Behavioral Responses to an Annual Wealth Tax: Evidence from Sweden *

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Abstract

This paper addresses the behavioral effects of an annual wealth tax. I use Swedish tax records over the period 2000-2006 to estimate bunching at kink points in the progressive tax schedule and find significant estimates of the implied elasticity of taxable net wealth in the range \([0.1, 0.3]\). I decompose the effects into a reporting response and a real saving response. Using asset-level data on the portfolio of each resident in Sweden, I disentangle active changes (savings) in the portfolio from passive (capital gains and losses) movements. Exploiting features of the institutional setting, I find that an increase in the tax is likely to stimulate evasion rather than deter savings.

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1 Introduction

What is the effect of a wealth tax on capital accumulation? Standard growth models recognize the size of the capital stock as a primary driver of economic growth. Yet, the impact of capital and wealth taxes on savings and wealth is poorly understood (Bernheim, 2002, Kopczuk, 2013). I address this classic question using a unique dataset comprising 51 million observations in a panel of Swedish tax payers.

Historically, many western economies have taxed net wealth and a number of countries, including France, Norway and Spain, still uphold these policies. The widespread implementation of these taxes is perhaps surprising given the lack of theoretical consensus on how wealth should be taxed, and the sparse knowledge about their effects.

In the last century, capital taxation has arguably never been more hotly debated than in recent years. Piketty and Zucman (2014) document that while total wealth amounted to about 2-3 times annual income in developed countries in 1970, it corresponds to about twice that today. This suggests not only that capital taxation may be a relatively more important source of government revenue today than forty years ago, but also that, because wealth is typically much more concentrated than income, redistributional wealth taxation may be warranted.1 Opponents of capital taxation argue that the introduction of distortive taxes may hamper capital accumulation in the long run and view wealth inequality as a natural byproduct of a society supporting entrepreneurship and investments.

In recent years, there has been renewed academic interest in the normative aspects of capital and wealth taxation. The proposition that capital taxes should be set to zero, as argued by Aktinson and Stiglitz (1976), Chamley (1986) and Judd (1985), has been scrutinized and challenged.2 Within this growing strand of literature, Diamond and Saez (2011) question assumptions made in the optimal taxation literature and propose a rationale for positive capital income taxes. Piketty and Saez (2013) derive expressions for optimal inheritance taxation as a function of empirically estimable parameters.3

The contribution of this paper is to analyze how wealth taxation works in practice. To quantify the welfare costs of taxes, Feldstein (1978) expresses the deadweight loss of capital income taxation in terms of empirically estimable elasticities. In later work, Feldstein (1995, 1999) shows that the tax elasticity of the tax base is a so-called sufficient statistic for welfare analysis by incorporating all responses. When approaching wealth taxation from an empirical perspective, our first objective should thus be to estimate the effect of the wealth tax on growing wealth-to-income ratios and the unequal distribution of wealth.

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1In fact, Piketty (2014) proposes an annual wealth tax of the kind studied in this paper as a response to growing wealth-to-income ratios and the unequal distribution of wealth.

2Atkinson and Stiglitz (1976) argue that, in the presence of skill heterogeneity, the possibility of using non-linear income taxes implies that there is no role for capital taxes. Chamley (1986) and Judd (1985) show that optimal capital taxes should be zero in the long run. Here the result depends on the infinite-horizon setting and a tax distortion which grows exponentially over time and cannot be optimal from the social planner’s point of view.

3Boadway, Chamberlain and Emmerson (2011), Banks and Diamond (2011) and Kopczuk (2013) provide extensive surveys of the literature on optimal wealth and capital income taxation.
taxable net wealth, a sufficient statistic for the ensuing utility flow.

However, even if such an elasticity can be credibly estimated, it only provides part of the picture. To understand the workings of a wealth tax, margins of adjustments might still matter, not just the composite, reduced form response. Taxation typically affects not only the incentives to save, but may also trigger undesirable behavior in terms of tax sheltering. Chetty (2009) challenges the results in Feldstein (1995, 1999) and shows that a distinction between real responses and reporting responses becomes crucial for welfare analysis if the marginal tax dollar lost to evasion is tantamount to a transfer across agents.\footnote{This decomposition hinges on evasion costs being transfers across agents. The effect on the tax base remains a sufficient statistic for welfare analysis when evasion is present and costs are not transfers but, for example, moral costs.} As noted by Kopczuk (2013), this is an area where evidence is particularly scant. The issue of tax sheltering may be particularly relevant in the context of wealth taxation. Opponents of wealth taxation recognize a range of well-known problems associated with the implementation of wealth taxes, including difficulties in defining a comprehensive tax base, in appraising assets and in preventing tax evasion (Adam et al., 2011 and Brown, 1991).

Assessing the effects on the tax base and decomposing these into real and reporting responses may help us understand important aspects of policy. But even with perfect knowledge of these effects, the story would remain incomplete. If the ability to comprehend the tax system differs across individuals, they may be asymmetrically affected by tax reforms. Traditional models of optimal taxation generally assume that all agents are rational and respond optimally to policy. In practice, opaque reforms and salient policies may trigger widely different responses.\footnote{See Chetty, Looney and Kroft (2007) for policy responses and salience.} For instance, the tendency to confound marginal and average tax rates indicate that individuals may not necessarily respond as predicted to a progressive wealth tax.\footnote{On the confusion of marginal and average taxes, see Liebman and Zeckhauser (2004) and Feldman and Katuščák (2006).} If comprehension of the tax scheme is unevenly distributed, the tax burden may fall disproportionally on the less able.

Motivated by this background, I investigate the behavioral effects of the Swedish annual wealth tax, using a unique dataset, comprising about 51 million observations in a panel of individual taxpayers covering the years 2000-2006. I quantify the effects of the tax by estimating the tax elasticity of taxable net wealth and decompose responses into an intertemporal substitution effect and a reporting response.

Sweden introduced a progressive tax on net wealth in 1947. From 1991, when Sweden implemented an extensive tax reform, until 2007, when the tax was repealed, it had two brackets, separated by a threshold.\footnote{On the reform in 1991, see Agell et al. (1996).} The marginal tax rate was zero below the threshold, and 1.5 percent above it and the threshold was changed a number of times. The design of the tax schedule gives rise to two sources of variation that can be exploited empirically. First, the threshold for taxable wealth creates a kink in the budget set which makes individuals bunch at the kink point. Second, the change in the threshold over time enables a difference-
in-difference research design.

Using the variation in tax rates across brackets, I start by estimating bunching at the kink point, i.e., the excess mass in the distribution at the threshold. When applying the methods proposed by Saez (2010) and Chetty et al. (2011) to the data, I find significant evidence of bunching at the kink point. However, the implied net-of-tax rate elasticities are low and lie in the range $[0.12, 0.33]$, depending on the chosen bunching estimate. This interval encompasses the estimated estate tax elasticities surveyed in Kopczuk (2013), ranging between 0.1 and 0.2. By linking the wealth-tax records to military enlistment data, which include a measure of cognitive ability, I also test the hypothesis that high-skilled individuals respond differently to tax changes than low-skilled individuals.\(^8\) Individuals with higher education have consistently higher elasticities, and in the preferred specifications, individuals with high IQ have a 16 percent larger elasticity than low-IQ individuals.

Another way to assign the workings of the tax is to measure how much of inheritance transfers show up in taxable wealth depending on the wealth tax. By linking received inheritances to the wealth tax records at the individual level for the population of Swedes during the years 2001-2004, I estimate how much of the transfers translate into wealth growth using difference-in-differences and regression-kink designs. I find that wealth growth increases by 44% for receivers of inheritance when the wealth tax is removed. Alternatively, a SEK 1,000 inheritance leads to higher wealth growth of SEK 426 after the tax is removed.

To understand the nature of the responses, I illustrate the dynamic effects of wealth tax reform in a lifecycle model with overlapping generations, where borrowing-constrained agents save to smooth consumption in the face of uncertainty. I then contrast these predictions to the dynamics observed empirically whenever the tax threshold is shifted. Empirically, taxable wealth responds instantaneously to tax reforms, but because wealth is a stock, rather than a flow variable, the model cannot under any reasonable parameterizations generate such immediate responses. This suggests that responses to the wealth tax are mainly about reporting and not about real responses.

I then exploit the extraordinarily detailed information about the wealth composition of each Swedish citizen. The dataset includes, among other things, annual snapshots of all financial assets held outside retirement accounts, including bank accounts, bonds, mutual funds, stocks and quoted options at the asset-level. With information on asset prices and annual returns, I decompose the change in the market value of the portfolio into active rebalancing (saving) and passive return fluctuations (real capital gains and losses).\(^9\) Using difference-in-differences and regression kink designs around the tax cutoff, I find that savings do not respond to the wealth tax. The same is true for realizations of capital gains and losses, as well as for taxable income.

To further understand the anatomy of responses, I also exploit the process of filing wealth

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\(^8\) Since military enlistment was mandatory for males in the sample cohorts, this proxy for actual ability is not plagued by selection bias.

\(^9\) Because I do not know when the portfolios are rebalanced, I assume that portfolios are rebalanced either in the beginning of, or, at the end of each year.
taxes. Swedish taxpayers annually received a prepopulated tax return based on the net wealth reported to the tax authority by third parties, such as banks and financial institutions. However, they were required to report any omitted assets and liabilities themselves. In practice, the main component of non-third-party reported wealth was cars. By linking the data to the Car Registry, a register compiled by the Swedish Transport Agency that lists all cars owned by Swedish residents together with information on brand name and vintage, I investigate the distribution of third-party reported net wealth for those who do not own a car.\footnote{Importantly, the Tax Agency did not have access to the Car Registry and therefore did not include the value of cars when computing prepopulated net wealth.} As long as this group does not have any other non-third-party reported assets or liabilities, they can only respond to the tax in real terms through assets and liabilities that are reported by third-parties. These responses would then manifest themselves as bunching around the threshold in the distribution of third-party reported wealth. Assessing the distribution around the kink, I find no evidence of bunching in third-party reported wealth for this subgroup.

To address individuals’ opportunities to legally avoid the tax, I investigate contributions to tax exempt retirement accounts. Again, using both difference-in-differences and regression kink designs, I find no evidence of such responses.

Finally, I use the data from the Car Registry to cross-check the sum of self-reported assets against car holdings. I find that close to the threshold, the fraction of car owners who self-report assets at a higher value than their cars are worth, is only 15-20 percent.

This paper contributes to the literature on savings responses to capital taxation. In the public economics literature, Kopczuk and Slemrod (2001), Holtz-Eakin and Marples (2001) and Joulfaian (2006) estimate the response of wealth accumulation to changes in estate taxes. By observing snapshots of wealth only once for each individual, in this case at death, it is difficult to weigh together different tax rates over one’s lifetime. Relative to that literature, the Swedish setting with an annual wealth tax, which is, under some assumptions, isomorphic both to a capital income tax and to an estate tax, provides a clearer picture of responses to tax reforms. In the savings literature, there are numerous papers that estimate the responsiveness of savings to interest rate fluctuations. Estimating Euler equations, they report interest elasticities near zero.

The rest of the paper is organized as follows. Section 2 presents the institutional setup. Section 3 describes the data. In Section 4, estimates of bunching at kink points along with implied net-of-tax rate elasticities are presented. Section 5 analyzes how much of inherited wealth leads to wealth growth depending on the wealth tax. A decomposition of responses into real and reporting effects are performed in Section 6. Section 7 concludes.
2 Institutional Setup

In a comprehensive tax reform dated 1947, the Swedish parliament supplemented the existing inheritance and gift tax with a separate progressive annual wealth tax and an estate tax.\textsuperscript{11} The adoption of the reform was preceded by intense debate. In the opening speech of a meeting with the Swedish Economic Association in 1947, Eli Heckscher criticized the higher taxes on wealth not only for their distortive effects on private savings but also for the risk of increased tax avoidance.\textsuperscript{12} The difficulties associated with the legal implementation of an annual wealth tax are also recognized in the recent work by, for example, Adam et al. (2011) and Boadway, Chamberlain and Emmerson (2011). Defining a broad tax base is appealing for achieving equity. Exemptions trigger avoidance behavior which favor those who have an ability to place wealth in exempt assets. At the same time, to mitigate efficiency losses of the tax, exempting investments in small firms may be favorable. Moreover, implementing a broad tax base is difficult for valuation and administrative reasons. Although the inclusion of listed stocks in the tax base is feasible by collecting information on holdings from third-parties, such as brokers or banks, and evaluating them using stock prices, other assets, such as human capital, are intractable both to value and to measure.

While the Swedish estate tax was repealed in 1953, the annual wealth tax was in place until January 1 2007.\textsuperscript{13} Net worth was taxed according to a progressive tax scheme. In 1991, a system with three marginal tax brackets was converted into a two-bracket system, with a zero marginal tax rate for net wealth below \$133,000 (SEK 900,000) and a marginal tax rate of 1.5 percent for net wealth above this threshold.\textsuperscript{14} The tax was filed jointly for couples with children below 18 years of age. As of 2001, the threshold was different for singles and for couples who were required to file jointly. During the period 2000-2006, the threshold was increased several times, as displayed in Table 1. Approximately 8 percent of the population paid the wealth tax in 2000. In 2001 and 2002, the threshold for paying wealth taxes was raised both for singles and couples filing jointly, thus reducing the revenue from the wealth tax, along with the number of taxpayers.

Taxable assets consisted primarily of shares in publicly traded companies, bonds, bank-account holdings, real estate, cars, boats and capital insurance. The wealth tax base was defined as the total value of these taxable assets net of liabilities, like real-estate mortgages and consumption loans, i.e., net worth.

The purpose of the wealth tax was redistribution in recognition of the potentially distortive effects of the tax on investments. To avoid the displacement of firms abroad and to stimulate investments, various tax exemptions, which narrowed the tax base, were installed

\textsuperscript{11}Formally, wealth was taxed from 1910, but before 1947 a fraction of the wealth was added to income and taxed through the income tax system.
\textsuperscript{12}See Nationalekonomiska Föreningen (1948). Heckscher criticized the proposed wealth taxes for cultivating a tax-avoidance norm, rather than inducing individuals to behave as if the price on transfers or savings was raised. Ohlsson (2011) gives a detailed summary of the events surrounding the reform.
\textsuperscript{13}The tax on inheritance and \textit{inter vivos} gifts was abolished in 2005.
\textsuperscript{14}$1 \approx 6.5$ SEK as of September 2013.
over time. Since 1991, stocks not listed or traded on organized exchanges were not subject to wealth taxes. Moreover, as the tax was considered to be a deterrent to stock enlistment of companies in publicly traded markets, company ownership above 25 percent was tax exempt. Although the taxable amount should, in principle, reflect market value, some stocks were taxed only at 80 percent of their market value, while other stocks remained completely tax exempt. Incentives for the placement of wealth in assets that legally avoided the wealth tax were amplified by retirement savings and life insurance being exempt from the tax. The valuation and administration of the financial component of the tax base was done through reports by third-parties and stock exchanges to the Swedish Tax Agency (Skatteverket). The Tax Agency similarly collected information on housing property. Real estate, including tenant owned co-operations, was taxable at 75% of the assessed market value.

The filing of the wealth tax occurred in the spring of year \( t + 1 \) for wealth holdings as of December 31 in year \( t \). In the spring of year \( t + 1 \), the Tax Agency sent out prepopulated tax forms which were based on third-party reports from banks, investment funds, brokers and other financial institutions. Figure 1 displays a prepopulated tax return. However, the tax base also comprised non-third party reported assets such as cars, boats, securities and liabilities abroad, and debt within families. The taxable net wealth equalled the sum of third-party reported net wealth and self-reported net wealth. Tax payers with third-party reported wealth levels above the tax threshold were obliged to self-report the values of assets and liabilities that were part of the tax base but not reported by third-parties. Tax payers with third-party reported wealth levels below the threshold were obliged to report assets and liabilities if the sum of the third-party reported wealth tax component and the non-third-party reported component exceeded the threshold. The form in Figure 2, which was appended to the return sheet, explains how to calculate the tax liability. Upon receiving the tax form, the taxpayer was allowed to make adjustments and submit a final return by May 1 in year \( t + 1 \). In the analysis, I investigate the effects of the tax on both third-party reported net wealth, and taxable net wealth.

While individuals may have responded to tax changes through strategic portfolio choices, the wealth tax was not associated with deduction opportunities. However, individuals with low income and high net wealth were tax exempt to some degree. Both a general law stipulating that total tax liability should never exceed 60 percent of income and a specific law entailing a reduction in the wealth tax for households with low income and high real-estate value were in place during the latter years of the study (2005-2006).\(^\text{15}\) In case of excess tax liability, the wealth tax was lessened, but not by more than 50 percent of the pre-limit liabilities. The wealth tax could not be exempted in its entirety. Such exceptions suggest another margin of response to the wealth tax, namely reduction of taxable income. I investigate those responses in Section 6.

In addition to the wealth taxes, real estate was taxed annually at 1 percent of the (assessed) taxable value. Movements in the wealth tax bracket between years \( t \) and \( t + 1 \) were,

\(^\text{15}\) A general tax reduction law was in place during the whole sample period.
in practice, indexed against changes in the taxable value of real estate.\textsuperscript{16} When the tax value for real estate was revalued, the wealth tax was also reformed to avoid implausible increases in tax liability. By the end of the 1990s, the government renewed its procedure for computing the taxable value of real estate, implying substantial increases in tax liabilities. These were accommodated by movements in the wealth tax bracket several times at the beginning of the 2000s. The indexation of the wealth tax bracket to the real estate tax suggests that the increase in the threshold was not driven by a powerful lobby of wealthy households.

On top of wealth, real estate, inheritance and \textit{inter-vivo} gifts, capital income is subject to taxation. The tax base is the sum of interest income, rental income, dividends minus interest payments (mortgages, credit cards, bank loans). In addition, realized capital gains and losses are added to the tax base.\textsuperscript{17} Capital income is taxed (credited for negative values) according to a two-bracket system, with a marginal tax rate of 30 \% for capital income above SEK $-100,000$ and 22 \% below the threshold. Negative capital income is credited against other taxes.

\section{Data and Sample Restrictions}

This paper uses data from the following administrative registers provided by Statistics Sweden: (i) The Income and Tax Register (Inkomst- och Taxeringsregistret); (ii) The Integrated Database for Labour Market Research (LISA); (iii) Military Enlistment Data from the National Service Administration (Pliktverket) and (iv) The Car Registry (Fordonsregistret). The data contain social-security number equivalents, which enables linking together the datasets at the individual level.

\subsection{Data}

From The Income and Tax Register, I retrieve all third-party reported asset items, taxable assets, taxable liabilities as well as liable wealth taxes for each Swedish taxpayer above 15 years of age over the years 1999-2006. The third-party reported items include all financial assets, such as stocks, funds, bonds and bank account holdings, held by each resident on December 31 each year. In particular, the assets are identified by their International Securities Identification Number (ISIN) and I observe the number of units held as well as

\textsuperscript{16}See the Swedish Government Official Reports (2004). Henrekson and Jakobsson (2001) provide a survey of the impacts of wealth taxes on business ownerships in Sweden and recapitulate the political agenda behind various reforms.

\textsuperscript{17}Realizations of positive capital gains on real estate are added to the tax base at the rate of 73.3 \%, whereas realizations of losses are added at the rate of 50 \%. The corresponding values for gains and losses on co-operative apartments are 90 \% and 63 \%. Realizations of business property gains and losses are added at the rate of 90 \% and 63 \% respectively. Realized losses on financial securities such as stocks, bonds, funds, commodities, options, are subtracted from the corresponding gains. Positive net values are added to the tax base, whereas negative values are added to the tax base at the rate of 70 \%. 


the tax value of each asset.\footnote{As described above, some stocks were taxed at 80\% of their market value, some were completely tax exempt. Bank account holdings were added to the wealth tax base with no reduction.} I use price and return data from Bloomberg, Morningstar, Moneymate, FactSet, Datastream and the Swedish Tax Agency to assess the market value of the securities.\footnote{I thank László Sándor for providing these data.} Financial savings are defined as $s_{it} = \sum_{j=1}^{n} (A_{ijt} - R_{jt} A_{ijt-1})$. $s_{it}$, the savings of individual $i$ during year $t$, are the sum of the asset-specific active changes. $A_{ijt}$ denotes the market value of individual $i$’s holdings of asset $j$ at the end of year $t$ and $R_{jt}$ is the gross return on asset $j$ during year $t$.\footnote{The implicit assumption in this definition, is that individuals rebalance their portfolios just before the annual snapshots are taken. Because I do not observe exactly when the rebalancing decisions are made, I also construct a savings variable which assumes that portfolios are rebalanced in the beginning of the year, defined as $s'_{it} = \sum_{j=1}^{n} (A_{ijt} - A_{ijt-1} - (R - 1) A_{ijt})$.} By observing the exact composition of the portfolio, I thus distinguish changes in wealth accruing from active rebalancing decisions and from fluctuations in asset values. This decomposition provides a unique backdrop for studying real savings responses due to the wealth tax. When computing $s_{it}$ I use stocks, bonds and funds.\footnote{I exclude quoted options as they are hard to price and very few hold them. I also exclude bank account holdings when computing savings and interest measures because of a change in how they were reported, which occurred in 2006. Before 2006, bank account holdings were only reported if the interest payments exceeded 100 SEK. For 2006 and 2007, all bank account holdings with more than 10,000 SEK were reported, leading to a substantial increase in bank account holdings.} I do not observe investments in home improvements or home equity and I investigate the consequences of this limitation by analyzing responses among the sample of renters. Since wealth in Individual Retirement Accounts (IRAs) were tax deductible, I do not observe the stock of retirement assets and can not base my return calculations on those asset returns. However, since contributions to IRAs are tax deductible from income tax liabilities, I do observe the annual flow into the IRA.

Using the third-party reports and tax records from the Swedish Tax Agency, I calculate two distinct measures of net wealth: third-party reported net wealth and taxable net wealth. The latter measure coincides with the former if no self-reported adjustments were made by the taxpayer. Although third-party reports exist for all taxpayers, the self-reported component of the tax base was only required to be stated if the prepopulated third-party reported wealth was above the threshold or if the taxpayer had taxable wealth above the threshold. In case the third-party reported net wealth was below the kink and the household did not pay any wealth tax, I assume that taxable net wealth was equal to third-party reported net wealth. This may create a bias when estimating the responses to the wealth tax. I solve this issue by retrieving information on the quantitatively most important part of non-third-party reported wealth, namely car ownership.

The database is linked to the Car Registry, which lists all cars owned by each Swedish resident. These data hold information on brand name and vintage. Importantly, this register was compiled by the Swedish Transport Agency and not used by the Tax Agency, despite cars being a component of the tax base. To cross-check self-reported assets against car holdings, I retrieve prices of new cars from 1999 and onwards from the webpage of the
The car values are devaluated according to a devaluation model provided at www.bilpriser.se.\textsuperscript{23}

For households with a prepopulated third-party reported net wealth above the kink that end up below the kink, taxable net wealth is also not reported in a number of cases. I deal with this in two ways. In the first approach, I do not include these households in the bunching estimation procedure at all. In the second approach, I assume that the distribution of reported taxable net wealth for those below the kink is representative for those where taxable net wealth is missing and extrapolate values to those with no reported taxable net wealth. I therefore refer to the second approach as the extrapolation method.\textsuperscript{24} While both approaches imply a lower density to the right of the kink, the bunching estimate will be lower in the first approach.

Received inheritance records are derived from the population of estate tax filings of Swedish individuals who died during 2001-2004. Because of the inheritance tax, that was repealed on December 17 2004, records of the social-security number equivalents of the donees as well as taxable inheritance values are precisely measured during this time period.\textsuperscript{25}

Demographic information on individual characteristics such as age, education, occupation, wage earnings and family status, is collected from the LISA database, which includes both spouses’ social-security numbers, enabling me to link couples filing the wealth tax jointly.\textsuperscript{26} As in The Income and Tax Register, this database comprises individuals above 15 years of age. I am able to match 99.9 percent of the tax payers to the demographic database, yielding a matched dataset consisting of 50,894,803 observations over the period 1999-2006.

To obtain data on cognitive skills, I exploit psychological tests from the military draft. Before enlisting in the military, all men in Sweden were drafted and had to go through two days of various testing. The test procedure was in principle mandatory until 2010, but since the number of candidates fell in the 2000s, I confine the sample to include only cohorts of men born from 1951 until 1979. Approximately 90 percent of all men in my data who were born in the defined time period enlisted with the military.\textsuperscript{27}

\textsuperscript{22}The Tax Agency publishes a list of prices on new cars to assess fringe benefits accruing from business cars. I obtain prices on new cars with a vintage later than 1989 from the Tax Agency’s website (October 11, 2013). Not being able to assess the value of cars built in 1989 and earlier is unlikely to be a problem. The rapid depreciation of most cars implies that the value of cars built before 1990 is low. Furthermore, vintage cars, i.e. cars older than 30 years, were tax exempt.

\textsuperscript{23}Bilpriser monitors car transactions and constructs devaluation models based on vintage, car type and transaction values. For example, a one-year old gasoline driven SUV is reported to be worth 68 % of the new price.

\textsuperscript{24}This method may yield biased results if the sample with missing taxable net wealth values is endogenously selected. Running a regression on the sample of households with third-party reported net wealth above the kink who pay no wealth taxes, I find that an indicator for having a value is not significantly correlated with cognitive skills or wage earnings.

\textsuperscript{25}The inheritance tax was set to be repealed on January 1 2005, but the tsunami that hit Thailand on December 25 2004, causing the death of approximately 500 Swedes, led the government to ex-post change the repeal date to December 17 2004. The estate tax filings are thus of good quality throughout 2004.

\textsuperscript{26}In addition to married couples, the database includes information on common-law spouses who have children. The final dataset comprises both types of relationships.

\textsuperscript{27}There is some variation in the availability of enlistment data over the years. For example, the enlistment
The enlistment usually took place the year in which the candidates turned 18. Apart from physical tests and a semi-structured interview with a psychologist that evaluated noncognitive skills, a cognitive skills test was taken. As the test was subject to minor revisions in 1980 and 1994, I create a normalized measure of cognitive skills by ranking test scores within enlistment years by percentile, and applying the inverse of the standard normal distribution to obtain a standard normal measure of cognitive skills. 4,558,931 household-year observations of the remaining sample of tax payers were matched with enlistment data. No women appear in the resulting dataset and the unit of observation is either a single man or an enlisted man in a couple.

3.2 Sample restrictions
Since the wealth tax was filed jointly by households, with the sum of all household members’ net wealth constituting the taxable net wealth, lack of data on individuals below 16 years of age implies that I am not able to assess taxable net wealth figures for households with children. Fortunately, the demographic dataset contains information about household status, including information about children below 18 years of age. I thus confine the sample to consist of single households and couples without children. This results in 34,244,990 observations. In sum, this represents 67 percent of the total number of observations. Out of these, 5 percent, or 1,681,294 observations include positive wealth tax payments.

Special rules applied to the wealth tax value of real estate assets used for business purposes, whereas single-dwelling houses and holiday homes had the same wealth tax value as their property tax value. Because I am not able to assess the tax value of households owning agricultural, rental or industry property, I remove those households from the analysis. This implies dropping 3,245,116 observations.

When constructing savings variables from annual snapshots of the households’ portfolios, I obtain measures for the years 2000-2006. To consistently perform the empirical analysis on the same sample, I remove the year 1999 from the analysis.

Table 2 and 3 present summary statistics for different subsamples. Consistent with a standard savings profile over the life-cycle, the table suggests that wealth tax payers are considerably older than the rest of the population. Since the oldest individuals in the sample with enlistment data were born in 1951, these households are, on average, younger and hold less assets than other households. The market value of assets net of liabilities and taxable data only includes about 40 percent of the men enlisting in the year 1985. There is no official reason for the varying data availability according to officials at the National Service Administration. In general, compliance is large and, according to Grönqvist et al. (2010), only the physically and mentally handicapped were exempted from enlistment. Consequences of refusal included fines and, even, imprisonment.

A comprehensive overview of the test procedure is found in Lindqvist and Vestman (2011). Carlstedt (2000) provides a review of the cognitive skills test, arguing that the test provides an accurate measure of general intelligence. Importantly, it was not possible to avoid military service or to gain other advantages by scoring low on the test.

Including observations for 1999 does not affect the results qualitatively, and the quantitative impacts are negligible. If anything, precision increases when including 1999.
income suggests that households have, on average, a wealth-income ratio of 2.7, slightly less than the ratios found for developed countries in Piketty and Zucman (2014).

4 Estimating the Tax Elasticity of Taxable Wealth

In this section, I estimate parameters needed for identification of the taxable wealth elasticity. The elasticity is of critical importance from the perspective of government revenue as well as from a normative point of view. One may show that under fairly general assumptions, this elasticity is a sufficient statistic for welfare analysis.

In Appendix A.1, I construct a canonical two-period setting where this result obtains. The model is stylized and abstracts from relevant features such as uncertainty, bequests, liquidity constraints, wealth-in-the-utility function and myopia, but serves to demonstrate this important point.

When features such as idiosyncratic uncertainty are take into account in a life-cycle model, a progressive wealth tax may induce interesting dynamic effects. To demonstrate the working of a wealth tax in a dynamic model of consumption and savings under income uncertainty, I set up a dynamic model in Appendix A.2. The seven years of data that are available are not enough for a thorough analysis of dynamic effects over the lifecycle, but I do shed some light on dynamic responses below.

I start this Section by showing how the elasticity can be computed from excess bunching and the tax schedule. I then estimate the extent of bunching using parametric as well as non-parametric methods and compute the implied taxable wealth elasticity. Throughout this Section, the results are subjected to extensive robustness analysis.

4.1 Bunching Estimation

Consider a simple dynamic framework where individuals trade off consumption today, $c$, against savings, $s$, with strictly quasi-concave preferences. Parallel to the labor supply context described in Saez (2010), they are heterogeneous with respect to preferences and savings technologies, which are distributed according to some continuous and differentiable cumulative distribution function. With a constant linear tax on wealth (stock of savings), denoted by $\tau$, and no uncertainty, individuals' wealth in steady state, $W$, will be distributed according to a smooth density function $h(W)$.

Introducing a kink in the budget set at wealth level $W^*$, by a higher marginal tax rate $\tau + d\tau$ above the kink, will trigger a savings response and, potentially, avoidance and evasion responses for agents with a taxable net wealth level above $W^*$. Agents that under the linear tax scheme chose taxable net wealth levels in some interval $[W^*, W^* + dz]$, will bunch at the kink point. The number of households that bunch is thus $B = h(W^*) \cdot dW^*$.\footnote{The expression is approximate, as it assumes a constant density over the net wealth interval of bunchers. The accuracy of the approximation increases as $dW^*$ decreases.} Individuals
who chose higher wealth levels in the absence of the higher tax, reduce their taxable wealth to the point where their indifference curves are tangent to the budget line under the higher tax (which has the slope $1 - \tau - d\tau$).

Under the assumption that the tax rate change at the kink is sufficiently small, so that the associated income effects are negligible, the response of taxable wealth can be interpreted by way of a compensated elasticity.\footnote{The associated income effect from crossing the wealth tax threshold is presumably low. This tax applied to the wealthiest 5-8 percent of the population and responses should reflect only relative prices changing at the threshold.} The elasticity refers to the percent change in wealth arising from a one-percent increase in the net-of-tax rate. Combining this with the expression for bunching at the kink gives

$$\frac{B}{h(W^*) W^*} = \varepsilon_{W^*}^{K \tau} \frac{d\tau}{1 - \tau},$$

where $W$ denotes taxable net wealth. This equation thus identifies the elasticity as a function of excess bunching and the tax schedule. As the response can differ over time, estimating bunching dynamically can potentially identify a vector of elasticities until the steady-state wealth distribution is obtained along with a long-run elasticity. If there are heterogeneous elasticities, bunching identifies the average elasticity.

### 4.1.1 Parametric Estimation

I start by estimating bunching, i.e. the excess mass in the distribution of taxable net wealth at the kink point. In order to obtain an estimate, the counterfactual density, i.e. the mass at the kink point if the tax rate were zero, must be gauged. I do this in two ways. The first approach makes my results directly comparable to the literature. Here, I use the parametric method for estimating bunching employed in Chetty et al. (2011). In the second method, I instead introduce a non-parametric approach to estimating bunching from the two-dimensional data on third-party reported and taxable net wealth.

Figure 3 plots the distribution of taxable net wealth for all Swedish households without children (below 18 years of age) for the years 2000-2006. In constructing the figure, I add up third-party reported assets, item by item, and subtract liabilities. This measure of net wealth was prepopulated on the individual tax returns. Taxable net wealth is computed by adding the self-reported net wealth to the third-party reported net wealth. To obtain centralized measures of wealth while taking the changes in the threshold illustrated in Table 1 into account, I calculate the difference between either wealth variable and the amount of wealth needed to reach the tax bracket with a positive marginal tax rate. Households are then grouped into SEK 5,000 bins. Bin counts are plotted around the kink point, which is demarcated by the vertical line at zero.

The figure reveals bunching in the distribution of taxable net wealth around the kink point: there are disproportionately many households at the kink in the otherwise smooth...
distribution. To estimate bunching at the kink – a value needed to identify the parameters of interest – an estimate of the counterfactual density at the kink is required. However, in contrast to the theoretical predictions, the spike in the empirical distribution is diffused to the left of the kink point.\textsuperscript{32} When estimating bunching, I account for such noise. Specifically, to gauge the excess mass at the kink, I first estimate the distribution of taxable net wealth in the absence of taxation. I fit a polynomial to the empirical distribution as follows:

\[ N_j = \beta_0 + \beta_1 W + \beta_2 W^2 + \cdots + \beta_n W^n + \sum_{i=-R}^Q \phi_i [W_j = i] + \varepsilon_j, \]

where \( N_j \) denotes the number of households in bin \( j \), \( W_j \) is wealth relative to the kink in SEK 5,000 intervals and \( n \) is the order of the polynomial. The sum of indicator variables on the right-hand side reflects the exclusion of observations close to the kink point, as these reflect bunching. \( R \) and \( Q \) define the lower and upper bounds of this interval, respectively. The counterfactual density is given by the predicted values, \( \hat{N}_j \), excluding the contribution of the \( \phi_i \) dummies around the kink. An estimate of the number of households bunching is thus \( \hat{B} = \sum_{j=-R}^0 N_j - \hat{N}_j \), i.e. the number of households in excess of the counterfactual density close to the kink point. The method overestimates the true value of \( \hat{B} \), however, since the counterfactual density does not satisfy the integration constraint. To correct for this, I follow Chetty et al. (2011) and estimate a counterfactual density that shifts the counterfactual distribution to the right of the kink until the integration constraint is satisfied.\textsuperscript{33} The relevant measure for the elasticity estimation is the estimated number of bunching households relative to the counterfactual density close to the kink point, measured as

\[ \hat{b} = \frac{\hat{B}}{\sum_{j=-R}^Q N_j}. \]

Figure 4 plots the distribution of taxable net wealth together with the counterfactual distribution, estimated as a seven-degree polynomial. The window of bunching is defined as SEK 40,000 below the kink, a value of \(-8\) in the figure. Marginal changes in the window of bunching and the order of the polynomial do not affect the estimated excess mass to any considerable extent. I estimate bunching at \( \hat{b} = 0.61 \), meaning that there is 61 percent more mass relative to the counterfactual distribution within SEK 5,000 of the kink. Figure 5 presents the bunching estimates using the imputation method, i.e including households with missing taxable net wealth values, which produces an estimate of \( \hat{b} = 1.30 \). Turning to heterogeneity in bunching, Figure 6, in general, reveal no differences between singles and couples without children that file the tax jointly.

The standard error for \( \hat{b} \) is estimated by a parametric bootstrap procedure, as in Chetty.

\textsuperscript{32}I discuss the potential causes for such asymmetric bunching below.

\textsuperscript{33}The counterfactual density is in this case given by: \( N_j \left( 1 + \mathbb{I}[j > Q] \right) \frac{\hat{B}}{\sum_{j=Q+1}^\infty N_j} = \beta_0 + \beta_1 W + \beta_2 W^2 + \cdots + \beta_n W^n + \sum_{i=-R}^Q \phi_i \mathbb{I}[W_j = i] + \varepsilon_j. \)
et al. (2011). It reflects misspecification of the polynomial rather than sampling errors, as
the estimate is constructed using the population distribution. The estimated standard error
in Figure 4 is 0.05, yielding a t-statistic on \( \hat{\beta} \) of 12.2 and the null hypothesis of no bunching
at the kink point is rejected with a p-value of \( 1.55 \times 10^{-34} \).

### 4.1.2 Robustness

Figures 4 and 5 display bunching that is not symmetrically distributed around the thresh-
old. This is consistent with a fixed cost incurred when crossing the threshold, i.e. with a
discontinuity in the average and not marginal tax rate at the kink. It is also consistent with
the confusion of average and marginal tax rates, which would generate a perceived fixed cost
incurred when crossing the kink. Finally, it may also be the structure of additional noise
that generates such an asymmetry. I investigate these possibilities below.

Tax payers are required to report non-third party reported assets and liabilities if they
are located above the threshold in terms of third-party reported wealth or, alternatively,
in case total taxable wealth places them in the positive tax bracket. If the calculation of
non-third party reported wealth implies a fixed cost, we would expect everyone located to
the right of the kink in third-party reported wealth to incur this cost and the fraction of
households calculating non-third party reported wealth to decrease from the kink as taxable
wealth decreases. The imposition of the fixed cost is thus sharp at the threshold in terms
of third-party reported wealth, but not taxable wealth. If households were responding to
this potential fixed cost, they would locate at the threshold in terms of third-party reported
wealth. Figure 7 displays the distribution of third-party reported net wealth around the
threshold. The estimated excess mass is only 0.09, suggesting that households do not respond
to the fixed cost.

Moreover, if we believe the asymmetry to be the result of a discontinuity in the fixed
cost, we would expect symmetric bunching at kinks where no such fixed costs are involved.
Gelber et al. (2013) study bunching at the kink in the marginal tax rate induced by the
U.S. Social Security Annual Earnings Test and find asymmetric bunching, although no fixed
costs are involved in crossing the threshold. In Sweden, capital income is taxed annually
at 30 % and capital losses deliver a tax credit of 30 % of the aggregate losses up to losses
of SEK 100,000, or, roughly, $ 15,000. Losses above that threshold deliver a tax credit of
30,000 plus 21 % of losses in excess of the threshold. If the realization of gains and losses
are easily monitored intertemporally, we would expect a sharp kink at this salient threshold.
However, looking at Figure 9, we see asymmetric bunching in the same manner as for the
wealth tax, although no fixed costs are incurred to the right of the threshold.

Second, asymmetric bunching at the wealth tax threshold is consistent with the confusion
of marginal and average tax rates, so that individuals think their total tax liability increases
discontinuously at the threshold. If this would be the case, we should expect similar responses
to other marginal tax kinks. However, investigating bunching at kink points in the Swedish
taxable earnings schedule, Bastani and Selin (2014) find symmetric bunching around the

15
kink where the marginal tax rate increases by 20%. This bracket shift occurs at the high end of the income distribution and, presumably, an important part of the potential wealth taxpayers are also subject to the high marginal tax rate in earnings. Another way to address this concern would be to investigate bunching among households who have paid wealth taxes historically and therefore would have learned about the tax schedule. Figure 10 shows bunching at the threshold for those who paid wealth taxes in the past. Although less precise, the graph displays asymmetric bunching in the same way as the graphs above.

To understand the shape of the distribution it is important to understand the noise that arises from the optimized level of wealth to the final, taxable wealth measure. Saez (2010) notes that taxpayers may be unable to perfectly control their incomes because of random events or do not know the exact location of kinks. Taxable wealth is more easy to control and, additionally, subject to salient thresholds at round numbers, which would result in less overall dispersion in this setting. However, there may still be noise arising from the filing of wealth taxes to the taxable figures observed in the data. The law stipulating that total tax liability never should exceed 60 percent of income lowers taxable wealth. Similarly, the taxable rate of assets such as stocks and bonds were adjusted after the filing of the wealth tax, but never upwards.

The identification of parameters in the theoretical framework relies on the assumption of the distribution of taxable net wealth being smooth in the absence of the wealth tax. This assumption can be relaxed by investigating movements in the tax bracket over time. The threshold defining the two tax brackets was different for singles and couples filing jointly. In addition, the threshold was changed several times and by separate amounts. Figure 8 investigates whether bunching follows the tax rate over time, or if alternative explanations account for the evolution of bunching. I compare the distribution of taxable net wealth for singles in 2001 to that of 2006, a time period marked by an increase in the threshold by SEK 500,000. The excess mass in 2001 is located at the tax threshold and the figure presents three hypothetical scenarios for the location of the kink in 2006. The first placebo-kink denotes the threshold value that would be obtained had it followed inflation, the second location indicates the same value had it followed the riskfree interest rate and the final kink denotes the value had it followed the Stockholm Stock Exchange Index. The figure confirms that the kink does move to the 2006 tax threshold.

4.1.3 Non-parametric Estimation

The parametric estimates of bunching in Section 4.1.1 rely on the estimated counterfactual density accurately reflecting the distribution of taxable net wealth. Since a higher marginal tax rate does not only affect households close to the kink, but all households to the right of the kink point, it is not obvious that the estimated counterfactual density closely matches the true one. A biased estimate of the counterfactual distribution would not only bias...
the counterfactual density close to the kink, but also the estimated number of households bunching.

My second approach instead estimates bunching non-parametrically, by exploiting the paired observations of third-party reported net wealth and taxable net wealth for each household. The idea is to gauge bunching by computing the number of households located above the kink in third-party reported net wealth but below the kink in taxable (self-reported) net wealth. Specifically, I use the following estimator of bunching:

$$\hat{B} = \sum_{i}^{N} I[W^* - \delta < W_i < W^* \text{ and } T_i > W^*],$$  \quad (4)

where $W_i$ denotes taxable net wealth, $T_i$ is third-party reported net wealth, $W^*$ defines the kink and $\delta$ is a lower bound on the amount of bunching per household. Thus, the counterfactual density is given by the number of households to the left of the kink in terms of third-party reported net wealth. The window of bunching is defined as above, i.e. as SEK 40,000 below the kink. I group the third-party reported net wealth distribution into bins of SEK 5,000 and use the number of households in the bin closest to the kink as a counterfactual.\(^{35}\) This estimator captures responses to the wealth tax occurring on the self-reported margin, both real responses (owning fewer or cheaper cars as a function of the tax) and reporting responses (i.e. failing to self-report non-third-party reported assets or self-reporting liabilities which do not exist).

Table 4 presents the results using this method. The standard errors are computed using a bootstrap method, in which new distributions of third-party reported net wealth and taxable net wealth are drawn with replacement from the true distribution. The standard error of the bunching coefficient is represented by the standard deviation of the distribution of estimated bunching coefficients. Estimated excess mass is always significant, with the magnitude increasing in the bandwidth of allowed bunching. The coefficient is also larger when using the imputation method. The point estimates are of the same order of magnitude as those obtained using the parametric method.

The non-parametric approach provides a measure of bunching at the household level, a novel feature in the bunching-literature. The graphs presented in Figure 11 show how bunching follows the threshold. Panel (a) displays bunching of couples within a window of SEK 40,000 below the kink of SEK 900,000. In 2000, this constituted the threshold for the marginal tax rate. The drop in bunching at this threshold after 2000 is not particularly surprising, given that households far below the kink are not obliged to self-report non-third party reported wealth, unless their wealth places them in the positive tax bracket. However, the increase in bunching when the thresholds come into effect reflects households starting to bunch when such incentives are provided.

To summarize, the two estimation procedures give statistically significant estimates of

\(^{35}\)Taking the average of the third-party reported net wealth in the interval of $[W^* - \delta, W^*]$ does not affect the results qualitatively, and the impact on estimated magnitudes is small.
bunching. The parametric approach has the advantage that it allows for the response to taxes to occur both through real and reporting responses. The non-parametric procedure, in contrast, presumes that the response occurs exclusively along the self-reporting margin. In the case of savings responses, the second approach, described by equation (4), thus underestimates the amount of bunching. On the other hand, bunching estimates from the first approach rely on the estimated counterfactual distribution being correct. In practice, the estimated excess mass will depend on the functional form assumptions about the order of the counterfactual polynomial in (2).

4.2 Elasticities

Recall that equation (1), \( B/h (W^*) W^* = \varepsilon_{W, r}^K d\tau/(1 - \tau) \), identifies the compensated net-of-tax elasticity of taxable net wealth, \( \varepsilon_{W, r}^K \), without making any parametric assumption about the preferences generating observed behavior. The approach is valid, as long as the kink is small and the associated income effects are negligible. Table 5 takes bunching estimates from Table 4 and derives elasticity estimates. The table is organized in six columns. The first two columns of Table 5 present estimated elasticities using the parametric approach to estimate bunching where a seven- or three-degree polynomial is fitted as the counterfactual distribution. The next two columns employ the imputation method to account for missing values and shows estimates based on the parametric approach, again with a seven- or three-degree polynomial. The last two columns use the non-parametric method, where estimates without imputation are shown first and with imputation last. Standard errors are computed using the delta-method.

The first row of Table 5 shows results for the full sample. Using the parametric approach with a seven-degree polynomial as counterfactual density, the net-of-tax rate elasticity is 0.127. This estimate is similar to that obtained using a three-degree polynomial. With the imputation method, implied elasticities are larger, with a point estimate of 0.270 for the seven-degree polynomial. Elasticity estimates based on the non-parametric method are similar to the parametric approach, as shown in columns (5) and (6), which implies that the parametric elasticity estimates are unlikely to be driven by the specification of the polynomial. This magnitudes are similar to the net-of-estate-tax elasticities of net worth reported by Kopczuk and Slemrod (2001), Holtz-Eakin and Marples (2001) and Joulfaian (2006). Breaking up the sample into high and low cognitive ability, elasticities are generally larger for high IQ individuals, defined as having a \( z \)-score above zero. Elasticity estimates for high-ability households are generally 16 % larger than those of low-ability households. The same holds when comparing households where at least one member has more than one year of tertiary education to those with lower education. Results for individuals working in the financial sector are about the same as for the general population.

Since wealth is a stock and not a flow variable, estimating these elasticities may yield different results depending on the time horizon considered. A shift in the threshold will

\[36\text{Recall that cognitive ability is standardized to a normal distribution with zero mean and variance one.} \]
induce real and sheltering responses today, but might take up to a generation before a steady state wealth distribution, where everyone’s wealth trajectory is chosen under the new regime, is reached. With seven years of data and multiple threshold shifts occurring during this period, I am not able to detect long run effects of the tax. However, Figure 11 shows responses to threshold shifts over the sample period for couples using the non-parametric framework. Similarly, Figure 12 presents the distribution of taxable wealth year by year. During the years 2002-2004 the threshold was constant for both singles and couples. Also in this framework bunching is eminent directly when the threshold has shifted and then remains constant for those years. The figure also suggests that the local bunching estimates are similar in different parts of the wealth distribution.

5 Changes in Wealth Due to Inheritance

I investigate the extent to which inheritances translate into wealth growth as a function of the wealth tax. The objective of this exercise is to assess how individuals respond to the wealth tax using data on this windfall gain.

However, before turning to the analysis, we must investigate whether the propensity to receive inheritances is independent of the wealth tax. If this were not to be the case, households would attempt to reduce the sum of taxable wealth in year $t$ by receiving less inheritance if accumulated wealth and inheritances would place them above the tax threshold. This could, for example, be accomplished through passing on inheritance to children. As shown in Panel A of Figure 14, displaying the distribution of taxable wealth in year $t-1$ and inheritances received during year $t$, there is no evidence of such bunching, which suggests that the likelihood of inheritances is unaffected by the tax.\(^{37}\)

The data include inheritance records for the Swedish population for 2001-2004. During this period, there was one reform that shifted the kink from SEK 1m to 1.5m for single individuals and from SEK 1.5m to 2m for couples filing the tax jointly, in 2002. Panel A of Figure 13 pools singles and couples receiving positive inheritances together and plots mean changes in third-party reported wealth for households locating within 500K above or below the 2001-cutoffs. The group locating below the cutoff is a control group as their incentives to transform inheritance into wealth growth were unaffected by the 2002-reform. The incentives to transform inheritances to wealth grew stronger in 2002 for the group locating within 500K above the cutoff, and they are thus referred to as a treatment group. Inheritances lead to higher wealth growth for households locating above the cutoff when the cutoff is increased. I quantify the impact of the reform by estimating:

$$\Delta W_{i,t} = \alpha + \beta_1 \text{post}_{i,t} + \beta_2 \text{above}_{i,t} + \beta_3 \text{post}_{i,t} \times \text{above}_{i,t} + \gamma X_{i,t} + \varepsilon_{i,t}. \quad (5)$$

\(^{37}\) Another way to see this is to study received inheritances over time, in a difference-in-differences setting. Panel B of Figure 14 shows inheritances received on either side of the 2001-kink over time. If inheritance transfers would respond, we would see a disproportional change in inheritances for the group located above the kink after 2001.
denotes the change in third-party reported wealth between the end of year \( t - 1 \) and end of year \( t \), post\(_{i,t} = \mathbb{I}(t \geq 2002) \) is an indicator for the years after the reform, above\(_{i,t} = \mathbb{I}(W_{i,t} > W_{2001}^*) \) is an indicator for having taxable wealth above the threshold and \( X_{i,t} \) is a vector of potential control variables.

Columns (1), (3) and (5) of Table 6 present estimates of \( \beta_3 \) for households locating within SEK 100,000, 250,000 and 500,000 of the 2001-kink and who receive inheritances. The average treatment effect implies that wealth growth is about SEK 70,000 higher for households locating above the threshold after the tax cutoff has been shifted, relative to the mean wealth growth of SEK 158,954 in 2001 for households locating within SEK 100,000 above the threshold.\(^3\)

I also investigate whether inheritances induce heterogeneous responses by estimating:

\[
\Delta W_{i,t} = \alpha + \beta_1 \text{inh}_{i,t} + \beta_2 \text{post}_{i,t} + \beta_3 \text{inh}_{i,t} \times \text{post}_{i,t} + \beta_4 \text{above}_{i,t} + \beta_5 \text{above}_{i,t} \times \text{inh}_{i,t} + \\
\beta_6 \text{post}_{i,t} \times \text{above}_{i,t} + \beta_7 \text{post}_{i,t} \times \text{above}_{i,t} \times \text{inh}_{i,t} + \gamma X_{i,t} + \varepsilon_{i,t},
\]

where \( \text{inh}_{i,t} \) denotes the amount inherited by each household \( i \).

Columns (2), (4) and (6) of Table 6 show that a SEK 1,000 inheritance leads to higher wealth growth by SEK 426 for households locating within SEK 100,000 above the threshold relative to before. Estimated magnitudes are quantitatively somewhat different when widening the interval considered around the kink, but t-statistics are consistently above 3.5.

The next exercise uses a regression-kink design (RK), by exploiting the sharp discontinuity in marginal returns to translate inheritances into third-party reported wealth at the kink. Panel B Figure 13 plots the mean change in third-party reported wealth between the end of year \( t - 1 \) and the end of year \( t \) against taxable wealth in year \( t - 1 \) plus inheritances received during year \( t \) for households who receive positive inheritances and exhibit changes in third-party reported wealth within SEK \([-300,000,500,000]\). The raw data reveal that the translation of inherited wealth into third-party reported wealth is stronger below the wealth tax threshold. The graph suggests that, above the threshold, households respond to the tax by consuming more of the inheritance or by engaging in avoidance or evasion behavior.

To estimate how the change in slopes on either side of the cutoff changed from 2001 to 2002-2004 I use the following equation:

\[
\Delta W_{i,t-1,t} = \alpha + \beta_1 \text{post}_{i,t} + \beta_2 \text{inh}_{i,t} + \beta_3 \text{post}_{i,t} \times \text{inh}_{i,t} + \beta_4 \mathbb{I}(W_{i,t-1} + \text{inh}_{i,t} > W_{2001}^*) + \\
\beta_5 \text{post}_{i,t} \times \mathbb{I}(W_{i,t-1} + \text{inh}_{i,t} > W_{2001}^*) + \beta_6 \mathbb{I}(W_{i,t-1} + \text{inh}_{i,t} > W_{2001}^*) \times \text{inh}_{i,t} + \\
\beta_7 \text{post}_{i,t} \times \mathbb{I}(W_{i,t-1} + \text{inh}_{i,t} > W_{2001}^*) \times \text{inh}_{i,t} + \delta X_{i,t-1} + \varepsilon_{i,t},
\]

where \( \mathbb{I}(W_{i,t-1} + \text{inh}_{i,t} > W_{2001}^*) \) denotes whether household \( i \) is located above the 2001-kink

---

\( ^3 \)The estimates are marginally significant when intervals of SEK 100,000 and SEK 250,000 around the threshold are considered, but are statistically significant with a \( p \)-value of 0.04 when considering households located within SEK 500,000 of the kink.
at the end of year $t$ given its wealth level at time $t - 1$ and received inheritance.\textsuperscript{39} The other variables are defined as above. In the equation, $\beta_7$ is the effect of inheritance on wealth growth for households within those wealth intervals relative to households outside the interval when the threshold has shifted.\textsuperscript{40} Columns (7)-(12) of Table 6 show estimates of Equation 7. An increase in inheritance of SEK 1,000 leads to additional wealth growth of SEK 50 when the reform has been implemented, but the difference is barely significant.

6 Anatomy of Responses

The tax elasticity of taxable wealth is a sufficient statistic for the deadweight loss of the wealth tax also in the presence of evasion and avoidance. However, if costs of engaging in tax sheltering are transfer, rather than resource, costs, the reporting responses that are subject to the transfer costs are not welfare losses. To compute the deadweight loss, it is therefore necessary to distinguish between real and reporting responses. This section aims at decomposing responses to the wealth tax into real effects and sheltering effects (avoidance and evasion).

6.1 Real Responses

First, the instantaneous responses observed in Figures 11 and 12 are consistent with reporting, rather than real, responses. To see this, consider an OLG-framework, where individuals live for $T + 1$ periods and spend $J$ of them working and the rest in retirement (see Appendix A.2 for the full model). At each point in time, there are $T + 1$ equally-sized generations alive. Labor earnings are stochastic while retirement benefits are deterministic and lower than the expected value of earnings. Borrowing is not allowed, implying two motives for wealth accumulation: precautionary motives and consumption smoothing. For reasonably chosen parameter values, Figure 15 shows the simulated path of wealth for one generation without and with a wealth tax. Consistent with the life-cycle hypothesis, individuals accumulate wealth until retirement and then consume their wealth until death deterministically occurs at age 85. Figure 16 shows the steady-state distribution of taxable wealth under the two regimes, with evident bunching.

\textsuperscript{39}As the threshold depends on household status, the indicator takes the value one if taxable wealth in year $t - 1$ plus received inheritances during year $t$ are above SEK 1 million for single households and above SEK 1.5 million for couples. I take into account that singles locating above SEK 1.5 million and couples locating above 2 million are not treated by restricting the analysis to households locating within at most SEK 500,000 around the kink.

\textsuperscript{40}The assumption that the sum of lagged taxable wealth and inheritances received during the year is the relevant benchmark for households when determining how to let wealth grow may be inappropriate. Wealth grows for more reasons than inheritances. This implies a fuzziness which is problematic for non-parametric RK estimators. However, Figure 13 suggests that the change in slopes indeed occurs at the defined cutoff although the series are somewhat noisy.
In Figure 17, the simulated dynamics of a wealth tax reform is presented. Upon the introduction of an unexpected, permanent wealth tax, households of different ages will respond heterogeneously to the reform. The model predicts a gradual shift of the wealth distribution until the new steady state is reached. Even though the model does not feature bequests, wealth-in-utility, or myopia, it is hard to believe that allowing for such savings motives would give instantaneous responses in taxable wealth, as wealth is a stock, and not a flow variable.

To further uncover potential real responses to the wealth tax, I use two estimators in the program-evaluation framework and investigate how active savings, realizations of capital gains and losses, taxable income and consumption durables respond. First, I estimate Difference-in-Differences (DD) equations, in the spirit of Equation 5, to study effects of the wealth tax on savings, realizations of capital gains and losses, consumption durables and taxable income. When estimating the equation, I restrict attention to the threshold increase occurring between 2004 and 2005 for couples filing the tax jointly, as that is the highest threshold ever in place and the opportunity to respond is higher at higher parts of the wealth distribution. The results are similar when focusing on other subsamples, however.

I complement this analysis with a regression-kink (RK) design as in Equation (7), but here I use taxable wealth at the end of year $t$ to assign the difference in slopes on either side of the kink over time. The marginal return increased between 2004 and 2005 for households located within SEK 500,000 above the threshold. To quantify the impact of the change in slopes over time, I estimate:

$$
y_{i,t} = \alpha + \beta_1 \text{post}_{i,t} + \beta_2 \text{above}_{i,t} + \beta_3 \text{post}_{i,t} \times \text{above}_{i,t} + \beta_4 W_{i,t} + \beta_5 \text{post}_{i,t} \times W_{i,t} + \beta_6 \text{above}_{i,t} \times W_{i,t} + \beta_7 \text{post}_{i,t} \times \text{above}_{i,t} \times W_{i,t} + \gamma X_{i,t-1} + \varepsilon_{i,t}, \quad (8)
$$

where $W_{i,t}$ denotes taxable wealth and $\text{above}_{i,t} = I(W_{i,t} > W_{2004}^*)$. $\beta_7$ is the coefficient of interest and measures the marginal effect of wealth on the outcome for households above the cutoff before the reform relative to after.

Panels A and B of Figure 18 show the mean of active investment decisions in stocks, funds and bonds against taxable wealth around the normalized tax threshold for the years 2000-2006. The graphs reveal that households save more, in absolute terms, as wealth increases, but there is no difference in the correlation between savings and wealth on either side of the kink. Panels C and D of Figure 18 restrict the analysis to couples filing the tax jointly and study this relation dynamically. The blue series show savings around the SEK 2-million kink for the years 2002-2004, and the red series represent 2005-2006. Despite the noise, it is difficult to see a change in slopes of savings before and after the reform. Panels E and F display that this is also the case when looking at mean savings over time for the group just below the 2004-cutoff and those just above the 2004-cutoff (who pay the tax in 2002-2004, but not thereafter. Table 7 formalizes the evidence suggested by the graphs in estimations of the DD and RK equations. When assuming that savings are rebalanced at the end of the year, the threshold shift increases savings by SEK 2,090, or by 8 percent of mean savings in 2004, for couples located within SEK 100,000 of the cutoff, but the effect is not
significantly different from zero. When assuming beginning-of-year rebalancing, I estimate an even impreciser effect. The results are unaffected by including controls. Moreover, increasing wealth by SEK 1,000 is estimated to increase savings by either SEK 11 or 51 when the cutoff has been shifted, depending on when rebalancing is assumed to take place (Columns (1) and (2) in Panel B), but the estimates are not significantly different from zero. If households were responding to the wealth tax by selling assets which are not captured in the savings variables, such as real estate, we would see changes in realizations of capital gains and losses around the threshold. Panel A of Figure 19 shows that the change in fraction of households realizing gains and losses as a function of taxable wealth is not different on either side of the cutoff in the cross section. This is confirmed dynamically in Panels C and E of Figure 19 as well as in Column (3) of Table 7.

Both savings and capital gains realization responses would materialize as effects on wealth being reported to the Tax Agency by third parties, such as banks and financial institutions. The major component of taxable assets that are not third-party reported is cars.\textsuperscript{41} While the Tax Agency did not have access to car registries, I have gained access to them and matched them with taxable wealth records at the individual level. Panel A of Figure 20 shows the mean value of cars against taxable wealth. Again, the absence of a kink in the slope does not necessarily imply that households abstain from having more or higher-value cars above the threshold. When computing the value of cars, I have information on brand, model and vintage, but not on mileage. It may be that measurement error in car values blur responses along this margin. I do, however, replicate the same plot in Panel B, where I restrict attention to cars with current vintage, i.e. newly purchased cars. Measurement error may be present here too, but it should be relatively smaller. There is no kink in the value around the threshold here either.\textsuperscript{42} Panels C and D of Figure 21 replicate these graphs for couples filing the tax jointly and adds the dynamic component, by exploiting the threshold shift. When quantifying the effects, the DD estimates reported in Column (5) of Table 7 imply that the threshold shift decreases the value of cars owned by couples located above the cutoff. The reform reduced car values by SEK 2,440, or by 3.4 percent of pre-reform mean car values for households within SEK 100,000 above the threshold and the corresponding RK estimate supports this hypothesis. Although column (6) shows a negative effect on the value of new cars of the tax, the point estimate is not significant and the impact on car ownership of the wealth tax is, if anything, very small.

If households are working to finance future consumption through wealth accumulation, taxing wealth is equivalent to taxing future consumption and should discourage taxable income. However, there is no effect on taxable income of the wealth tax as shown in the cross-section, Panel B of Figure 19. The same is true dynamically, as displayed in Panels D and F of Figure 19, and confirmed in Column (4) of Table 7.

\textsuperscript{41}In addition, assets such as boats, jewellery, caravans and horses were part of the non-third-party reported tax base.

\textsuperscript{42}This holds also when plotting number of cars owned around the threshold. Measurement error is not as acute for the number of cars owned, but it is the value of cars that matters for taxation.
The final step in investigating real responses to the wealth tax exploits that the tax base is comprised of two components. The largest share is wealth reported by third-parties, and an, on average, small share of the tax base is self-reported. The absence of bunching in third-party reported wealth, as displayed in Figure 7, does not necessarily imply an absence of real responses, as it is taxable, rather than third-party reported, wealth that matters for taxation. However, for one subgroup of households, the absence of bunching in third-party reported wealth does imply no real responses: those who have no wealth to self-report. Knowing the value of the most important component of non-third-party reported wealth, i.e. cars, Figure 22 shows third-party reported and taxable wealth around the threshold for households who do not own a car. The estimated bunching patterns follow those observed for the population. This suggests that there are indeed no real responses among those who do not own a car.

6.2 Reporting Responses

The wealth tax base provided many legal opportunities to avoid the tax. For instance, listed stocks were mostly only taxed at 80% of their market value and stocks in recently listed companies were completely tax exempt. For this reason, the existence of bunching in third-party reported wealth would be consistent with both real and avoidance responses. Moreover, accumulated assets in designated retirement accounts (similar to IRAs in the US) were also tax exempt. I do not observe the stock of retirement savings in my data, but I do hold information on annual contributions to those accounts. Panel A of Figure 23 shows mean annual contributions in retirement savings for households around the threshold. The absence of a higher propensity to save in retirement accounts above the threshold is also verified in a dynamic context. Panel B of Figure 23 shows mean retirement savings around SEK 2 million for couples filing the tax jointly. In the graph I distinguish between the period 2002-2004, when the cutoff was in place, and the period 2005-2006. Panel C shows contributions over time for households locating above and below the threshold. The fact that the slopes tend to be the same before and after the cutoff was changed, as the graph suggests, is also confirmed by a regression, presented in Column (7) of Table 7.

As a final exercise, I cross-check car values against self-reported assets. As described in Section 3, I do not observe self-reported assets item by item, which means that I can not compare the value of cars based on administrative records against self-reported cars. My analysis relies instead on cross-checking the value of cars against total self-reported assets. Panel A of Figure 21 shows the fraction of households who own a car and self-report more assets than their cars are worth. The fraction is between 15 and 25% within a taxable wealth interval of one million SEK above the threshold. Such low fractions support the hypothesis that households do not truthfully report assets and liabilities. Finally, Panel B of Figure 21 restricts the analysis to new cars. The pattern is similar to that in Panel A, which suggests that even when households presumably have a better understanding of what their cars are worth, they do not report them truthfully.
Another way to see how households fail to self-report assets and liabilities that are part of the tax base, is to add the car values to the third-party reported wealth values for those households who are not obliged to self-report the value. To take a conservative approach that avoids potential mismeasurements of cars, I only add 10 percent of the car value to non-third-party reported assets. To estimate the value of non-third-party reported liabilities, the Swedish Bankers’ Association reports that the total value of collateralized debt for cars, boats and consumption durables amount to about 2.48% of other collateralized debt in 2014. When estimating non-third-party reported wealth, I subtract, from the assessed car value, 2.4% of households collateralized debt. Finally, to be restrictive, I do not attempt to estimate boat values of individuals. This implies an underestimation of the potential underreporting. Figure 24 shows the resulting distribution. The even clearer bunching at the kink point arises because households to the left of the kink point, who have restrictively assessed non-third-party reported wealth that puts them in the positive tax bracket, do not report that wealth. As an important contributing factor, households who initially locate above the cutoff, self-report negative wealth, thereby reducing their total tax liabilities.

7 Conclusion

This paper contributes to our understanding of the workings of capital taxation. Using a panel of 51 million observations, comprising wealth records of the Swedish population for seven years, I address the behavioral effects of a wealth tax from different perspectives. The Swedish wealth tax comprised two tax brackets: one with a zero marginal tax rate and one with a tax rate of 1.5 percent. I find strong evidence of bunching at the threshold that translate into net-of-tax rate elasticities ranging from 0.12 to 0.33.

Moreover, when I investigate whether these responses reflect real responses – households reducing their savings or consumption durables as a response to the tax – or reporting responses – strategically investing their assets in tax exempt retirement accounts or engaging in tax evasion – my results suggest that the observed responses are driven by tax evasion. I use extraordinarily detailed asset level data for the entire population, that enable decomposing active investment/divestment behavior from passive market fluctuations, and find no responses on this margin. The same holds true for consumption durables.

The results also shed light on some of the well-known practical challenges involved in wealth tax implementation. In particular, taxes on wealth are marred by difficulties related to defining a tax base and to the appraisal of assets. When investigating the component of the wealth tax base that is subject to self-reporting, I find that tax payers significantly underreport the value of those assets.

Future research should aim at identifying the long-run effects of wealth taxation. The seven years of data used in the paper at hand may be insufficient for long-run effects on accumulated assets to be observable. In addition, savings responses depend, not only on current taxes, but also on expectations of future taxes. Since the Swedish wealth tax was
repealed at the end of the sample period, I am unable to address such effects. Understanding the impact of a more permanent tax on wealth is thus also an interesting avenue for future research. Another issue that data limitations prevent me from addressing, is to what extent the wealth tax triggered capital flight to international tax havens. From the viewpoint of policy, eliminating institutional loopholes and encouraging international monitoring and cooperation may be efficient ways of addressing such behavior.

If the practical difficulties of capital tax implementation can be resolved, wealth taxes are likely to be a powerful redistributional tool. My results suggest that the negative real effects of wealth taxation are negligible: deterring savings does not seem to be a cause for concern. My findings do however suggest that individuals are prone to evasion. An important task for future research is therefore to identify institutions that can deter tax sheltering. If we succeed in designing such institutions, a wealth tax need not be as distortive as commonly believed.

References


A Appendix

A.1 Welfare Effects of Wealth Taxation

The objective of this section is to present welfare-relevant statistics when analyzing changes in the wealth tax. I construct a simple, canonical two-period life-cycle model, as in Feldstein (1978), and implement the framework in Chetty (2009), but with wealth taxes instead of labor income taxes, and derive formulas for the marginal excess burden. I start by considering real responses only, and then add the possibility of reporting responses in the presence of resource and transfer costs. The model abstracts from income effects by analyzing the case with quasi-linear utility as well as interactions between labor supply and savings responses. The model also abstracts from the precautionary savings motive.

A.1.1 Only Real Responses

Consider a model where an individual chooses how to divide exogenous income between consumption today (c₁) and consumption tomorrow (c₂). Let the gross interest earned during the first period be R. u(c₁) is first-period consumption and the discount factor is denoted by β.

The individual’s problem is to maximize

\[ U = \max_s u(c_1) + \beta c_2 \]

subject to

\[ c_1 = y - s \]
\[ c_2 = (1 - \tau) Rs \]

Social welfare is defined as the sum of the individual’s utility and tax revenue:

\[ W = \{ u(y - s) + \beta (1 - \tau) Rs \} + \beta \tau Rs, \]

where I assume that the social planner discounts future revenue at the same rate as the consumer. Since utility is assumed to be quasi-linear, social welfare is a money metric and the marginal excess burden can be derived by differentiating (10) with respect to the tax rate. Importantly, since the individual has already chosen \( s \) to maximize utility, the behavioral responses of the wealth tax can be ignored when differentiating the terms in the
curly brackets. In case $\beta = 1/R$, the marginal excess burden is:

$$\frac{dW}{d\tau} = -s + s + \tau \beta \frac{d(Rs)}{d\tau} = \frac{\tau dRs}{R} d\tau,$$

where $Rs$ denotes taxable wealth (and taxable savings in this two-period setting). A sufficient statistic for how raising the wealth tax affects welfare is thus the effect on taxable wealth.

### A.1.2 Real and Reporting Responses

Suppose now that the individual can respond to the tax rate both by reducing wealth ($s$) and by sheltering money from the government ($e$). Sheltering can be accomplished either legally, through tax avoidance, or illegally, by way of tax evasion. Importantly, the costs of sheltering activities entail both resource costs (e.g., moral costs of evasion or time costs of avoidance) and transfer costs (e.g., fines for tax evasion collected by the government or hiring a broker to plan the portfolio allocation to avoid the tax). The resource costs are denoted $g(e)$, with $\frac{\partial g(e)}{e} > 0$ and the transfer costs take the form $F(Re, \tau)$ where $\partial F(Re, \tau)/\partial e > 0$. The individual now faces the following problem:

$$U = \max_s u(c_1) + \beta (c_2 - g(e))$$

subject to

$$c_1 = y - s$$
$$c_2 = (1 - \tau) R(s - e) + Re - F(Re, \tau).$$

The present value of social welfare becomes:

$$W = \{u(y - s) + \beta ((1 - \tau) R(s - e) + Re - F(Re, \tau) - g(e))\} + \beta \tau R(s - e) + \beta F(Re, \tau).$$
Again, because the individual has optimized on $s$ and $e$, the behavioral responses to tax changes have no effect on utility. Differentiating the welfare function gives:

$$
\frac{dW}{d\tau} = -\beta R (s - e) - \beta R \frac{\partial F (Re, \tau)}{\partial \tau} + \beta R (s - e) + \beta R \frac{\partial F (Re, \tau)}{\partial \tau} + \beta R \frac{\partial F (Re, \tau)}{\partial e} \frac{de}{d\tau} + \\
\tau \beta \frac{d(R (s - e))}{d\tau} + \frac{\partial F (Re, \tau)}{\partial e} \frac{de}{d\tau} + \frac{\tau dR (s - e)}{R}.
$$

Exploiting the first order condition for the individual, $\tau = \frac{\partial F (e, \tau)}{\partial e} + \frac{\partial g (e)}{\partial e}$, the above expression becomes

$$
\frac{dW}{d\tau} = \beta \left( \left( \tau - \frac{\partial g (e)}{\partial e} \right) \frac{\partial Rs}{\partial \tau} + \frac{\partial g (e)}{\partial e} \frac{\partial R (s - e)}{\partial \tau} \right),
$$

or, equivalently,

$$
\frac{dW}{d\tau} = \beta \left( \left( 1 - \frac{\partial g (e)}{\partial e} \right) \frac{\partial Rs}{\partial \tau} + \frac{\partial g (e)}{\partial e} \frac{\partial R (s - e)}{\partial \tau} \right).
$$

The marginal excess burden is thus a convex combination of the effect of the tax rate on actual wealth and taxable wealth. The weight on the effect on taxable wealth is increasing in the relative importance of resource costs of sheltering. Analogously, if there are only transfer costs of sheltering, the welfare relevant parameter is the response of actual savings.

**A.2 Dynamic Framework**

The purpose of this section is to illustrate how a wealth tax can influence savings and wealth dynamically. I present a canonical framework of intertemporal utility maximization, consistent with the Life Cycle Hypothesis (LCH) (Bernheim, 2002; Modigliani and Brumberg, 1954), in which individuals accumulate wealth both to finance consumption in retirement and as insurance against idiosyncratic shocks in labor earnings.

I consider a dynamic economy with a discrete set of generations $0, 1, \ldots, t$, of measure one. Individuals are identical and live for $T + 1$ years. There is no population growth, so that at each point in time, there are $T + 1$ individuals alive. The first $J$ years of each agent’s life are spent working, and the remaining $T + 1 - J$ are spent in retirement. Income while working is stochastic and, for simplicity, assumed to follow a first-order Markov chain. Let $y_t (h_t)$ denote income in period $t$ where $h_t$ is the realization of the state in that period. The transition probability, i.e. the probability that state $k$ is realized next period when the current state is $i$, is denoted $p_{ik} = P (h_{t+1} = k | h_t = i)$ with $\sum_k p_{ik} = 1$ for $i = 1, \ldots, m$. Income in each period of retirement, $b$, is deterministic and lower than the expected income
while working.

Individuals choose savings, $s_t$, and consumption, $c_t$, in each period. They face borrowing constraint and a progressive wealth tax $\tau_W$ above the threshold $W^*$ and maximize the expected lifetime utility:

$$\max_{\{c_t,s_t\}_{t=0}^T} \mathbb{E} \sum_{t=0}^{T} \beta^t \frac{c_t^{1-\frac{1}{\sigma}} - 1}{1 - \frac{1}{\sigma}}$$

(subject to

$$c_t + s_t \leq i_t(h_t)$$

$$s_t = W_{t+1} - \min\{W^*, W_t\} (1 + r) - (\max\{W^*, W_t\} - W^*) (1 + r) (1 - \tau_W)$$

$$W_{t+1} \geq 0$$

$$c_t \geq 0$$

$W_0$ given

$$i_t = \begin{cases} y_t(h_t) & \text{if } t < 40 \\ b & \text{if } t \geq 40 \end{cases}$$

where $\mathbb{E}$ is the expectations-operator, $\beta$ is the discount factor, $\sigma$ is the elasticity of intertemporal substitution and $r$ the rate of return on capital. Before solving the problem, I use that the wealth tax is isomorphic to a tax on capital gains, $\tau_c$, i.e.

$$(1 - \tau_W) (1 + r) a_t = (1 + (1 - \tau_c) r) a_t$$

$$\tau_c = \frac{1 + r}{r - \tau_W}$$

Equation 14 can then be written as:

$$s_t = a_{t+1} - \min\{W^*, a_t\} (1 + r) - (\max\{W^*, a_t\} - W^*) \left(1 + r \left(1 - \frac{1 + r}{r - \tau_W}\right)\right).$$

In solving this optimization problem, I rewrite it recursively and apply dynamic programming. Current assets and the realization of the shock are state variables. The optimal consumption and savings policy functions prescribe no remaining wealth at the time of death, $a_{T+1} = 0$. I solve for optimal consumption and savings as a function of the states numerically, by discretizing the state space and interpolating linearly between grid points.

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43 This problem could, in principle, be solved by solving a system of equation, one for each history of shocks. However, as the number of periods increase, the number of shock histories quickly increases, rendering such an approach infeasible.
A.2.1 Quantitative Analysis

The quantitative analysis is admittedly stylized and the objective is simply to show how responses to a wealth tax may materialize, both in steady state and transitorily. I assume that individuals live for 85 years, join the labor force at age 25 and earn labor income until they are 65. Thereafter, they live for 20 years in retirement. Income assumes one of two possible values: $y \in \{y(1), y(2)\}$ where $y(1) = 1$ and $y(2) = 2$ and $p_{11} = p_{22} = 0.8$ and $p_{12} = p_{21} = 0.2$ are the transition probabilities. Income in retirement is $b = 0.2$. Individuals start without any inherited wealth, so that $W_0 = 0$. The interest rate, $r$, is set to 8% and $\beta = 0.9$. All individuals start out in the high-income state.

I solve the model separately for two regimes: one where $t_W = 0$ and one where $t_W = 0.015$ above a wealth threshold $W^* = 1.5$. I then simulate the model for 1000 individuals. Wealth over the lifecycle for one generation in each of the two regimes is presented in Figure 15. The results show that households start out without wealth and then, on average, maintain fairly constant wealth until reaching 50-55 years of age, when they start to accumulate wealth quickly. Notice that the distribution of wealth at any age before the asset-accumulation stage is capped close to the threshold in the regime with a tax on wealth, whereas the no-tax regime generates higher wealth levels in almost every stage of life.

When there are 61 equally-sized generations alive at each point in time, Figure 16 shows the distributions of taxable wealth around the 1.5-threshold in the two regimes. Individuals bunch at the threshold in the progressive tax case, as implied by the life-cycle patterns.

Next, I investigate the dynamics. Suppose that the economy starts out without a wealth tax. When an unexpected and permanent wealth tax is introduced, individuals of different cohorts will react heterogenously depending on where in the life cycle they are. Figure 17 shows the distribution of taxable wealth around the threshold of 1.5 at different points in time after the tax has been introduced. The first subplot presents the distribution one year after the reform. In this plot, the youngest generation will make all wealth accumulation decisions under the new regime. In subplot (D), the regime has been in place for five years. Here, the youngest five generations will live their entire lives under the wealth tax regime. Notice how the wealth distribution adjusts gradually to the new steady state shown in Figure 16. The speed of adjustment is partly driven by parameter values, but will always be gradual rather than instantaneous.
<table>
<thead>
<tr>
<th>Year</th>
<th>Tax Revenue (%)</th>
<th>Tax Payers (%)</th>
<th>Threshold, Singles</th>
<th>Threshold, Couples</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1.0</td>
<td>7.7</td>
<td>900</td>
<td>900</td>
</tr>
<tr>
<td>2001</td>
<td>0.8</td>
<td>5.3</td>
<td>1000</td>
<td>1500</td>
</tr>
<tr>
<td>2002</td>
<td>0.5</td>
<td>2.3</td>
<td>1500</td>
<td>2000</td>
</tr>
<tr>
<td>2003</td>
<td>0.7</td>
<td>3.5</td>
<td>1500</td>
<td>2000</td>
</tr>
<tr>
<td>2004</td>
<td>0.7</td>
<td>3.6</td>
<td>1500</td>
<td>2000</td>
</tr>
<tr>
<td>2005</td>
<td>0.6</td>
<td>2.5</td>
<td>1500</td>
<td>3000</td>
</tr>
<tr>
<td>2006</td>
<td>0.7</td>
<td>3.0</td>
<td>1500</td>
<td>3000</td>
</tr>
</tbody>
</table>

Notes: The table shows aggregate statistics of the wealth tax for the period studied. Tax revenue is presented as percentage of total tax revenue. Monetary values are presented in 1000 SEK (1 USD ≈ 6.5 SEK).
# Table 2: Summary Statistics for the Swedish Population and Different Subsamples, 2000-2006.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Population</th>
<th>Singles and couples without children</th>
<th>Excluding self-employed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>All</td>
<td>Wealth Tax Payers</td>
</tr>
<tr>
<td>Age</td>
<td>47.733 (19.305)</td>
<td>53.268 (19.869)</td>
<td>52.905 (20.172)</td>
</tr>
<tr>
<td>Children</td>
<td>0.316 (0.465)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
</tr>
<tr>
<td>Male (%)</td>
<td>0.491 (0.500)</td>
<td>0.500 (0.500)</td>
<td>0.495 (0.500)</td>
</tr>
<tr>
<td>Married</td>
<td>0.414 (0.492)</td>
<td>0.384 (0.486)</td>
<td>0.363 (0.481)</td>
</tr>
<tr>
<td>Higher education</td>
<td>0.215 (0.411)</td>
<td>0.202 (0.401)</td>
<td>0.203 (0.402)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income and Taxes</th>
<th>Population</th>
<th>Singles and couples without children</th>
<th>Excluding self-employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxable Income</td>
<td>174,602 (172,292)</td>
<td>169,832 (155,912)</td>
<td>169,001 (151,721)</td>
</tr>
<tr>
<td>Wealth Tax Paid</td>
<td>744 (24,299)</td>
<td>891 (26,870)</td>
<td>743 (18,762)</td>
</tr>
<tr>
<td>Wealth Tax (%)</td>
<td>0.049 (0.215)</td>
<td>0.060 (0.238)</td>
<td>0.054 (0.226)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
<th>Population</th>
<th>Singles and couples without children</th>
<th>Excluding self-employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Skills</td>
<td>-0.003 (0.997)</td>
<td>-0.052 (1.018)</td>
<td>-0.052 (1.022)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Car</th>
<th>Population</th>
<th>Singles and couples without children</th>
<th>Excluding self-employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cars</td>
<td>0.527 (1.124)</td>
<td>0.514 (1.054)</td>
<td>0.512 (0.944)</td>
</tr>
<tr>
<td>Number of New Cars</td>
<td>0.161 (0.490)</td>
<td>0.146 (0.475)</td>
<td>0.147 (0.453)</td>
</tr>
</tbody>
</table>

| Observations | 50,894,803 | 34,244,990 | 30,999,874 | 1,681,294 | 4,514,871 |

Notes: This table presents means and standard deviations of key variables in the full sample and in different subsamples at the individual level. The population in columns (1)-(2) comprises tax payers aged 16 and older. Columns (3)-(10) describe the subsample of single households and couples without children below 18 years of age. Columns (5)-(10) removes individuals who own business property. Among those, (7)-(8) show statistics for wealth tax payers, and (9)-(10) present results for men with enlistment data. Children is an indicator variable for having one or more children below 18 years of age in the household. Married refers to share individuals married or in registered partnerships. Higher education is a dummy for having a degree beyond secondary school. Taxable income includes all wage earnings, non-labor income as well as pension income. Taxable income, wealth tax paid, car value and value of newly purchased cars are denoted in SEK (1 USD ≈ 6.5 SEK). The variable cognitive skills denotes the standardized value of the sum of subscores from the cognitive skills test taken at enlistment. Car value is calculated using the valuation method described in Section 3 and is denoted in SEK. The value of new cars restricts attention to cars bought in the current year.
<table>
<thead>
<tr>
<th>Population</th>
<th>Singles and couples without children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Excluding self-employed</td>
</tr>
<tr>
<td></td>
<td>Wealth Tax Payers</td>
</tr>
<tr>
<td></td>
<td>Enlistment Data</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td><strong>Wealth</strong></td>
<td></td>
</tr>
<tr>
<td>Taxable Assets, (Third-Party)</td>
<td>415,838</td>
</tr>
<tr>
<td>Debt, (Third-Party)</td>
<td>206,166</td>
</tr>
<tr>
<td>Financial Assets (Market)</td>
<td>204,683</td>
</tr>
<tr>
<td>Real Estate (Market)</td>
<td>480,740</td>
</tr>
<tr>
<td><strong>Portfolio Composition</strong></td>
<td></td>
</tr>
<tr>
<td>Real Estate (%)</td>
<td>0.512</td>
</tr>
<tr>
<td>Bank Account (%)</td>
<td>0.198</td>
</tr>
<tr>
<td>Funds (%)</td>
<td>0.208</td>
</tr>
<tr>
<td>Stocks (%)</td>
<td>0.060</td>
</tr>
<tr>
<td>Bonds (%)</td>
<td>0.022</td>
</tr>
<tr>
<td><strong>Wealth Accumulation</strong></td>
<td></td>
</tr>
<tr>
<td>Realized Capital Gains</td>
<td>10,963</td>
</tr>
<tr>
<td>Realized Capital Losses</td>
<td>1,048</td>
</tr>
<tr>
<td>Capital Income</td>
<td>7,101</td>
</tr>
<tr>
<td>Retirement Savings</td>
<td>1,906</td>
</tr>
<tr>
<td>Savings (end-of-year)</td>
<td>4,655</td>
</tr>
<tr>
<td>Savings (beginning-of-year)</td>
<td>1,729</td>
</tr>
<tr>
<td>Observations</td>
<td>50,894,803</td>
</tr>
<tr>
<td><strong>Inheritances, 2001-2005</strong></td>
<td></td>
</tr>
<tr>
<td>Value Inheritance</td>
<td>2,271</td>
</tr>
<tr>
<td>Inheritance Tax Paid</td>
<td>183</td>
</tr>
<tr>
<td>Observations</td>
<td>36,315,155</td>
</tr>
</tbody>
</table>

Notes: This table continues Table 3 by presenting wealth variables for the same samples. All monetary values are denoted in SEK (1 USD ≈ 6.5 SEK). Taxable assets and debt are reported to the Tax Agency by third-parties. When receiving these records, the Tax Agency retrieves prices and returns from various sources to generate a marked-to-market value of each asset. The tax value of each asset is then computed using valuation rules, as described in Section 2. These variables represent the sum of the taxable values. Financial assets is the market value of stocks, bank accounts, funds, bonds and quoted options. Real estate is the market value of real estate. Capital gains and losses refer to realizations during the year. Capital income refers to taxable capital income (including realizations of gains and losses, as well as home mortgage payments, etc). Retirement savings is savings in tax-deferred accounts. Savings refer to active changes in the portfolio comprising funds, stocks and bonds (values are mark-to-market). To remove noise arising from not being able to correctly price all assets, observations above the 99th and below the 1st percentile have been removed. End- and beginning-of-year means that portfolios are assumed to be rebalanced at the end, and, beginning, of the year, respectively. Inheritance records are retrieved using estate tax files for the years 2001 to 2005, inclusive.
<table>
<thead>
<tr>
<th></th>
<th>Parametric</th>
<th></th>
<th>Non-parametric</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>All</td>
<td>0.611</td>
<td>0.597</td>
<td>1.301</td>
<td>1.373</td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td>(0.065)</td>
<td>(0.069)</td>
<td>(0.091)</td>
</tr>
<tr>
<td>Couples</td>
<td>0.596</td>
<td>0.567</td>
<td>1.312</td>
<td>1.375</td>
</tr>
<tr>
<td></td>
<td>(0.074)</td>
<td>(0.075)</td>
<td>(0.097)</td>
<td>(0.111)</td>
</tr>
<tr>
<td>Singles</td>
<td>0.623</td>
<td>0.618</td>
<td>1.292</td>
<td>1.372</td>
</tr>
<tr>
<td></td>
<td>(0.058)</td>
<td>(0.066)</td>
<td>(0.076)</td>
<td>(0.122)</td>
</tr>
<tr>
<td>High IQ</td>
<td>0.492</td>
<td>0.401</td>
<td>0.933</td>
<td>0.937</td>
</tr>
<tr>
<td></td>
<td>(0.131)</td>
<td>(0.114)</td>
<td>(0.141)</td>
<td>(0.156)</td>
</tr>
<tr>
<td>Low IQ</td>
<td>0.424</td>
<td>0.576</td>
<td>0.655</td>
<td>0.854</td>
</tr>
<tr>
<td></td>
<td>(0.128)</td>
<td>(0.147)</td>
<td>(0.151)</td>
<td>(0.163)</td>
</tr>
<tr>
<td>High Education</td>
<td>0.522</td>
<td>0.528</td>
<td>0.907</td>
<td>1.001</td>
</tr>
<tr>
<td></td>
<td>(0.117)</td>
<td>(0.093)</td>
<td>(0.140)</td>
<td>(0.131)</td>
</tr>
<tr>
<td>Low Education</td>
<td>0.402</td>
<td>0.399</td>
<td>0.725</td>
<td>0.779</td>
</tr>
<tr>
<td></td>
<td>(0.134)</td>
<td>(0.115)</td>
<td>(0.170)</td>
<td>(0.142)</td>
</tr>
<tr>
<td>Financial Sector</td>
<td>0.555</td>
<td>0.508</td>
<td>0.835</td>
<td>0.809</td>
</tr>
<tr>
<td></td>
<td>(0.164)</td>
<td>(0.146)</td>
<td>(0.170)</td>
<td>(0.150)</td>
</tr>
<tr>
<td>Imputation</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Degree</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

**Notes:** This table shows the number of households who bunch computed in two ways. Columns (1)-(4) present bunching estimates using the parametric approach, see Equation (2). Standard errors are estimated by a parametric bootstrap procedure. Columns (1) and (3) estimate a seven-degree polynomial as the counterfactual density, while (2) and (4) fits a cubic function. Columns (5)-(6) compute bunching estimates in in accordance with Equation (4), with $\delta = 40,000$. The counterfactual density in the latter approach is obtained using third-party reported net wealth at the kink, as described in the text. Here, standard errors are estimated using a non-parametric bootstrap procedure, in which new distributions of paired third-party reported net wealth and taxable net wealth are drawn with replacement from the true distribution. The standard error of each estimate is the standard deviation of the distribution of the $\hat{b}$s. Imputation refers to the method of handling missing values described in Section 3. High-IQ and low-IQ households are defined as the male having, respectively, positive and negative z-scores in cognitive ability. In case of two men filing the tax together, I take the average. High education refers to whether any of the household members have tertiary education longer than one year. Financial sector refers to those households where one member works in the financial sector.
<table>
<thead>
<tr>
<th></th>
<th>Parametric</th>
<th>Non-parametric</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>All</td>
<td>0.127</td>
<td>0.124</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>Couples</td>
<td>0.124</td>
<td>0.118</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Singles</td>
<td>0.129</td>
<td>0.124</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>High IQ</td>
<td>0.102</td>
<td>0.083</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Low IQ</td>
<td>0.088</td>
<td>0.119</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.030)</td>
</tr>
<tr>
<td>High Education</td>
<td>0.108</td>
<td>0.110</td>
</tr>
<tr>
<td></td>
<td>(0.024)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Low Education</td>
<td>0.083</td>
<td>0.083</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Financial Sector</td>
<td>0.115</td>
<td>0.105</td>
</tr>
<tr>
<td></td>
<td>(0.034)</td>
<td>(0.030)</td>
</tr>
<tr>
<td>Imputation</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Degree</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

Notes: This table shows net-of-tax rate elasticities obtained using the estimation procedures in Section 4.1.1 and 4.1.3. The different samples are described in the notes of Table 4. Standard errors are computed with the delta-method.
Table 6: Inheritance and Wealth Growth.

<table>
<thead>
<tr>
<th></th>
<th>DD</th>
<th>RK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) (2) (3) (4) (5) (6)</td>
<td>(7) (8) (9)</td>
</tr>
<tr>
<td>Above × Post</td>
<td>71,099 67,365 69,603</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(44,060) (39,379) (34,167)</td>
<td></td>
</tr>
<tr>
<td>Above × Post × Inh.</td>
<td>0.426 0.230 0.345</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.061) (0.066) (0.040)</td>
<td></td>
</tr>
<tr>
<td>Above × Post × Wealth</td>
<td>0.050 0.065 -0.008</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.078) (0.038) (0.027)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>10,317 10,317 26,543 26,543 58,369 58,369</td>
<td>11,027 27,986 60,820</td>
</tr>
</tbody>
</table>

Notes: This table shows estimates of $\beta_3$ in Equation 5 (Columns 1, 3 and 5) and $\beta_7$ in Equation 6 (Columns 2, 4 and 6). All columns restrict the sample to households receiving positive inheritances. Columns (1)-(2) further restrict the sample to include households with taxable net wealth within SEK 100,000 of the kink. The corresponding intervals for Columns (3)-(4) and (5)-(6), respectively, are SEK 250,000 and SEK 500,000. Columns (7)-(9) present RK estimates for intervals of SEK 100,000, 250,000 and 500,000 around the kink. Standard errors in Columns (1), (2) and (7) are clustered at the SEK 10,000 wealth-bin level. Standard errors in the remaining columns are clustered at the SEK 25,000 wealth-bin level. The years considered are 2001-2004 and the estimates include both singles and couples (with different threshold shifts).
Table 7: Responses to Threshold Shifts.

<table>
<thead>
<tr>
<th>Dep. Var:</th>
<th>Savings (end) (1)</th>
<th>Savings (beg.) (2)</th>
<th>Realizations (3)</th>
<th>Taxable Income (4)</th>
<th>Car Value (5)</th>
<th>New Car Value (6)</th>
<th>Retirement Savings (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Cutoff</td>
<td>2,090.602</td>
<td>1,040.628</td>
<td>-0.001</td>
<td>5,276.845</td>
<td>-2,440.356</td>
<td>-943.619</td>
<td>276.135</td>
</tr>
<tr>
<td>× Post</td>
<td>(1,727.772)</td>
<td>(2,461.803)</td>
<td>(0.008)</td>
<td>(4,102.870)</td>
<td>(1,141.491)</td>
<td>(905.802)</td>
<td>(253.228)</td>
</tr>
</tbody>
</table>


Panel B: Regression-Kink Estimates.

<table>
<thead>
<tr>
<th>Taxable Net</th>
<th>-0.011</th>
<th>0.051</th>
<th>0.012 × 10^6</th>
<th>-0.004</th>
<th>0.057</th>
<th>0.027</th>
<th>-0.006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wealth ×</td>
<td>(0.051)</td>
<td>(0.060)</td>
<td>(0.022 × 10^6)</td>
<td>(0.114)</td>
<td>(0.030)</td>
<td>(0.026)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Above × Post</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Observations | 66,652 | 66,652 | 75,930 | 75,930 | 75,930 | 75,930 |

Notes: Panel A shows estimates of a difference-in-differences equation, similar to Equation 5, but around a different threshold. Here, the sample includes couples over the years 2002-2006, who have taxable wealth within SEK 100,000 below the kink (control) and within SEK 100,000 above (treatment). Observations with extreme values for savings have been removed. Panel B shows estimates of $\beta_7$ in Equation 7, for the same sample. All specifications control for education (six dummies representing two levels of primary school, two levels of secondary school and two levels of tertiary education), county fixed effects and age. Standard errors clustered at SEK 5,000 intervals.
Notes: Section 5 in the figure displays the filing of the wealth tax. The section Tillgångar refers to assets. Taxpayers were supposed to fill in the total value of taxable assets in field 66 if their taxable net wealth exceeded the threshold. The section Skulder refers to liabilities. Taxpayers filled in the total value of liabilities in field 67.
Notes: This formula was appended to the prepopulated tax return. Households were supposed to use this to compute wealth tax liabilities.
Figure 3: Taxable net wealth distribution around the threshold.

Notes: The figure shows the distribution of taxable net wealth around the shift in the tax brackets, demarcated by the vertical at 0, for the years 2000-2006. The dotted series consist of a histogram relative to the normalized kink point. Each bin corresponds to the number of households within SEK 5,000.
Figure 4: Estimated bunching of taxable net wealth at the threshold.

Notes: The figure replicates Figure 3 and adds the estimated counterfactual density, displayed by the solid line in red. The counterfactual density was obtained by fitting a seven-degree polynomial to the density, excluding points within SEK 40,000 below the kink. $b$ denotes the estimated excess mass and $s.e.$ is the estimated standard error.
Figure 5: Estimated bunching of taxable net wealth at the threshold, imputation method.

Notes: This figure replicates Figure 4 but uses the imputation method – which is described in the text – to deal with missing taxable net wealth values.
Figure 6: Taxable net wealth around the threshold, by household status.

(a) Couples

(b) Singles

Notes: These figures present the taxable net wealth distribution for couples and singles, respectively, for the years 2000-2006. The dotted series consist of a histogram relative to the normalized kink point. Each bin corresponds to the number of households within SEK 5,000. The estimated counterfactual density, displayed by the solid line in red, was obtained by fitting a seven-degree polynomial to the actual density, excluding points within SEK 40,000 below the kink. \( b \) denotes the estimated excess mass and \( s.e. \) is the estimated standard error.
Notes: The figure shows the distribution of third-party reported net wealth around the shift in the tax brackets, demarcated by the vertical line at 0, for the years 2000-2006. The dotted series consist of a histogram relative to the normalized kink point. Each bin corresponds to the number of households within SEK 5,000. The estimated counterfactual density, displayed by the solid line in red, was obtained by fitting a seven-degree polynomial to the actual density, excluding points within SEK 40,000 below the kink. \( b \) denotes the estimated excess mass and \( s.e. \) is the estimated standard error.
Figure 8: Does bunching track the tax? Bunching in 2001 and 2006.

(a) 2001

(b) 2006

Notes: These figures present the taxable net wealth distribution for singles in 2001 and 2006. The figure shows the kinks in 2001 and 2006, located at SEK 1 million and SEK 1.5 million, respectively. The additional vertical lines represent the position of the 2001-kink if it followed - from the left to the right - inflation, the riskfree interest rate or a stock market index return, respectively. The inflation data was obtained from Statistics Sweden, the riskfree interest rate and the stock market index return from Sveriges Riksbank.
Figure 9: Capital income losses around the threshold.

Notes: The figure shows the distribution of taxable capital income losses for 1995-2009 around the threshold of SEK 100,000 where the induced marginal tax credit decreases from 30% to 21%. Each bin corresponds to the number of households within SEK 500.
Notes: The figure shows the distribution of taxable net wealth around the shift in the tax brackets, demarcated by the vertical at 0, for previous wealth tax payers. The graph consists of couples and singles in 2002 and 2003 who paid wealth taxes in 2001 and couples in 2005 and 2006 who paid wealth taxes in 2004. The dotted series consist of a histogram relative to the normalized kink point. Each bin corresponds to the number of households within SEK 5,000.
Figure 11: Bunching over time - couples.

(a) 2000 kink

(b) 2001 kink

(c) 2002,2003,2004 kink

(d) 2005,2006 kink

Notes: These graphs show bunching – computed by the non-parametric method – over time at different kinks for couples. In (a), bunching at the threshold of SEK 900,000, which was the threshold in 2000, with a window of SEK 25,000 is displayed. (b), (c) and (d) present similar graphs for bunching at thresholds corresponding to the years 2001, 2002-2004 and 2005-2006, respectively. All graphs additionally plot bunching at placebo kinks of SEK 2.5 million and SEK 3.5 million. All bunching estimates are computed using the imputation method.
**Figure 12:** Taxable net wealth around the threshold, year by year.

(a) 2000  
(b) 2001  
(c) 2002  
(d) 2003  
(e) 2004  
(f) 2005  
(g) 2006  

**Notes:** These figures plot the empirical distribution of taxable net wealth around the (normalized) kink point year by year. The vertical line denotes the location of the threshold. The counterfactual density, graphed by the solid curve in red, was obtained as in Figure 4.
Figure 13: Changes in Third-Party Reported Wealth and Inheritance.

Panel A shows mean change in third-party reported net wealth from December 31 year $t - 1$ to December 31 $t$ for couples and singles who receive positive inheritance transfers during the year. The blue series comprises households locating within SEK 500K below the 2001-kink (which is SEK 1m for singles and SEK 1.5m for couples) and who thus never pay the tax. The red series corresponds to households locating within SEK 500K above the cutoff and thus pay the tax in 2001 but not thereafter.

Panel B is constructed as follows. I take the change between third-party reported wealth as in Panel A (y-axis) and plot it against taxable wealth in $t - 1$ plus inheritances received during the year (x-axis) for those who receive positive inheritance transfers and had changes in third-party reported wealth within the 5th and 95th percentile of the wealth growth distribution. Each bin corresponds to the number of households within SEK 25,000, and each dot represents the mean in that bin.

Figure 14: Taxable Wealth and Received Inheritance.

Panel A shows the distribution of taxable wealth in year $t - 1$ plus inheritances received during the year around the normalized kink point. Each bin corresponds to the number of households within SEK 10,000. Panel B shows mean inheritance transfers received for couples and singles locating within 500K below the kink (control) and within 500K above the kink (treatment).
Notes: The figure shows simulated wealth over the lifecycle for thousand individuals according to the dynamic model laid out in Equation (13) in the case without a wealth tax (Panel A) and with (Panel B). The y-axis represents wealth and the x-axis age. The blue boxes show the wealth interval, for each age, between the 25th and the 75th percentiles. The central mark in each box is the median. The dashed interval represents the rest of the wealth support for each age group. In the lower plot, a wealth tax of 0.015 % is paid on wealth above 1.5.

Notes: The figure shows the distribution of wealth without (Panel A) and with (Panel B) a wealth tax around the threshold of 1.5. In constructing these figures, I assume that there are thousand individuals alive in each cohort rendering a total population in the economy of 61,000.
Figure 17: Wealth Distributions Upon a Reform Shift.

(a) One Year After  
(b) Two Years After  
(c) Three Years After  
(d) Five Year After  
(e) Ten Years After  
(f) Thirty Years After  

Notes: These graphs show the simulated distributions of wealth after implementing a permanent and unexpected wealth tax. The number of individuals alive in the economy is 61,000 and is the same in each graph.
Figure 18: Savings and the Wealth Tax.

(A) Savings Around the Kink

(B) Savings Around the Kink

(C) Savings Around the Kink, 2002-2006

(D) Savings Around the Kink, 2002-2006

(E) Savings Above and Below the Kink, 2002-2006

(F) Savings Above and Below the Kink, 2002-2006

Notes: Panel A shows active savings in SEK against taxable wealth around the tax threshold for all singles and couples during 2000-2006, when rebalancing is assumed to occur at the end of the year. Panel B presents the analogue when rebalancing takes place at the beginning of the year. To remove noise, I first regress, respectively, savings and wealth on year dummies. I take the residuals from these regressions and add back the mean. Each dot corresponds to mean savings within a wealth bin of 25,000. Observations with extreme values for savings (above SEK 500,000 and below −125,000) have been removed. The solid lines are best-fit lines on either side of the threshold.

Panels C and D restrict the sample to include couples during 2002-2006 and show saving around the threshold dynamically. The dashed line shows the location of the threshold during 2002-2004. The blue series show savings for that time period and the red series denote 2005-2006. Each dot corresponds to mean savings, controlling for year fixed effects. Observations with extreme values have been removed and each observation shows mean savings within a bin of SEK 25,000.

Panels E and F, finally, show savings over time for couples within SEK 100,000 below the kink (control) and above (treatment).
**Figure 19: Realizations of Capital Gains or Losses, Taxable Wealth and the Wealth Tax.**

(a) **Realizations Around the Kink**  
(b) **Taxable Income Around the Kink**

(c) **Realizations Around the Kink, 2002-2006, Couples**  
(d) **Taxable Income Around the Kink, 2002-2006, Couples**

(e) **Realizations Above and Below the Kink, 2002-2006**  
(f) **Taxable Income Above and Below the Kink, 2002-2006**

**Notes:** Panel A shows the fraction of couples and singles who realize capital gains or losses against taxable wealth for 2000-2006. Panel B presents the corresponding graph with taxable income on the y-axis. Panel C and D restrict the sample to couples filing the tax jointly and 2002-2006. I first regress, respectively, the indicator of realizing capital gains or losses, taxable income and wealth on year dummies. I take the residuals from these regressions and add back the mean. The graphs show realizations and taxable income around the 2002-kink for the years 2002-2004 in blue and for 2005-2006 in red, controlling for year fixed effects. In Panels A, B, C and D, each observation shows mean within a bin of SEK 25,000. Panel E and F show realizations and taxable income over time for couples locating above the kink in red (treatment) and below the kink in blue (control).
Figure 20: Cars and Taxable Wealth.

(A) Value Cars Around the Kink

(B) Value New Cars Around the Kink

(C) Value Cars Around the Kink, 2002-2006

(D) Value New Cars Around the Kink, 2002-2006

(E) Value Cars Above and Below the Kink, 2002-2006

(F) Value New Cars Above and Below the Kink, 2002-2006

Notes: Panel A shows mean value of cars (in SEK) against taxable wealth around the threshold for all couples and singles during 2000-2006. Section 3 explains how the car value was calculated using the car brand, model and vintage. Panel B replicates A but restricts the value to only include cars purchased during the current year. Mean values in Panel B are lower because fewer households buy cars each year. Panel C and D restrict the sample to couples filing the tax jointly in 2002-2006. I first regress, respectively, the value of cars, the value of new cars and wealth on year dummies. I take the residuals from these regressions and add back the mean. The graphs show mean car value and mean value of new cars around the 2002-kink for the years 2002-2004 in blue and for 2005-2006 in red, controlling for year fixed effects. In Panels A, B, C and D, each observation shows mean within a bin of SEK 25,000. Panel E and F show car value and value of new cars over time for couples locating above the kink in red (treatment) and below the kink in blue (control).
Figure 21: Self-reporting of Cars.

(A) Reporting Cars

(B) Reporting Newly Purchased Cars

Notes: Panel A shows the fraction of car-owning households who self-report more assets than their cars are worth against taxable wealth close to the tax cutoff for the years 2000-2006. Panel B replicates Panel A but restricts the sample to households who purchased cars during the year. Each bin corresponds to taxable wealth of SEK 25,000. Each dot corresponds to mean of the fraction reporting more within a taxable wealth bin of 25,000.

Figure 22: Wealth Around the Threshold for Car Owners.

(A) Third-Party Reported Net Wealth

(B) Taxable Net Wealth

Notes: Panel A shows the distribution of taxable net wealth around the shift in the tax brackets, demarcated by the vertical at 0, for the years 2000-2006 for households who own no cars. Panel B shows the distribution of third-party reported wealth around the threshold for the same sample. The dotted series consist of a histogram relative to the normalized kink point. Each bin corresponds to the number of households within SEK 5,000.
Figure 23: Avoidance Responses and Taxable Net Wealth.

(a) Retirement Savings Around the Kink

(b) Retirement Savings Around the Kink, 2002-2006

(c) Retirement Savings Above and Below the Kink, 2002-2006

Notes: Panel A shows retirement savings in SEK for couples and singles during 2000-2006. Panel B restricts the sample to couples filing the tax jointly in 2002-2006. I first regress, respectively, retirement savings and wealth on year dummies. I take the residuals from these regressions and add back the mean. The graphs show retirement contributions around the 2002-kink for the years 2002-2004 in blue and for 2005-2006 in red, controlling for year fixed effects. Each observation represents mean savings in a bin of SEK 25,000. Panel C shows contributions over time for couples locating above the kink in red (treatment) and below the kink in blue (control).
Notes: The figure shows taxable wealth around the threshold, when non-third-party reported taxable wealth has been imputed and added to households who are not obliged to self-report the value of those assets and liabilities (i.e. for those who do not have third-party reported wealth above the threshold or who do not make self-reported adjustments). To be restrictive, only 10% of the imputed car value has been added to the non-third-party reported wealth. The Swedish Bankers’ Association report that collateralized loans for cars, boats and consumption durables amount to 2.5% of other forms of collateralized debt. 2.5 of the third-party reported debt are thus subtracted from the imputed non-third-party reported assets.