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Abstract

There is an ongoing debate about whether inheritance and estate taxes are effective in raising revenues and in contributing to a more equal society. The different views on transfer taxes are largely dependent on beliefs about whether people plan their wealth to avoid these taxes. In this paper, we follow Kopczuk (2007) and study people's planning response to the onset of terminal illness. An extension of Kopczuk's work is that we can effectively control for responses in wealth caused by terminal illness but unrelated to tax planning. We do this by exploiting a tax reform in Sweden that removed the incentives for people to plan their estates to avoid inheritance taxation. We find some evidence of long-term terminal illness inducing responses consistent with tax planning, but that these are not widespread or efficient enough to reduce the overall tax burden in the study population. Our results, similarly to those of Kopczuk, show that people appear to postpone some decisions about their estates until shortly before death.

Keywords: tax avoidance, tax evasion, tax reform , terminal illness
JEL Classification: H26, H31, D64, D14

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1 Introduction

This paper is about people's planning towards the end of life, just before the demise, to reduce inheritance tax payments. Transfer taxes, such as inheritance and estate taxes, are highly debated in many countries, and there is little consensus about whether these taxes should be increased, decreased or abolished all together (see, for instance, Piketty (2014)). The different views partially stem from ideological predispositions, but also from different beliefs regarding the effectiveness of these taxes when it comes to mitigating inequality and raising revenue.

That taxes affect the behavior of taxpayers is acknowledged among scholars and policymakers. Private transfers of wealth, such as inheritances, involve two parties: the donor (the decedent) and the donee (the heir), and there is indicative evidence that taxes on these transfers induce behavioral responses along several dimensions, such as wealth accumulation, labor supply and entrepreneurial activity of the concerned agents (Poterba 2001; Joulfaian and Wilhelm 1994; Elinder, Erixson, and Ohlsson 2012; Holtz-Eakin et al. 1993).

Other responses to transfer taxes are intended to reduce tax liability. Transfer taxes are usually seen as easy to avoid, and avoidance is believed to be widespread. The estate taxes in the U.S. and the U.K. are often referred to as "voluntary" because they can be avoided by careful planning (Cooper 1977). Similar opinions were brought with regard to about the inheritance tax in Sweden (Egendomsskattekommittén 2004). These claims are supported by the fact that in every country with inheritance or estate taxes, there are large sectors of lawyers providing advice on how to lower the tax burden, thus suggesting that people are interested in this matter and willing to pay for it. Despite this popular belief and indirect evidence, we know little about whether, to what extent, how and why people avoid transfer taxes. This is unfortunate from a policy perspective, because if people plan their wealth to avoid transfer taxes, then these taxes are less effective in raising revenues or in contributing to a more equal society (Boadway et al. 2010; Piketty and Saez 2013). As with most tax planning, it also comes with a cost as individuals spend time and money in trying to avoid the tax. Tax planning is thus associated with societal costs and reduced social welfare.

One reason for the limited knowledge about tax planning is that it is inherently difficult to quantify, since people do not report to the tax authorities or answer survey questions about their tax avoidance. Moreover, since inheritance taxation only occurs at one point in time and—at least hypothetically—is associated with a long planning horizon, it is difficult to say whether the outcome, observed at the time of the taxation, is a consequence of current or previous tax regimes.

Researchers have made creative attempts to overcome these methodological obstacles. In solving the first problem—measuring the extent of avoidance—one set of studies investigate the extent of (legal or illegal) tax planning by comparing estates of decedents to the wealth of living individuals, weighted by their mortality risk (Wolff 1996; Poterba 2001). Although the estate sizes are smaller than the wealth of the living, which is consistent with tax planning, the results have shown to be sensitive to assumptions about mortality risks and should thus be taken with a grain of salt (Eller, Erard, et al. 2001). Another strand of the literature draws on American data on estate tax audits. Comparisons of the tax liability before and after an audit reveal that around 10 percent of the tax filers do not fully comply with the tax law (Eller and Johnson 1999). These estimates, however, may represent a lower bound of non-compliance, since some sophisticated evasion strategies may not be captured by audits.

Another method to estimate inheritance tax planning, on which we extend in this study, was proposed by Kopczuk (2007). Kopczuk uses a sample of American estate tax payers from the late 1970s and measures tax planning by comparing the values of estates across decedents who passed away from illnesses of different lengths.[1] The underlying assumption of the strategy is that planning is more efficient the earlier it is carried out and that additional time for planning should have a negative effect on the value of the estate. Planning could, of course, be carried out at any point in time and is often more successful the earlier it is carried out, but research in psychology and behavioral economics suggests that people tend to deny their mortality and procrastinate on decisions associated with their deaths (Becker 1973; Wong et al. 1994; Kopczuk and Slemrod 2005). This appears to be the case even when there are gains to be made from these decisions in terms of lower tax payments. In the U.S., for instance, the most basic strategy for avoiding the estate tax is to exploit the annual gift exclusion, which allows donors to make tax-free gifts up to a value of USD 13,000 (in 2011) per donee annually, to as many people as they wish. Yet, several studies show that taxpayers underutilize inter vivos gifts as a tax planning tool despite its potential gains (Joulfaian and McGarry 2004; McGarry 2000, 2001; Poterba 2001). It appears unlikely that this is due to ignorance of the loopholes in the tax system, but rather that people are reluctant to transfer wealth when still alive, since they then have to give up control over their assets (Schmalbeck 2001; Kopczuk 2013). The onset of terminal illness, however, is a signal that it is time to start planning and the earlier this signal comes, the more effective could the tax planning be. In line with this hypothesis, Kopczuk finds that the estates of those who die from an illness lasting hours to years are 10–20 percent smaller than the estates of those

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1. In an ogoing research project, Suari-i-Andreuy et al. (2016) study tax planning among Dutch decedents using the methodology in Kopczuk (2007).

who die instantaneously. He moreover finds responses in deductions, gift patterns and the composition of assets that are consistent with the reduction in estate size being the consequence of tax avoidance. From these findings, Kopczuk concludes that taxpayers indeed seem to value tax reductions, but that they tend under-invest in tax planning until the onset of a terminal illness—probably because they are reluctant to part with their wealth.

However, one issue with the interpretation of the results in Kopczuk (2007) is that a lengthy illness may induce real drops in wealth (e.g., because of lost income, increased medical expenditures, or consumption), which are unaccounted for by the empirical strategy. Although Kopczuk does a thorough job in presenting evidence against these confounding factors, it is difficult to entirely neglect their potential role.

In this paper, we extend on the methodology in Kopczuk (2007) to account for the confounding factors explicitly by using exogenous variation in incentives to plan for taxation, a variation created by the repeal of the inheritance tax on bequests to spouses in Sweden in 2004. More specifically, we estimate the effect of the inheritance tax on tax planning by comparing the difference in wealth at death between individuals passing away instantaneously and from a lengthy terminal illness before the tax repeal, when incentives to plan prevailed, with the similar difference among decedents passing away after the repeal, when incentives had been removed. The empirical strategy is best described as a repeated cross-section difference-in-differences design. The identification assumption that needs to be fulfilled for this strategy to produce consistent estimates is that the relationship between terminal illness length and estate size would have been the same for individuals passing away before and after the tax repeal had the tax repeal not occurred. Several tests support the validity of the identification assumption—at least for long-term terminal illness—thus making us confident in interpreting any responses in wealth to such illness as being a result of the inheritance tax.

By using this identification strategy, we isolate the planning carried out by the decedent just prior to his or her death. This is relevant given the previous research suggesting that tax payers tend to postpone their planning for as long as possible and also that knowledge about the responses of decedents is important to the literature on optimal inheritance taxation[2]

We carry out the empirical analysis using data from an administrative database covering the entire population of married Swedes passing away over the period 2002–2004. The database provides information on the dates on which the decedents passed away, which allows us to categorize the decedents as having passed away before or after the repeal of the tax on spousal bequests. The database also provides information on the value of the

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2. See, for instance, Piketty and Saez (2013).

decedents' estates and the inheritance tax payments, which are the outcomes we study. To enable the analysis, we also add data from several other administrative registers: data on health and cause of death from medical records are used for determining the length of the decedent's terminal illness, and data on net worth and on other economic and demographic characteristics from government registers are used for validating the empirical strategy and testing for heterogeneities in responses.

Our results could be summarized as follows: we do not find any evidence of tax induced *reductions* in estate size or tax payments in response to terminal illness. The results instead show that long-term illness leads to *increases* in the outcomes. This is somewhat surprising given the negative relationship reported in Kopczuk (2007) and we therefore investigate potential reasons for the discrepancy in findings. The results show that the discrepancy is not due to our controlling for possible confounding factors: the estimates remain positive when we employ Kopczuk's empirical strategy. Moreover, we show that the discrepancy remains when we restrict the analysis to only include the very wealthy, as in Kopczuk (2007), or other sub-groups for which tax planning is more likely to be prevalent. We conclude that the differential results are instead likely to stem from differences in tax systems, norms or differences in preferences or means for planning between the two study populations. However, we do find that some planning activities have taken place in response to the terminal illness. For instance, we find that long-term illness increases the likelihood of the decedent having written a will stipulating that the estate is to be divided into more inheritance lots than dictated by the succession rule default. Distributing the wealth among a larger set of heirs could lower the tax payment, since the tax was progressive and each heir was entitled to a deductible exemption. We also find that decedents plan in anticipation of the inheritance tax by reducing the value of their separate property relative to the value of their marital property. This was potentially beneficial since all separate property of the decedent was part of the estate and thus liable to taxation, as opposed to marital property of which only half was liable to taxation. These findings suggest that long-term terminal illness triggers the use of some tax planning tools, although not enough to reduce average tax payments.

The outline of the paper is the following: Section 2 provides a review of the institutional context: the succession rules in Sweden, the structure of the inheritance tax and its repeal. In Section 3 we describe the empirical strategy, the underlying assumptions and some identification issues. Section 4 details the data together with a description of how we construct the key variables and the resulting study population. Section 5 discusses the plausibility of the identifying assumptions. Section 6 provides the results and, finally, in Section 7 we present some concluding remarks.

2 Institutional setting

The basic principle of succession in Swedish inheritance law is that closer relatives of the decedent inherit before more distant relatives. The decedent's offspring—children, grandchildren and so on—are denoted direct heirs and are the first in line to inherit. In the absence of direct heirs, the decedent's parents, siblings and their descendants (i.e., nephews or nieces) inherit. If there are no heirs in this group, then the estate is transferred to the decedent's grandparents and their children (i.e., the decedent's aunts or uncles).

If the decedent was married, then the surviving spouse's right to inherit takes precedence. However, in cases where the decedent had relatives (e.g., children), the spouse does not inherit the estate with full ownership, but rather with what is referred to as free disposition. This means that the spouse is free to spend the inheritance but prohibited to testate it, and that the children will receive their inheritances from the first spouse when the surviving spouse passes away.[3]

The value of the estate to be left by a married decedent is the sum of the decedent's separate property and his or her share of the marital property. This is by default transferred to the surviving spouse.[4] The decedent has the opportunity of deviating from the default rule and testate property to others than the spouse, but the law stipulates that the surviving spouse is always entitled to an amount of at least four price base amounts (the price base amount was SEK 38,600 in 2003).[5] The amount, however, is passed on to the beneficiary of the will when the surviving spouse passes away.

2.1 The Swedish inheritance tax

Before 2004, all inheritances in Sweden were subject to taxation.[6] The tax was designed as an inheritance tax, which implies that the inheritance received by the heir constituted the tax base, as opposed to estate taxes under which the tax payment is calculated on the value of the estate.

The information underlying the tax calculations was collected by the tax agency from estate inventory reports. An estate inventory report should be filed for every Swede passing away and the report ought to include the decedent's name, address, personal identity

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3. The exception to this rule applies when the decedent has children from a previous marriage or partnership. These children do not have to wait until the death of the surviving spouse; they become entitled to the inheritance from the day their parent passes away.

4. If the decedent does not leave a spouse behind, the default rule is that the estate is divided in equal shares between the decedent's direct heirs.

5. This rule is denoted *Basbeloppsregeln*. The price base amount is related to CPI.

6. Inheritances received by charitable organizations and other organizations working for the greater good of society were exempted from taxation

number, date of death and marital status, as well as the will and marital agreement (if any). If the decedent was married, marital property and any separate property of the surviving spouse had to be reported as well. The decedent's assets and debts were to be declared at their values as of the time of death. The person in charge of the estate report (usually a relative, or sometimes a law firm, bank or mortician) was required to support the values with documentation from banks, financial intermediaries, real estate agents, etc. The basic rule was that assets were to be declared at their market value. Some assets, however, were exempted from that rule. Real estate was reported at its tax-assessed value, which was targeted 75 percent of the market value. Stocks listed on a stock exchange were generally assessed at 80 percent of their full market value, while unlisted stocks were assessed at 30 percent of their market values.[7] Closely held businesses of the decedent were valued at their estimated sales value as of the date of death. The value of the assets, net of outstanding debts and, if the decedent was married, removal of the marital property of the surviving spouse, constituted the estate.

The tax agency calculated the inheritance lots by dividing the taxable part of the decedent's estate according to the conditions of the decedent's will and the legal rules of the succession scheme. The beneficiary (or beneficiaries) of the will were given priority in the estate division while the remaining property was divided in equal portions between the legal heirs.[8]

The tax schedule depended on the relationship between the decedent and the recipient. For a surviving spouse, amounts exceeding a basic deductible exemption of SEK 280,000 were taxed according to a progressive tax schedule with three tax brackets, with marginal tax rates of 10 percent, 20 percent and 30 percent. Direct heirs and other heirs faced the same tax rates, but were entitled to lower deductible exemptions than surviving spouses (SEK 70,000 and SEK 21,000, respectively). Table 1 reports the tax schedules for the three tax classes.

2.1.1 The repeal of the tax on spousal bequests

On October 22, 2003, the Social Democratic government submitted its budget proposal to the Parliament, suggesting that the tax on spousal bequests was to be repealed from January 1, 2004 (Regeringens proposition 2003/04:15). The main reason, as stated in

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7. Stocks on lists other than the Stockholm Stock Exchange main list were reported at 30 percent of their market value.

8. Any property that the decedent had possessed with free disposal was divided between the previously deceased spouse's legal heirs and legatees. In practice, the tax agency divided the joint estate of the decedents into two parts: one from the first decedent and one from the second decedent, which were then distributed in equal portions between the heirs of the two decedents, respectively.

Table 1: The inheritance tax schedule

Inheritance (net of deduction)[1]			Tax payment		
Surviving spouse and Class 1					
	<	300,000			10%
300,000	-	600,000	30 000	+	20% within bracket
600,000	<		90,000	+	30 % within bracket
Class 2					
	<	70,000			10%
70,000	-	140,000	7,000	+	20% within bracket
140,000	<		21,000	+	30% within bracket
Class 3					
	<	90,000			10 %
90,000	-	170,000	9,000	+	20% within bracket
170,000	<		25,000	+	30% within bracket

Notes: Table from citera Elinder, Erixson, Escobar, et al. (2014). All amounts in SEK. The amounts were not adjusted for inflation. [1]The deduction for surviving spouse was SEK 280,000 SEK. It was SEK 70,000 for heirs in Class 1 and SEK 21,000 for heirs in Class 2 and 3.

the bill, was that housing prices in Swedish metropolitan areas, such as Stockholm, had increased substantially, which had resulted in increased tax values. Subsequently, many surviving spouses in these areas with relatively small incomes faced large tax payments. According to anecdotal evidence, surviving spouses were not seldom forced to sell their houses to afford the inheritance tax payments. In an interim report presented to the Government in January 2003, the The Property Tax Committee, commissioned by the Government to evaluate property and wealth taxes in Sweden, raised similar concerns and suggested that the tax on bequests to spouses should be abolished from July 1 that same year (Egendomsskattekommittén 2004). Many consultation bodies had advocated retroactive implementation of the new legislation to also include bequests from individuals having passed away during the first six months of the year, but their proposal was turned down by the Government, with the argument that there were no exceptional circumstances required for a retroactive implementation. Instead, on December 17, three months after the submission, the Government's initial proposal stating that the tax would be repealed from 2004 was passed in the Parliament.

The repeal of the tax implies that spousal bequests from persons having passed away after December 31, 2003 are not liable to taxation. Gifts between spouses remained taxable, however, until the complete abolishment of the inheritance tax in December 2004.[9]

3 Empirical strategy

Our objective is to estimate the effect of inheritance taxation on estate planning shortly before death. The empirical strategy builds on and extends the strategy used by Kopczuk (2007). Kopczuk uses data on a cross-section of married estate tax filers in the U.S. during the late 1970s and studies the occurrence of estate planning by comparing estate sizes across decedents suffering terminal illnesses of different lengths. The core of Kopczuk's strategy is that decedents passing away from a lengthy illness have had time to plan their estates (and more so the longer the illness) as compared to those who pass away suddenly. His estate tax returns data, among other things, contain information on the length of the illness that preceded the demise, which he uses for categorizing deaths as having occurred instantaneously (within an hour), as having occurred after a period of illness lasting for hours to a month (medium) or having occurred after a period of an illness lasting more than a month (long). Hen then studies their differential effect on the estate size.

We extend on Kopczuk's methodology by exploiting the variation in incentives to plan created by a repeal of taxes on bequests to spouses in Sweden, which took place in 2004.

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9. See Erixson (2014) for a description of the complete abolishment of the inheritance tax.

Our strategy compares the effect of passing away from a medium or long-term illness, relative to instantaneously, before the tax repeal, when incentives to plan prevailed, with the similar effect after the tax repeal, when planning incentives had been removed.[10] The strategy is best described as a repeated cross section difference-in-differences (DiD) strategy, which compares the tax planning of two treated groups, decedents passing away from long-term and medium-term illness, with one untreated group, decedents passing away instantaneously, before and after the reform.

The advantage of our empirical strategy is that it effectively accounts for biases from responses in wealth caused by the terminal illness itself, and not tax planning, since these should be unrelated to the tax repeal. It is not obvious in what direction such responses would bias the estimates of tax planning if we simply regressed estate size on illness length, without using the tax induced variation. For instance, individuals who are still working when they get terminally ill may lose some of their income and therefore have to consume out of their wealth. Similarly, terminal illness may also reduce wealth if people have a precautionary motive for accumulating wealth (i.e., that wealth is accumulated solely for the purpose of insuring against adverse events in the future, such as lost income or unforeseen medical expenses). According to this theory, the onset of an illness, suggesting to the individual that life expectancy is shorter than previously thought, would lead to an increase in the rate at which the wealth is consumed. On the other hand, it is also possible that wealth, and thus estate size and tax payments, could increase after the onset of terminal illness, if the illness makes the individual unable to pursue consumption. Such a positive effect is particularly likely in Sweden, where the healthcare insurance is universal, medical services are, largely, free of charge, and long-term care is income-tested, implying that people do not have to finance this type of arrangement through their savings, but can do that solely through their retirement income. Incidentally, this is the opposite of what Kopczuk proposes regarding the effect of medical expenditures and terminal illness in his American setting, where a lengthy terminal illness may induce high personal costs for medical services, which in turn may lead to the individual consuming out of his or her wealth, thereby reducing the estate size and tax payments.[11]

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10. Kopczuk makes an attempt at using variation in incentives to plan generated by a reform of the estate tax in end of 1976, which increased the exemption level for spousal bequests. However, since he is unable to precisely determine the date when the study subjects passed away, and thus correctly categorize them as having passed away before or after the tax reform, the results are only indicative and not stressed in the paper.

11. Kopczuk (2007) consults the early 1990s AHEAD/HRS exit surveys and shows that for individuals with comparable wealth to those in his study, these expenditures constitute at most 4 percent of their wealth, leading him to conclude that medical expenditures are unlikely to explain the findings of his

As the confounding responses discussed above are unlikely to be affected by the inheritance tax, and therefore exist both before and after the tax repeal, our empirical strategy effectively accounts for them. Thus, the impact of such responses is captured in the estate size of individuals passing away after the reform and controlled for when regressing estate size on length of illness for decedents passing away before the reform less the impact of length of illness on estate size of individuals who passed away after the reform. The empirical strategy is captured by the following regression model:

$$
\begin{aligned}
y_{ist} = \alpha &+ \beta_1 Medium\ illness_s \times Tax\ regime_t + \beta_2 Long\ illness_s \times Tax\ regime_t \\
&+ \beta_3 Tax\ regime_t + \beta_4 Medium\ illness_s + \beta_5 Long\ illness_s + \gamma \mathbf{X_i} + u_{ist}
\end{aligned} \tag{1}
$$

where y_{ist} denotes the outcome (e.g., estate size) of individual i, passing away from an illness of length s, at time t. Length of illness is captured by the two indicator variables: $Medium\ illness_s$ and $Long\ illness_s$, which take value one for medium length and long-term terminal illness, respectively, and zero otherwise.[12] Instantaneous death is the reference category. $Medium\ illness_s$ and $Long\ illness_s$ are intended to control for factors, linking length of illness and the outcomes, other than tax planning. The indicator variable $Tax\ regime_t$ takes the value one if the individual passed away before the tax repeal (2002 or 2003) and zero after (2004) and controls for differences in estate size between the decedents passing away on each side of the reform that are unrelated to the length of illness. The coefficients of interest are those on the interactions between the indicator for tax regime and length of illness (β_1 and β_2), as they capture the tax planning induced by long-term and medium-term terminal illness. The model is also augmented with a vector, $\mathbf{X_i}$, containing individual-level controls, intended to control for observable (and potentially also unobservable) factors affecting both the outcome and the length of terminal illness.[13] The controls are redundant for identification if the outcome would have evolved similarly in the two groups had the tax repeal not occurred—the so-called parallel trends assumption discussed in Section 5. Nevertheless, we include the controls to increase the precision of estimates by reducing the variance of the error term (u_{isc}).

study.

12. Length of illness is defined following Kopczuk (2007), see Section 4.

13. Kopczuk includes controls for total income (measured 7 years before the demise), a third order polynomial in age and an indicator for whether the decedent passed away in 1977. In our specification, the controls are: wealth and income measured in the third year before death, gender, education, number of children, year of death and a third order polynomial in age.

4   Data and study population

In this section, we present the dataset of the study.[14] The first subsection describes the data sources and how we construct the variables of interest, and the second subsection describes the study population.

4.1   Data sources and variables of interest

Information on the study population is collected from a Swedish administrative register called the Belinda database. The Belinda database covers the estate inventory reports of all Swedes passing away during the period 2002–2004.[15] Included in the database are personal details (identity number, marital status, date of death etc.), legal circumstances (will, marital agreement, life insurance policy) for the decedents, as well as information about the value of the estate. The estate is the decedent's net worth at the time of death and is the amount that is transferred to the heirs. The estate size is the outcome of primary interest to us and it captures planning responses intended to reduce the value of the tax base. It also conforms to the outcome used by Kopczuk (2007). The Belinda database, moreover, contains information on the heirs: their relationship with the decedent and the value of the inheritances they receive from the decedent. Using this information, we construct the second primary outcome, which is the total inheritance tax payment associated with the estate; that is, the sum of the inheritance tax payments. For decedents passing away after the tax repeal, tax payment is calculated using the estate size and the division scheme dictated by the estate report. This outcome captures margins of tax planning that do not reduce the value of the tax base yet reduce the tax payment, such as the inclusion of additional heirs, etc. Thus, we may find a response in tax payment to terminal illness even if there is no response in the estate size.

In the estimations, we apply the inverse hyperbolic sine transformation to the outcome (Burbidge et al. 1988; Hochguertel and Ohlsson 2009). This is to accommodate zeros in the outcomes, reduce the influence of outliers and facilitate an interpretation of the responses in percentage terms.[16]

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14. Access to the data has been granted to the researchers at the Department of Economics at Uppsala University associated with the project Intergenerationella överföringar: orsaker och konsekvenser. Due to its sensitive and confidential nature, the data cannot be exported from the closed server environment at Statistics Sweden.

15. The time frame is dictated by the fact that the tax agency was obliged to electronically codify all estate reports in the country from July 2001. This obligation ceased in 2005, when the inheritance tax was abolished.

16. As a robustness check, we also report results from estimations with the logarithm of one plus the outcome value (see Table B 1), which is the transformation applied by Kopczuk (2007).

The key explanatory variable is length of terminal illness. There is no direct measure of length of terminal illness available in Swedish registers. Instead, we create it using data from the Cause of Death Register and National Patient Register, which are both provided to us by the Swedish Board of Health and Welfare. The Cause of Death Register contains data from the death certificates of all Swedes who have passed away, and, among other things, covers information on the date and cause of death. Cause of death is determined by physicians and has been categorized according to WHO's *International Statistical Classification of Diseases and Related Health Problems* (ICD).

The National Patient Register contains data on all hospital admissions (inpatient care) of Swedish citizens, including information on dates of the hospitalization episodes and the disease or symptom that the patient was treated for. The physician is required to report the diagnosis (mapped into ICD code following the same logic as the Cause of Death Register) for the primary disease (or symptom) that the patient was treated for, as well as any other conditions that the patient had during the admission. For the decedents in the Belinda database, we have added these data from 1993 until the point in time when they passed away.

We proceed in the following way to calculate the length of terminal illness: First, we use the Cause of Death Register to identify the main cause of death, defined by an ICD code. Second, we search in the Patient Register for the hospital admission when the patient was initially diagnosed with the disease that matches the cause of death (by ICD code). And, finally, we count the number of days between the initial diagnosis and the date of death and turn them into a variable denoted length of terminal illness. For some individuals, the Cause of Death Register also reports contributory causes of death. For example, an individual may be reported as having lung cancer (ICD code C349) as the main cause of death and chronic obstructive pulmonary disease (COPD, ICD code J440) as contributory cause of death. If the COPD diagnosis precedes the lung cancer diagnosis in time, we define length of terminal illness as the number of days between the COPD diagnosis and the demise, rather than by the number of days since the lung cancer diagnosis.

The reform of the ICD system in 1997, which replaced the previous ICD-9 system with the current system ICD-10 system, makes it difficult to track specific diagnoses over time. We therefore conduct the matching between cause of death and illness by using the 21 ICD diagnosis chapters, as these are translatable over time, before and after 1997. Information regarding the diagnosis chapters is presented in Table A1 of Appendix A.

To enable a comparison with Kopczuk (2007), we aggregate length of terminal illness into three categories: instantaneous, medium and long. Instantaneous deaths are defined as those where death occurs on the same day as the onset of the terminal illness. This

definition includes deaths that occur within minutes and hours after the onset of illness and is thus, somewhat broader than Kopczuk's definition, which only considers deaths within minutes (in his analysis deaths occurring within hours are included in the medium category). The medium category contains illnesses lasting for one day up to a month (30 days) and the long category contains illness lasting more than one month.

How well does our length of illness measure capture actual length of illness? Table 2 reports the incidence of different categories of causes of death represented in the study population by length of terminal illness. It displays a pattern in line with what we would expect. For example, we see that the share of deaths due to cancer increases with length of terminal illness, whereas deaths from heart diseases are most common in the group of decedents passing away instantaneously.

One concern, however, is that our length of illness measure fails to capture illnesses that have been diagnosed outside hospitals, in primary (outpatient) care.[17] If the illness has been diagnosed in primary care before being treated (and diagnosed) in a hospital, our measure of length of illness will be shorter than the actual length of illness.[18] While this is a potential concern, the effect of such measurement errors should be reduced by our aggregation of illness length into three categories.

4.2 Defining the study population

In this section, we describe how the study population is defined. We start with the entire population of deceased Swedes during the period 2002–2004 and restrict it to the relevant population of study—decedents affected by the inheritance tax and the tax reform. In addition, we apply some restrictions that are required for the research design. These restrictions are described below.

First, we restrict the population to married decedents (i.e., decedents who leave behind a surviving spouse).[19] This is because married decedents constitute the population affected by the repeal of the tax on spousal bequests, which we use for identification. The restriction has the additional benefit of making our population more comparable to that of Kopczuk (2007), who also primarily focuses on married decedents. There are in total 91,189 married decedents in the Belinda database.

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17. Treatment of minor health contingencies, medical check-ups and other forms of preventive care is a matter for the primary care sector.

18. Since 2001, the Board of Health and Welfare keeps a register on primary care admissions. Unfortunately, these data were of low quality during the study period and are not recommended to be used for research purposes.

19. Married decedents with children who are not common with the surviving spouse are not part of the study population, as they were unaffected by the tax repeal.

Table 2: Descriptive statistics: causes of death

	(1) Instantaneous	(2) Medium illness	(3) Long illness
Infections	0.98	2.11	1.17
Cancer	7.85	32.17	39.47
Blood	0.21	0.24	0.22
Endocrine	1.80	1.15	2.48
Mental	6.93	1.39	2.50
Nervous	5.93	2.34	2.49
Eye	0.00	0.00	0.00
Ear	0.00	0.01	0.00
Circulatory	50.14	42.01	37.98
Respiratory	4.92	7.14	5.94
Digestive	1.82	5.10	2.78
Skin	0.09	0.08	0.10
Musculoskeletal	0.14	0.26	0.40
Genitourinary	1.04	1.14	1.39
Pregnancy	0.01	0.00	0.00
Congenital	0.07	0.05	0.10
Symptoms	6.98	0.19	0.49
Factors	1.89	0.40	0.12
External	9.21	4.23	2.37
Total	100.00	100.00	100.00
Observations	13,988	8,586	68,615

Notes: Causes of death among all married decedents in 2002–2004. All causes of death are provided in percent. For ICD chapters corresponding to each group of diagnoses, see Table A1. ICD chapters that do not correspond to any of the causes of death in our study population are not included in the data.

Second, we restrict our focus to decedents passing away in the same year as the onset of the terminal illness. This is to avoid the possibility that decedents who passed away in 2004, but who became terminally ill before the tax repeal, have also planned for the tax, as they did not know whether or not they would outlive the tax or that they engaged in planning before they learned that the tax was going to be repealed. After this restriction, 31,020 individuals remain.[20]

Third, data on monetary variables, such as the value of the estate, are lacking for decedents passing away between December 17 and 31, 2004. This is a consequence of the removal of the tax agency's obligation to codify the values after the final abolishment of the inheritance tax. We therefore omit decedents who passed away during this period from the analysis. To avoid bias from seasonal patterns in mortality, we also exclude decedents passing away between December 17 and 31 in 2002 and in 2003. This leaves 29,215 individuals.

Fourth, we restrict the population to decedents who had sufficient wealth to have tax planning incentives. Since we focus on married decedents, the relevant threshold is the one for the inheritance tax on spousal bequests, which was SEK 280,000. However, we do not want to define tax liability based on the estate size at death because we may then fail to capture planning causing the estate to fall below the tax threshold. Kopczuk (2007) faces this type of truncation problem and uses parametric and semiparametric methods to address this. Unlike Kopczuk, however, we have information on those located below the threshold, and we also observe the decedents' wealth in the years before their demise. The information comes from the Wealth Register, which contains annual information on net worth (assets minus debts), measured on December 31, for the 1999–2007 period. This information allows us to construct a measure of tax liability that is exogenous with respect to the terminal illness, or put differently: that is determined before the onset of the terminal illness. We define tax liable decedents as those with net worth in the third year before the year of the onset of illness exceeding SEK 280,000. In total, 14,940 decedents have estates liable to taxation and they constitute our study population.[21]

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20. It is unclear how this restriction differentiates our sample since he does not report any summary statistics with respect to the categorical variable underlying the aggregated length of illness indicators.

21. Determining tax liability in this way requires a report on net worth in the third year before the year of the onset of illness and also that the decedent has not changed marital status during the period between the wealth measurement and onset of illness. We drop six decedents because they lack information on net worth and 262 because they change marital status. In addition, 272 observations are dropped because information was missing, or obviously erroneous, on the variables illness length or inheritance size.

5 Specification checks and descriptive statistics

Causal identification in a difference-in-differences design requires the outcomes of the treated and the control groups having evolved similarly in a hypothetical world without treatment. In our study, this implies that the trend in the outcome (e.g., estate size) over the studied years should be the same for those passing away from terminal illness (medium or long) and those passing away instantaneously, had there been no tax repeal. If the trends are parallel, then the outcome of those passing away instantaneously works as a counterfactual for those passing away from a terminal illness, when controlling for the outcomes of those passing away before the tax repeal.

The parallel trends assumption cannot be tested explicitly, as the counterfactual trends are unobservable, but we can evaluate the plausibility of the assumption by studying the actual trends. In Figure 1, we plot the mean of the (inverse sine) estate size for the decedents in each of the studied years. The first graph compares the estate size for those passing away after medium-length illness to those passing away instantaneously, whereas the second graphs compares those passing away from a long-term illness to those passing away instantaneously. To believe in the parallel trends assumption, we require that the estate size evolves in a similar way in the groups of long-term and medium-term ill, as in the group of those passing away instantaneously, over the years 2002 and 2003. That would suggest that the trends would have continued to evolve similarly had the reform in 2004 never occurred. We see that the trends appear to be parallel when we compare those passing away after a long-term illness and those passing away instantaneously, but not when we compare those passing away after a medium-term illness with those passing away instantaneously. The trends in Figure 1 thus strengthen the credibility of the estimated effects for those passing away after a long-term illness but not for those passing away after a medium-term illness. This interpretation is further supported by the estimates in Table B 2. The table shows the estimates of a version of Specification 1 on estate size, which captures the effect of the different illness lengths on estate size for each year relative to 2002. It is estimated by replacing $Tax\ regime_t$ in Specification 1 with indicators for the years 2003 and 2004. We see that there is no difference in the effect of long-term illness in 2003 relative to 2002, but that there is such a difference with regard to the effect of medium-term illness.

Our data only covering decedents in three years means that the trends we are able to study are fairly short. It is therefore useful to compare predetermined characteristics of decedents passing away instantaneously or from a medium or long illness before and after the tax repeal. In Table 3 we report descriptive statistics on predetermined characteristics separately for decedents passing away before the tax reform (Panel A) and decedents

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passing away after the tax reform (Panel B). If we look within the two panels, we see that there are differences in characteristics across the three length of illness categories, but that the individuals of each category are quite similar before and after the reform. When we test for differences in predetermined characteristics, using Specification 1, estimates presented in Table 4, we see that they are in general small and statistically insignificant. The exceptions are the estimates with respect to income. The estimate on medium-term illness is significant at the one percent level, a finding that together with the results on parallel trends implies that the response to medium long illness, because of the inheritance tax, may not lend a causal interpretation. The estimate on long-term illness, however, is only weakly significant ($p<0.10$). This is still worrisome, but as the trend in estate size for these decedents appears to be parallel to the corresponding trend of decedents passing away instantaneously, and given that there is no estimable effect on pre-illness wealth—arguably the most important of the predetermined outcomes—the overall interpretation is that the effect of long-term illness may be causally identified.
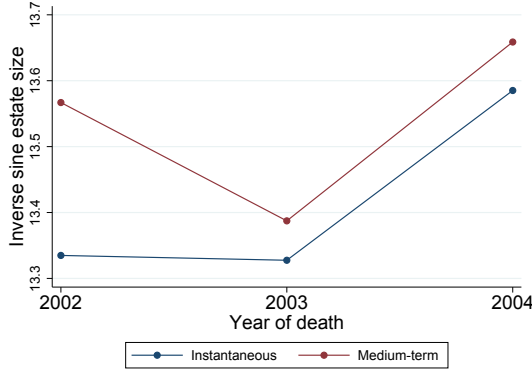
(a) Estate size
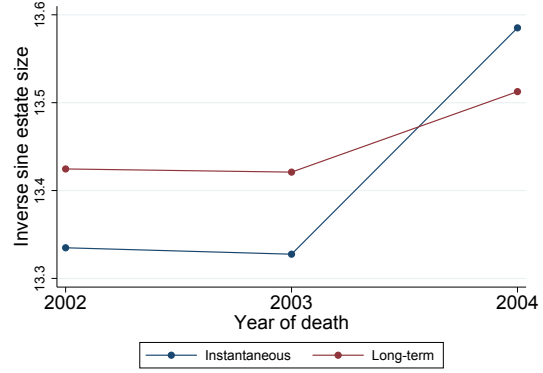
(b) Estate size
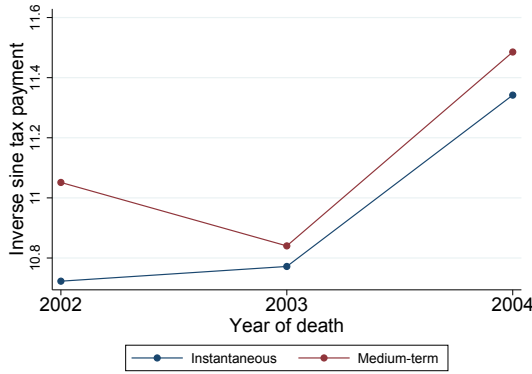
(c) Tax payment
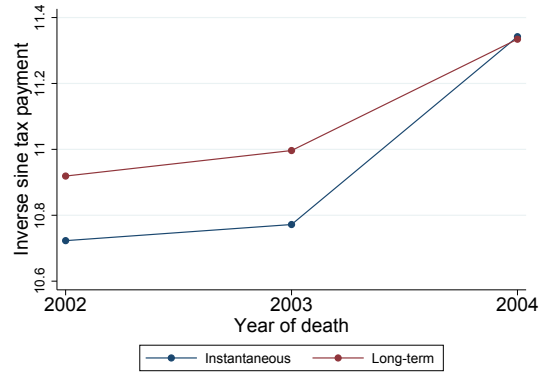
(d) Tax payment

Figure 1: Trends in estate size and tax payment. The figures compare the average (inverse sine) estate size among decedents passing away in 2002 or 2003 (pre-reform) and 2004 (post-reform). Subfigure a (c) compares the estate size (tax payment) among those passing away instantaneously and those passing away after medium-term terminal illness. Subfigure b (d) compares the estate size (tax payment) among those passing away instantaneously and those passing away after long-term terminal illness.

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Table 3: Background characteristics by length of terminal illness

	(1)	(2)	(3)
	Panel A: Before the tax repeal		
	Instantaneous	Medium illness	Long illness
Age	76.51	77.24	74.42
Sex	75.97	75.29	70.64
No. of children	1.96	1.96	2.03
University education	16.06	14.79	15.75
Income	179,716	177,709	185,742
Wealth	1,227,099	1,237,700	1,282,190
Illness length	0.00	10.82	107.43
No. of hospitalizations	2.71	3.49	5.25
Observations	4,789	2,367	2,660
	(1)	(2)	(3)
	Panel B: After the tax repeal		
	Instantaneous	Medium illness	Long illness
Age	76.57	77.53	74.59
Sex	76.96	72.48	70.68
No. of children	1.96	2.04	2.04
University education	16.50	14.31	17.80
Income	187,944	173,309	193,252
Wealth	1,242,491	1,172,863	1,360,597
Illness length	0.00	10.92	108.23
No. of hospitalizations	2.77	3.85	5.57
Observations	2,261	1,090	1,180

Notes: Means. Wealth and income are measured in SEK three years before death. Length of illness is measured in days. Male and university education are measured in percent. Age is measured in years.

Table 4: Specification test—regression on observables

	(1) Wealth	(2) University education	(3) No. children	(4) Income	(5) Age
Medium×Tax regime	0.0413	0.00930	-0.0805	0.159***	-0.244
	(0.0324)	(0.0158)	(0.0540)	(0.0450)	(0.457)
Long×Tax regime	0.0447	-0.0144	0.000818	0.0804*	-0.196
	(0.0315)	(0.0153)	(0.0525)	(0.0437)	(0.445)
Medium	-0.0181	-0.0178	0.0765*	-0.114***	0.558
	(0.0269)	(0.0131)	(0.0448)	(0.0373)	(0.379)
Long	0.00711	0.0170	0.0725*	-0.0317	-2.419***
	(0.0262)	(0.0128)	(0.0437)	(0.0363)	(0.370)
Tax regime	-0.0127	-0.00720	-0.00243	-0.0853***	0.205
	(0.0184)	(0.00895)	(0.0307)	(0.0255)	(0.260)
No. of observations	14,940	14,940	14,940	14,940	14,940

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1. The outcome wealth denotes the (inverse sine) wealth three years before death; age is the decedent's age at death; university education indicates whether or not the individual had a university education; male is an indicator for the decedent being male; income denotes the (inverse sine) income of the decedent three years before death. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age, less the variable that is the outcome in that estimation.

6 Results

In this section, we report the estimation results. The first subsection details estimates of tax induced responses in estate size and tax payment as a result of terminal illness. They suggest that terminal illness, if anything has a positive effect on the estate sizes and tax payments of the population at large. Next, the results of two placebo tests are presented, which further support that length of terminal illness is positively associated with the decedent's wealth. Moreover, we investigate whether or not the positive relationship remains when we restrict the analysis to only include the very wealthy or other subgroups for which tax planning is more likely to be prevalent. We also find evidence that planning strategies—such as the addition of more heirs to the estate—have been carried out, but that they are not widespread or efficient enough to reduce the average tax payment.

6.1 Main results

Table 5 reports the coefficient estimates obtained from Specification 1 with estate size and tax payment as outcomes. Column 1 details the estimates with respect to (inverse sine) estate size. We see that the point estimates on the interaction terms are positive, suggesting that the estate size increases in response to the inheritance tax among decedents passing away from a terminal illness. While the coefficient on the interaction between medium-term illness and passing away under the tax regime is statistically insignificant, the coefficient on the long-term illness interaction term is statistically significant at the five percent level. Translated into relative changes, the estimates imply that the estate size increases by about 18 percent in response to the tax among decedents passing away from a long-term terminal illness. From column 2, we see that the (inverse sine) tax payment also increases in response to long-term terminal illness under the tax regime. The effect is statistically significant at the five percent level and, translated into relative changes, around 25 percent. Taken together, the findings indicate that people, if anything, increase their wealth in response to the tax, rather than decrease it, which was the case in in Kopczuk (2007).

6.2 Placebo tests

There are several possible explanations for the difference between our findings and those of Kopczuk (2007). To exclude the first of these possibilities—that there is something wrong with the identification strategy—we carry out two placebo tests intended to complement the specification checks in Section 3.

In the first test, we test for responses among decedents with wealth below the tax threshold in the third year before the onset of illness. Since these decedents did not have any incentives to plan for the inheritance tax, we should not expect to find a differential response to terminal illness between those passing away before and after the tax repeal. However, the presence of a differential response would indicate that something, unrelated to the tax repeal and unaccounted for by the empirical strategy, affecting the wealth of terminally ill individuals in general may have taken place. Table B 3 in Appendix B reports the results from this placebo test and we see that the coefficients on the long-term illness interactions are negative, but statistically insignificant, suggesting that terminal illness does not have a positive impact among these decedents.

In the second test, we exploit that unmarried decedents (widowed, divorced and never married) are unaffected by the repeal of the tax on spousal bequests, as their estates are transferred to heirs other than a surviving spouse (commonly the children), whose receipts remained liable to taxation also after January 1, 2004. Thus, as in the first test, we do not expect to find a differential response to terminal illness between unmarried decedents passing away before and after the reform. The estimates obtained in this placebo test, reported in Appendix B, Table B 4, are statistically insignificant, indicating that the tax induced responses observed in the main population are not present among unmarried decedents.

In sum, the two placebo tests strengthen our belief that the increase in estate size and tax payments observed in the main study population is a response to the changed planning incentives brought on by the tax repeal.

6.3 Relating the results to Kopczuk (2007)

The results reported so far suggest that people, if anything, increase their wealth in response to terminal illness, rather than decrease, as was the case in Kopczuk (2007). One potential reason for our results being different from those of Kopczuk is that we use a different and, as we argue, more credible identification strategy. To evaluate the importance of the identification strategy for our results, we follow Kopczuk's methodology; that is, we regress length of illness on estate size and tax payment for individuals passing away during the tax regime (i.e., without exploiting the tax repeal), to see if we could replicate his results. The estimates are reported in Table 6. They reveal a positive and statistically significant relationship between length of illness and the outcomes. It can be noted that the coefficient estimates on long-term illness are smaller than the corresponding main estimates. A possible reason for this is that responses to terminal illness, which are unrelated to the inheritance tax, induce a downward bias to the estimates from

Table 5: Estimates of tax induced respones to terminal illness

	(1) Estate size	(2) Tax payment
Medium×Tax regime	0.0554	0.0166
	(0.0766)	(0.112)
Long×Tax regime	0.167**	0.222**
	(0.0744)	(0.109)
Medium	0.0559	0.133
	(0.0635)	(0.0928)
Long	-0.0888	-0.0681
	(0.0620)	(0.0907)
Tax regime	-0.222***	-0.578***
	(0.0467)	(0.0682)
No. of observations	14,940	14,940

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 and the full taxable population. The outcomes are transformed using the inverse hyperbolic sine transformation. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

the more naïve strategy. For instance, people who become terminally ill may lose income or engage in end-of-life consumption, which would lead to a reduction in wealth. Thus, these findings point at the importance of using the tax reform to account for these types of confounding factors. However, the findings also suggest that the positive relationship between terminal illness and wealth, which we observe, is not an artifact of the identification strategy, but instead the result of the tax payers' responses in this setting being different from the responses in Kopczuk (2007).[22]

Table 6: Replication of Kopczuk (2007)

	(1) Estate size	(2) Tax payment
Medium	0.0708*	0.136**
	(0.0367)	(0.0553)
Long	0.0529*	0.138***
	(0.0284)	(0.0429)
No. of observations	18,478	18,478

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated by regressing long-term and medium-term indicators on the indicated outcome. The outcomes are transformed using the inverse hyperbolic sine transformation. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

That our results differ from those of Kopczuk (2007) may also be due to the fact that we study decedents with, on average, comparably low levels of wealth. The decedents in Kopczuk's study all have wealth above the threshold for estate tax filing, which was USD 120,000 in 1977 (the year he studies). This corresponds to SEK 2 million in 2003 prices, and is substantially higher than the SEK 280,000 threshold for the inheritance tax in Sweden during our study period.[23] It is possible that wealthy individuals can plan with access to more sophisticated and efficient planning tools than less wealthy individual,

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22. We have tested for whether the discrepancy between our results and those reported in Kopczuk (2007) is due to our requirement that the illness should not have lasted for more than one year, while the illnesses in Kopczuk (2007) could have lasted for many years. However, the results suggest that this is not the reason, see Appendix D.

23. On the other hand, Kopczuk (2007) finds that the response to the tax is declining in net worth, a result that may depend on the wealthy having engaged in more planning beforehand, before they got terminally ill.

because their relative cost of legal and financial advice is lower.[24] Wealthy individuals may also have higher incentives to plan, as the progressivity of the inheritance tax implies that their potential gains from planning are greater.

To evaluate the relevance of this explanation, we test for heterogeneous responses across the wealth distribution. Table 7 and 8 report the estimates on estate size and tax payment from Specification 1 separately for each quartile in the distribution of wealth measured in the third year before the onset of terminal illness. The decedents in the top wealth decile are the most similar to the decedents in Kopczuk's study in terms of wealth level. We also test for responses among the very wealthy decedents by studying the top decile in the wealth distribution separately. The results tell us that there is little difference in estimates across the four quartiles and the top decile; the coefficients are generally positive and statistically insignificant, possibly due to there being relatively few observations in each group. These results suggest that the discrepancy in the responses between our study and Kopczuk (2007) is not due to differences in the wealth of the decedents.[25]

Moreover, Kopczuk (2007) reports results showing that young decedents reduce their wealth more in response to terminal illness than old decedents. There are two possible explanations for this finding. The first is that young decedents are more likely to experience an income loss when they become terminally ill and are therefore more likely to consume out of their wealth. Such a real response is accounted for by our empirical strategy. The other possible explanation is that the onset of terminal illness is a stronger signal to someone relatively young rather than relatively old, as the relatively old may already have realized that his or her end is approaching and has carried out some planning. We investigate whether a similar pattern is evident in our data by testing for responses among decedents younger than the median age (at death), which is 78 years in the study population. It can be seen from the Table 11 that the coefficient estimates are negative rather than positive, as they were in the full population. Although imprecisely estimated, they suggest that relatively young decedents reduce the estate size and tax payment in response to terminal illness. Moreover, when we estimate the model with a triple interaction between length of illness, tax regime indicator and an indicator for

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24. Indirect evidence of this is reported in Su (2008), who finds that the probability of financial planning in the terminal stage of life is positively associated with the individual's net worth.

25. We also test for differential responses between the different wealth groups by estimating Specification 1 augmented with an indicator for being in the top wealth decile, which is included on its own, and interacted with the length of illness-tax regime interaction terms as well as the length of illness and tax regime indicators. The results show that the response among decedents in the top of the wealth distribution is not statistically significantly different from the response of the less wealthy, see Table 9 and 10.

Table 7: Tax induced responses to terminal illness on estate size by pre-illness wealth

| | Wealth quartile | | | | Top decile |
	(1)	(2)	(3)	(4)	(5)
Medium×Tax regime	-0.0193	0.0985	0.0492	0.0360	-0.0829
	(0.177)	(0.143)	(0.123)	(0.140)	(0.228)
Long×Tax regime	0.0432	0.0922	0.276**	0.122	0.0947
	(0.176)	(0.138)	(0.119)	(0.134)	(0.216)
Medium	0.0778	0.0735	0.00327	0.0849	0.216
	(0.146)	(0.120)	(0.100)	(0.117)	(0.192)
Long	0.0656	-0.0554	-0.282***	-0.0673	-0.0273
	(0.147)	(0.114)	(0.0988)	(0.113)	(0.181)
Tax regime	-0.193*	-0.223***	-0.195**	-0.230***	-0.304**
	(0.109)	(0.0851)	(0.0761)	(0.0856)	(0.137)
Mean	376,634	619,080	1,009,588	3,053,131	5,111,133
No. of observations	3,751	3,807	3,689	3,693	1,474

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 and the column header indicates the subpopulation upon which it is estimated. The studied outcome is (inverse sine) estate size. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Table 8: Tax induced responses to terminal illness on tax payment by pre-illness wealth

	Wealth quartile				
	(1)	(2)	(3)	(4)	(5)
Medium×Tax regime	-0.0853	0.0245	-0.00822	0.0537	-0.0560
	(0.250)	(0.218)	(0.166)	(0.183)	(0.286)
Long×Tax regime	-0.0782	0.381*	0.228	0.119	0.105
	(0.248)	(0.211)	(0.161)	(0.175)	(0.270)
Medium	0.192	0.204	0.00281	0.129	0.258
	(0.207)	(0.183)	(0.136)	(0.153)	(0.240)
Long	0.207	-0.205	-0.238*	-0.0427	0.0307
	(0.207)	(0.174)	(0.134)	(0.147)	(0.226)
Tax regime	-0.455***	-0.612***	-0.491***	-0.687***	-0.761***
	(0.154)	(0.130)	(0.103)	(0.112)	(0.172)
Mean	376,634	619,080	1,009,588	3,053,131	5,111,133
No. of observations	3,751	3,807	3,689	3,693	1,474

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 and the column header indicates the subpopulation upon which it is estimated. The studied outcome is (inverse sine) tax payments. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Table 9: Testing for tax induced responses to terminal illness on estate size among subgroups of the study population—Triple DiD

	(1) Top wealth decile	(2) <78	(3) University education	(4) Children
Medium illness triple interaction	-0.234 (0.217)	-0.127 (0.130)	-0.0401 (0.185)	-0.167 (0.203)
Long illness triple interaction	-0.153 (0.200)	-0.211* (0.125)	0.143 (0.166)	-0.164 (0.202)
Medium×Tax reform	0.0738 (0.0792)	0.137 (0.0983)	0.0798 (0.0827)	0.224 (0.196)
Long×Tax reform	0.168** (0.0772)	0.291*** (0.106)	0.141* (0.0812)	0.313 (0.196)
Medium×Het. var.	0.226 (0.196)	0.181 (0.115)	0.269 (0.165)	0.0911 (0.180)
Long×Het. var.	0.140 (0.181)	0.156 (0.112)	-0.100 (0.147)	0.165 (0.179)
Medium	0.0674 (0.0659)	-0.0106 (0.0835)	0.0369 (0.0691)	-0.00699 (0.172)
Long	-0.0867 (0.0645)	-0.143 (0.0895)	-0.0561 (0.0683)	-0.218 (0.172)
Het. var.	1.264*** (0.0680)	-0.178*** (0.0415)	0.0673 (0.0574)	-0.218*** (0.0641)
Tax reform	-0.250*** (0.0435)	-0.256*** (0.0445)	-0.253*** (0.0445)	-0.255*** (0.0445)
No. of observations	14,940	14,940	14,940	14,940

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 interacted with an indicator (Het. var.) for belonging to the subpopulation indicated by the column header. The outcome is (inverse) estate size. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Table 10: Testing for tax induced responses to terminal illness on tax payment among subgroups of the study population—Triple DiD

	(1) Top wealth decile	(2) <78	(3) University education	(4) Children
Medium triple interaction	-0.296	0.126	0.233	-0.391
	(0.315)	(0.191)	(0.273)	(0.298)
Long triple interaction	-0.330	-0.337*	-0.0257	-0.247
	(0.290)	(0.185)	(0.244)	(0.297)
Medium×Tax reform	0.0424	0.000584	0.0206	0.407
	(0.115)	(0.145)	(0.122)	(0.288)
Long×Tax reform	0.229**	0.415***	0.226*	0.444
	(0.112)	(0.156)	(0.119)	(0.289)
Medium×Het. var.	0.284	0.00621	0.103	0.192
	(0.284)	(0.170)	(0.242)	(0.265)
Long×Het. var.	0.269	0.215	-0.138	0.277
	(0.263)	(0.166)	(0.217)	(0.263)
Medium	0.145	0.140	0.138	-0.0266
	(0.0956)	(0.123)	(0.102)	(0.254)
Long	-0.0347	-0.128	0.00797	-0.251
	(0.0936)	(0.132)	(0.100)	(0.253)
Het. var.	2.406***	-0.0337	0.502***	-0.554***
	(0.0986)	(0.0613)	(0.0845)	(0.0943)
Tax reform	-0.587***	-0.595***	-0.591***	-0.597***
	(0.0630)	(0.0656)	(0.0654)	(0.0655)
No. of observations	14,940	14,940	14,940	14,940

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 interacted with an indicator (Het. var.) for belonging to the subpopulation indicated by the column header. The outcome is (inverse sine) tax payments. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Table 11: Tax induced responses to terminal illness among subgroups of the study population

	Estate size			Tax payment		
	(1)	(2)	(3)	(4)	(5)	(6)
	<78	University education	Children	<78	University education	Children
Medium×Tax regime	-0.0812	0.131	0.0186	-0.0921	0.170	-0.0379
	(0.142)	(0.269)	(0.0816)	(0.180)	(0.322)	(0.120)
Long×Tax regime	-0.0118	0.304	0.136*	-0.137	0.0414	0.197*
	(0.127)	(0.247)	(0.0791)	(0.161)	(0.295)	(0.116)
Medium	0.154	0.0649	0.0801	0.200	0.0937	0.166*
	(0.118)	(0.223)	(0.0677)	(0.149)	(0.267)	(0.0995)
Long	0.0128	-0.183	-0.0647	0.147	-0.0449	-0.0460
	(0.106)	(0.203)	(0.0659)	(0.134)	(0.243)	(0.0969)
Tax regime	-0.0983	-0.312*	-0.210***	-0.323***	-0.528***	-0.590***
	(0.0857)	(0.161)	(0.0499)	(0.108)	(0.192)	(0.0734)
No. of observations	6,801	2,277	13,246	6,801	2,277	13,246

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1. The column titles indicate the subpopulation upon which Specification 1 has been estimated. The outcome in columns 1–3 is the (inverse sine) estate size and in columns 4–6 the (inverse sine) tax payment. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

young decedents, we find that the reductions in tax payment and estate size of the young individuals, passing away after a long-term illness, are statistically significant, see Table 9 and 10. This finding supports the argument in Kopczuk (2007) that terminal illness has a stronger signal value for individuals who are younger when they become sick.

In addition to wealth and age heterogeneity, our data allow us to test for heterogeneous responses across additional dimensions, which have not been studied before. We carry out these tests to see whether the differences between our and Kopczuk's findings depend on other differences among the decedents we study.

The first such dimension is education. Effective tax planning requires financial knowledge, as well as knowledge about inheritance law in general and the inheritance tax law in particular. Although there is little evidence with regard to the impact of education on

tax avoidance, a growing number of studies on heterogeneity in financial literacy report that such literacy is positively correlated with education (see Lusardi and Mitchell (2014) for references). Moreover, Palmer et al. (2006), Goetting and Martin (2001) and Erixson and Ohlsson (2014) find that the probability of having a will, which may be seen as a proxy for legal knowledge, is positively correlated with level of education. Similarly, Su (2008) finds that the probability of end of life financial planning is increasing in relation to the level of education. However, we do not find that tax induced planning is more prevalent among decedents with a university education than in the full population, as can be seen in Table 11.

The second dimension is whether the decedent had children or not, which is motivated by the literature on bequest motives. A common explanation for why people plan their estates is that they want to leave as large bequests as possible to their heirs. A vast body literature shows that people's wealth accumulation during life is partly motivated by a desire to leave bequests to their heirs (see Kopczuk and Lupton (2007) and Dynan et al. (2002), and references therein). Thus, if the decedents studied in Kopczuk (2007) would have a stronger bequest motive than the decedents in our study, this could explain why our estimates differ. The most prominent theories of bequest motives—joy-of-giving, altruism and exchange—predict that people will aim to maximize the bequeathable amount, suggesting relatively more tax planning among decedents with an operative bequest motive. Following the reasoning of Hurd (1987) we conjecture that decedents with children should be more likely to have a bequest motive and consequently reduce their wealth more in response to terminal illness than childless decedents. While there is empirical evidence suggesting that having children is not the sole motivation for dying with bequeathable wealth (Kopczuk and Lupton 2007), we nevertheless consider this a proxy for tax planning incentives. However, the coefficient estimates for decedents with children are akin to those for the full population, as seen in Table 11.[26] These results suggest that bequest motives are also unlikely to explain why our estimates differ from those of Kopczuk (2007).

Taken together, the results reported in this section make us confident when it comes to ruling out tax induced reductions in wealth because of terminal illness of similar magnitudes as those reported in Kopczuk (2007).

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26. We are also unable to estimate statistically significant differences between the two groups, see Table 9 and 10.

6.4 Tests for specific tax avoidance strategies

That we do not find any responses in estate size and tax payment consistent with tax planning does not necessarily imply that individuals do not plan their estates in order to the inheritance tax. For instance, it could be that they plan, but that they are unsuccessful in reducing their tax burden. In what follows, we investigate whether the onset of terminal illness induces tax planning by testing for responses in some tax planning tools.[27] Because strategies that were carried out after demise are unlikely to be affected by the illness length, we focus on strategies that could be implemented in anticipation of the demise and are thus something the decedent is able to control. The tests are conducted by regressing Specification 1 on outcomes that capture the specific avoidance strategy.

Will writing and addition of more heirs to the estate. Under a progressive inheritance tax where a share of the inheritance is exempted from taxation, the total tax payment could be lowered by distributing the estate over more heirs than dictated by the succession law default. This would result in the inheritances falling into a lower tax bracket or below the level of the deductible exemption.[28] To deviate from the succession law default in this way requires a will.

We see from Table 12 that the onset of long-term illness under the tax regime increases the likelihood of the decedent having a will by 5.4 percentage points, or about 25 percent compared to the baseline incidence,[29] and also that it increases the likelihood of adding additional heirs by 3 percentage points, or about 40 percent.[30] The coefficient estimate with respect to medium illness, for both outcomes, is positive, although statistically insignificant.

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27. A commonly used strategy for avoiding inheritance and estate taxation is gift giving during life (Joulfaian 2004; Nordblom and Ohlsson 2006; Ohlsson 2011). The Swedish inheritance tax was accompanied by a gift tax. The gift tax was similarly progressive and the law allowed an annual exemption of SEK 10,000 for each gift recipient. Thus, by giving away amounts below SEK 10,000 per year during life, the inheritance tax could be avoided. Unfortunately, we do not have information about gifts below the taxable exemption, but only on taxable gifts ($>$ SEK 10,000) that have taken place during the ten years before the demise. These gifts, however, were considered inheritances in advance and the tax agency taxed them jointly with the inheritance, implying that their presence is not a sign of tax avoidance. Moreover, the tax on gifts between spouses was abolished jointly with the inheritance tax, implying that any response in giving may just be a mechanical consequence of removed incentives to give following the reform.

28. This is unlike an estate tax—whether proportional or progressive—under which the tax burden is invariant to estate division.

29. The baseline incidence is 20.4 percent.

30. The baseline incidences is 7.4 percent.

Table 12: Testing for specific tax planning strategies

	(1) Will	(2) Additional heirs	(3) Marital agreement	(4) Heir has seperate property	(5) Decedent's share	(6) Funeral expenses
Medium× Tax regime	0.0282	0.0160	0.00338	-0.00781	0.00734	0.201**
	(0.0183)	(0.0154)	(0.0112)	(0.00996)	(0.0254)	(0.0854)
Long×Tax regime	0.0538***	0.0279*	0.0132	0.000384	-0.0622**	0.0639
	(0.0178)	(0.0150)	(0.0109)	(0.00968)	(0.0248)	(0.0830)
Medium	0.000472	-0.00741	0.00389	0.0107	-0.00592	-0.169**
	(0.0152)	(0.0128)	(0.00927)	(0.00826)	(0.0211)	(0.0708)
Long	-0.0180	-0.0213*	-0.00178	0.00599	0.0717***	-0.0827
	(0.0148)	(0.0125)	(0.00906)	(0.00807)	(0.0206)	(0.0692)
Tax regime	0.0107	0.0751***	0.00935	0.0130**	-0.0160	-0.0754
	(0.0112)	(0.00940)	(0.00682)	(0.00608)	(0.0155)	(0.0521)
No. of observations	14,930	14,940	14,930	14,940	14,738	14,939

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 and the full taxable population. The column headers indicates the studied outcome. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Division of property. When a married person passes away, the marital property of the decedent and surviving spouse is divided and half of the amount is included in the decedent's estate, which, during the tax regime, was liable to taxation. The remainder was kept outside of the estate and thus not liable to taxation.[31] In addition, during the tax regime, the separate property of the decedent was considered part of the estate and thus liable to taxation when transferred to the spouse. The separate property of the surviving spouse, however, was kept outside of the estate and was thus unaffected by the inheritance tax. Subsequently, married couples had tax incentives to set up a marital agreement stating that certain assets were to be separate property of the surviving spouse and that the separate property of the decedent was to be marital property.

The results of Table 12 suggest no effects on the likelihood of marital agreements, nor on the likelihood of the surviving spouse having separate property. However, there is a statistically significant decrease of 6 percentage points in the ratio between the estate size and the sum of the marital property, on the one hand, and the decedent's separate property on the other. In relative terms, the effect is approximately 11 percent.[32] This finding implies that the marital property relative to the decedent's separate property increases because of the terminal illness, which is consistent with tax avoidance, as it suggests that the decedent holds less separate property in response to the tax.

Funeral expenses. Expenditures associated with the funeral (e.g., the purchase of a coffin, flower arrangements, mourning clothing, memorial reception, gravestone, etc.) were tax deductible, which implies that the tax payment could be lowered by increasing these expenditures.[33] Although funeral arrangements are commonly carried out by the decedent's heirs, the decedent could influence the expenses by communicating the details about the funeral before death or in the will, or pay the expenses in advance through so-called funeral insurance.[34] However, we find no effect of long-term illness on the funeral expenses, but there is a positive and significant effect of medium-term illness. Why there only is an effect on medium-term illness is a bit difficult to explain, and we cannot exclude that it depends on the possible violation of the identifying assumption in this group. Nevertheless, the finding suggests that the tax may have encouraged a response

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31. See Section 2.

32. The baseline being 55 percent.

33. According to the tax agency, "reasonable" funeral expenses were deductible whereas expenses "unusually large in relation to the estate size" required supporting documentation to be approved by the tax agency.

34. Strictly speaking, to increase funeral expenses because of the inheritance tax is not to be seen as a tax planning strategy as it implies changed consumption. However, this is one of few consumption responses that are likely to be related to both terminal illness, which makes the individual think of death, and the inheritance tax, which made the relative price on such expenses lower. In a sense, to test for funeral expenses is also to test for, and a way to quantify, possible bias due to such responses.

in funeral expenses among these decedents, but not among those passing away from a long-term illness.

To conclude, we find that decedents respond to long-term terminal illness by reducing the relative value of their separate property and by increasing the number of heirs. These responses are consistent with tax avoidance. The results suggest that these avoidance strategies require more than one month's time to be carried out, as decedents only respond to long-term illness. We also find that the decedents respond to medium-term terminal illness by increasing their funeral expenses, which is also consistent with tax avoidance. The results in the previous subsections, however, suggest that these tax planning strategies are not wide-spread or efficient enough to reduce the average estate size and the tax payments.

7   Concluding discussion

Previous work by Kopczuk (2007), shows that people who pass away from a terminal illness, and therefore have time to plan their estates, leave behind less wealth than those who pass away instantaneously. This has been interpreted as evidence of tax planning.

We extend on Kopczuk's work by exploiting a tax reform that removed the incentives for married decedents to plan their estates and avoid inheritance taxation. In this way, we effectively control for responses in wealth caused by terminal illness but unrelated to tax planning.

In contrast to Kopczuk, however, we find no evidence of people reducing their wealth in response to terminal illness. If anything, the estate size and the tax payment increases. This suggests that the onset of terminal illness does not result in people reducing their wealth to avoid the inheritance tax. This finding remains also when we employ Kopczuk's empirical strategy suggesting that discrepancy in findings is unlikely to be explained by the different methodologies. Instead, one should consider that Kopczuk studies a population that faced higher tax rates, another institutional setting and passed away almost 30 years earlier, when norms may have been different.

However, how can we explain that the decedents in our study hold more, instead of less, wealth in anticipation of the inheritance tax? One possible explanation is that they accumulate wealth to afford the tax payment. Remember that we focus on spousal bequests, which, unlike inheritances to, for instance, children, do not increase the wealth of the recipient. Rather, a spousal bequest converts the couple's marital property of the couple into the separate property of the surviving spouse. To illustrate this explanation, consider a couple with a house worth SEK 2 million. The house is marital property, and the couple has no debts and no other assets. When the first spouse passes away, the

bequest to the surviving spouse amounts to SEK 1 million (half the marital property) and the tax payment is SEK 210,000. Unless the house is to be sold, the couple has to save (or borrow, if possible) in order to finance the tax payment. Joint savings of the married couple will increase the estate size and the tax payment, which is consistent with our estimates. The positive effect may thus be interpreted as an income effect of the tax that the decedent and surviving spouse are reminded of as a result of onset the terminal illness. Unfortunately, we are unable support or reject this explanation empirically, and it should rather be seen as a conjecture. However, it is in line with one of the motivations for the repeal of the tax on spousal bequests; to not force widows to sell their houses to afford the tax payment.[35]

Although we are unable to establish reductions in estate size and tax payments, we do find traces of tax planning strategies: decedents reduce the relative value of their separate property and increase the number of heirs among which the estate is distributed. The response in these avoidance strategies tells us that people postpone decisions about their wealth until shortly before death. Given that we find no reduction in the tax payment, we must ask whether this planning would have been more efficient had it been carried out earlier. Kopczuk (2007)'s results also indicate postponement of planning, and his explanation for this is that the rich have a desire to retain control over their wealth, either because it allows them to exert influence on the heirs, that wealth as such delivers utility or because they find it hard to accept their own mortality. Similar to Kopczuk, we are unable to distinguish between the exact motives, but our findings suggest that they also play a role almost 30 years later, in a different country, and for people with comparably moderate levels of wealth.

Our findings also contribute to our knowledge concerning inheritance taxation. It is usually argued that the inheritance tax payment is dependent on the individual's ability to plan and, in particular, the availability of time to plan. That those who lack time to plan, because they die instantaneously, do not get the same opportunity to reduce their tax payments through last-minute planing was raised as a concern by the opponents of the Swedish inheritance tax (Arvs- och gåvoskattekommitén 1987). However, we do not find support for that concern, as individuals experiencing a long-term terminal illness do not reduce their tax payments.

It should be noted that our findings concern inheritance tax planning carried out by

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35. We test for differences in tax induced responses to terminal illness between decedents with and without real estate wealth, with the prior that, if the explanation is correct, we would see a relatively larger increase in estate size among decedents with real estate. While the estimate is in line with what we would expect, it is too imprecise to be seen as supporting the explanation. See Table B 5 in Appendix B.

married decedents shortly before passing away. We leave it for future research to study planning activities earlier in life, as well as tax planning among surviving spouses and other heirs.

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A   Appendix: Definition of ICD chapters

Table A1: Diagnose variables, corresponding ICD chapters and ICD codes (by version)

Variable	ICD chapter	ICD-10	ICD-9
Infections	I. Certain infectious and parasitic diseases	A00-B99	001-139
Cancer	II. Neoplasms	C00-D49	140-239
Blood	III. Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50-D89	280-289
Endocrine	IV. Endocrine, nutritional and metabolic diseases	E00-E89	240-279
Mental	V. Mental and behavioral disorders	F01-F99	290-319
Nervous	VI. Diseases of the nervous system	G00-G99	320-389
Eye	VII. Diseases of the eye and adnexa	H00-H59	360-379
Ear	VIII. Diseases of the ear and mastoid process	H60-H95	380-389
Circulatory	IX. Diseases of the circulatory system	I00-I99	390-459
Respiratory	X. Diseases of the respiratory system	J00-J99	460-519
Digestive	XI. Diseases of the digestive system	K00-K94	520-579
Skin	XII. Diseases of the skin and subcutaneous tissue	L00-L99	680-709
Musculoskeletal	XIII. Diseases of the musculoskeletal system and connective tissue	M00-M99	710-739
Genitourinary	XIV. Diseases of the genitourinary system	N00-N99	580-629
Pregnancy	XV. Pregnancy, childbirth and the puerperium	O00-O99	630-676
Perinatal	XVI. Certain conditions originating in the perinatal period	P00-P96	760-779
Congenital	XVII. Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99	740-759
Symptoms and signs	XVIII. Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00-R99	780-799
Injury	XIX. Injury, poisoning and certain other consequences of external causes	S00-T88	800-999
External	XX. External causes of morbidity	V00-Y99	E01-E99
Factors	XXI. Factors influencing health status and contact with health services	Z00-Z99	V01-V82

B   Appendix: Additional results and placebo tests

Table B 1: Robustness check: Outcomes transformed using logarithm plus one

	(1) Estate size	(2) Tax payment
Medium×Tax repeal	0.0539	0.0173
	(0.0734)	(0.107)
Long×Tax repeal	0.161**	0.210**
	(0.0713)	(0.104)
Medium	0.0542	0.127
	(0.0609)	(0.0885)
Long	-0.0852	-0.0641
	(0.0595)	(0.0865)
Tax repeal	-0.221***	-0.567***
	(0.0447)	(0.0651)
No. of observations	14,940	14,940

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 and the full taxable population. The outcomes are transformed logarithm of the outcome plus one. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

C   Appendix: The population of non-married dece-dents

We provide estimates based on the population of exit households. We then focus on exit households with inheriting children for reasons of tax calculation (these also represent the most general case). Both men and women are included. This leaves 111,863 individuals passing away between January 1, 2002 and December 17, 2004. After restricting to those not mortally ill more than two years before their demise, 69,706 remains. The taxable population has to be redefined based on the tax schedule for children heirs, and equal division among the decedent's children is assumed (non-equal division and inclusion of additional heirs may be part of the response as it affects the tax payment). The taxable

Table B 2: Estimates of responses to terminal illness in each year, relative the effect in 2002

	(1) Estate size	(2) Tax payment
Medium×2003	-0.172**	-0.260**
	(0.0878)	(0.129)
Medium×2004	-0.158*	-0.185
	(0.0894)	(0.132)
Long×2003	0.00371	0.0285
	(0.0848)	(0.125)
Long×2004	-0.162*	-0.204
	(0.0871)	(0.128)
Medium	0.232***	0.328***
	(0.0613)	(0.0904)
Long	0.0897	0.196**
	(0.0597)	(0.0880)
2003	-0.00730	0.0489
	(0.0501)	(0.0738)
2004	0.250***	0.619***
	(0.0510)	(0.0752)
No. of observations	14,940	14,940

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 but with $Tax\ regime_t$ replaced by indicators for passing away in 2003 and 2004. The outcome is (inverse sine) estate size and tax payment. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Table B 3: Placebo—Estimates of tax induced responses to terminal illness among decedents with wealth below SEK 280,000

	(1) Estate size	(2) Tax payment
Medium×Tax regime	0.0951	-0.00281
	(0.236)	(0.229)
Long×Tax regime	-0.287	-0.158
	(0.226)	(0.220)
Medium	0.239	0.306
	(0.197)	(0.192)
Long	0.279	0.248
	(0.188)	(0.183)
Tax regime	-0.208	-0.278**
	(0.137)	(0.133)
No. of observations	13,117	13,117

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 and the population of individuals with wealth below the tax threshold in the third year before the onset of terminal illness. The outcomes, indicated in the column headers, are transformed using the inverse hyperbolic sine transformation. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Table B 4: Placebo—Estimates of tax induced responses to terminal illness among non-married decedents

	(1) Estate size	(2) Tax payment
Medium×Tax regime	0.00654	-0.182
	(0.106)	(0.219)
Long×Tax regime	0.0886	0.229
	(0.113)	(0.233)
Medium	0.219**	0.646***
	(0.0869)	(0.179)
Long	0.152	0.374*
	(0.0933)	(0.192)
Tax regime	-0.236***	-0.572***
	(0.0617)	(0.127)
No. of observations	11,949	11,949

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 and the population of exit households with taxable wealth in the third year before their the onset of the terminal illness (over the years 2002–2004). The outcomes, indicated in the column headers, are transformed using the inverse hyperbolic sine transformation. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

Table B 5: Testing for differential tax induced responses to terminal illness among decedents with and without real estate

	(1) Estate size	(2) Tax payment
Medium×Tax reform ×Real estate	0.0860 (0.167)	0.192 (0.246)
Long×Tax reform ×Real estate	0.117 (0.167)	0.361 (0.246)
Medium×Tax reform	0.00719 (0.157)	-0.0965 (0.231)
Long×Tax reform	0.0659 (0.159)	-0.0857 (0.234)
Medium×Real estate	-0.0307 (0.146)	-0.308 (0.215)
Long×Real estate	-0.104 (0.149)	-0.479** (0.220)
Medium	0.0980 (0.135)	0.393** (0.199)
Long	0.0171 (0.140)	0.392* (0.206)
Real estate	-0.0884* (0.0525)	0.0731 (0.0773)
Tax reform	-0.255*** (0.0445)	-0.594*** (0.0656)
No. of observations	14,940	14,940

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using Specification 1 interacted with an indicator for whether the decedent held real estate in the third year before the onset of terminal illness. The outcomes, indicated in the column headers, are transformed using the inverse hyperbolic sine transformation. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.

population of exit households is defined as all individuals with a wealth in the third year before the onset of terminal illness larger than SEK 70,000 (the threshold for tax payment for children), when divided by the number of children. The population comprises 29,525 individuals. The Kopczuk population is defined by the same criterion as before (i.e., all individuals with wealth of more than 1,100,000 SEK, two years before their demise). This population consists of 5,660 individuals.

D Appendix: Estimates of long-term illness with onset earlier than the year of demise

To make our population more comparable to that of Kopczuk (2007) with respect to the length of the long-term illness, we allow the decedents to have been ill for up to nine years before their demise, which is the furthest back in time we are able to observe in the Patient Register with regard to medical history. Since we then do not have information on wealth before the onset of the illness for a non-trivial share of the decedents, we use all married decedents including those with wealth below the tax threshold in the estimations. The results from this exercise (see Table D1) show that the coefficients on both the medium and long illness indicators are positive and statistically significant for both outcomes. That the estimations include also individuals without incentives to plan means that we may underestimate these responses. However, the underestimation would not lead to positive estimates if the true response is negative. In sum, we can conclude that the positive estimates are not the due to the fact that we do not allow illness to last for more than two years.

Table D1: Kopczuk specification—full population

	Estate size	Tax payment
Medium	0.252***	0.328***
	(0.0624)	(0.0729)
Long	0.241***	0.260***
	(0.0404)	(0.0472)
No. of observations	55,035	55,035

Notes: Standard errors in parenthesis. *,** and *** denote p-values smaller than 0.1, 0.05 and 0.01, respectively. Estimated using the empirical strategy of Kopczuk (2007) on the full population (including those with wealth below tax threshold in the third year before death). The outcomes, indicated in the column headers, are transformed using the inverse hyperbolic sine transformation. A set of controls is included in each estimation. The set of controls consists of wealth and income three years before death, education, year of death, sex and a third order polynomial in age.