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Giving to the children or the taxman?[☆]

Lessons from a Swedish inheritance tax loophole

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ABSTRACT

Wealth transfer tax systems based on inheritances and *inter vivos* gifts, rather than estates, allow donors to shift wealth among potential recipients with the goal of minimizing tax burdens. However, tax minimization often requires the donor to give up control over wealth if the transfers are made as *inter vivos*. Usually, such behavior is difficult to analyze as many potential heirs and many different tax schedules are involved. In this article, we study a simple setting that allows us to obtain transparent and credible evidence of inheritance tax responses. Swedish heirs could easily lower their inheritance tax bills to zero by giving part of the inheritance to their children. Using detailed administrative data, we show that many heirs tax minimized in a precise fashion. Still, among those inheriting just above the exemption, only about a half avoided the tax. Preferences for holding wealth and information seem to play major roles. Our findings have general policy relevance, because similar (but more complex) tax avoidance strategies can be used to avoid any inheritance tax.

1. Introduction

In recent decades, the importance of inherited wealth has increased and it now constitutes 50–60 percent of all wealth in Europe and the U.S. (Alvaredo et al., 2017). This has led to an increasing interest in progressive inheritance and wealth taxation, which are potentially powerful instruments in mitigating wealth inequality. At the same time, actual progressive wealth transfer taxes often contain loopholes, severely eroding the tax base and the intended progressivity. In bequest based inheritance tax systems, which are common around the world, decedents face strong incentives to shift wealth among potential heirs with the goal of minimizing the tax burden. However, tax minimization often requires giving up control over wealth assets through elaborate *inter vivos* gifts. And as noted by Schmalbeck (2001, p.156), “people simply do not like to give away their property while they are alive”.

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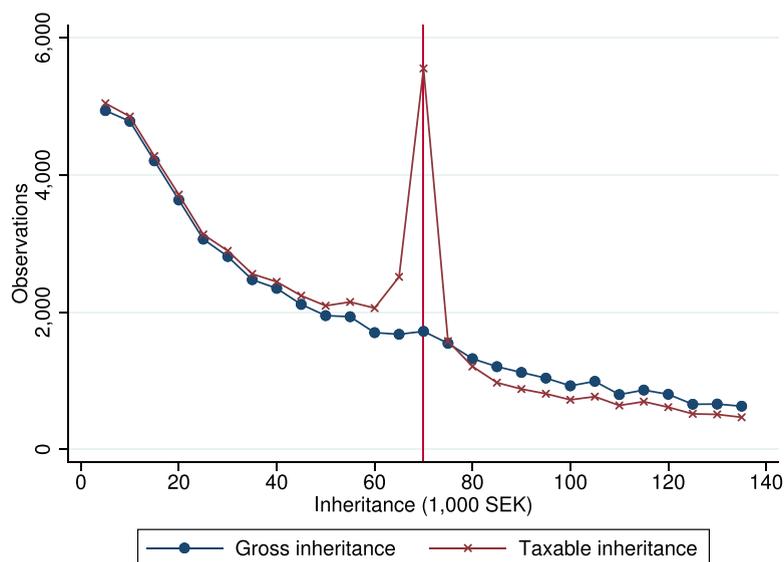


Fig. 1. Distribution of gross inheritances and the distribution of taxable inheritances of heirs receiving a gross inheritance of less than SEK 140,000. The gross inheritance is the sum of the taxable inheritance and the tax-favored gifts to children. The vertical line indicates the taxable exemption at SEK 70,000. The binsize is SEK 5,000. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Usually, this tax shifting behavior is difficult to analyze as many potential heirs and many different tax schedules are involved. In this article, we study a *simple* setting that allows us to obtain transparent and credible evidence of inheritance tax responses. Up to 2004 Sweden levied a bequest based (as opposed to estate based) inheritance tax, and a striking feature of the tax law was that heirs with children faced a one-time opportunity to reduce their own taxable inheritance by transferring part of it to their children, a wealth transfer we refer to as a *tax-favored inter vivos gift*.¹ The wealth received by the children was treated as if directly inherited from the decedent and taxed separately according to the inheritance tax schedule. In this way, heirs avoided inheritance taxes, but at the cost of losing control over the assets. In a way, the heirs disinherited themselves. The Swedish inheritance tax schedule had a low basic exemption at SEK 70,000 (US\$ 9,500). Many individuals in the middle of the income- and wealth distributions received inheritances close to it. These people could entirely avoid the inheritance tax by reducing their taxable inheritances down to the exemption, through these gifts.

We access rich administrative data on the universe of Swedish heirs who inherited wealth from their last surviving parent. In contrast to previous studies on intergenerational tax planning, e.g. Joulfaian (2004), Bernheim et al. (2004), Nordblom and Ohlsson (2006), Ohlsson (2011), we access micro data both on donors and donees.

To demonstrate the importance of these tax-favored gifts for the tax base elasticity, we graph the distributions of gross inheritances, before gifts are made, (in dark blue) and the taxable inheritance, after gifts, (in red) in the range 1 to SEK 140,000 in Fig. 1. If the taxable inheritance is less than or equal to SEK 70,000 (the exemption level), the inheritance tax bill is zero. There is substantial bunching at the exemption in the distribution of taxable inheritances, but not in the distribution of gross inheritances. The implied tax base elasticity is around 1.5 — and the high elasticity originates from tax-favored gifts.² On the contrary, earlier bunching estimates of tax base elasticities tend to be small (Kleven, 2016), and this holds true also for wealth taxes (Seim, 2017; Jakobsen et al., 2019) and inheritance taxes (Glogowsky, 2021; Goupille-Lebret and Infante, 2018).

The tax base elasticity illustrated in Fig. 1 originates from both intensive and extensive margin giving responses, and we study both margins separately. We study the intensive margin using bunching estimation, which reveals massive bunching at the exemption level among those who give. From our model's perspective, the analysis suggests that parents consider own wealth and the children's consumption as being close to perfect substitutes. We also document that those who responded did so in a remarkably precise fashion. In general, they transferred exactly the amount required to escape the inheritance tax, which led to extreme bunching at the point where the tax liability went to zero. This finding is at odds with recent economics research suggesting that broad groups of people misperceive non-linear price schedules, see e.g., Liebman and Zeckhauser (2004) and Ito (2014).³

¹ The Swedish term is *arvsavstående*. An alternative English translation would be a *waiver*.

² The normative implications of the tax incentive are complicated, because tax induced *inter vivos* gifts bring about clear positive externalities on the recipients. Therefore, following the same logic as Dörrenberg et al. (2017), we do not interpret our tax base elasticity estimates as representing deadweight losses. Moreover, it is not necessarily a bad thing to provide incentives for middle-aged parents to transfer resources to less wealthy young children, but we do not explore the desirability of such policies in this paper.

³ In the taxation literature, an analogous finding is that wage earners typically do not bunch at convex kink points of the income tax schedule, where the marginal tax rate increases (Saez, 2010). Bastani and Selin (2014) shows that this holds also when the tax change at the kink is very large, and Søgaard (2019)

In our novel extensive margin analysis, we use gross inheritances as a forcing variable, allocating heirs into treated and non-treated groups, based on whether or not the inheritance is larger than the taxable exemption. Since there is a *slope change* in the relationship between the tax gain from giving and the inheritance size at the exemption of SEK 70,000, we estimate a regression kink design (RKD) model. We find a large and significant slope change in the probability to give at the threshold, which can be rationalized by a simple model, in which heirs have heterogeneous tastes for giving and experience different optimization frictions (fixed costs of giving). The steep upwards slope in the probability to give suggests that heirs made tax-favored gifts to children even when the tax savings were small.⁴ Still, the giving probability stabilizes around 50% at a small distance from the discontinuity. Accordingly, half of the heirs actually choose to pay the “voluntary tax” in an environment where giving was simple, and the loophole had been in place for a very long time.

Interestingly, we find that siblings, who share the same estate, often co-ordinated their actions. The sibling correlation in the probability to give is large (0.85). To dig even deeper into the mechanisms at work, we use a smaller data source containing information on expenses on legal advice with the estate report. Legal advice was common, around 70% in the relevant sample bought such services, and heirs hiring legal advisers were significantly more likely to make tax-favored gifts. This association is interesting, and it could – together with the high degree of collective action among siblings – help explain why so many people fine tuned their gifts. Still, 48% of heirs with legal advice did not make tax-favored gifts (and 21% of those without legal advice did it), indicating that preferences for controlling wealth had a great impact on these decisions.

The distinction between estate based systems and bequest based inheritance tax systems is central to the understanding of our paper. In the latter kind of systems, total taxes can often be lowered by splitting the estate into many progressively taxed bequests. At a conceptual level, it is easy to see that our results generalize to bequest based inheritance tax systems with similar (but more complex) incentives: All allocations that can be achieved with tax-favored gifts can be achieved with wills written by the decedent. With estate taxes, tax avoidance primarily aims at lowering the value of the estate. However, in both systems tax avoidance is typically a sequence of actions and gifts *before* the donor’s demise. In such a process, other factors than distrust may prevent people from tax planning. Surveys suggest that many feel uncomfortable talking about their legacy, and it is common that inheritance planning are dealt with only after serious illnesses (Kopczuk, 2007; Erixson and Escobar, 2020).⁵ Given how easy the planning is in our setting, the estimates we provide may be seen as an upper bound on tax planning responses in any bequest based inheritance tax system.

This paper is structured as follows. In the next section we present the relevant aspects of the (now abolished) Swedish inheritance tax, and in Section 3 we present our data source. In Section 4 we outline a model framework, which we use to estimate giving behavior both along the intensive and extensive margins. The intensive margin (bunching) analysis is reported in Section 5, while the extensive margin (regression kink) analysis is described in Section 6. In Section 7 we look at upper kinks and calculate tax revenue losses. We explore potential mechanisms in Section 8, while Section 9 concludes the paper.

2. Institutional setting

2.1. Inheritance law

The default rules of the Swedish inheritance law stipulate that in case the decedent had children they inherit and the estate is divided between them in equal parts. However, if the decedent was married, his or her spouse had the right to dispose of the estate and the decedent’s children received a postponed right to the inheritance.⁶ The decedent could circumvent the default rules by writing a will including more heirs or dictating another division of the estate.

When someone passes away, the first thing to be done is to form an estate inventory, listing all the assets and debts of the decedent at the time of death. Forming the inventory is obligatory and the tax authority requires that a report of the inventory (an estate report) is filed within three months of the decedent’s demise. It is the responsibility of the heirs to file the report, but it may be administered by only one of the heirs. As we will show in Section 8, it was also common to buy administrative help from a lawyer, a mortician or someone else chosen by the heirs. We refer to such third-parties as *legal advisers*.

shows the same thing when the policy response is salient in other respects. By contrast, self-employed often tend to respond stronger to kinks, see e.g. Saez (2010), and le Maire and Schjerning (2013). As pointed out by Kleven et al. (2011), observed differences in bunching between self-employed and employees tend to originate from differences in exposure to third-party income reporting. In our context, *all* individuals report their estates and inheritances under the same conditions, and it is then natural that the distinction between self-employed and employees turns irrelevant.

⁴ In a simple numerical calibration we find that the average optimization friction (fixed cost of giving) is SEK 436 (US\$ 60). It should be pointed out, however, that his calibration rests on some strong assumptions: In particular, we assume uniform preference and fixed cost distributions. The important lesson is that frictions were small for a substantial proportion of the population.

⁵ In several countries with gift taxation, there is an annual exemption, meaning that people can make tax free gifts of up to that amount in each year. This, in turn, reduces inheritance taxation upon the donor’s demise as the taxable estate is reduced. However, a number of studies focusing on the US (Joulfaian and McGarry, 2004; McGarry, 2000, 2001; Poterba, 2001) show that this was not used to the extent one would expect from the point of view of tax minimization. For instance, Joulfaian and McGarry (2004) find that despite their potential to reduce tax liability, gifts were infrequent and only constituted about 10 percent of the value of the estates. Kopczuk (2013) interprets this phenomenon as evidence of people’s reluctance to give up wealth and that they have motives to hold wealth that go beyond consumption.

⁶ However, if they were only the decedent’s children, and not the spouse’s, they had the right to inherit the estate immediately upon their parent’s death.

2.2. The inheritance tax

The Swedish inheritance tax was a bequest based tax. Accordingly, the tax was not based on the value of the estate, but on the inheritances received by each heir. The tax was on short notice repealed in 2004, see [Escobar \(2017\)](#) and [Elinder et al. \(2014\)](#) for details.

The inheritance tax schedule was progressive and depended on the relationship between the decedent and heir. In our paper, we mainly focus on children who inherit. They face a tax schedule which is given by the following expression:⁷

$$T(z) = \begin{cases} 0 & z < 70,000 \\ 0.1 \times (z - 70,000) & 70,000 \leq z < 370,000 \\ 0.2 \times (z - 370,000) + 30,000 & 370,000 \leq z < 670,000 \\ 0.3 \times (z - 670,000) + 90,000 & 670,000 \leq z \end{cases} \quad \text{if} \quad (1)$$

where z is the taxable inheritance and SEK 70,000 is the exemption level. At upper segments, the marginal inheritance tax rate was 20% up to SEK 670,000, and it was 30% for taxable inheritances exceeding SEK 670,000.⁸

The inheritance tax was integrated with the Swedish gift tax. This means that gifts made by the decedent to an heir before death should be included in the inheritance tax base. Thus, when the person passed away, all gifts he or she had made before death was added to any inheritance the heir received. The inheritance tax was then calculated based on this sum, minus any taxes the heir had paid on the gifts when they were received.

2.3. The tax-favored gifts

The tax law allowed the heir to reduce the taxable value of the inheritance, z , by transferring parts (or all) of the received wealth through a gift, which we here refer to as a *tax-favored inter vivos gift*. For the gift to be tax-favored, it had to fulfill the following requirements:

- It had to be made at the same time as the estate division.
- The heir could only make it to his or her direct descendants, i.e., those who would have inherited in a hypothetical situation in which the transferring heir had been deceased.
- The heir had to make gifts of equal size to all children and not exclude any children.
- The heir had to make the gift without any preconditions.

If these requirements were fulfilled, the recipients of the gift were treated in the same way as the original heirs to the estate, meaning that the recipients paid taxes on the received wealth according the same inheritance tax schedule as the transferring heir.⁹ This meant that the tax-favored gift were to be added to any other inheritance the children received from the decedent, or gifts received before the decedent passed away, when inheritance taxes are calculated.¹⁰

The progressive inheritance tax created strong incentives for heirs to make the tax-favored *inter vivos* gifts. Consider, for instance, an heir with two children who inherits SEK 120,000. The tax on this inheritance is 10 percent of the amount exceeding the basic exemption of SEK 70,000, i.e., SEK 5,000. However, thanks to the tax-favored gifts, the heir could reduce her tax bill to zero by passing on SEK 25,000 to each child. The two children do not have to pay any taxes as they received less than the basic exemption.¹¹ In addition, these tax-favored gifts were, unlike other gifts, not included in the inheritance tax calculation when the parent later passed away and the children inherited. Thereby the transfer allowed families to effectively skip taxes on this transferred wealth for one generation.

It was comparably easy to make the tax-favored gifts. The only requirement was that the heir stated the transfer in a signed document sent to the tax authority together with the estate report. The document was supposed to contain the name of the person making the transfer and the recipients, as well as the amount transferred. The transfer could consist of any asset the heir had received. Cash was perhaps easiest, but for instance real estate, or a share of real estate, could also be transferred.

Even though the tax-favored gifts were efficient and seemingly easy to carry out, reducing the tax payment was not costless. It required that the heir made two trade-offs. The first is shared with other tax planning strategies that involve giving: the trade-off

⁷ The kink points varied with the relationship between the decedent and heir. The reported schedule is valid for direct descendants of the decedent (children, grandchildren, etc.), which is our study population in this paper.

⁸ In the situation when the decedent is married and the children receive a postponed right to the inheritance, the transferred wealth is taxed in two steps: first the spouse pays taxes when he or she receives the right to dispose of the estate, and then the children pay taxes when the spouse passes away and they receive their inheritances.

⁹ Tax-favored gifts in Sweden can be contrasted against the tax *penalty* for generation skipping transfers in the US. The latter applies to generation skipping transfers exceeding a very high threshold (11.4 million USD in 2019), and its purpose is to prevent tax avoidance of the decedent, who otherwise could save on taxes by transferring wealth directly to her grandchildren in the estate based US tax system. In our setting, the children of the decedent (the heirs) are the agents who transfer wealth for tax purposes.

¹⁰ Due to data limitations, we do not take transfers directly from the decedent to the grandchildren into account when calculating the budget constraints below in Section 4.3. However, less than 5% of the grandchildren (children of the heirs) that receive tax-favored gifts also receive such transfers.

¹¹ Besides this immediate tax gain, the transfer may also reduce tax payments upon death of the heir, as the bequests he or she leaves will be of lower value because of the transfer. More examples of tax avoidance in this context can be found in [Ohlsson \(2007\)](#).

between tax minimization and keeping control over wealth. The second trade-off is more specific to this setting and is due to the requirements that the transfer had to fulfill to receive beneficial tax treatment. For instance, the requirements implied that the heir could not make the transfer to whomever he or she wanted, this was restricted to direct heirs. Neither could the heir exclude any of his or her children, nor discriminate between them with respect to the size of the transfers. Thus, for an heir who had strong preferences to distribute the wealth unequally between his or her children, or strong preferences on how the transfer should be used by the recipients, it may have been better to transfer the wealth through regular gifts, and pay the gift taxes. In practice, informal gifts were probably also common: parents could e.g., buy a car and let their children use it. However, when tax minimizing, it was usually better for a parent to make a tax-favored gift rather than an informal gift, as the informal gift did not reduce the parent's inheritance taxes.

It is unlikely that a large number of heirs just stated the gifts in the estate report but never implemented them. There were control mechanisms in place: tax-favored gifts to minors were reported by legal guardians, who were appointed by the municipal administration. To obtain a further view on this issue, we exploited administrative data on wealth for those receiving tax-favored gifts, the year before and the year after the transaction was supposed to be made. There is indeed a surprisingly high correlation between the size of the gift and the change in the children's wealth, even after controlling for the size of the inheritance. A gift of SEK 1 is associated with a SEK 0.57 increase in wealth, which is a large estimate given the measurement problems involved.¹² The significant correlation strongly suggests that most children actually received the gifts.

Regarding the historical background of the tax-favored gifts, we have not been able to find any stated intention behind the policy, which strongly promoted *inter vivos* giving. Interestingly, the gifts are not explicitly regulated by law, but by custom and practice. Occasionally, the possibility of transferring inheritances has been subject to policy discussions (see [Arvs- och gåvoskattkommittéen, 1987](#)), and it was several times proposed that the possibility should be removed as it was a popular way of avoiding taxes. One argument in favor of the policy, however, was that the same allocation could, in principle, be achievable through wills written by the decedent.

3. Data

The study requires extensive and detailed data on inheritances, heirs and the heirs' use of tax-favored gifts. We obtain these data from the Belinda database, which is extensively described by [Elinder et al. \(2014\)](#). The database is unique in both its coverage and level of detail. It was collected by the Swedish tax agency and covers the universe of estate reports in Sweden over the period 2002–2004.

The database provides us with information from the estate report on how much each heir inherited, the heir's relationship to the decedent and whether or not the estate included a will, beneficiaries to insurance policies, etc. Most importantly, it tells us how many children the heirs had, and whether or not the heirs made gifts out of their received inheritances. This allows us to create variables on the amount given by an heir, the gross inheritance (inheritance before the tax-favored gifts had been made) and the taxable inheritance (the inheritance after the tax-favored gifts had been made). By linking the database to other administrative registers, we also observe various demographic characteristics of the decedents and the heirs.

3.1. Study population

A few restrictions on the full population of heirs are required for the analysis. First, as the Swedish inheritance tax schedule depends on the relationship between the decedent and the heir, we restrict our attention to individuals who inherit their parents. This excludes, for instance, surviving spouses and non-related heirs, who faced other incentives and basic exemptions. Second, to ensure that all individuals who receive the gifts, from the heirs, face the same tax schedule, we also restrict the population to heirs (children of the decedents) who themselves have children. Third, we restrict the population to heirs who received positive inheritances, as heirs inheriting zero cannot make the tax-favored gifts. The restrictions leave 71,691 heirs.

To make the budget constraints more comparable we focus in our main analysis on heirs receiving inheritances of a value in the range SEK 1–140,000. The upper restriction ensures that all individuals only face one kink. However, we will come back to the individuals receiving inheritances larger than SEK 140,000 later. This restriction leaves 54,511 individuals who have inherited their parents. The focus is not restrictive, but covers a large share of the inheritance distribution. The tax schedule was fixed in nominal terms 2002–2004. For this reason, we do not adjust for inflation in the analysis. Inflation was low in Sweden during this time period.

In [Table 1](#), we see that compared to the full distribution of inheriting children, the individuals on which we focus have slightly lower incomes and wealth, but are close to identical in the degree of self-employment, their gender, age and the extent to which they are married and have children.¹³ The average wealth in this group should also be compared to the average wealth of the adult

¹² This exercise is influenced by [Nekoei and Seim \(2023\)](#), Appendix B.2. In Figure E2 of our Online Appendix E, we visualize the correlation between the change in the child's wealth and the size of the gift. The regression in Table E1 confirms this positive relationship and additionally shows that it is not driven by any inheritance received directly from the decedent or initial differences in wealth. We do not expect the association to be 1 to 1. First, bank holdings are imperfectly measured. Second, children may, of course, consume the gift immediately. The increase in wealth could be compared to the pattern seen in E3 of Online Appendix E, in which a similar pattern cannot be found.

¹³ Note that the variable for capital income is measured net of interest payments deduction, meaning that people who have a mortgage typically get low or negative capital income.

Table 1
Descriptive statistics.

	All inheriting children	Main study population
<i>Heir characteristics</i>		
Labor income	177,733	167,612
Capital income	12,797	3,403
Net wealth	713,508	563,174
Self employed	0.06	0.06
Age	52.84	53.55
Male (share)	0.52	0.52
Married (share)	0.61	0.62
Children (share)	0.27	0.24
<i>Inheritance characteristics</i>		
Gross inheritance	127,849	45,527
Net inheritance	102,492	41,606
Earlier taxable gift (share)	0.02	0.02
Earlier taxable gift (value)	136,965	98,751
Observations	71,691	54,511

Note: Means. Labor income, capital income and net wealth, net and gross inheritance as well as earlier gifts are measured in SEK. The average value of earlier taxable gifts is conditional on there being a gift. Age is measured in years.

population at large, SEK 460,000, and of the average 53 year old, SEK 593,000. The comparisons show that individuals receiving an inheritance of about the taxable exemption are not exceptionally rich, but rather representative.¹⁴

The table also shows that the individuals on which we focus receive gross inheritances of SEK 45,527 on average, and net inheritances of SEK 41,606, on average. The difference between these two reflects the use of tax-favored gifts. Both the net and gross inheritances in this group are smaller than among all inheriting children, which is natural given the restriction based on the inheritance size. It is worth noting that the reported size of inheritances is small relative to the wealth the heirs already have. However, the values are not directly comparable as net wealth is measured in market value, whereas the inheritance is measured in tax value, which undervalues several assets substantially. The table shows that the use of taxable gifts before the decedent's demise are quite rare. Only two percent of the heirs reported historical taxable gifts in their estate reports. In addition, there is no clear difference between all inheriting children and our main study population in the frequency of such gifts. Their size, on the other hand, differs. Conditional on receiving gifts, individuals in the main study population receive gifts of approximately SEK 100,000, whereas the corresponding figure among all inheriting children is about SEK 135,000.¹⁵

4. Model framework

In this section, we present a model framework in which the heirs trade of utility of own consumption and the children's consumption. The model, which should be interpreted broadly to incorporate many potential mechanisms, organizes thoughts regarding our empirical specification.

4.1. Formal model

We consider a stylized model economy in which agents (heirs) differ in three dimensions: the preference for giving to their children, θ , the gross inheritance received, I , and a fixed cost of making the transfer, γ (optimization friction).¹⁶ Examples on fixed costs are the monetary costs to hire tax advice, or the effort and knowledge needed to make the transfer. These arbitrarily correlated heterogeneity parameters are smoothly distributed in the population, which is normalized to unity.

The heir (parent) faces a trade-off between adding the inheritance to own wealth, w , and passing it on to her J children. In the latter case, she reduces the inheritance tax liability. The heir's utility function can be written in the following way:

$$U = u(w) + \theta \sum_{j=1}^J \Phi(c_j), \quad (2)$$

where $u(w)$ is the heir's utility from wealth, whereas $\Phi(c_j)$ represents the heir's utility as a function of child j 's consumption. U is increasing and concave in w and c_j . θ , which differs across heirs, is the weight she gives to her children's utility. The specification

¹⁴ Averages in 2003, based on own calculations.

¹⁵ Taxable inheritances include the sum of gifts during the four most recent years that sum up to more than SEK 10,000, annually.

¹⁶ In similarity with the literature on labor supply and taxation, see, e.g., Kleven and Kreiner (2006), we will make a distinction between the intensive and extensive margins of giving, where the latter arise due to fixed costs. Selin and Simula (2020) studied an optimal tax model with fixed and variable costs of tax planning (income shifting).

of utility in (2) is typical for altruistic models of intergenerational transfers, see, e.g., the discussion in Laitner (1997). $u(w)$ should be interpreted broadly; it encompasses both utility from consumption, and the intrinsic value of holding wealth, see, e.g., the survey by Kopczuk (2013)

We denote the total amount transferred to the children by A . $T(z)$ is the inheritance tax function, and z is the tax base. For the moment, we assume that $T(z)$ is a convex and smooth function. When the heir transfers A \$, she reduces her own inheritance tax liability by $[T(I) - T(I - A)]$ \$. Thus, the heir's wealth, w , can be written

$$w(A) = y^p + I - A - T(I - A) - \gamma \cdot \mathbb{1}_{A>0}, \tag{3}$$

where y^p is other exogenous income of the heir. $\mathbb{1}_{A>0}$ is an indicator function, which is one if A is positive and the heir has to pay the fixed cost γ , and zero otherwise.

The heir has to give the same amount, $\frac{A}{J}$ \$, to all her children (see Section 2). If she passes on wealth to the children, the consumption of the individual child j increases by $[\frac{A}{J} - T(\frac{A}{J})]$ \$. The given amount is taxed according to the inheritance tax function, $T(z)$, also at the level of the child. Note, however, that the tax bases differ. The heir reports $z = I - A$, whereas the child reports $z = \frac{A}{J}$. The consumption of child j can be written

$$c_j(A) = y_j + \frac{A}{J} - T\left(\frac{A}{J}\right), \tag{4}$$

where y_j is other exogenous income of child j . The prices on the composite goods w and c_j are normalized to 1. By plugging (3) and (4) into (2), we see that the only relevant choice variable in this problem is A : when the heir determines A , she also determines $w(A)$ and $c_j(A), j = 1, \dots, J$.

If we differentiate (2) with respect to A , and slightly rearrange the first-order condition, we see that, for interior solutions, the optimal quantity of A^* implicitly satisfies:

$$\frac{1 - T'(I - A^*)}{1 - T'(\frac{A^*}{J})} = \theta \frac{\overline{\Phi}'(c_j(A^*))}{u'(w(A^*))}, \tag{5}$$

where $\overline{\Phi}' = \frac{\sum_{j=1}^J \Phi'_j}{J}$ is the average marginal utility of consumption of the J children. In equilibrium, the heir will choose A such that the endogenous marginal tax price, on the left-hand side of (5), will equate the marginal rate of substitution of the children's consumption for own wealth, on the right-hand side. We let $p = \frac{1 - T'(I - A^*)}{1 - T'(\frac{A^*}{J})}$ refer to the linear price of A , which we obtain by linearizing the budget constraint around the optimum.

4.1.1. A tractable special case

To arrive at a tractable empirical model, we assume $u(w) = w$, $\Phi(c_j) = \frac{c_j^{1-\frac{1}{\epsilon}}}{1-\frac{1}{\epsilon}}$, and $y^p = y_j = 0$ for all j . Then the utility function, (2), can be written

$$U = w + \theta J \frac{\left(\frac{A}{J}\right)^{1-\frac{1}{\epsilon}}}{1-\frac{1}{\epsilon}}. \tag{6}$$

We also focus on the empirically relevant scenario, in which children do not pay any tax on the gift, i.e. $T(\frac{A^*}{J}) = T'(\frac{A^*}{J}) = 0$.¹⁷ In this setting, the heir chooses between own consumption, c , and the tax-favored gift, A , and the before-tax and after-tax gift coincide. Heirs maximize (6) subject to $w = I - A - T(I - A) - \gamma \cdot \mathbb{1}_{A>0}$, where $T(I - A)$ now is a piece-wise linear inheritance tax function, see Eq. (1) in Section 2.2. One may argue along the lines that this special case of the general model of Section 4.1 is akin to a warm-glow model, because the tax-favored gift has to be shared equally, and the parent does not consider the children's incomes.

The purpose of the intensive margin analysis is to estimate ϵ . This parameter reflects the (compensated) elasticity of gifts with respect to the tax price at a linear segment of the piece-wise linear tax function. Note that if the marginal inheritance tax rate is constant the price p will also be constant. Then the heir's optimum is $A^* = [\frac{p}{\theta}]^{1-\epsilon} J$, and the elasticity is $-\frac{\log A^*}{\log p} = \epsilon$.¹⁸ If own consumption and children's consumption are close substitutes (complements), the elasticity will be large (small).

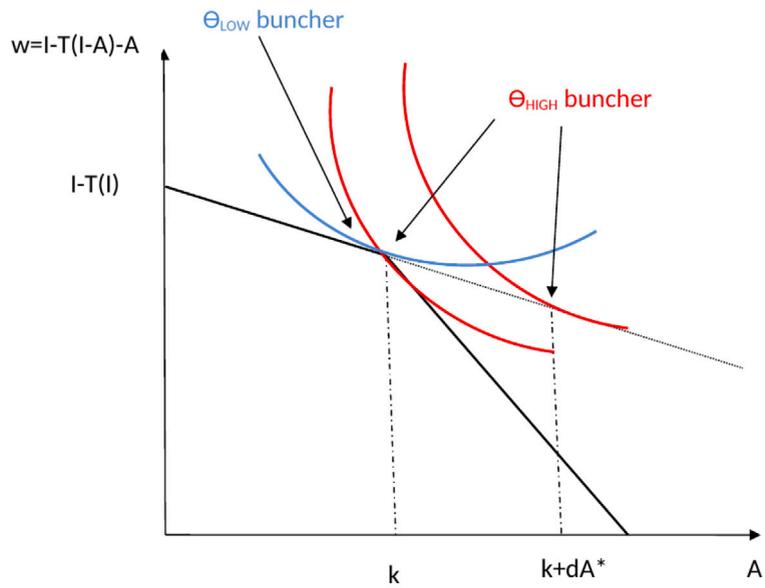
4.2. Bunching and the elasticity

As the model of Section 4.1.1 can be thought of as a two-good problem, analogous to the standard consumption-leisure problem, the logic of the Saez (2010) methodology to estimate the compensated elasticity applies. The theoretical intuition is contained in

¹⁷ In our main empirical analysis, we restrict our sample to heirs receiving gross inheritances below SEK 140,000. For the majority of heirs, who had two or more children, the children would never have to pay any taxes on the gift, because the equally sized gifts could never exceed the basic exemption of SEK 70,000.

¹⁸ The quasi-linear specification might *ex ante* be thought of as unrealistic, but is not a limitation in the current application, as our empirical method only recovers the compensated price response. Using numerical simulations, Bastani and Selin (2014) showed in a taxable income context that the bunching estimator recovers the compensated elasticity also when there is a significant curvature in the utility of consumption and the kink is large.

(a) Pre- and post reform budget constraints.



(b) Pre- and post reform densities.

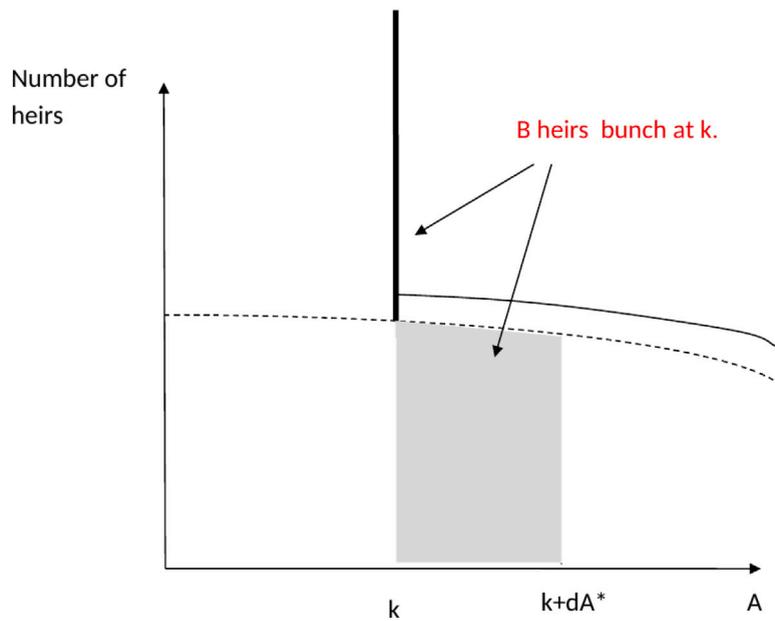


Fig. 2. Bunching graph (hypothetical reform).

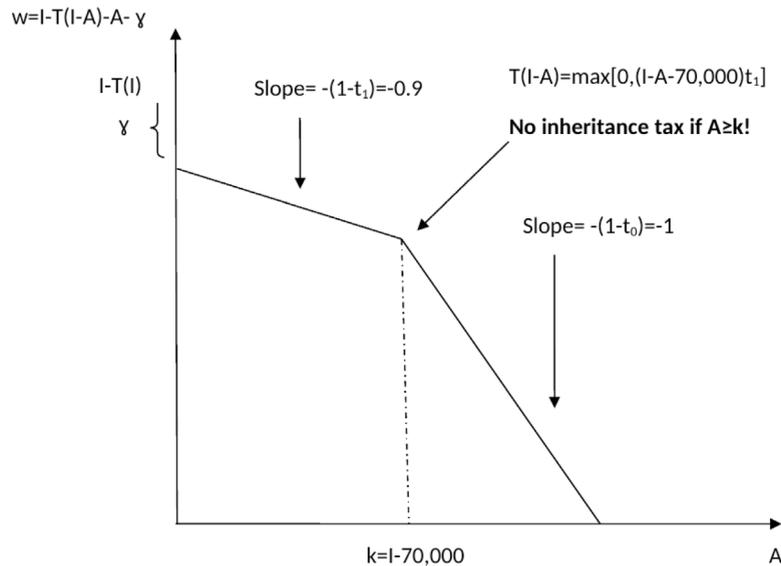


Fig. 3. The budget constraint of a parent with at least two children when the gross inheritance falls in the range of SEK 70,000 to SEK 140,000.

Fig. 2. Under a hypothetical linear price schedule with a constant slope $-p$, gifts $A(\theta)$ will be smoothly distributed in the population (as θ is smoothly distributed). In the hypothetical scenario where a convex *kink point* is introduced at k units of A , the slope will be $-(p + dp)$ above k , and a certain number of agents, B , with values of θ between θ_{LOW} and θ_{HIGH} , will find it optimal to locate at k . With a small kink, the number of agents who bunch is $B = \tilde{g}(k) dA^*$, where $\tilde{g}(k)$ is the counterfactual density at k , i.e., the density in the absence of a kink.¹⁹ In the spirit of Saez (2010) the elasticity can be recovered using the following relationship

$$\varepsilon = - \frac{B}{\tilde{g}(k) \times \left(\frac{dp}{p}\right) \times k} \tag{7}$$

When ε is low (high), the indifference curves are curved (flat). Saez (2010) showed that the number of agents who bunch is proportional to the compensated elasticity. The key challenge is to estimate $\tilde{g}(k)$, because B can be inferred from $\tilde{g}(k)$ and the observed distribution. The price change and the kink are directly observed. We further discuss estimation issues below in Section 5.1.

4.3. Budget constraints

A typical budget constraint for someone receiving a gross inheritance larger than the basic exemption of SEK 70,000 is shown in Fig. 3. It contains two segments and one kink point. If an heir chooses not to make a gift, her own wealth amounts to $I - T(I)$. If the heir instead chooses to make a gift, her wealth drops by the fixed cost γ and pre-tax gift A , but increases with the tax savings $[T(I) - T(I - A)]$. The relative price of A to w is $1 - t_1 = 0.9$ for the first units of A . However, at k the tax price changes discontinuously. Accordingly, for units of A exceeding k , the tax price is $1 - t_0 = 1$.

A non-standard feature of our setting is that parents actually face different budget constraints in the $w - A$ plane, since gross inheritances, I , differ.²⁰ To illustrate this: If an heir's gross inheritance is SEK 100,000, the kink point in units of A will be at SEK 30,000. However, if an heir's gross inheritance is instead SEK 130,000, the kink point will be located at SEK 60,000. In intensive margin analysis of Section 5, we will pool individuals with different gross inheritances and graph their tax-favored gifts, while normalizing the kink to be zero.

¹⁹ There is a recent econometrics discussion on what kind of structural restrictions on preferences that are needed to identify the elasticity, see Blomquist et al. (2021). Saez (2010) derives an analytical expression for the elasticity under the assumption that the underlying preference distribution takes on a trapezoid shape. In our setting, these issues will not be of central importance, because we will observe extreme bunching at the kink.

²⁰ More generally, the number of children, J , is also an important determinant of the budget constraints. However, this is of less importance in the main analysis of Section 5, where we restrict the sample to heirs receiving up to SEK 140,000 in gross inheritance. The number of children does, however, affect the incentives to give away the heir's entire inheritance. An heir with a gross inheritance of SEK 100,000 and one child would reach the child's exemption at SEK 70,000. An heir with the same gross inheritance but with two children gives SEK 50,000 to each child. Accordingly, the heir with two children may give away the entire inheritance, while the dynasty is paying an inheritance tax of zero.

4.3.1. Interpretation of intensive margin responses

Before continuing, we would like to remark on the interpretation of the intensive margin elasticity. Taken literally, it reflects the marginal rate of substitution between own wealth and the children's consumption. We are however hesitant to interpret our estimates in a structural way, because the model abstracts from the possibility that heirs may substitute tax-favored gifts with informal gifts. In particular, one may expect heirs to transfer informal gifts from the point where the entire inheritance tax bill is zero. In similarity with the previous literature on *inter vivos* gifts we do not observe the "total transfer" since data on informal gifts are missing. The responses we observe are capturing both real responses (children get larger transfers than they otherwise would) and avoidance responses (parents substitute informal gifts with tax-favored gifts). Hence, "own wealth" includes informal gifts, and the estimated elasticities should be interpreted as reduced form elasticities.

Note that this issue does not arise in the extensive margin analysis of Section 6, because when giving the first dollar the heir always has an incentive to reduce the inheritance tax liability by making a tax-favored gift; the tax bill is left unaffected if an informal transfer is made.

In general, we do not aim at estimating structural parameters, nor assessing social welfare. Using similar data, [Khomenko and Schürz \(2019\)](#) structurally model the behavior of old age individuals and simulate welfare effects from various policies. The central identifying assumption in their model is that the true policy-invariant preference parameters for making bequests can be inferred from the subsample of decedents who had the opportunity to avoid all taxes through tax-favored gifts. By contrast, we focus on a different research question, namely how sensitive the heir's decision is to the strong incentive structure.

4.4. The extensive margin response

First we consider a setting without frictions, i.e., $\gamma = 0$ for everyone. When the budget set is convex, as in [Fig. 3](#) with $\gamma = 0$, the price of giving is the lowest on the first segment. Accordingly, since the utility function is well-behaved, an heir chooses to give a positive amount of A if and only if the marginal rate of substitution of A to c at $A = 0$ exceeds the *first-dollar tax price*, $1 - t_1$.²¹ In our model, this is equivalent to having drawn a sufficiently large value of θ . Note that the first-dollar tax price changes discontinuously as a function of I at the basic exemption: heirs receiving gross inheritances just below SEK 70,000 face a first-dollar tax price of $1 - t_0 = 1$, whereas heirs receiving I just above SEK 70,000 face a first-dollar tax price of $1 - t_1 = 0.9$. In a frictionless environment, we therefore expect a *level shift* in the probability to give at $I = 70,000$. Its magnitude will be determined by the underlying preference distribution.

In reality, such a jump in the probability to give is unlikely due to optimization frictions. Following [Chetty \(2012\)](#) and [Kleven and Waseem \(2013\)](#), we model the optimization friction as a fixed cost of adjusting to a frictionless optimum. In the presence of fixed costs, the extensive margin response, locally around the exemption level, is no longer determined by the first-dollar tax price. The key issue now, from the heir's viewpoint, is whether or not the *tax gain* from giving is sufficiently large to outweigh the loss in own consumption and the fixed cost. Consider an heir receiving a gross inheritance of $I = 71,000$. Since the inheritance tax rate in the first bracket is $t_1 = 0.1$, the maximum financial gain from giving away wealth is SEK 100 (approximately US\$ 14). Clearly, this heir must draw an extremely low value of the fixed cost to find it optimal to give. As I increases, the incentive to give also increases. Accordingly, while the first-dollar tax price changes discontinuously in its *level* at 70,000, the tax gain from giving changes discontinuously in its *first derivative* at 70,000. Therefore, we expect a *slope change* in the probability to give at SEK 70,000, and the magnitude of the response will depend on the distribution of fixed costs. If a large number of individuals are indifferent between giving and not giving at small values of the tax gain, the slope change will be large and vice versa.²² [Fig. 4](#) illustrates the first-dollar tax price and tax gain as functions of the gross inheritance locally around SEK 70,000. The Regression Kink Design (RKD), which we will present in Section 6.2, will recover the derivative of the giving probability with respect to the tax gain.

5. The intensive margin: empirical strategy and findings

In this section, we focus on heirs who received gross inheritances in the range SEK 70,000–140,000, and therefore faced a significant tax incentive to make tax-favored gifts. However, all heirs in this range also had the possibility to completely avoid inheritance taxes by giving away newly received wealth so that the heir's net inheritance was less or equal to SEK 70,000, which was the basic exemption.

5.1. Empirical strategy

We first construct histograms by normalizing the amount given, A , such that $k = 0$ for everyone, while removing individuals who give nothing. Hence, if people transfer wealth up to the kink, we should observe a spike at zero. We estimate counterfactual distributions using the estimation approach suggested by [Chetty et al. \(2011\)](#), which has now become a standard tool in empirical public finance. The data on tax-favored gifts made by heirs with gross inheritances in the range SEK 70,000 to SEK 140,000 are collapsed into bins reflecting SEK 1,000 intervals, and A_q is the gift relative to the kink, $A_q = \{-70, -69, \dots, 0, \dots, 70\}$. On the binned

²¹ In the context of female labor supply, [Hausman \(1980\)](#) discusses the conditions under which the slope of the budget constraint at zero hours determines the extensive margin response and the role of fixed costs.

²² In Online Appendix A we write down these conditions more precisely. Typically, the slope change in $Pr(A > 0 | I)$ will depend on both the fixed cost and the preference distribution.

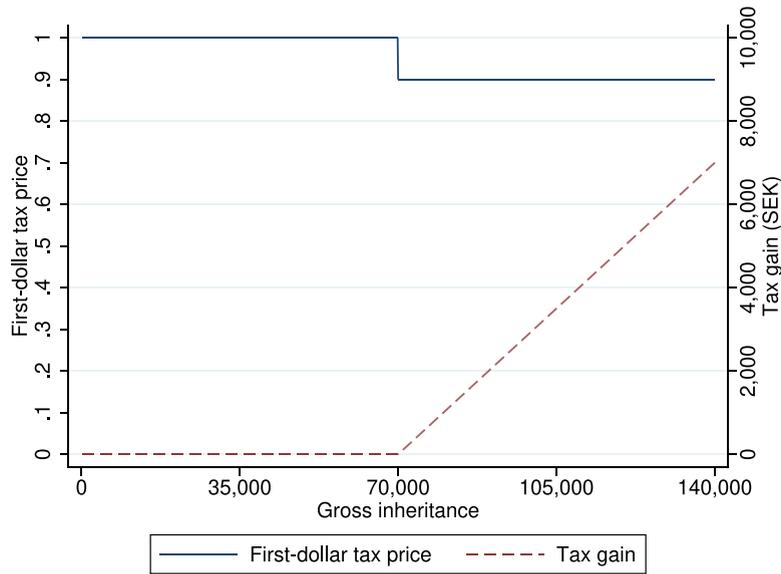


Fig. 4. The extensive margin incentives. The figure shows the change in tax gain and first-dollar tax price at the taxable exemption of SEK 70,000.

data, we estimate the counterfactual frequency distribution by fitting a polynomial to the observed distribution, while excluding a region around the kink. The excluded region is chosen based on visual inspection, and we allow it to be asymmetric around the kink. Ideally, the excluded region should be chosen so as to capture exactly those individuals bunching. The number of individuals in bin q is given by the regression:

$$C_q = \sum_{i=0}^s \beta_i A_q^i + \sum_{i=-R_-}^{R_+} \delta_i \times \mathbb{1}_{q=i} + \eta_q \tag{8}$$

where the first term on the right-hand side is a s :th degree polynomial in A_q . In the baseline estimations, we use a 7th order polynomial. $\mathbb{1}_{q=i}$ is a dummy variable, which takes the value of 1 if bin q is part of the excluded region, and η_q is an error term.

The number of individuals who bunch at the kink, B , can be estimated as

$$\hat{B} = \sum_{-R_-}^{R_+} (C_q - \hat{C}_q), \tag{9}$$

where C_q is the actual number of individuals in bin q and \hat{C}_q is the estimated counterfactual height of bin q . The counterfactual density at k can be estimated as

$$\hat{g}(k) = \frac{\sum_{j=-R_-}^{R_+} \frac{\hat{C}_j}{R_- + R_+ + 1}}{\xi}, \tag{10}$$

where ξ is the binwidth. To arrive at an elasticity estimate, we simply plug (9) and (10) into (7). We evaluate the elasticity at the average value of k in the sample. In the regression we normalize $\xi = 1$. When evaluating the elasticity we express k in units of SEK 1000 (the same unit used to bin the data). Following Chetty et al. (2011), standard errors are bootstrapped on the binned data.

5.2. Bunching: evidence and interpretation

Fig. 5 shows the excess mass estimate, its bootstrapped standard error, and the implied elasticity.²³ The following features of the graph are striking:

Large bunching at the kink point. We see that most heirs, who choose to make the gifts, transfer wealth such that their taxable inheritances amount to the basic exemption, i.e., SEK 70,000. In regions further away from the kink, the density is small.²⁴ A situation where agents exclusively choose to locate at corners of the budget constraint corresponds to perfect substitutability

²³ In Fig. 5 we use a symmetric excluded region with $R_- = R_+ = \frac{SEK5000}{SEK1000}$. However, given the asymmetry around the kink, we also experimented with asymmetric excluded regions, $R_- = 1$ and $R_+ = 7$. The results were quite similar.

²⁴ The low density far to the left of the kink is, however, an artifact of how we construct the graph and lacks any economic meaning. Since we normalize the budget constraints such that $k = 0$ for everyone, only heirs with a gross inheritance close to SEK 140,000 could possibly locate far out to the left.

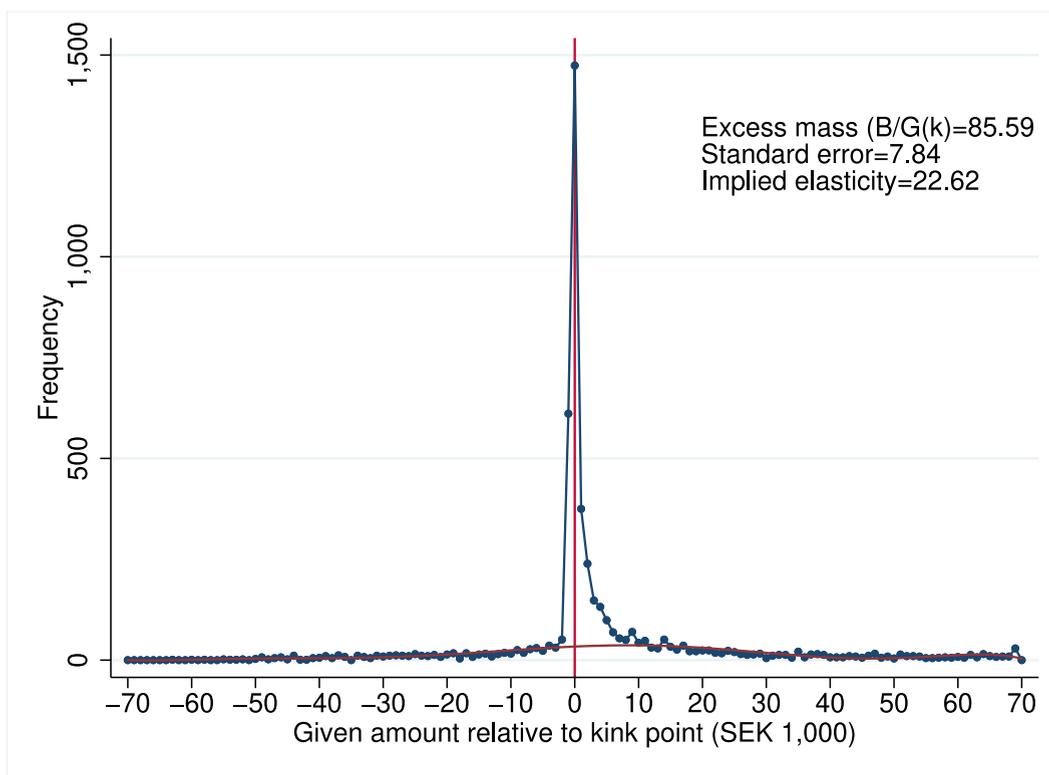


Fig. 5. Intensive margin elasticity. The figure shows the distribution and estimated counterfactual distribution of gifts. The distributions are normalized so that 0 implies that an individual has given exactly the tax minimizing amount. The elasticity is estimated on heirs receiving gross inheritances of SEK $70,000 < I < 140,000$, using a binsize of SEK 1,000.

between the transfer, A , and wealth, w , and a tax price elasticity approaching infinity. We compute an elasticity of around 23. From a model perspective, this tells us that the consumption of the two generations are close substitutes from the parents' point of view.

Bunching is precise. Clearly, we observe a spike, i.e., a huge excess mass *exactly* occurring at the kink. Accordingly, in contrast to, e.g., the labor supply context, optimization frictions do not seem to matter to any large extent at the intensive margin: heirs who make the gifts seem to be fully aware of the tax code. In Section 6 we will discuss the role of optimization frictions for extensive margin behavior. The large and precise response contrasts bunching estimates obtained in labor market contexts, see, e.g., [Kosonen and Matikka \(2022\)](#) for notches and [Sogaard \(2019\)](#) for kinks.

Bunching is asymmetric to the right. Few heirs locate at a distance more than SEK 1,000 to the left of the kink. Accordingly, few heirs must pay the inheritance tax after having made the tax-favored gift. On the other hand, there is a hump to the right of the kink. This extra mass, located just to the right of the kink, should not necessarily be interpreted as being a consequence of optimization errors. Remember that, to the right of the kink, the inheritance tax liability is zero regardless of how much the parent transfers.²⁵ An heir who just wants to minimize tax payments, and is indifferent between A and w , is indifferent between $A = k$ and $A > k$. Still, the fact that a vast majority of heirs bunch exactly at k strongly indicates that people in general are *not* indifferent between A and w : heirs prefer keeping control over their wealth, otherwise they would not mind giving away more.

6. The extensive margin: empirical strategy and findings

About half of the heirs we study do not make tax-favored gifts. This highlights the importance of the extensive margin. In this section, we study the extensive margin and how it depends on taxes.

²⁵ For heirs with one child only, an additional kink emerges in the budget set at $A = \text{SEK } 70,000$, because at that point the child reaches the basic exemption and becomes liable for the inheritance tax.

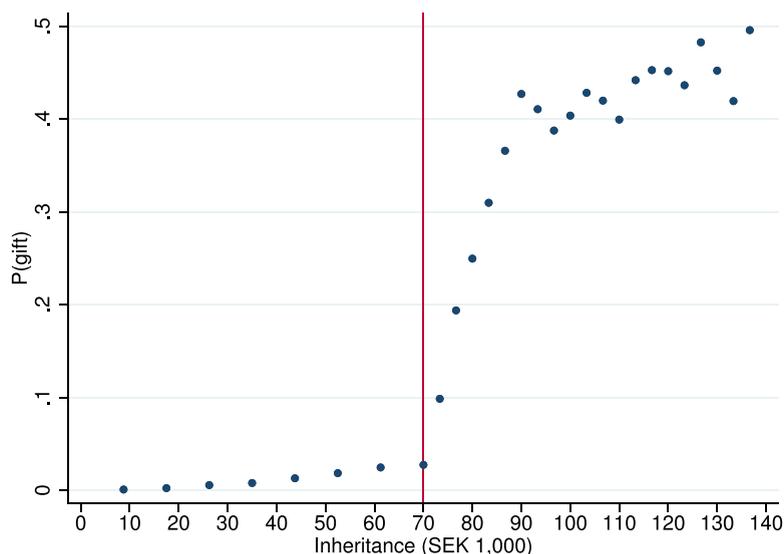


Fig. 6. Extensive margin. The figure shows the relationship between the probability to give and gross inheritance. The vertical line indicates the taxable exemption of SEK 70,000. Binsize selected following the integrated means squared error (IMSE) approach of Calonico et al. (2015).

6.1. Graphical evidence

The incentive to make tax-favored gifts depends on the gross inheritance. If the gross inheritance, I , is lower than the basic exemption, SEK 70,000, the inheritance tax is zero no matter what, and the inheritance tax bill does not depend on the gift, A .²⁶ If, on the other hand, the gross inheritance is, say SEK 71,000, the heir can make a small financial gain of SEK 100 from a transfer. The financial gain from making that transfer monotonically increases in I . In this section, we consider I as being a forcing variable, which assigns heirs to treatment and non-treatment at SEK 70,000. As we elaborated on in Section 4.4, the nature of the incentive change depends on whether optimization frictions are present or not. In a frictionless environment, the first-dollar tax price is the relevant incentive variable, and its *level* decreases discontinuously at SEK 70,000. By contrast, in an environment with frictions (modeled as fixed costs of making the transfer) the financial gain is the relevant incentive variable — its *slope* changes discontinuously at SEK 70,000.

To begin with, we examine the discontinuity graphically. In Fig. 6 we plot the share making tax-favored gifts on the gross inheritance.²⁷ We draw the following tentative conclusions from the figure:

Visually, there is a slope shift in the outcome at the discontinuity. The probability to make a tax-favored gift is positive, but small, to the left of SEK 70,000. Heirs to the left SEK 70,000 were probably doing tax planning to avoid the gift tax. At SEK 70,000, the slope of the giving probability increases dramatically.

Fixed costs exist, but seem to be small for a large fraction of the population. The slope in the giving probability is very steep to the right of the basic exemption. Interestingly, the response function has a concave shape. The giving probability stabilizes already at approximately SEK 20,000 to the right of the exemption level.

A substantial proportion of heirs with incentives to give do not give. When we look at heirs receiving around SEK 140,000, who may gain SEK 7,000 from making the tax-favored gift, we see that the average giving probability is around 0.5.

6.2. The slope shift: a Regression Kink Design (RKD)

Once more, our aim is to estimate the giving probability with respect to the tax gain. Therefore, we now analyze the slope shift in light of our model. First, we must characterize the probability to make a tax-favored gift at a specific point in the distribution of gross inheritances. We assume that the reservation value for the fixed cost of giving $\tilde{\gamma}(\theta, I)$ for all values of the preference parameter, θ , falls within the support of the fixed cost distribution. As we show in the Online Appendix, the giving probability, conditional on gross inheritance I , is then the probability that the individual draws a value of γ that is smaller than the reservation value $\tilde{\gamma}(\theta, I)$.²⁸ More formally:

$$\Pr\{\gamma < \tilde{\gamma}(I, \theta) | I\} = F[\theta, \tilde{\gamma}(I, \theta) | I], \quad (11)$$

²⁶ Heirs receiving $I < \text{SEK } 70,000$ still have some incentives to make tax-favored gifts if they want to transfer newly inherited money to children in a legal way. Gifts exceeding SEK 10,000 were subject to gift taxation.

²⁷ We have chosen optimal binsize as determined by the integrated means squared error (IMSE) approach of Calonico et al. (2015).

²⁸ In the Online Appendix we consider a situation in which the order of integration changes at some value of I .

where F refers to the joint c.d.f. of θ and γ conditional on I . In the empirical analysis we want to estimate the following derivative locally at $I = 70,000$:

$$\frac{\partial Pr(A > 0|I)}{\partial \tau(I)} = \frac{\partial \tilde{\gamma}(I, \theta)}{\partial \tau(I)} \int_{\theta} f[\theta, \tilde{\gamma}(I, \theta)|I] d\theta = \int_{\theta} f[\theta, \tilde{\gamma}(I, \theta)|I] d\theta, \tag{12}$$

where $\tau(I) = t_1 \times (I - k_1)$ is the tax gain from making the transfer (illustrated in Fig. 4 above). f is the corresponding p.d.f., evaluated at $\tilde{\gamma}(I, \theta)$, i.e., the threshold value of γ at which an individual is indifferent between giving and not giving. Hence, the RKD estimate will reflect the number of individuals who are indifferent between giving and not giving at small values of the tax gain (averaged over the preference parameter).²⁹ It can be shown that $\frac{\partial \tilde{\gamma}(I, \theta)}{\partial \tau(I)} = 1$ when utility is quasi-linear in consumption, see the Online Appendix. Intuitively, the only component of the reservation value that depends on I is the tax gain.

Suppose that it is random whether the gross inheritance, I , falls just to the left or the right of SEK 70,000. If so, a Regression Kink Design (RKD) can identify a local treatment effect by comparing the magnitude of a kink in the treatment variable and the induced kink in the outcome variable (Nielsen et al., 2010). Our RKD estimand of (12) can be written:

$$\left. \frac{\partial Pr(A > 0)}{\partial \tau(I)} \right|_{I=70,000} = \frac{\lim_{I \rightarrow 70,000^+} \frac{\partial Pr(A > 1|I)}{\partial I} - \lim_{I \rightarrow 70,000^-} \frac{\partial Pr(A > 0|I)}{\partial I}}{\lim_{I \rightarrow 70,000^+} \frac{\partial \tau(I)}{\partial I} - \lim_{I \rightarrow 70,000^-} \frac{\partial \tau(I)}{\partial I}}, \tag{13}$$

where the numerator is estimated by separate local linear regressions to the left and to the right of SEK 70,000, weighted with a triangular kernel. We choose the bandwidth following the algorithm developed by Calonico et al. (2014), which trades off bias against variance.

As shown by Card et al. (2015), there are two key assumptions that must be fulfilled for causal identification with a regression kink design. Translated into our setting, the first assumption requires that there is no change in the relationship between the first derivative in the probability to give and the gross inheritance received that is not related to the change in the tax gain, at the kink point of SEK 70,000. We test for this assumption by applying the RKD specification on a number of predetermined characteristics, and we see no clear signs of manipulation, see Online Appendix B. The second assumption requires that the distribution of gross inheritances received is smooth at the threshold. The sufficient condition is that the *partial derivative* of the density function with respect to inheritances is continuous at the kink. Following Card et al. (2015), we test for the continuity of the first derivative of the pdf, and we cannot reject the null hypothesis of no change in derivative at the kink. We refer the reader to Online Appendix B for further details and graphical exposition.

As was to be expected from Fig. 6, we find that a SEK 100 (US\$ 14) increase in the tax gain increases the probability of giving by 2.87 percentage points (std error of 0.472), using a bandwidth of SEK 16,722 (see Figure E1 of Online Appendix E for details). It is a large and statistically significant response, meaning that many heirs faced very low fixed costs of optimizing.

In general, there is no striking evidence of heterogeneity with respect to the heirs' income or wealth. This is mainly due to the estimates not being precise enough to be informative on the issue. However, there are indications that heirs with wealth above the median are more likely to give tax-favored gifts along the extensive margin. When we partition the sample with respect to the heirs' wealth, we obtain a point estimate of 3.61 (std error of 0.354) for high wealth heirs and 2.31 (0.294) for low wealth heirs.

6.2.1. A remark on our extensive margin approach

It is uncommon to estimate extensive margin responses to taxes using RKD designs. The only exception we are aware of is Gelber et al. (2021), who study extensive margin labor supply responses at the exemption level of the social security earnings test. In their model, the slope of the extensive margin labor supply incentive changes discontinuously as a function of *desired earnings*, measured as lagged earnings, at the tax kink. In that setting, intensive margin frictions are central, because in the absence of such frictions agents will adjust their labor supply when the kink is introduced, and there will be no first-order change in the slope in the employment probability at the kink. By contrast, in our model *extensive margin* frictions are central, because in their absence we would observe a level rather than a slope shift at the kink.

6.3. The level shift and frictions: a simple calibration

The estimated slope shift provides valuable information on the distribution of optimization frictions locally around $I = 70,000$. However, the frictionless policy response is arguably more interesting, i.e., the response we would hypothetically observe in the absence of frictions. In the presence of frictions, we cannot identify this level shift through credible causal inference. To make progress, we impose structure on the heterogeneity parameters θ and γ , and we calibrate the two-good model of Section 4 to match the observed response function of Fig. 6. In a minimalistic spirit, we assume that all three heterogeneity parameters are independently and uniformly distributed. We let $\theta \sim \mathcal{U}(0.8, 1)$ and $\gamma \sim \mathcal{U}(0, \bar{\gamma})$. Moreover, we let $I \sim \mathcal{U}(0, 140000)$, and we generate 2,000,000 observations in this interval. The tax gain is given by $\tau(I) = t_1 \times (I - k_1) = 0.1 \times (I - 70,000)$. Since we estimated a

²⁹ If one considers substitution between gifts subject to the gift tax and tax-favored gifts, there is a tax gain also to the left of SEK 70,000. This incentive explains the positive mass to the left of the kink in Fig. 6. In our formal derivations, we do not consider this margin, because it does not fundamentally affect the interpretation of the RKD estimate. The slope change in the tax gain is nevertheless the same. (The level of the tax gain at I would, however, be important when evaluating elasticities.)

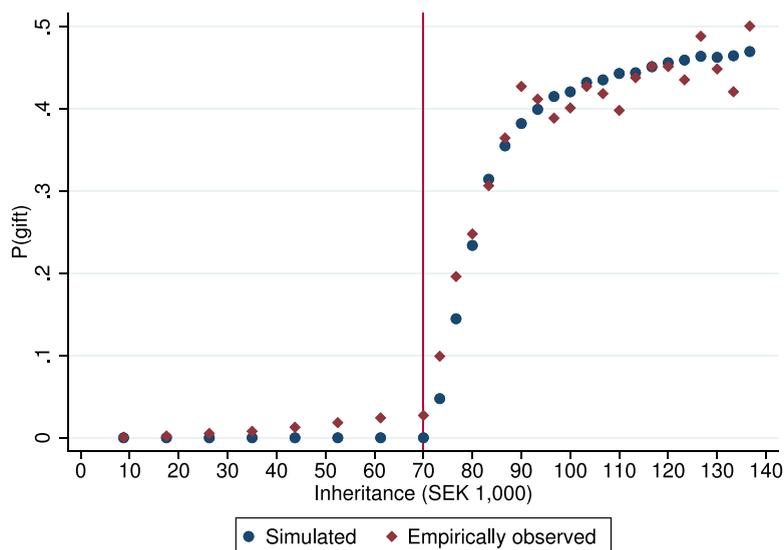


Fig. 7. Simulated and empirical observed extensive margin responses. Relationship between both the observed and simulated probabilities to give and the gross inheritance. The vertical line indicates the taxable exemption of SEK 70,000. The empirically observed probabilities are identical to those of Fig. 6.

very large intensive margin elasticity in Section 5.2, we now consider A as being infinitely price elastic. When $\epsilon \rightarrow \infty$ the utility function of Eq. (6) becomes linear in both arguments. We let a simple algorithm find the optimal values of A^* . In Online Appendix A, we derive a closed form expression for $Pr(A > 0|I)$ for uniform distributions and linear utility, see equation (A.11). Using this expression, we solve for the $\bar{\gamma}$ that generates the estimated slope change at SEK 70,000.

In Fig. 7 we graph both the observed $Pr(A > 0|I)$ and the simulated $Pr(A > 0|I)$ as functions of I . It is striking that the chosen parameterization generates a concave function, which is close to the observed one. Since θ is uniformly distributed between 0.8 and 1, and the first-dollar tax price is lowered from 1 to 0.9 at SEK 70,000, the frictionless response at the discontinuity is a jump by 50 percentage points (from zero). The average (and median) friction is low, SEK 436 (US\$ 60). A caveat is that we have used the most simple parametric assumptions, and it would of course be possible to impose other distributional assumptions. It cannot be excluded that those who do not give face very high fixed costs, e.g. due to poor knowledge. Without variation in kink size, it is difficult to credibly identify θ and γ .

7. Tax base elasticities and implications for tax revenues

As already mentioned in Section 1, we have also estimated the tax base elasticity locally around the exemption level. Adopting a standard bunching methodology, we estimated a significant tax base elasticity of 1.53 (see Online Appendix C1 for details). But what about the two upper kinks at SEK 370,000 and SEK 670,000? The inheritance distribution is of course thinner when moving further up in the distribution, and it is more difficult to achieve statistical precision there. Still, at the SEK 370,000 kink, where the marginal tax rate increases from 10% to 20%, we estimated a significant elasticity of 0.34, see Figure C2a of Online Appendix C. It is tempting to think that the excessive bunching we observe at SEK 70,000 not only reflects the heirs' responsiveness to financial incentives, but also an intrinsic aversion against paying inheritance taxes.³⁰ However, we hesitate to draw such a conclusion. One should keep in mind that heirs inheriting around SEK 370,000 were facing a more complex budget constraint than those inheriting just above the SEK 70,000 kink. They could, e.g., make tax-favored gifts up to the *children's* basic exemption of SEK 70,000. Moreover, the share making tax-favored gifts was increasing in the gross inheritance. Approximately 60% of heirs inheriting around SEK 370,000 make gifts, and 75% of those receiving around SEK 670,000 made tax-favored gifts.

How much tax revenues were lost due to the tax-favored gifts? We examined this issue by comparing actual revenues collected with the revenues that would have been collected if the gifts had not been made. We include the entire population of heirs who were eligible for tax-favored gifts, including heirs receiving large inheritances. A substantial share of tax revenues, 31%, were lost due to tax-favored gifts.

³⁰ If so, SEK 70,000 would be a *reference point*. Seibold (2021) showed that German elderly workers tend to retire at well-advertised statutory retirement ages (often with small changes in financial incentives), while there is little bunching at strong financial discontinuities. In the presence of reference points, we cannot in general rule out that some heirs would give a *smaller* amount than they would have given in the absence of the reference point created by the tax kink.

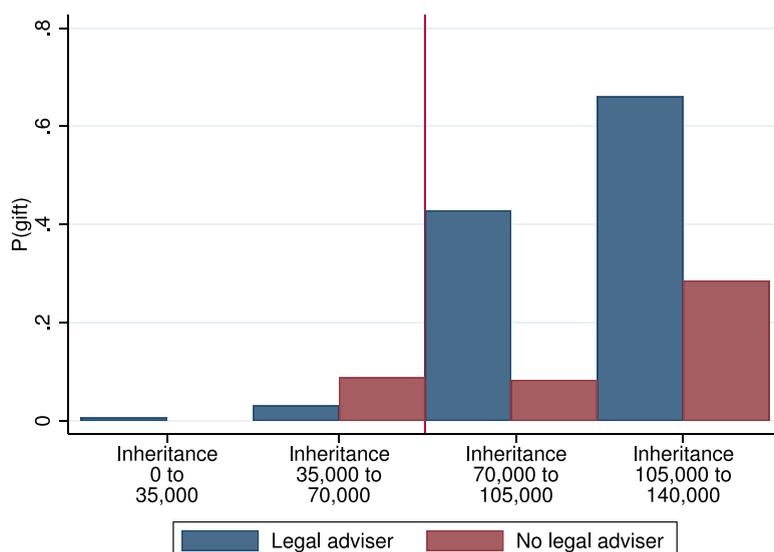


Fig. 8. Share of individuals making gifts among those with and without legal advisers. N = 546.

8. Mechanisms

We emphasized in Section 2 that it was common to hire legal advice when filing the estate report. The adviser could, e.g., be a lawyer, or a mortician. There is a smaller data source on estate reports, unique in its level of detail, which contains information on the assets and debts of the estate and, most importantly, on the expenses for professional help to establish the estate report. The latter were deductible from the inheritances when the tax was calculated. The data are obtained from a random sample covering 3 percent of the estate reports in 2004 (approximately 3000 reports). After imposing the same sample restriction as in the main analysis, 546 heirs remain,³¹ 70% of whom hired legal advice.

The observations are too few to perform RKD or a bunching analysis. Still, the sample is sufficiently large to be informative on the significant correlation between the probability to give and the probability to hire an adviser. Fig. 8 shows that the transfers were much more common among heirs who had help from a legal adviser. The simple comparison suggests that those who hired an adviser were three times more likely to make a tax-favored gift than others.

The advisers were available at a moderate cost. The average cost per estate was SEK 4,000 (US\$ 480), which implies that the average cost per heir was about SEK 2,300 (US\$ 270).³² Even though the cost was moderate, the expense was often larger than the potential tax gain from giving. Clearly, the heirs did not hire advisers solely for tax purposes, but also because they needed help in general with the estate inventory.³³ Still, the results indicate that advisers guided the choice on how much to give, and they most likely played a key role in dissolving optimization frictions. However, selection mechanisms are probably also at play; people who are more prone to avoid taxes by giving to children may also be more prone to hire legal advisers. Viewed from a broader perspective, the abundant supply of cheap tax planning advice could perhaps be interpreted as a market-level response to the tax rules.

Finally, it is worth emphasizing that 48% of heirs with legal advice did not make tax-favored gifts (and 21% of those without legal advice did it). Hence, these services cannot possibly explain all variation in giving behavior. Preferences for holding wealth also seem to be important.

8.1. Co-ordination among siblings

Among the heirs we study, siblings inherit the same decedent, typically receive the same amount and file a joint estate report (Erixson and Ohlsson, 2019). This also implied that siblings shared legal adviser. Fig. 9 provides clear evidence that siblings strongly coordinated their behavior. The figure compares the distribution of individual heirs' taxable inheritances and the distribution of average taxable inheritances in the family. Heirs without children are excluded from the family in these calculations as they typically do not have the same opportunity to make the tax-favored gifts. The population of heirs in the graph is restricted

³¹ The gross inheritance received must be positive but less than SEK 140,000, and the heir must have children.

³² The maximum amount paid for one estate was SEK 28,000 (US\$ 3,300).

³³ Descriptive statistics show that the use of advisers was pretty common also among those receiving less than SEK 70,000: about 65 percent of the estates with heirs receiving less than SEK 70,000 report expenses for legal advice, while 80 percent of the estates with heirs receiving more than SEK 70,000 used legal advice.

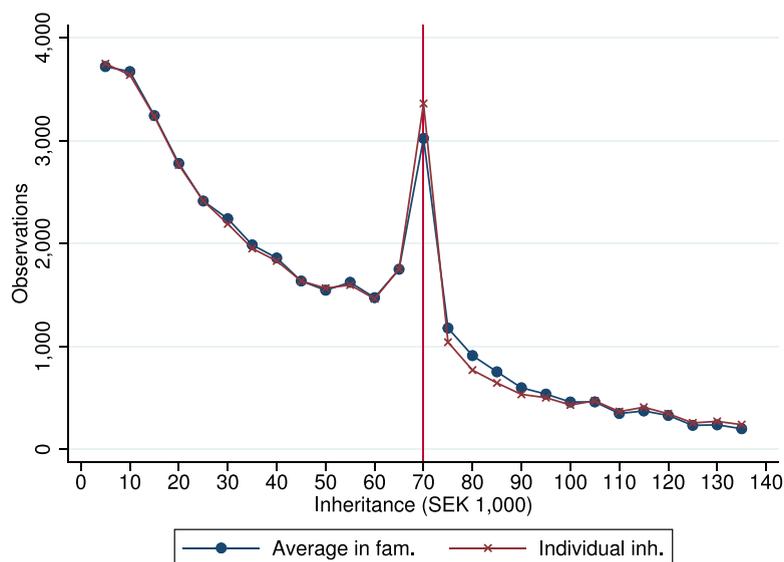


Fig. 9. Distributions of taxable inheritances, individual and averaged within families. The vertical line indicates the taxable exemption of SEK 70,000. The binsize is SEK 5000.

so that gross inheritances received by siblings within a family are the same, meaning that any difference between the distributions depends on differences in the siblings' decision to give. If all siblings transferred the same total wealth to their children, the two distributions would be identical. From the figure, we see that the distributions are similar, with the peak at SEK 70,000 being only slightly lower for the average inheritances than the individual inheritances.³⁴ The strong sibling correlation indicates that co-operation and legal advice were important factors. However, the correlation may of course also arise due to similar preferences for holding wealth.

8.2. The role of decedents

Finally, it is also important to reflect upon the role of the decedents, who may impact on the heirs giving behavior by bequeathing wealth to grandchildren while being alive. We do not believe, however, that the behavior of decedents induces a large bias to our results. The specification tests presented in Online Appendix Section B suggest that no large manipulation of gross inheritances occurs at the cut-off.

Moreover, if strategic behavior were important we would expect results to differ between heirs to decedents who die suddenly and heirs to decedents who were able to plan for death due to long illness. The latter group was able to undertake tax planning in advance, and these heirs were perhaps less prone to engage in tax planning after the decedent's demise. Following the definitions in Erixson and Escobar (2020) we partitioned the sample into "sudden deaths" and "others", and we re-estimated the extensive margin effect on these two subsamples. The point estimate was slightly larger for heirs to decedents who died suddenly (others); a SEK 100 (US\$ 14) increase in the tax gain increases the probability of giving by 3.35 percentage points (2.69 percentage points), with a standard error of 0.432 (0.264). Even though there is a tendency that "sudden deaths" react more, the difference is not large, and it is far from being significant.

9. Concluding remarks

Under the Swedish inheritance tax regime heirs could lower their inheritance tax bills to zero by giving part of the inheritance to their children. We use detailed administrative data for the last three years of the Swedish inheritance tax, 2002–2004, to examine the mechanisms behind the heirs' giving behavior. We document that the Swedish inheritance tax base was highly elastic, and the elasticity arose due to tax-favored *inter vivos* gifts. We show that those who responded did so in a very precise fashion. Most often, they transferred exactly the amount required to escape the inheritance tax, which led to extreme bunching at the point where the tax liability went to zero. Moreover, heirs made tax-favored gifts to children even when the tax savings were small. We find that

³⁴ To study the correlations along the intensive and the extensive margins separately and put numerical values on them, we estimate the sibling correlation in probabilities to make gifts, and to give to the minimum tax minimizing amount. We construct the estimates of the sibling correlation using the between and within family variation, obtained using a mixed-effect logistic regression. The estimation is described in more detail in Online Appendix D. The results show that the sibling correlation in the probability to give is 0.85 and the probability to give the tax minimizing amount is 0.88. This confirms that the giving behavior is strongly correlated within sibling groups.

siblings, sharing the same estate, often coordinated their actions, and we show that the decision to give was highly correlated with the decision to buy legal advice with the estate report.

Still, many individuals preferred giving their wealth to the taxman rather than to the children. Actually, half of the heirs with gross inheritances above the exemption level did *not* avoid the inheritance tax — despite the fact that giving was so simple, and the loophole had been in place for a very long time. The estimates we provide may be seen as an upper bound on the prevalence of inheritance and gift tax planning in contexts where tax avoidance is more challenging.

Beyond ending this paper, we want to remark on a normative aspect of this tax incentive. The tax base elasticity analyzed in this paper is not necessarily a sufficient statistic for the deadweight loss of the inheritance tax, because the tax-favored gift is not a waste from the society's viewpoint, but a transfer to someone else in the economy, cf. Dörrenberg et al. (2017) and Chetty (2009). Could it be socially desirable to subsidize gifts out of newly inherited wealth? Tax-favored gifts change allocations both *between* and *within* dynasties. Between dynasties, tax-favored gifts may substantially alter the incidence of progressive inheritance taxation. But within-dynasty effects of the policy may also impact on social welfare. Most heirs receive the inheritance at an age when they are the least liquidity constrained. Hence, subsidizing wealth transfers to children could e.g. be desirable if liquidity constraints prevent heirs' children from entrepreneurship or other socially efficient activities, see Lindh and Ohlsson (1996) for empirical evidence pointing in this direction. Another issue with welfare implications, which we cannot study with our data and we therefore leave for future research, is that tax incentives for giving to children may crowd out gifts to other people, e.g. distant relatives.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.euroecorev.2023.104382>.

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