteristics of a child are independent of parental *net* income once we control for *gross* income of parents, Y_i^P, as well as a child's birth cohort, β_c^K:

$$E(\eta_i^K | I_i^P, Y_i^P, \beta_c^K) = g(Y_i^P) + \beta_c^K$$

where we proxy for $g(Y_i^P)$ in our estimations using parental gross income percentile fixed effects, i.e., $g(Y_i^P)$ takes a value of 1 for parents whose gross income is in 50th percentile, for example, and 0 otherwise. Given this assumption, equation (4) becomes:

$$Y_i^K = \alpha_1 I_i^P + \alpha_2 g(Y_i^P) + \alpha_3 \boldsymbol{X}_i^K + \alpha_4 \boldsymbol{X}_i^P + \epsilon_i^K \tag{5}$$

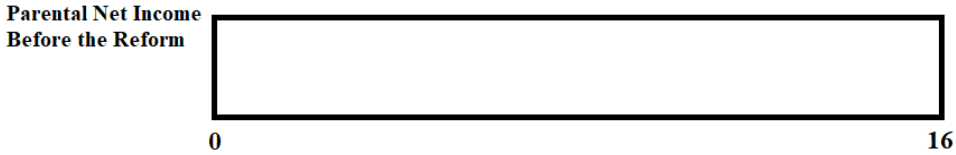
where $E(\epsilon_i^K I_i^P) = 0$. Second, to identify the causal effect of parents' net income on children's income, we take advantage of the tax reform that took place in Sweden in 1991 and exogenously altered the relationship between net and gross income of parents. Considering that this relationship changed over time in response to the reform, we thus modify equation (5) to allow for net income of parents to be a time-dependent function, i.e., $I_{i,t}^P$:

$$Y_i^K = \alpha_1 I_{i,t}^P + \alpha_2 g(Y_i^P) + \alpha_3 \boldsymbol{X}_i^K + \alpha_4 \boldsymbol{X}_i^P + \epsilon_i^K \tag{6}$$

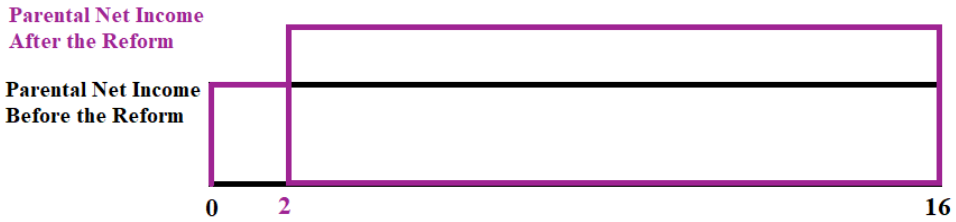
This exogenous change in the dependency between net and gross income is the main mechanism that allows for identification of the causal effect of parental net income. α_1 in equation (6) above then captures the *causal* impact of parents' financial resources on

children's income.

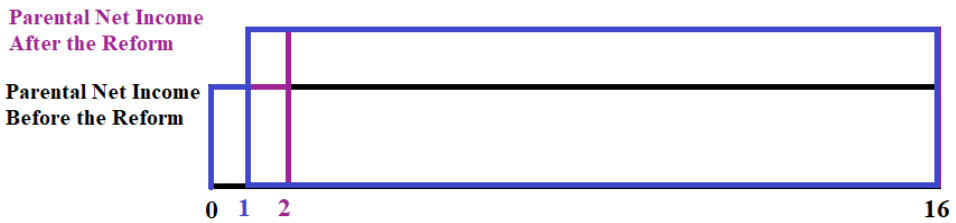
To illustrate the idea behind our identification strategy, we present a simple example. Let the following graph represent parental net income during individual A's childhood, i.e., when he/she was between 0 and 16 years old.



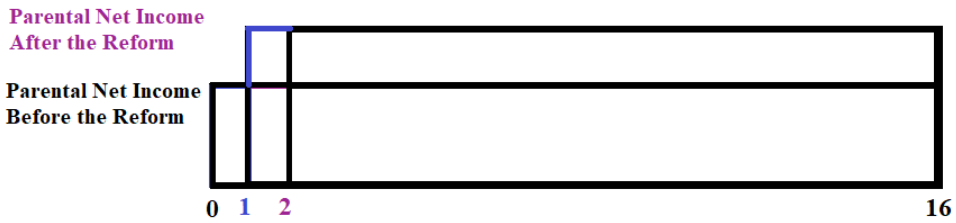
Now assume that individual A's parents experienced an exogenous increase in net income when he/she was 2 years old – that is depicted by a bump up from a black to pink line below:



Consider another individual B who was 1 year old in 1991. For him/her, the change in parental net income due to the tax reform is given by a change from a black to blue line:



Then the only difference between individuals A and B, assuming all other observable characteristics of the two families are the same with the exception that the parent-child pair in family A was born one year earlier, is that individual B's family had one more year of extra net income when he/she was young. This can be seen in blue below:

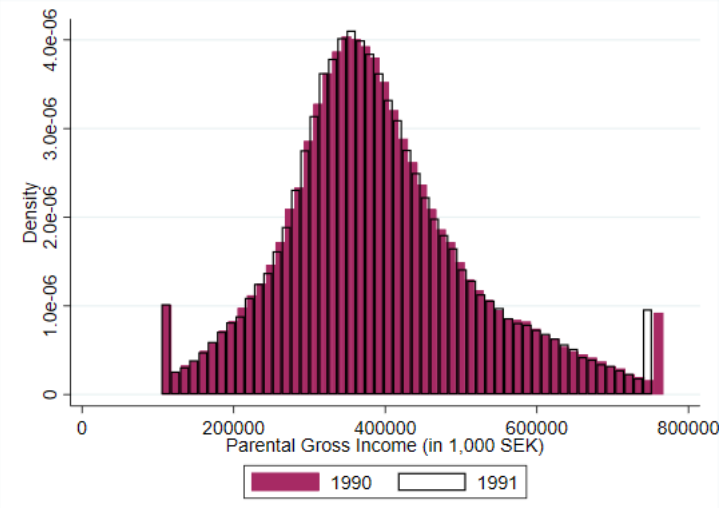


Although the example above compares two families with children who were born 1 year apart, it should be noted that our empirical model controls for children's birth

year fixed effects, thus comparing children who were born the same year and only a few *months* apart. This implies that identification comes from comparing two families that have gross income in the same percentile of income distribution, mothers and fathers who were born the same year and resided in the same municipality, who have children of the same gender that were born the same year but a few months apart. Despite similarities in observable characteristics of these two families, children in the families are affected differently because a child in one family was born a few months later and thus had more financial resources available to him/her due to the tax reform that increased net income of parents by 5%, on average. Hence, the tax reform helps us identify how changes in parental *net* income, while holding parental gross income constant, affect children's gross income.

In our identification strategy outlined above we are implicitly assuming that parental gross income remained the same, i.e., parents did not strategically respond to the tax reform in terms of hours worked. To assess plausibility of this assumption, in Figure 4 below we present distributions of parental gross income in 1990 and in 1991.

Figure 4: Distribution of Parental Gross Income in 1990 and 1991



Notes: Source: Statistics Sweden. The figure above compares gross income of parents in the main sample in 1990 and 1991. All income measures are presented in year 2000 prices.

Similarity between the distributions indicates that parents did not seem to have responded to the tax reform by changing their number of hours worked. This is further supported by data from the OECD that includes the average number of hours worked for

every employed individual in Sweden between 1970 and 2017. In particular, Figure B.2 in Appendix B shows that the number of hours worked decreased by less than 1% for the sample of employed individuals between 1990 and 1991 from 1,575 to 1,562. Similarly, Blomquist et al. (2001) evaluates tax reforms carried out in Sweden between 1980 and 1991 and shows that the net increase in average desired hours of work was only 2%. Additionally, Figures B.3 and B.4 in Appendix B show that parents in our sample did not respond to the reform by taking more parental leave time or sick leave, respectively. Thus, we believe that the assumption of the absence of a strategic response from parents in terms of hours worked is plausible.

It is, however, possible that parents reacted to the tax reform in other ways through increased saving, risk-taking or through reduced levels of stress (Feldstein 2008). Moreover, a decrease in the tax rates could have also impacted provision of public goods such as quality of children's education. To address these concerns, in Table B.1 in Appendix B we re-estimate equation (6) above focusing on families that are identical in terms of observables with the only difference being that the children are born a few *days* apart instead of months. In this case, our estimates capture how, for children born a week apart, an increase in the number of stressful days for parents by 1, for example, differentially affects their income 30 years later. Similarity of the estimates in Table 7 in the next subsection and in Table B.1 in Appendix B demonstrates that other behavioral responses by parents as well as changes in the provision of public goods by the government are less likely to be driving our results. Thus, we believe that our estimates capture the causal impact of parents' financial resources and not of other factors that might have changed as a result of the tax reform.

At last, since the reform was implemented at the beginning of a very sharp recession in Sweden, we need to ensure that we are indeed capturing the effect of the tax reform and not of the economic recession. Hence, we turn to the report by the Welfare Commission[34] that provides a comprehensive assessment of welfare developments in Sweden in the 1990s (Palme et al. 2003). In their summary research, the Commission points out that the main changes in welfare trends were in employment levels and mental health of individuals.

[34]The Welfare Commission is a commission of academic researchers that were brought together by the Swedish Government with the aim of providing a comprehensive assessment of welfare developments in Sweden in the 1990s (Palme et al. 2003).

Moreover, the report shows that groups that were most vulnerable during this time were immigrants, single mothers, and elderly. We thus check whether our estimates are sensitive to these changes in work conditions of the parent generation. Given significant changes in the employment rates in Sweden in the early 1990s, we start off by limiting our sample to those parents that were employed throughout the entire period between 1990 and 1995. Similarity in the findings in Table B.2 in Appendix B that contains results for employed parents and Table 7 in the next subsection that includes all parents in the sample demonstrates that our results are less likely to be driven by changes in the level of employment. Since we have shown above that increased levels of parental stress do not seem to alter our results, next we verify whether exclusion of immigrant parents impacts our estimates.[35] Table B.3 in Appendix B shows that our findings do not change when we exclude this group of parents. Overall, we believe that our estimates are capturing the effect of the tax reform and not of other macroeconomic shocks that took place in Sweden at that time.

Given this identification strategy, in the next subsection we describe our empirical method to estimate the effect of changes in parents' financial resources on children's outcomes.

6.2 *FE and OLS Estimates*

In this subsection we present our estimates of the causal effect of parents' financial resources on children's income using the empirical model outlined in the previous subsection. As mentioned earlier in the paper, since parents' financial resources are measured using parental net income, throughout this subsection we will be using parents' financial resources and parental net income terms interchangeably.

Table 7 below presents our FE and OLS estimates. Column 1 contains our FE estimates obtained using the identification strategy, given by equation (6) in the previous subsection, that additionally controls for family gross income percentiles. Our FE results demonstrate a strong positive relationship between parents' financial resources and children's income and suggest that a 1,000 SEK increase in parental net income increases

[35] We do not verify exclusion of single mothers or elderly on our results since these groups are not part of the main sample.

children's income by 97 SEK, on average.

Our OLS findings in Column 2 predict a larger impact of parental net income with a 1,000 SEK increase in parental net income being associated with a 238 SEK increase in children's income. The difference in magnitudes between the FE and OLS findings indicates a significant endogeneity bias that is present in the OLS estimates and prompts the use of FE models.

Table 7: The Effect of Parents' Financial Resources on Children's Income

	FE	OLS
Parental Net Income (1,000 SEK)	98***	238***
	(7)	(4)
Child is Male	64,525***	64,563***
	(494)	(495)
Observations	248,738	248,738
Adjusted R^2	0.142	0.134

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Column 1 additionally controls for parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

To ensure consistency of our FE estimates given in Table 7 above with the existing literature, in Table B.5 in Appendix B we also estimate how parental net income affects other outcomes of children. We find that a 1,000 SEK increase in parental net income boosts both children's grades after ninth grade and cognitive IQ scores of boys at age 18 by 0.001 of a standard deviation. Although the effect of parental income on children's grades and cognitive IQ scores may seem rather small, it is consistent with the estimates of the effect of parental income on children's IQ scores in Norway (Løken et al. 2012).[36]

Instead of controlling for family gross income percentiles as we did in Table 7 above, in Table B.4 of Appendix B we additionally explore how our estimates of the impact of parents' financial resources on children's gross income vary by parental income deciles. We find that, although the impact of parents' net income varies substantially at the bottom and top of the income distribution,[37] it is broadly uniform between the third and ninth deciles. As such, in the rest of this section we continue estimating the average impact

[36] Additionally, in Table 10 in Section 7 we show that a 10% increase in parental net income is associated with an increase in the magnitude of 2% and 2.8% in children's grades and cognitive IQ scores, respectively.

[37] This is also consistent with the previous literature (Österberg 2000; Jantti et al. 2006; Hirvonen 2008). and our findings for the educational reform in Section 5.2.

of parents' net income while controlling for parental gross income *percentiles* instead of estimating the impact separately for each income decile.

Table 7 above shows that an increase in parents' financial resources has a positive impact on children's outcomes. However, it comes short of identifying if the timing of a change in parents' financial resources also matters. The latter is important from a policy perspective because, if the timing matters, there is an opportunity to increase the impact of parents' financial resources on the intergenerational transmission of income by strategically timing when, during one's childhood, parents receive additional income. As such, in line with the literature on the dynamics of life cycle skill formation, we also test if the impact of an exogenous change in parents' financial resources differs by children's age. Specifically, we divide our sample of children into the following three age categories based on their age in 1991, i.e., the year the parents experienced the tax reform: 0–5, 6–10, and 11–16. Table B.6 in Appendix B displays our findings and highlights the importance of the timing of changes in parental income for children. Specifically, the Table shows that a 1,000 SEK increase in parents' financial resources leads to a 84 SEK and 112 SEK increase in children's income if the increase occurred when the child was 6–10 and 11–16 years old, respectively.

Due to data limitations[38] and since we are measuring individuals' income between the ages of 30 and 40, unfortunately, we cannot estimate the impact of parental income for children in the youngest group. Therefore, to identify if the impact of an increase in parents' financial resources on children is larger for the youngest or the oldest group, in Table B.7 in Appendix B we show our estimates for all groups using individuals' average income, measured between the ages of 27 and 32, as the outcome of interest. Analogous to the findings in Table B.6, we find that parental income during one's teenage years has the largest impact on his/her later-life income. Specifically, we find that a 1,000 SEK increase in parents' financial resources when the child is 0–5, 6–10, and 11–16 years old increases his/her income by 32 SEK, 42 SEK, and 59 SEK, respectively. Altogether, consistent with a growing body of research that finds that additional resources during one's teenage years have the largest impact on his/her later-life outcomes both in Scandinavian countries (Humlum 2011; Carneiro et al. 2021) and the U.S. (Bastian and Michelmore 2018; Manoli

[38]The tax reform took place in 1991 and our data covers only until 2014.

and Turner 2018), our estimates indicate that an increase in parental income during one's teenage years has a larger impact on his/her income during adulthood compared to a change earlier in one's life.

Analogous to Section 5.2, accounting for potential heterogeneous effects of parents' financial resources on children's income by parents' education levels, we also re-estimate our FE and OLS findings above for highly educated parents. Similar to Section 5.2, we define highly educated parents as those who have more than the new level of compulsory education of 9 years. Table 8 below demonstrates our findings and shows that the causal impact of parents' financial resources on children's income is estimated at 100 SEK for this group of parents. This estimate is not statistically different from the finding of 98 SEK for the full sample of parents. This, in turn, suggests that the results are less likely to be driven by a subgroup of parents. The latter is not surprising considering that we explicitly control for gross income of individuals in our FE approach.

Table 8: The Effect of Parents' Financial Resources on Children's Income for Parents with More Than 9 Years of Schooling

	FE	OLS
Parental Net Income (1,000 SEK)	100***	240***
	(8)	(4)
Child is Male	64,346***	64,374***
	(543)	(546)
Observations	183,295	183,295
Adjusted R^2	0.136	0.128

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40, for parents who have more than 9 years of schooling. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, as well as municipality fixed effects for fathers. Column 1 additionally controls for parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Given homogeneity of estimates, next we look at whether the importance of parental net income differs based on children's gender. Analogous to the estimates for parental education in Section 5.2, Table 9 below demonstrates that parents' financial resources matter less for daughters with the impact being in the magnitude of 90 SEK compared to 105 SEK for sons. This, in turn, also has implications for gender gap in children's income and suggests that an exogenous increase in parents' financial resources might have a small effect in decreasing the gender gap in children, favoring boys.

Table 9: The Effect of Parents' Financial Resources on Children's Income by Child's Gender

	All	Sons	Daughters
Parental Net Income (1,000 SEK)	98***	105***	90***
	(7)	(10)	(6)
Child is Male	64,525***		
	(494)		
Observations	248,738	127,840	120,895
Adjusted R^2	0.142	0.052	0.058

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40, by child's gender. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, and parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

In addition to exploring heterogeneity in our estimates by children's gender, we next analyze whether gender of the parent matters by identifying whether an increase in mother's financial resources has the same impact on children's outcomes as that of father's. Specifically, in Table B.8 in Appendix B we identify the intergenerational impact of changes in parents' financial resources on children separately for each parent-child pair. Panel A of the Table shows that both mothers' and fathers' income has a significant impact on that of the children.[39] Specifically, the Table shows that a 1,000 SEK increase in the mother's net income increases the daughter's income by 160 SEK and son's income by 75 SEK. A 1,000 SEK increase in the father's net income, on the other hand, increases the daughter's and son's income by 149 and 108 SEK, respectively. Altogether, consistent with the broader literature that focuses on parent-child income mobility pairs in Sweden (Österberg 2000; Hirvonen 2008) and the U.S. (Chadwick and Solon 2002; Raaum et al. 2008), our findings highlight stronger mother-daughter and father-son income links.

In general, our results using the tax reform of 1991 suggest that a 1,000 SEK increase in parental net income leads to a 98 SEK increase in children's income. Since the impact of parental education on the intergenerational transmission of income in Section 5 was estimated using the average *gross* income of both parents and children, we convert net income of parents to gross income. As a result, we find that a 1,000 SEK increase in parental *gross* income increases children's gross income by 74 SEK, on average.[40]

[39] Additionally, in line with our findings that utilize the educational reform, in panels B and C of the Table we show that an exogenous change in parents' financial resources – due to the tax reform – has little impact on both sons' and daughters' labor force participation.

[40] This estimate is obtained by accounting for the fact that parental net income is 0.76% of parental

Overall, in this section we first show that a 1,000 SEK increase in parents' financial resources increases children's income by 74 SEK. Second, we show that the timing of a change in parents' financial resources matters for children with an increase in parental income during a child's teenage years having the largest impact on his/her later-life income compared to a change earlier in his/her life. Third, we demonstrate that the impact of parents' financial resources on children is homogeneous across various groups of parents with different levels of education. Fourth, similar to the impact of parental education on children, we show that availability of financial resources benefits sons more compared to daughters. Finally, we show that changes in parents' financial resources have the largest impact on the intergenerational income mobility of the mother–daughter pair.

6.3 *Relative Importance of Parental Education and Parent's Financial Resources on Children's Income*

In this subsection, we aim to present the relative importance of parental education and parents' financial resources on children's income. Our estimates of parental education indicate that a 1,000 SEK increase in parental income, resulting from a change in parental education, leads to a 280 SEK increase in children's income. Findings on the importance of parental resources, in turn, suggest that a 1,000 SEK increase in parents' financial resources results in a 74 SEK increase in children's income. The relative importance of these two mechanisms implies that financial resources amount to around 25% of the effect of parental education on the intergenerational transmission of income. This finding also indicates that non-pecuniary benefits associated with education account for about 75% of the impact of parental education on children.

One of the potential ways in which parents' education can impact children – other than income – is through the amount and quality of time parents spend with their children (Guryan et al. 2008). The neighborhood and school sorting have also been shown to be important factors in explaining higher income and lower educational mobility in Scandinavian countries (Landersø and Heckman 2017). In Table A.3 in Appendix A we show that factors such as decision of parents to have children or the number of children

gross income in our data.

they chose to have, on the other hand, did not seem to have played a significant role in our setting.

Accounting for the possibility that parental education and parents' financial resources have different relative impact on children based on their gender, we also show that non-pecuniary benefits matter more for sons compared to daughters. Specifically, we find that a 1,000 SEK increase in parental income – resulting from changes in parental education – and financial resources increases income of sons by 353 SEK and 80 SEK,[41] respectively. The corresponding estimates for daughters are 208 SEK and 68 SEK. These results imply that non-pecuniary benefits associated with parental education amount to around 80% and 70% of parental education for sons and daughters, respectively. This finding of a larger impact of non-pecuniary benefits on sons compared to daughters is also consistent with the existing literature. Bertrand and Pan (2013), for instance, show that the quality of parental inputs has larger impacts on the behavioral and disciplinary outcomes of boys than it does of girls in the U.S. Similarly, Fan et al. (2015) provides evidence from Norwegian registry data that a decrease in the mother's time input – as a result of increasing employment during children's early years – has a differentially adverse effect on the educational attainment of sons relative to daughters.

By further exploring implications of our results for the gender income gap, we find that an increase in the mother's financial resources has the largest impact on daughters. Using the educational reform, on the other hand, we show that an increase in maternal income – resulting from changes in maternal education – has a bigger effect on sons than on daughters. Hence, our results indicate that changes in maternal education tend to benefit sons more whereas changes in maternal income, while holding maternal education constant, tend to benefit daughters the most. Differences in the impact of maternal income, based on the mechanism through which it changes, thus highlight differences in the gender income gap implications of educational and income transfer policies.

Overall, in this paper we show that an increase in parental education benefits children not only through increased financial resources, but also through non-pecuniary changes in the type of parent one is. Moreover, we show that the latter accounts for the majority

[41] The estimate was obtained by converting the results given in Table for parental net income into gross income.

of the impact of parental education on children.

7 Robustness Analysis

This section discusses a number of robustness checks, supporting the validity of our main results.

Fertility.–Our intergenerational analysis relies on the fact that fertility rates were not affected by the educational reform. Table A.3 in Appendix A shows that the educational reform participation did not significantly affect either decision of parents to have children or the number of children they chose to have.

Linear Trends in Municipality Characteristics.–In our analysis of the impact of parental education on the intergenerational income mobility, we condition on parental municipality of residence. However, we do not include linear trends in municipality characteristics. Given the possibility that characteristics of reformed municipalities are correlated with the educational reform implementation year, we also add linear trends for municipality characteristics in our estimation. This, however, does not alter our results of the impact of the reform participation on individual's income as can be seen from Table A.7 in Appendix A that presents our results with and without municipality linear trends.

Log Specification.–Throughout the paper we have measured both parents' and children's income in levels. For comparison, in Table 10 below we present our findings of the effect of an exogenous increase in parental net income on children's outcomes when income is measured in logs instead of levels.

Table 10: FE Estimates of Log(Parents' Financial Resources) on Children's Standardized Grades and IQ Scores

	Grades	Cognitive IQ
Log(Parental Net Income)	0.203***	0.280***
	(0.021)	(0.022)
Child is Male	-0.408***	
	(0.006)	
Observations	243,876	92,386
Adjusted R^2	0.140	0.072

Notes. The table above presents the effect of parents' financial resources/net income on children's standardized grades after ninth grade and cognitive IQ scores of boys. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, as well as parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

In line with the results in Dahl and Lochner (2012) and Bastian and Michelmore (2018), we find that measuring income in logs instead of levels does not change our main results. Specifically, we find that a 10% increase in parental net income during an individual's childhood increases his/her standardized grades after ninth grade by 2%, and the cognitive IQ scores by 2.8%.

Inclusion of Parents that Lost Income Following the Tax Reform.–To identify the causal impact of parents' financial resources on the intergenerational transmission of income in Section 6 of the paper, we take advantage of a tax reform that increased net income of parents by 5% on average. This 5% increase implies that most parents in our sample experienced an increase in their income following the tax reform. However, as can be seen in Figure B.1 in Appendix B that presents the distribution of changes in parental net income between 1990 and 1991, less than a quarter of parents in our sample incurred an income loss as a result of the tax reform. As such, to ensure that our estimates of parents' financial resources are not driven by a subsample of parents that lost income, in Table B.9 in Appendix B we present our results for the full sample of parents as well as a subsample of parents that experienced an income gain. The Table shows that an increase in parents' financial resources by 1,000 SEK increases children's income by 98 SEK and 108 SEK for the full sample and the subsample of parents that experienced an income gain, respectively.[42] Given the similarity of the estimates, we thus believe that inclusion of parents that incurred an income loss does not significantly affect our estimates of the causal impact of parents' financial resources on the intergenerational transmission of income.

[42]In Table B.10 in Appendix B we show that a decrease in parents' financial resources by 1,000 SEK decreases children's income by 49 SEK for the sample of parents that experienced an income *loss*. To identify whether the impact of parental income gain on children is symmetric to that of an income loss, in Table B.11 in Appendix B we limit the sample of parents to those that have similar characteristics, but have experienced a different change in their net income as a result of the tax reform. In particular, limiting the sample to parents that experienced an income change of no more than 10,000 SEK – that is less than 3% of net income of parents in 1990 on average – we find that a 1,000 SEK increase in parental income leads to a 62 SEK increase in children's income whereas a 1,000 SEK loss leads to a decrease in children's income of 67 SEK. Although the impact of an increase in parental income on the intergenerational income mobility is lower in absolute terms than the decrease, we cannot reject that the estimates are the same. This finding of a symmetric effect on children of a decrease and an increase in parental income is also consistent with the broader literature that explores how childhood experiences affect individuals' income. Using data for over 7 million families that moved across commuting zones and counties in the U.S., Chetty and Hendren (2018), for example, shows that the impact of a move to better and worse areas during childhood on individual's income is symmetric.

8 Concluding Remarks

There are two main mechanisms in the canonical family model of the transmission of income across generations – parental income and parental education. In this work we provided novel empirical evidence to separately identify the significance of these two mechanisms in explaining the intergenerational transmission of income by taking advantage of two reforms that affected the *same* group of parents.

The first is an educational reform in the 1960s in Sweden that increased compulsory schooling from seven/eight years to nine years, abolished placement based on academic achievement after grade six, and imposed a nationally unified curriculum. This reform influenced every individual who went to school under the new system either by increasing the number of years of education or by changing the set of school peers/teachers each student was exposed to. Taking advantage of the exogenous change in parental education as a result of the reform, we estimate that a 1,000 SEK increase in parental income – as a result of changes in parental education – leads to a 280 SEK increase in children's income.

The second is a tax reform of 1991 that had an impact on parents while they were working and exogenously altered their income. The tax reform of 1991 increased net income of parents in our sample by 5% on average. Utilizing this exogenous change in parents' financial resources, we show that a 1,000 SEK increase in parental income – resulting from changes in parents' financial resources – leads to a 74 SEK increase in children's income.

In sum, using these two reforms we first show that a 1,000 SEK increase in parental income – as a result of the educational reform – results in a 280 SEK increase in children's income. Using the tax reform, we find that a 1,000 SEK increase in parental income – as a result of the tax reform – increases children's income by 74 SEK. Given the relative impacts of these two mechanisms on the intergenerational transmission of income, we can thus conclude that parents' financial resources amount to only about 25% of the effect of parental education on children's income. This finding also implies that non-pecuniary benefits associated with parental education – such as the amount and quality of time parents spend with their children – amounts to around 75% of the impact of parental

education on children. Considering that the impact of non-pecuniary benefits might differ based on children's gender, we also show that non-pecuniary benefits matter more for sons with the effect being around 80%. Overall, our findings suggest comparatively modest impact of parents' financial resources. This might, however, be due to generous social safety net that is present in Sweden. As such, one should be careful when considering the implications of educational and tax reforms in other non-Scandinavian countries.

Overall, this paper improves understanding of the mechanisms that drive intergenerational transmission of income and shows that both parental education and financial resources are important in explaining intergenerational transmission of inequality compared to changes in parents' financial resources alone. This result is important for evaluation of policies aimed at increasing equality of opportunity.

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Appendix A

Table A.1: The Effect of the Educational Reform on Individuals' Outcomes While Controlling for Municipality Characteristics

	Education	Log(Income)	Income	Ever Empl.	Years Empl.
Reform (Dummy)	0.256***	0.007***	796.427**	0.001	0.014***
	(0.019)	(0.003)	(327.238)	(0.001)	(0.005)
Male (Dummy)	-0.155***	0.490***	73101.450***	0.039***	0.132***
	(0.022)	(0.005)	(748.532)	(0.001)	(0.005)
Area (in 1,000 Sq Km)	-0.002***	-0.000	-2.371	-0.000	-0.002***
	(0.001)	(0.000)	(17.697)	(0.000)	(0.000)
Municipality Population	-0.009***	0.000	9.509	0.000	-0.003***
	(0.001)	(0.001)	(43.208)	(0.000)	(0.001)
Share of Farming Area	-0.029***	-0.005***	-649.115***	-0.003***	0.004
	(0.010)	(0.002)	(185.465)	(0.001)	(0.010)
Share of Agricultural Estates	-0.025	-0.023	-2805.592*	-0.010	0.146***
	(0.068)	(0.014)	(1663.104)	(0.007)	(0.034)
Municipality Income Per Capita	-0.453***	-0.026***	-569.875	-0.005**	-0.109***
	(0.036)	(0.007)	(746.890)	(0.003)	(0.023)
Real Estate Value Per Capita	0.001	-0.000	59.135	0.000	0.002
	(0.004)	(0.001)	(78.598)	(0.000)	(0.003)
Observations	920,584	920,584	920,584	920,584	920,584
Adjusted R^2	0.047	0.192	0.242	0.033	0.815

Notes. The table above presents the effect of the reform on schooling, gross income, probability of ever being employed, and the number of years an individual was employed between the ages of 30 and 40. Municipality Income Per Capita and Real Estate Value Per Capita variables are given in 1,000 SEK with Municipality Population being in 1,000. The table also controls for an indicator for being born in a Nordic country and birth cohort of individuals as well as municipality fixed effects. The results are displayed for individuals born between 1943 and 1960, i.e., born 6 years before and 5 years after the reform for each municipality (excluding the preceding cohort). All income measures are presented in year 2000 prices. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.2: The Effect of the Educational Reform on Individuals' Employment Outcomes

	Men		Women	
	Ever Employed	Years Employed	Ever Employed	Years Employed
Reform (Dummy)	0.001	0.020***	0.002	0.018**
	(0.001)	(0.007)	(0.002)	(0.008)
Observations	487,765	487,765	457,972	457,972
Adjusted R^2	0.008	0.832	0.056	0.798

Notes. The table above presents the effect of the educational reform on the probability of ever being employed and the number of years an individual is employed between the ages of 30 and 40 by individuals' gender. The table also controls for an indicator for being born in a Nordic country and birth cohort of individuals as well as municipality fixed effects. The results are displayed for individuals born between 1943 and 1960, i.e., born 6 years before and 5 years after the reform for each municipality (excluding the preceding cohort). All income measures are presented in year 2000 prices. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.3: The Effect of the Educational Reform on Individuals' Decision to Have Children and the Number of Children

	Number of Children	Decision to Have Children
Reform (Dummy)	-0.0048	-0.0004
	(0.0200)	(0.0015)
Observations	270,451	270,451
Adjusted R^2	0.081	0.013

Notes. The table above presents the effect of the reform on individuals' decision to have children and the number of children they choose to have. The table also controls for an indicator for being born in a Nordic country, gender, and birth cohort of individuals as well as municipality fixed effects. The results are displayed for individuals born between 1943 and 1960, i.e., born 6 years before and 5 years after the reform for each municipality (excluding the preceding cohort). All income measures are presented in year 2000 prices. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.4: The Effect of the Educational Reform on Individuals' Income by Their Education Levels

	All	9 Years	10 Years or More
Reform (Dummy)	0.007***	0.014**	0.006**
	(0.003)	(0.006)	(0.003)
Male (Dummy)	0.506***	0.574***	0.501***
	(0.005)	(0.008)	(0.006)
Observations	945,737	227,483	701,270
Adjusted R^2	0.172	0.180	0.180

Notes. The table above presents the effect of the educational reform on individuals' income, between the ages of 30 and 40, by their education levels. The table also controls for an indicator for being born in a Nordic country and birth cohort of individuals as well as municipality fixed effects. The results are displayed for individuals born between 1943 and 1960, i.e., born 6 years before and 5 years after the reform for each municipality (excluding the preceding cohort). All income measures are presented in year 2000 prices. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.5: The Effect of the Educational Reform on Individuals' Outcomes by Their Gender

	Women		Men	
	Education	Income	Education	Income
Reform (Dummy)	0.341***	942*	0.219***	426
	(0.023)	(561)	(0.018)	(392)
Observations	487,765	487,765	457,972	457,972
Adjusted R^2	0.059	0.034	0.035	0.057

Notes. The table above presents the effect of the educational reform on schooling and gross income of individuals between the ages of 30 and 40 by their gender. The table also controls for an indicator for being born in a Nordic country and birth cohort of individuals as well as municipality fixed effects. The results are displayed for individuals born between 1943 and 1960, i.e., born 6 years before and 5 years after the reform for each municipality (excluding the preceding cohort). All income measures are presented in year 2000 prices. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.6: IV Estimates of the Effect of Parental Income on Children's Income for All Parents and Those That Did Not Change Municipality of Residence

	All	Did Not Move
Panel A: Second-stage estimates:		
Parental Income (1,000 SEK)	280***	273**
	(87)	(126)
Child is Male	65,116***	65,384***
	(466)	(571)
Panel B: First-stage estimates:		
Reform Participation	5,386***	4,707***
	(8.66)	(6.44)
Wald F Statistic	162	83
Observations	270,452	181,279
Adjusted R^2	0.127	0.128

Notes. The table above demonstrates the causal effect of a change in parental income as a result of the educational reform on that of their children. Column 1 includes all individuals in our main sample whereas Column 2 limits it to parents who had the same municipality of residence in 1960 and 1968. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.7: IV Estimates of the Effect of Parental Income on Children's Income With and Without Municipality Linear Trends

	Without Mun. Linear Trends	With Mun. Linear Trends
Parental Income (1,000 SEK)	286***	287***
	(85)	(85)
Child is Male	65,119***	65,122***
	(473)	(473)
Area (1,000 Sq Km)		50
		(64)
Municipality Population (1,000)		-124
		(99)
Share of Farming Area		-2125***
		(447)
Share of Agricultural Estates		-6529
		(4267)
Municipality Income Per Capita (1,000 SEK)		-3325
		(2599)
Real Estate Value Per Capita (1,000 SEK)		-446*
		(240)
Observations	262,750	262,750
Adjusted R^2	0.126	0.126

Notes. The table above demonstrates the causal effect of a change in parental income as a result of the educational reform on that of their children. Column 1 includes all individuals in our main sample whereas Column 2 also controls for linear trends in municipality characteristics. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.8: The Effect of Maternal and Paternal Income on Children's Income by Child's Gender

	All	Sons	Daughters
Maternal Income (1,000 SEK)	360***	460***	248*
	(83)	(91)	(143)
Paternal Income (1,000 SEK)	226***	291***	173**
	(44)	(43)	(81)
Observations	265,046	128,777	136,264

Notes. The table above presents the effect of maternal and paternal income on that of children by child's gender. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.9: The Effect of Parental Income on Children's Income by Child's Gender and Parental Employment Status

	All	Sons	Daughters
Panel A: Estimates for Employed Parents:			
Parental Income (1,000 SEK)	273***	372***	188*
	(88)	(142)	(109)
Child is Male	65,500***		
	(475)		
Panel B: Estimates for All Parents:			
Parental Income (1,000 SEK)	280***	353***	208*
	(87)	(135)	(108)
Child is Male	65,116***		
	(466)		

Notes. The table above presents the effect of parental income on that of children by child's gender for employed parents and for all parents. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table A.10: The Effect of Parental Income on Children's Income in Logs

	IV	OLS
Panel A: Second-stage estimates:		
Log(Parental Income)	0.299**	0.201***
	(0.138)	(0.004)
Child is Male	0.243***	0.243***
	(0.003)	(0.003)
Panel B: First-stage estimates:		
Reform Participation	0.018***	
	(0.002)	
Wald F Statistic	141	
Observations	270,452	270,452
Adjusted R^2	0.075	0.086

Notes. The table above demonstrates the effect of a change in parental income as a result of the educational reform on that of their children. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

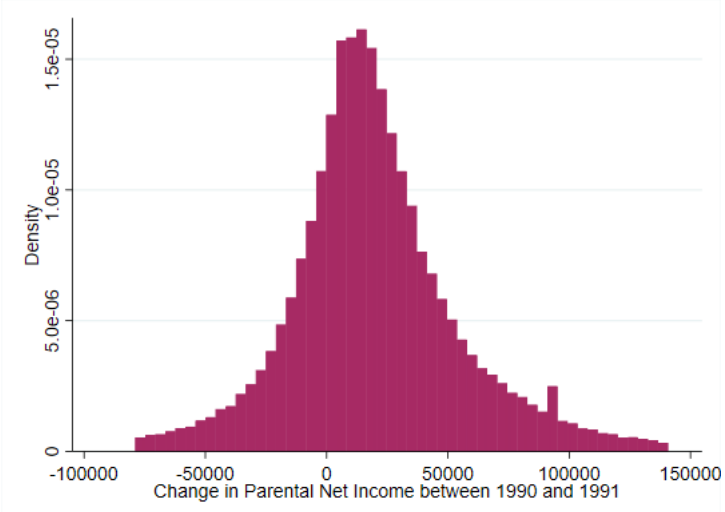
Table A.11: The Effect of Parental Income on Sons' Income

	IV	OLS
Panel A: Second-stage estimates:		
Log(Parental Income)	0.349*	0.204***
	(0.188)	(0.006)
Panel B: First-stage estimates:		
Reform Participation	0.019***	
	(0.003)	
Wald F Statistic	83	
Observations	139,063	139,063
Adjusted R^2	0.009	0.029

Notes. The table above demonstrates the effect of a change in parental income as a result of the educational reform on that of their sons. An individual's income is estimated by the average gross income when he/she was between 30 and 40 years old. Parental income is estimated using the sum of the mother's and father's income. The results are displayed for sons of individuals subject to the educational reform. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, as well as municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

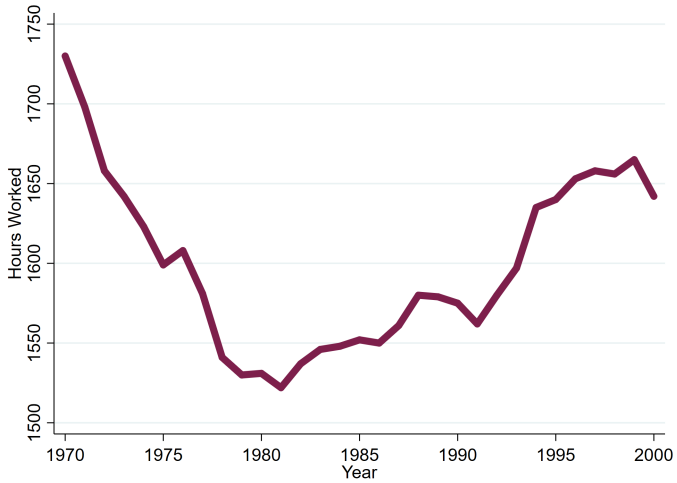
Appendix B

Figure B.1: Distribution of Changes in Parental Net Incomes between 1990 and 1991



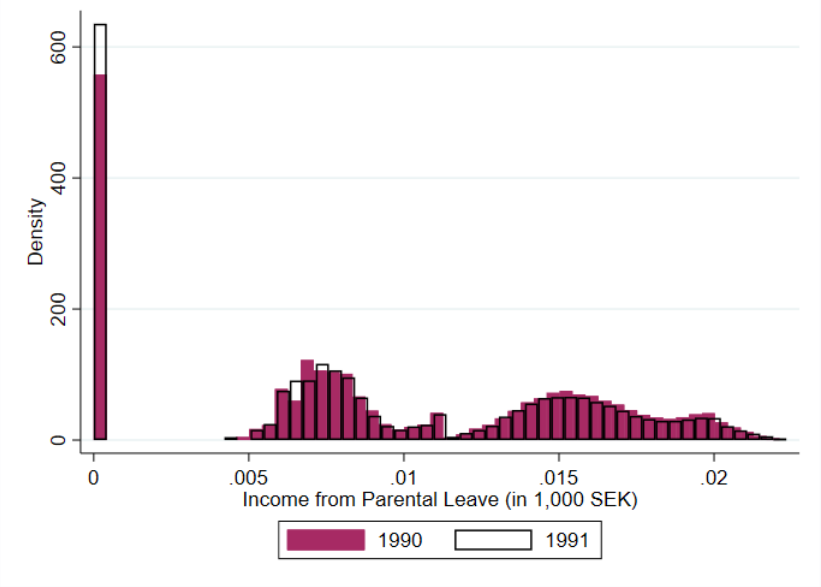
Notes: The figure above displays distribution of changes in parental net incomes between 1990 and 1991 for parents in our sample. All income measures are presented in year 2000 prices.

Figure B.2: Average Hours Worked for Employed Individuals in Sweden



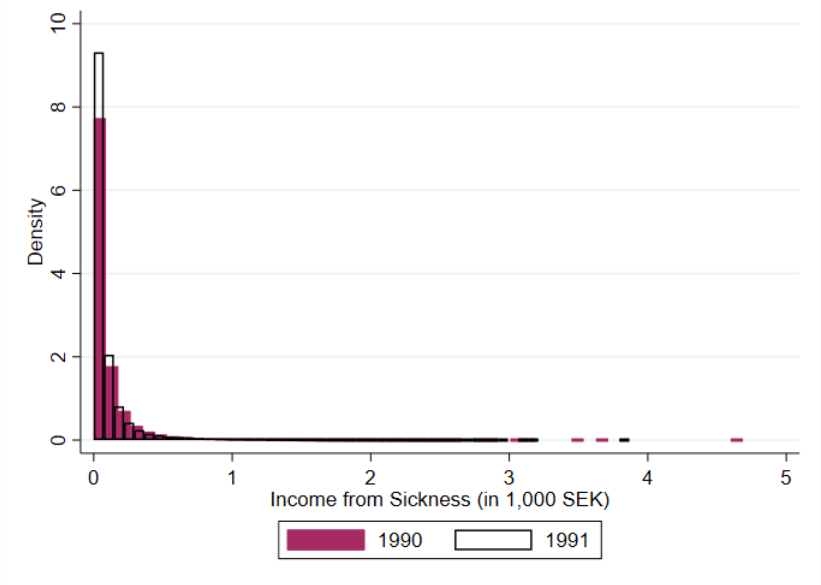
Notes: Source: OECD data for hours worked for Sweden taken from *https://data.oecd.org/emp/hours-worked.htm.*

Figure B.3: Distribution of Income from Parental Leave in 1990 and 1991



Notes: The Figure above show the distribution of income from parental leave in 1990 and 1991.

Figure B.4: Distribution of Income from Sickness in 1990 and 1991



Notes: The Figure above show the distribution of income from sickness in 1990 and 1991.

Table B.1: The Effect of Parents' Financial Resources on Children's Income for Children Born in the Same Year and Month

	FE	OLS
Parental Net Income (1,000 SEK)	98***	238***
	(7)	(4)
Child is Male	64,528***	64,566***
	(494)	(495)
Observations	248,738	248,738
Adjusted R^2	0.143	0.134

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, and and children's birth month fixed effects. Column 1 additionally controls for parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.2: The Effect of Parents' Financial Resources on Children's Income for Parents Employed in 1990 and 1995

	FE	OLS
Parental Net Income (1,000 SEK)	103***	244***
	(8)	(4)
Child is Male	65,992***	66,044***
	(520)	(525)
Observations	214,405	214,451
Adjusted R^2	0.143	0.137

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40. The results are displayed for children of individuals subject to the educational reform and for parents who were employed both in 1990 and 1995. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Column 1 additionally controls for parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.3: The Effect of Parents' Financial Resources on Children's Income for Non-Immigrant Parents

	FE	OLS
Parental Net Income (1,000 SEK)	99***	238***
	(7)	(4)
Child is Male	64,558***	64,594***
	(494)	(497)
Observations	242,577	242,705
Adjusted R^2	0.142	0.134

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40. The results are displayed for children of individuals subject to the educational reform and for non-immigrant parents. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, as well as municipality fixed effects for fathers. Column 1 additionally controls for parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.4: The Effect of Parents' Financial Resources on Children's Income by Parental Income Deciles

	Parental Income Decile									
	1	2	3	4	5	6	7	8	9	10
Parental Net Income	68***	53***	91***	82***	121***	118***	117***	91***	110***	168***
	(11)	(15)	(15)	(15)	(20)	(16)	(15)	(16)	(16)	(18)
Observations	24,865	24,865	24,861	24,867	24,862	24,884	24,832	24,856	24,850	24,833
Adjusted R^2	0.104	0.118	0.121	0.131	0.127	0.132	0.115	0.115	0.105	0.101

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40, by parental income deciles. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, and municipality fixed effects for fathers. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.5: FE Estimates of Parents' Financial Resources on Children's Standardized Grades and IQ Scores

	Grades	Cognitive IQ
Parental Net Income (1,000 SEK)	0.001***	0.001***
	(0.000)	(0.000)
Child is Male	-0.408***	
	(0.006)	
Observations	243,876	92,386
Adjusted R^2	0.141	0.074

Notes. The table above presents the effect of parents' financial resources/net income on children's standardized grades after ninth grade and cognitive IQ scores of boys. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, as well as parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.6: The Effect of Parents' Financial Resources on Children's Income by Their Age at Exposure

	All	Ages 6-10	Ages 11-16
Parental Net Income (1,000 SEK)	98***	84***	112***
	(7)	(11)	(9)
Child is Male	64,525***	56,737***	67,569***
	(494)	(816)	(613)
Observations	248,738	795,46	145,098
Adjusted R^2	0.142	0.105	0.160

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40, by children's age in 1991. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, and parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.7: The Effect of Parents' Financial Resources on Children's Income – between the Ages of 27 and 32 – by Their Age at Exposure

	All	Ages 0-5	Ages 6-10	Ages 11-16
Parental Net Income (1,000 SEK)	50***	32***	42***	59***
	(6)	(12)	(8)	(7)
Child is Male	48,795***	34,808***	46,670***	52,679***
	(658)	(1181)	(884)	(727)
Observations	270,912	27,201	97,496	146,202
Adjusted R^2	0.103	0.049	0.090	0.129

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 27 and 32, by children's age in 1991. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, and parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.8: The Effect of Mothers' and Fathers' Financial Resources on Children's Income and Labor Force Participation

	All	Son	Daughter
Panel A: The impact on children's income			
Maternal Net Income (1,000 SEK)	116***	75***	160***
	(5)	(8)	(6)
Paternal Net Income (1,000 SEK)	129***	149***	108***
	(5)	(7)	(6)
Panel B: The impact on children's decision to become employed			
Maternal Net Income (10,000 SEK)	0.001***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)
Paternal Net Income (10,000 SEK)	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Panel C: The impact on children's number of years employed			
Maternal Net Income (1,000 SEK)	0.001***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)
Paternal Net Income (1,000 SEK)	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Observations	267,353	137,658	129,695

Notes. The table above presents the effect of mothers' and fathers' financial resources/net income on children's labor force participation and income, defined as the average gross income of an individual between the ages of 30 and 40. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, and parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.9: The Effect of Parents' Financial Resources on Children's Income for Parents that Experienced Net Income Gain

	Full Sample	Income Gain Sample
Parental Net Income (1,000 SEK)	98***	108***
	(7)	(9)
Child is Male	64,525***	65,020***
	(494)	(530)
Observations	248,738	190,441
Adjusted R^2	0.142	0.143

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40. Column 1 presents the results for the full sample. Column 2 limits the sample of parents to those who experienced an increase in their net income as a result of the tax reform. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, as well as parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.10: The Effect of Parents' Financial Resources on Children's Income for Parents that Experienced Net Income Loss

	Full Sample	Income Loss Sample
Parental Net Income (1,000 SEK)	98***	49***
	(7)	(10)
Child is Male	64,525***	62,955***
	(494)	(856)
Observations	248,738	58,294
Adjusted R^2	0.142	0.133

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40. Column 1 presents the results for the full sample. Column 2 limits the sample of parents to those who experienced a decrease in their net income as a result of the tax reform. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, as well as parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.

Table B.11: The Effect of Changes in Parents' Financial Resources on Children's Income for Parents that Experienced Less Than 10,000 SEK Change in Net Income

	Income Gain Sample	Income Loss Sample
Parental Net Income (1,000 SEK)	62***	67***
	(14)	(19)
Child is Male	64,810***	62,020***
	(978)	(1312)
Observations	34,234	22,275
Adjusted R^2	0.140	0.135

Notes. The table above presents the effect of parents' financial resources/net income on children's income, defined as the average gross income of an individual between the ages of 30 and 40. Column 1 presents the results for the sample of parents to those who experienced an increase in their net income of no more than 10,000 SEK as a result of the tax reform. Column 2 limits the sample of parents to those who experienced a decrease in their net income of no more than 10,000 SEK as a result of the tax reform. All income measures are presented in year 2000 prices. The table also controls for an indicator for being born in a Nordic country and birth cohort fixed effects for both parents and children, children's gender, municipality fixed effects for fathers, as well as parental net income percentile fixed effects. Standard errors are in parenthesis and are clustered at the 1960 municipality level. *, **, and *** mean statistically different from zero at 10, 5, and 1% levels of significance.