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The Impact of Inheritances on Heirs' Labor and Capital Income*

Mikael Elinder, Oscar Erixson, and Henry Ohlsson

Abstract

The objective of this paper is to study when and how much labor and capital income of heirs respond to inheritances. We estimate fixed effects models following direct heirs, inheriting in 2004, during the years 2000–2008 using Swedish panel data. Our first main result is that the more the heir inherits, the lower her labor income becomes. This labor income effect appears in the years after the heir had inherited and is stronger for old heirs than for young heirs. We also find evidence of anticipation effects that occur before the actual transfer. Our second main result is that the more the heir inherits, the higher her capital income becomes. This effect only appears in the years after receiving the inheritance. It seems to be dissipating after a couple of years.

KEYWORDS: inheritances, windfall gains, labor income, capital income, anticipation

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1 Introduction

Decedents in Europe and the United States have become wealthier and wealthier, leaving larger bequests to their heirs.[1] Knowledge about behavioral effects of inheritances is essential for a wide range of economic questions. The distribution effects of intra-family wealth transfers and effects of inheritance and estate taxation, for instance, depend on how inheritances affect labor supply, consumption and savings decisions.[2] An inheritance tax reduces the amount received by the heir. If inheritances reduce labor supply, then a higher inheritance tax may yield higher income tax revenues. The idea that inheritances depress work effort and encourage spendthrift behavior has been labeled "the Carnegie conjecture" in the economic literature (Holtz-Eakin, Joulfaian, and Rosen, 1993). There are, however, few studies on behavioral responses to inheritances because micro data on inheritances are not easily available. The existing studies have with rare exceptions focused on the United States and used survey data or register-based data covering only the very wealthy.[3]

Sweden differs from the United States in at least two important respects. First, decedents cannot disinherit their children. Second, labor income taxes are higher. These institutional differences are likely to affect the responses to inherited wealth.

We contribute to this literature by using Swedish register-based panel data to study how inheritances affect labor and capital income. Special emphasis is placed on the timing of these responses. A standard life-cycle model of consumption predicts that the timing and magnitude of behavioral responses to inheritances critically depend on whether the inheritance is anticipated or not. Responses in consumption and labor supply will be smoothed over the entire lifetime if inheritances are anticipated. Responses will, on the other hand, take place after receiving the inheritance if the heir does not anticipate the inheritance.

Our data cover individuals who received inheritances in 2004 and include information on the inherited amount, family characteristics, and the heirs' labor and capital income for the period 2000–2008. The average inheritance in our sample

[1] For an excellent description of the evolution of inheritances in France, see Piketty (2011), for estate tax revenue in the United States, see Joulfaian (2011), and for inheritance tax revenue in Sweden, see Ohlsson (2011).

[2] Kopczuk (2009) discusses the implications of transfer taxes. Horioka (2009) discusses inequality aspects of inheritances and bequests.

[3] Holtz-Eakin et al. (1993), Joulfaian and Wilhelm (1994), Weil (1994), Joulfaian (2006), Brown, Coile, and Weisbenner (2010) are studies from the United States on the effects of inheritances on labor supply, consumption and savings. Faria and Wu (2012) study the effect of inheritance on labor supply of entrepreneurs in the United Kingdom.

amounts to about SEK 300,000.[4] This is significantly smaller than the inheritances examined in the earlier studies.

The panel structure of our data allows us to estimate fixed effect models. We can in this way account for unobservable individual characteristics, such as taste for leisure and risk aversion, which may correlate with both the inheritance and the outcome variables. The length of our panel also allows us to consider that the timing of responses to inherited wealth may be different from responses to other wealth shocks. For instance, the deceased's health has usually deteriorated before the death. Important behavioral responses could, therefore, also occur before the demise if heirs spend time caring for their parents.[5] Mourning may also depress work effort. Thoughts about how to incorporate inheritances optimally into the allocation of assets may be put aside for similar reasons.[6] This discussion also suggests that it would be inappropriate to compare responses in heirs' labor and capital income to those of individuals who have not lost a relative. We therefore limit the analysis to individuals who have received inheritances and use variation in the inherited amount to estimate responses in labor and capital income.

We present estimates of the marginal propensity to earn labor income out of wealth, also known as the marginal propensity to consume leisure.[7] It may take time to adjust labor supply in response to a wealth shock. Responses may also occur before receiving the inheritance if the heirs anticipate it. Therefore, it is important to trace the dynamics of the responses from both a theoretical and a policy perspective.

We present estimates for the four years before inheriting, the year when the inheritance is received, and for the four years after inheriting. We find substantial negative impacts of inheritances on labor income in each of the four years after inheriting. On the other hand, there are no effects in the year when the inheritance

[4]The exchange rate has fluctuated around 7 SEK/USD and 9 SEK/EUR during the studied period. A USD bought more SEK in the beginning of our sample period and fewer in the end. The SEK/EUR rate was comparatively stable.

[5]Studies have documented a negative relation between the provision of informal care to elderly parents and labor market outcomes of the children. The outcomes are labor force attachment, earnings, hours of work, etc., see Ettner (1995), Bolin, Lindgren, and Lundborg (2008), Fevang, Kverndokk, and Røed (2012).

[6]Studies have found that the death of a parent is associated with severe grief among adult children - presumably with worse performance at work (Umberson, Wortman, and Kessler, 1992, Umberson and Chen, 1994, Kessler, 1997, Bennedsen, Pérez-González, and Wolfenzon, 2010). Schulz, Mendelsohn, Haley, Mahoney, Allen, Zhang, Thompson, and Belle (2003) find that individuals who provided informal care to their dying parents are likely to show depressive symptoms. They also increase their consumption of antidepressant medicines immediately after the bereavement. A year after the demise the symptoms had, however, returned to levels lower than those prior to the death.

[7]Effects of wealth shocks on labor income also complement the literature on labor income elasticities that focuses on changes in income taxes, Feldstein (see 1995, 1999), Gruber and Saez (see 2002), Kopczuk (see 2005), Blomquist and Selin (see 2010), Saez, Slemrod, and Giertz (see 2012).

is received or the four years before. Our estimates of the marginal propensity to earn labor income after receiving an inheritance range from -0.04 to -0.09. This suggests that labor income decreases by an amount corresponding to 4–9 percent of the wealth increase. The labor income effect is stronger for old heirs than for young heirs.

Our estimates are higher than what has been reported in previous studies of labor income responses to wealth shocks. The magnitudes in these studies suggest that labor income decreases by a corresponding 1 to 2 percent of the wealth increase.[8] We want to provide a more complete picture of how heirs respond to inheritances. We therefore follow Joulfaian (2006) and also present estimates of the marginal propensity to earn capital income.

The theoretical model suggests that if heirs increase their capital income less than what the return on the inheritance would yield, then consumption has increased. In reality, however, there is another possibility. Positive responses in capital income may reflect that capital gains on inherited assets have been realized. Realized capital gains can be used for consumption or be invested in new assets. Both, however, are important behavioral responses that have not been sufficiently studied. [9]

We do not find any responses in capital income before the inheritance is received. We do, however, find large increases in capital income in the years immediately after inheriting. Effects this large suggest that capital gains on inherited assets have been realized.

Our results imply that the short-run increase in capital income tend to outweigh the decrease in labor income. The heirs make themselves better off in terms of leisure as well as consumption possibilities.

Our empirical approach is limited in one respect. The estimates only capture responses to inheritances that were not anticipated prior to 2000, which is the start of our sample period. The individual fixed effects capture the responses taking place before the start of our sample period. We can, however, correlate the estimated individual fixed effects with the inherited amounts in a second step. This is to assess the importance of anticipation effects occurring before our sample period. This way we can separate the responses before the sample period from the responses during the sample period but before the inheritance is received.

[8]Cheng and French (2000) and Poterba (2000) review the literature on the marginal propensity to earn and consume out of wealth. The wealth effects on labor supply and consumption have also been studied using lottery winnings (Imbens, Rubin, and Sacerdote, 2001), stock market returns (Coronado and Perozek, 2003, Juster, Lupton, Smith, and Stafford, 2006, Coile and Levine, 2006), and housing capital gains (Engelhardt, 1996).

[9]Engelhardt (1996) and Juster et al. (2006) discuss the difference between active and passive saving.

The results suggest that the heirs might have reduced their labor incomes already before the start of our sample period. We interpret this as indicating that the inheritances were at least partly anticipated. There is, on the other hand, no evidence of any responses in capital income during the years before the beginning of the sample period.

2 Theoretical framework

Our starting point is a life-cycle model of consumption and labor supply (MaCurdy, 1981) to illustrate how inheritances affect heirs' optimal labor supply, consumption, and savings decisions (Weil, 1996, Joulfaian, 2006). Heirs derive utility from consumption and leisure, which are both assumed to be normal goods. We assume that labor supply is endogenous and that there is a bequest motive.[10] Our focus is on how anticipation, labor income taxation, and liquidity constraints might affect behavioral responses when inheriting.[11]

Suppose that an heir receives an inheritance at the time of the donor's death. The heir, however, knows the size and the time of the transfer already from young age. Such anticipated inheritances will not affect either labor supply (and labor income) or consumption when inheriting. However, the responses to an anticipated inheritance will affect the heir's optimal consumption and labor supply paths already from the beginning of the life-cycle. Consumption will be smoothed over the life-cycle. Similarly, the labor supply response will occur from the beginning of the life-cycle. There will be no change in labor supply at the time of the inheritance. The inheritance will cause a one-to-one change in wealth when received as there will be no changes in consumption or hours worked.

On the other hand, if the inheritance is not anticipated, it will affect labor supply, consumption, and savings. The heir will act as if the inheritance is a windfall gain and there will be discontinuities in the consumption and labor supply paths: The inheritance will increase consumption in each period during the heir's remaining life-time. The labor supply path will follow the same logic with decreasing hours of work. The larger the unanticipated inheritance, the larger is the corresponding response. Consequently, the inheritance will cause a smaller than

[10] The bequest motives might be consistent with joy-of-giving (egoistic) models (Blinder, 1976, Abel and Warshawsky, 1988), altruistic models (Becker, 1974, Barro, 1974), or strategic models (Cox, 1987, Bernheim, Shleifer, and Summers, 1985).

[11] A formal version of the model is provided in the first version of this paper; see Elinder, Erixson, and Ohlsson (2010).

a one-to-one wealth increase when inheriting. An inheritance that is partly anticipated and partly unanticipated can be viewed as two separate inheritances: one that is perfectly anticipated and one that is unanticipated.

Suppose there is a proportional *tax* on labor income. How will changes in labor income tax rates affect labor supply and savings responses to inheritances? An increase in the tax rate further increases the heir's optimal leisure time. In other words, the negative labor supply response will be larger when the tax rate is higher.

People may not always be able to borrow against a future inheritance. One should keep this in mind when using this framework to study responses to inheritances. There will be no consumption and labor supply responses before the inheritance is received if the heir faces binding *liquidity constraints*. This result holds even if the inheritance is perfectly anticipated. It is, therefore, not possible to use responses after the inheritances are received to infer if they are anticipated or unanticipated in this situation. The outcome will be similar if heirs who anticipate the inheritance are risk averse or prudent (Kimball, 1990, Weil, 1996).

3 Institutional context

It is likely that the extent to which an inheritance is anticipated by the heir depends on the institutional context.[12] Succession rules in many European countries, more or less, follow the Roman tradition with restricted testamentary freedom. Parents are prohibited from completely disinheriting a child. Germany, France, and Sweden, are examples of this.[13] Anglo-Saxon countries, e.g., the United States and the United Kingdom, on the other hand, often grant full testamentary freedom. Therefore, it is likely that a larger fraction of received inheritances are anticipated in countries with restricted testamentary freedom. Children are certain to inherit at least a share of the estate if it is positive.[14] This implies that heirs' labor income responses after inheriting may be smaller in Sweden than in the United States.

Sweden and many other European countries, however, have higher marginal tax rates on labor income than the United States. Theoretically, the higher tax rate, the larger the increase in leisure in response to inheritance.

[12]There is a more extensive presentation of Swedish succession rules in the first version of this paper, see Elinder et al. (2010).

[13]Pestieau (2003) is an excellent review of differences in institutions governing inheritances and transfer taxes across countries.

[14]The elderly also face lower risks of large out-of-pocket health care expenses in the final stages of life in countries with generous public insurance systems. This makes a parent's bequeathable wealth more predictable.

Taken together, it is therefore not clear if responses in labor and capital income after receiving an inheritance can be expected to be larger in Sweden than in the United States. Restricted testamentary freedom and high marginal tax rates also give the heirs incentives to reduce their labor income long before the inheritance is received.

This section presents the main rules governing the deceased and heirs in Sweden. The default succession scheme in Swedish civil law implies that closer relatives to the deceased inherit before more distant relatives. The deceased's descendants, i.e., children, grandchildren, etc., are the first in line to inherit.

A surviving spouse does not inherit the deceased's estate if the deceased has children. These children will inherit. A surviving spouse, however, has the right to dispose the estate freely for the remainder of her life if the deceased and the surviving spouse have common children.[15] Common children are referred to as direct heirs with a postponed right to inherit. They have to wait until their second parent dies to receive their inheritances.

More distant relatives will inherit the estate if there are no direct heirs. The estate will go to a public fund, The Swedish Inheritance Fund, if there are no legal heirs and if there is no surviving spouse.

The default succession scheme can be set aside by a will. This is a legally binding document declaring the deceased's last wish on how the estate should be divided. The testator is, however, only allowed to bequeath up to half the estate. The remaining part is divided among legal heirs according to the default succession rules.[16]

The inheritance data we use are collected from estate inventory reports. The estate inventory report provides information about the deceased's complete balance sheet at the time of her death.[17] It served as a basis for the inheritance tax until the tax repeal from 2005.[18]

The estate was reported by those in charge of the estate, usually a surviving spouse or a child for smaller estates, or banks or law firms for large estates. The reported values should be supported by documentation from banks, financial insti-

[15]This has been the rule since the reform of the Marriage Act in 1988 (Brattström and Singer, 2007). Free disposal means that the surviving spouse can spend, but not bequeath, the money.

[16]See Angelini (2009), Table 2, for corresponding rules in other European countries.

[17]The estate inventory report should be prepared within three months after the time of death. It is to be filed with the Swedish Tax Authority within a month after its completion.

[18]The inheritance tax was to be repealed from January 1, 2005. Parliament, however, later changed the repeal date to December 17, 2004. The reason was that many Swedes died in the Asian Tsunami on December 26, 2004. The gift tax was repealed at the same time. Surviving spouses were exempted from tax already from January 1, 2004. The inheritance tax was progressive in two dimensions; first, large inheritances were taxed at higher rates than small. Second, direct heirs faced lower tax rates than more distant heirs.

tutions, real estate agents, etc. Heirs had incentives to underreport the estate value, to lower their tax payments, until the repeal of the inheritance tax. The deceased may also have engaged in tax planning (or evasion) both during life, and shortly before death, (see Bernheim, Lemke, and Scholz, 2004, Joulfaian, 2004, Nordblom and Ohlsson, 2006, Kopczuk, 2007, Eliason and Ohlsson, 2010).

Most assets and debts were to be valued at market prices. For example, financial assets were to be declared according to their market values as of the date of death.

There are, however, reasons to believe that the reported inheritance values until and including 2004 understated the market values of the transfer. There were several exemptions from the principle of market prices. The most important exception concerned real estates. The tax value of this asset was supposed to be 75 percent of the market value. Any assets that were realized by the estate manager before the actual estate division were valued at market prices. Heirs, therefore, had tax incentives to postpone realization of capital gains on real estate until the estate was divided.

It is an option, not an obligation, to inherit according to Swedish law. Heirs can never be forced to pay the debts of estates in deficit. In many situations, *inter vivos* gifts are regarded as inheritances received in advance. The law defines when and how such transfers should be taken into account when dividing an estate. The objective is to ensure that succession rules are not circumvented by *inter vivos* gifts.

4 Data and empirical strategy

It is difficult to obtain inheritance data of high quality. Inheritance data from surveys are likely to be influenced by errors such as recall biases (Brown et al., 2010) and underreporting (Kurz, 1984, Juster, Smith, and Stafford, 1999). Administrative tax records have more precisely measured data. The disadvantage is that the value of an inheritance (or an estate) needs to be above a certain threshold to be taxed (Behrman and Rosenzweig, 2004). It is therefore not possible to draw conclusions for individuals who are not affected by the taxation. The threshold for taxation was very low in Sweden. Administrative data on inheritances in Sweden, therefore, cover a much larger part of the population of heirs than in the United States.

We use a dataset of decedents and heirs that was originally collected from *the Swedish Tax Authority's Inheritance Tax Register*. The objective was to study the incidence and the determinants of unequal sharing of bequests between heirs (Ohlsson, 2007). To make data collection feasible, the sample was limited to dece-

dents registered in the City of Stockholm who passed away in 2004 and their heirs.[19] The sample was also limited to deceased who had a will, more than one child, and a positive estate, as these are necessary conditions for unequal sharing. In addition, the sample only includes decedents who were not married at the time of their death. This was done to avoid the uncertainties in estate division that might appear when there is a surviving spouse.[20]

While this is not a perfectly representative sample of decedents and heirs, we still believe that it is appropriate for this study. The decedents and the heirs are relatively wealthy. It is therefore less likely that the heirs are liquidity constrained. Furthermore, most heirs are in their prime age making it likely that they have good access to credit markets. This is an advantage. It should be noted, however, that being relatively wealthy in Sweden is quite different from being very wealthy in the United States. The average estate in our sample is about twice as large as the average net worth in the Swedish population (Berg, 2006). Kopczuk and Saez (2004) reports that the average net worth of the two percent of the decedents who file estate tax returns in the United States is more than 13 times higher than average wealth.

The complete sample contains 232 decedents and 820 heirs. The estates were divided up in inheritances transferred to 573 children, 176 grandchildren, 8 partners, 45 relatives, and 18 other individuals and charities. Few lots go outside the family. This suggests that testators tend to follow the principles of the default succession rules. The dataset has information on the net worth of the estate, the value of each inheritance received by the heirs, and data on possible taxable *inter vivos* gifts made by the decedent to each heir during the last ten years.

We have added data on annual labor income, capital income, self-employment income, taxable wealth, and real estate wealth for decedents and for heirs. These data come from *the Tax Authority's Register of Final Tax on Income*. This concerns the nine years 2000–2008 for the heirs. Taxable wealth is measured on a household basis, whereas the other variables are measured at the individual level. Demographic characteristics, such as sex, marital status, year of birth, number of children, place of residence etc., have been collected from *the Tax Authority's Total Register of the Population*.

We study responses to inheritances in a sub-sample of heirs who were between 21 and 59 years old in 2004. There are three reasons for this. First, we want to separate labor income responses from normal retirement and education decisions. Second, we do not want to include retired heirs. People tend to spend down their wealth after retirement and this might result in negative saving. Third, we do not

[19]The data were collected manually from estate reports at the Uppsala Tax Office.

[20]We can expect that individuals who no longer have any parents alive do not anticipate any large inheritances in the future. This is an advantage for this study.

want to include heirs who are minors during the sample period.

We only include direct heirs (children) in our sample. The responses of other heirs could be quite different. It becomes more clear to which population our results generalize when the sample is limited to direct heirs.[21] We have complete observations for every year for about 96 percent of the heirs. We lack income data for at least one year for the remaining 4 percent. This leaves us with an unbalanced panel of 374 direct heirs and 3,310 observations during 9 years.

The reported inherited amount is our main explanatory variable. It is calculated as the amount inherited by the heir excluding *inter vivos* gifts.[22] The amount is also net after taxes.

Ideally we would have preferred to have data on hours worked, effort, and wage rates. This is not possible, so we use taxable labor income instead. Taxable labor income includes salaries, social insurance benefits (sickness, parental, and unemployment), and pension payments. This, in some sense, captures aspects of hours worked, effort, and wages. Changes in taxable labor income are likely to reflect conscious decisions. It is desirable from a tax revenue perspective to use taxable labor income, since the effects on tax revenues come via taxable income.

Capital income includes interest received on financial assets, dividends, and realized capital gains minus interest paid on loans and realized capital losses. Capital income is the result of past and present savings and investment decisions. It is taxed independently of how long a particular asset has been held. Capital gains are only taxed when realized. The capital income tax rate has been 30 percent throughout the sample period.

One can think of using capital income to calculate an approximate measure of wealth.[23] The analysis could then be done using wealth rather than capital income. We would, however, need to assume rates of return on assets. This is difficult since we do not have information about the heirs' portfolios composition. Returns on different assets have also varied substantially during the sample period.

[21]The original data contained one decedent with a very considerable estate. The heirs of this estate have been excluded from the analysis.

[22]Gifts are excluded because only gifts that have been declared for taxes are reported in our data. Furthermore, we do not know when they were received.

[23]The correlation between taxable wealth in period $t-1$ (for those with taxable wealth) and capital income in period t is 0.21. This is statistically significant at all conventional levels.

4.1 The heirs

Table 1 provides descriptive statistics for the heirs.[24] Inheritances vary between zero and SEK 2,6 million with an average value of SEK 300,000.[25] The P90:P10 ratio shows that those in the top of the distribution inherit around 12 times more than those at the bottom. The heirs have an annual labor income of on average SEK 310,000 in 2003. Inheritances are, on average, almost as large as average annual labor income. This suggests that inheritances may considerably influence economic behavior.

The heirs in our sample are on average 50 years old when inheriting.[26] Women are in slight majority and about half of the heirs are married. Heirs have, on average, 1.45 siblings and 1.75 children. Almost all the direct heirs in the sample, 96 percent, are children of the decedents.[27] Furthermore, 75 percent of the heirs live in Stockholm County.

Our sample of heirs is not completely representative for the entire population of Swedes. These heirs have more siblings than Swedes on average.[28] This is a consequence of the sampling criteria. They also earn more. The corresponding mean in labor income for Swedes aged from 21 to 64 was 219,800 in 2003.

There is one clear advantage of having a sample with wealthier decedents and higher income heirs than Swedes on average. It is less likely that our heirs face binding liquidity constraints. Otherwise, such constraints might confound the interpretation of our empirical results.

4.2 Empirical challenges and estimation framework

We guide our estimation strategy by visually inspecting how labor income and capital income evolve over the sample period. We observe labor and capital income for

[24]Descriptive statistics for the decedents are presented in Appendix A.

[25]Estates are reported in the 2004 price level. All amounts reported in the paper are, therefore, deflated to the 2004 price level. Inflation was low during the studied period. The CPI increase from 2000 to 2008 was 14.6 percent. The year by year CPI increases were: 2.4 percent (2001); 2.2 percent (2002); 1.9 percent (2003); 0.4 percent (2004); 0.5 percent (2005); 1.4 percent (2006); 2.2 percent (2007); 3.5 percent (2008).

[26]This is considerably older than in previous studies. The heirs in Joulfaian and Wilhelm (1994) are 42 years old on average. Holtz-Eakin et al. (1993) and Joulfaian (2006) report average ages of 39.

[27]The remaining 4 percent are grandchildren. We have only included grandchildren when they are direct heirs. Grandchildren become direct heirs when a child of a decedent is already deceased. Omitting grandchildren does not affect the empirical results.

[28]Blomquist (1979) report that the inherited amount is inversely related to the number of children of the deceased.

Table 1: Descriptive statistics for the heirs.

	Mean	S.d.	Median
Inheritance, 2004	299.3	313.4	192.3
Age, 2004	49.97	7.88	50
50 years and older in 2004, percent	55		
Male, percent	47		
Married, percent	52		
Number of siblings	1.45	0.69	1
Number of children	1.75	1.10	2
Direct heir child of the deceased, percent	96		
Living in Stockholm County, percent	75		
Labor income, 2003	311.3	231.5	269.7
Capital income, 2003	-1.3	64.5	-4.3
Self-employment income, 2003	7.7	61.8	0
Share with taxable wealth in 2003, percent	20		
Taxable wealth, 2003[a]	2,468	1,974	2,114
Share with taxable real estate in 2003, percent	68		
Taxable real estate, 2003[b]	972	1,341	701
Share with taxable gift(s), percent	8		
Value of gift(s), 2004[c]	241.9	274.3	155
Number of observations	374		

Notes. Amounts are measured in SEK thousands, price level 2004.
[a] the value is conditional on having taxable wealth,
[b] the value is conditional on having taxable real estate,
[c] the value is conditional on having received a gift.

each heir in the sample during four years before the decedent passed away (2000–2003), the year when the decedent died (2004), and the following four years (2005–2008).

We classify heirs into two groups: The high inheritance group consists of heirs with inheritance higher than the sample mean (SEK 299,000). Those with inheritances below the sample mean are classified as the low-inheritance group. We then compute sub-sample means for inheritances in the two groups.[29] The question is: Do the two groups differ in labor income and capital income responses?

The two lines in Figure 1 show how labor income evolves for the heirs in the two inheritance groups. We first observe that those who inherit less have higher labor income on average than those who inherit more. This result perhaps surprises some. It might be expected that inheritance amounts would be positively correlated with the heir's earnings potential. However, those who inherit more might also have anticipated a larger inheritance. They therefore have had stronger incentives to reduce their labor supply long before the actual inheritance is received.

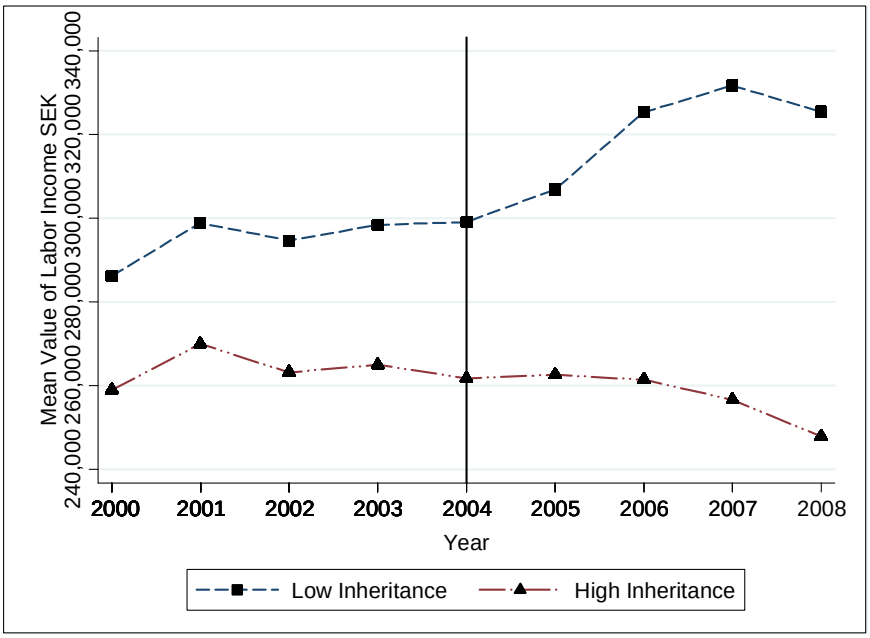
Figure 1 also shows that the two groups have similar labor income trajectories in the pre-inheritance period, although the levels differ. Labor income in the high inheritance group declines gradually for all years after the inheritance is received. On the other hand, labor income in the low-inheritance group increased dramatically up to 2007. This pattern is consistent with a situation in which those in the high inheritance group inherit more than anticipated. It is also consistent with the low inheritance group inheriting less than what they anticipated. We emphasize, however, that Figure 1 shows the unconditional means. The differences between the groups do not necessarily reflect causal effects of inheritances.

Figure 2 shows how capital income evolves during the sample period. The capital income trajectories of the two groups are similar during the pre-inheritance years. Capital income increases from zero to almost SEK 48,000 in 2004, when the inheritances are received. The inherited amount in itself may explain the dramatic surge. Some heirs may decide to realize inherited capital gains, for instance, to re-optimize their asset composition.

The financial upturn starting in 2004 may also explain the increase in capital incomes. The Riksbank's decrease of the repo rate from 2.75 in 2003 to 2 percent in 2004 could also contribute to higher capital incomes for the heirs who had debt. Capital income in the low-inheritance group decreases in 2005. On the other hand, the high-inheritance group's capital income continues to rise. Capital income increases for both groups in the subsequent years followed by a dramatic fall in 2008. The difference between the two groups almost disappears as a consequence.

[29] We exclude heirs with incomes outside 1.96 standard deviations from the sample mean.

Figure 1: Annual labor income 2000–2008.
Note. The solid vertical line indicates the year when inheritance is received.



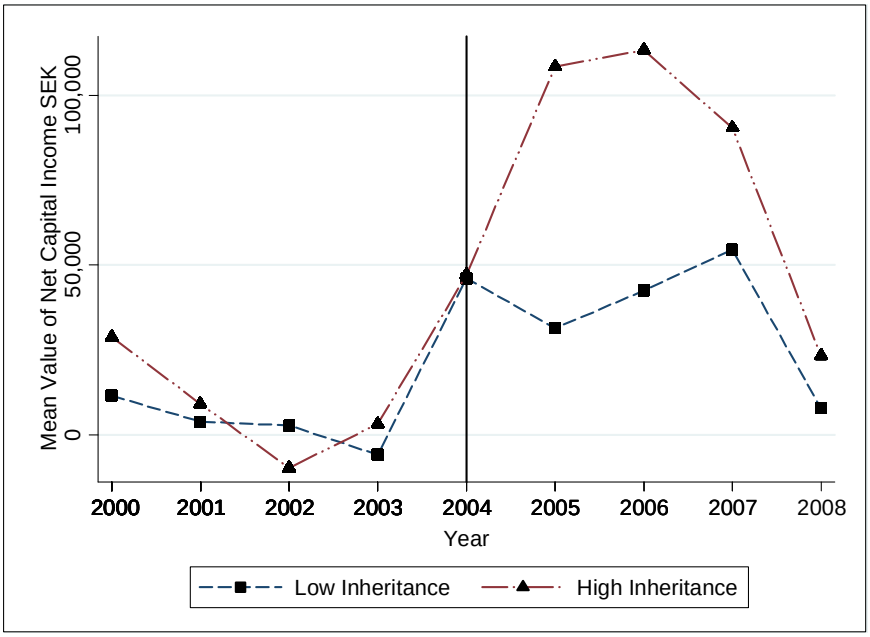


Figure 2: Annual capital income 2000–2008.
Note. The solid vertical line indicates the year when inheritance is received.

There are at least two plausible explanations for why capital incomes converge. First, the stock market share of wealth is increasing in wealth (Guiso, Haliassos, and Jappelli, 2002). The financial crisis in 2008 might therefore have hit wealthier heirs harder. Second, those who inherited more may also have had a larger share of their wealth invested in assets that yield little or no cash flow, e.g., residential real estate.

It is clear that the two groups follow the same trends in labor and capital income in the years before the inheritance was received. This is, however, not a formal test. The observed differences during the post-inheritance period may depend on differences in inherited amounts. But the observed differences may also depend on differences in the heirs' characteristics, characteristics that are correlated with the inherited amount. We need a more thorough econometric analysis to test this. We will, therefore, now turn to the empirical model.

4.3 Empirical model

It is reasonable to believe that heirs differ in unobservable characteristics, such as taste for leisure, risk aversion, early family upbringing, ability, etc. This may affect their behavior and, therefore, also their labor and capital income. Cross section analysis is likely to yield upward-biased estimates of the labor and capital income responses if, for example, inheritances are positively correlated with unobserved income potential. We deal with this type of omitted variable bias by estimating models with individual fixed effects. This approach is similar in spirit to a difference-in-differences approach. Individuals inheriting different amounts serve as counterfactuals to each other in our approach.

Suppose that one heir inherits more than another heir. It is crucial for our approach that these two heirs would have had the same labor or capital income had they inherited the same amount. This is necessary for obtaining unbiased estimates, at least conditional on a fixed effect. We cannot test this assumption. Figure 1 and Figure 2, however, indicate that this assumption is reasonable. The labor income trajectories of the high- and low-inheritance groups follow the same trends before the year when the inheritances are received. The same is also true for the capital income trajectories.

We start by running different versions of the following regression to explore the effects of inherited amounts on our dependent variables:

$$y_{it} = \sum_{t=2000}^{2008} \delta_t I_{i2004} + \beta X_{it} + \theta_t + a_i + u_{it}, \qquad (1)$$

where y_{it} is individual i's labor or capital income in year t. The sample period is $t =$ 2000 through 2008. These variables are both measured in SEK. The main variable of interest is the inherited amount, I_{i2004}. It is also measured in SEK. We interact the inherited amount with year indicators to estimate the annual responses of our dependent variables. The vector X_{it} includes controls for a third order polynomial in age,[30] and in some specifications, also individual specific trends. We want to avoid having differences in age-related factors (e.g., human capital, labor market experience, and job tenure) bias our estimates.

We include a full set of year dummies, θ_t, to capture time effects such as macroeconomic changes etc. Moreover, a_i captures an individual fixed effect. This includes factors that are assumed to be constant over time and correlated with the inherited amount and the dependent variables. We also report results from specifications where we control for individual-specific linear time trends.

The idiosyncratic error u_{it} is assumed to be uncorrelated with I_{i2004}, X_{it}, and a_i. We cluster the standard errors on the family level to allow for within-family correlation of the error term. The F and t statistics are valid under these assumptions. We can consistently estimate δ_t as the annual marginal causal effect of an additional SEK inherited.

Our theoretical model suggests that the individual fixed effects capture responses to the anticipations of inherited amounts formed before the studied period. This implies that δ_t, $t = 2000, \ldots, 2003$, capture responses to updated anticipations of inherited amounts.

On the other hand, δ_t, $t = 2004, \ldots, 2008$, capture responses to inherited amounts that were not anticipated at the time when the inheritance was received. The annual effects δ_t, in other words, underestimate the total causal effects if inheriting was anticipated before the studied period. Therefore, we also test for early anticipation effects by correlating the estimated individual fixed effects from the empirical model (1) with the inherited amounts.

5 Results

Subsection 5.1 presents the main regression results for labor income and several robustness tests. Corresponding results for capital income are in Subsection 5.2. The estimated coefficients of the inheritance-year interaction variables are the parameters of prime interest. We choose 2003, the year before the deceased passed away, as the reference year. We present the results from the tests for pre-sample period anticipation effects in Subsection 5.3.

[30] The first order polynomial term is omitted since it is colinear with time.

5.1 Labor income

Table 2, column 1, reports small and statistically insignificant effects of the inherited amount on labor income in the years before the inheritance was received. This suggests that anticipation effects are either small or that the heir has adjusted her labor income already before the start of our sample period. We also do not find any statistically significant effects the year when the inheritance is received. We cannot, however, observe the exact dates when the estates are divided and the inheritances are transferred to the heirs. A possible explanation for the insignificant effect is that many inheritances were received late in 2004 (or even early in 2005). Therefore, these inheritances may have had relatively small effects on the labor income in 2004. The estimated coefficients for the subsequent years 2005–2008 are economically and statistically significant. Heirs use some of their newly obtained wealth to increase their consumption of leisure as expected.

The estimated effect of the interaction term for 2005 is that labor income decreases by SEK 0.048 for each additional SEK received. The estimated responses are almost twice as large the following two years. The results suggest that it takes time for the responses to materialize in labor income.

Assuming that the response in 2008 reflects a new optimum, we can approximate the effect on the life-time income of the heir. On average, the heirs are 50 years old and the inheritances are SEK 299,000. Therefore, the coefficient estimate for 2008 implies that average annual after tax labor income decreases by approximately SEK 14,400.[31]

Suppose that we also assume that heirs retire at age 65 and that there is no time discounting. A back-of-the-envelope calculation then suggests that the impact on life-time labor income corresponds to about 72 percent of the inherited amount. The impact of the inherited amounts on labor income is large. We also see that the coefficients of the age variables are imprecisely estimated. A Wald-test, however, tells us that the age variables are jointly significant at the ten percent level.

There is a potential drawback with our empirical model (1). It does not allow for heirs to have different trends in labor income growth. This was also mentioned when discussing Figure 1. Although average wage increases in Sweden were moderate during our sample period, income growth may still differ substantially between socioeconomic groups.

Therefore, we also include individual specific linear trends in our empirical model. Column 2 in Table 2 presents the results. Although the coefficient estimates are somewhat smaller in absolute magnitude than the baseline estimates in

[31] We assume that the average heir pays 30 percent in labor income tax. This is a plausible assumption as most heirs in our sample were in this labor income tax bracket in 2004.

Table 2: Labor income.

	1	2	3 young heirs, 21−49	4 old heirs, 50−59
Inherited amount*Year				
2000	-0.028	-0.038	0.016	-0.064
	(0.029)	(0.027)	(0.024)	(0.043)
2001	-0.038	-0.046*	0.008	-0.074*
	(0.029)	(0.027)	(0.019)	(0.043)
2002	-0.012	-0.016	-0.001	-0.025
	(0.019)	(0.018)	(0.019)	(0.023)
2003, reference				
2004	-0.026	-0.022	-0.002	-0.042
	(0.018)	(0.018)	(0.019)	(0.028)
2005	-0.048**	-0.040*	-0.017	-0.069***
	(0.021)	(0.022)	(0.027)	(0.022)
2006	-0.092***	-0.080***	-0.100	-0.091***
	(0.029)	(0.030)	(0.066)	(0.023)
2007	-0.085***	-0.070**	-0.038	-0.114***
	(0.024)	(0.027)	(0.033)	(0.031)
2008	-0.069***	-0.049*	-0.033	-0.091***
	(0.021)	(0.028)	(0.034)	(0.025)
$Age^2/100$	-13.9	-11.2	-13.3	-1,715
	(79.1)	(77.9)	(142.9)	(1,456)
$Age^3/10,000$	-2.90	-4.91	-8.26	1,006
	(56.68)	(55.82)	(120.05)	(881)
Constant	692	3,658	571	34,662
	(1,240)	(3,554)	(1,593)	(28,698)
Individual fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Individual specific time trends	No	Yes	No	No
Number of heirs	374	374	150	224
Number of obs	3,310	3,310	1,326	1,984

Notes. Amounts are measured in SEK thousands, price level 2004.
Standard errors are clustered on family.
* significant at the 10 percent level, ** significant at the 5 percent level,
*** significant at the 1 percent level

column 1, this exercise largely confirms our previous findings.

Our theoretical approach suggests that the magnitude of responses to inheritances depends negatively on the length of the heirs' remaining lifetime. Fewer remaining years to live lead to fewer years during which the inheritance can be consumed. We would, therefore, expect labor income responses to be larger for old heirs than for young. We have estimated separate models for young and old heirs to test for this. The threshold age is 50.

The results, presented in Table 2, suggest that old heirs (column 4) reduce their labor income more than young heirs (column 3). This result is in accordance with our hypothesis. Imbens et al. (2001) report similar results for lottery prize winners.

In Appendix B, Table 6, we present results from a set of specifications similar to those presented in Table 2. The difference, however, is that we let the entire pre-inheritance period (2000–2003) be the reference period. Regarding the results, we note first of all that the coefficient estimates become smaller in size. Moreover, we see that the responses in 2005 become statistically insignificant as a result of this change in reference period. However, the main finding, that inheritances reduce labor income, remains.

A related literature studies if receiving an inheritance enables the heir to become an entrepreneur by relaxing liquidity constraints. The results are clear-cut: Inheriting increases the probability of starting a business (Holtz-Eakin, Joulfaian, and Rosen, 1994a,b, Lindh and Ohlsson, 1996, Blanchflower and Oswald, 1998, Hurst and Lusardi, 2004). It also improves the performance of existing businesses.

Our labor income measure does not include income from small businesses and sole proprietorships. This is a limitation. We have information about the heirs' self-employment income; however, only about 12 percent of the heirs in our sample report this type of income. Therefore, it would not be fruitful to perform a separate analysis of self-employment income.

Instead, we have calculated an extended labor income variable by adding self-employment income to labor income. We have estimated the empirical model with extended labor income as dependent variable; see the Appendix B, Table 7, column 1. The results are both quantitatively and qualitatively similar to those for labor income.

The labor income distribution is positively skewed. We have accounted for this by estimating the empirical model with the logarithm of labor income as dependent variable. The results are similar to the main results in Table 2. Table 7, column 2, in Appendix B reports the results.

The results are also robust to specifications where we limit the sample to heirs with labor income within 1.96 standard deviations from the sample mean. We report the details in Table 7, column 3, in Appendix B.

We pointed out in Section 3 that real estate wealth is declared according to its tax value in the estate inventory report. This implies that the reported values of inheritances of real estate in our sample are below the market value. Suppose that we adjust the inheritances to reflect market values rather than the reported values. How will our previous results change? We will now come closer to the true effect. The previously understated estate value, leading to upward biased coefficient estimates, is corrected.

We divide the tax value of real estate with the factor 0.75 to get the market value. The difference between the market value and the reported value is then distributed equally between the legal heirs of each donor. We calculate the average inherited amount at market value to SEK 330,000. Estimating the empirical model (1) using the inherited amount at market value, however, yields results that are akin to those presented in Table 2. Table 7, column 4, in Appendix B presents the detailed results.

We have also estimated the empirical models without any age restrictions; see Table 7, column 5, in Appendix B. It is reassuring that these estimations give virtually the same results as the baseline specification. (The statistically insignificant coefficient estimate for 2005 is the exception.)

The responses to inheritances may, as discussed earlier, be affected by liquidity constraints. We estimate separate models for heirs with positive and negative capital income in 2000 to study the potential impact of liquidity constraints. The idea is that heirs with positive capital income are less likely to be liquidity constrained. We use capital income as early as in 2000 to reduce the risk of capital income being endogenous with respect to the inheritance. Larger responses for heirs with negative capital income than for heirs with positive capital income suggest that liquidity constraints are important. However, we find slightly smaller responses for heirs with negative capital income. We conclude that our results are not likely to be driven by liquidity constraints. The results are presented in Appendix B, Table 7, columns 6 and 7.

We conclude that the inherited amount affects the heir's labor income negatively during all the four years following the transfer. In other words, we find that the negative impact of the inherited amount lasts a long time. This is contrary to the findings of Joulfaian and Wilhelm (1994) but similar to those with respect to lottery winnings in Imbens et al. (2001). Our findings suggest that the inherited amount is at least partly not anticipated. The succession rules guarantee each direct heir a share of the estate. Inheriting *per se* is, therefore, expected. However, our results are not consistent with the inherited amounts being perfectly anticipated. The relatively large responses are consistent with the theoretical prediction that high marginal tax rates create disincentive effects.

5.2 Capital income

We proceed by estimating responses in capital income. Column 1 in Table 3 shows that there are no statistically significant effects during the pre-inheritance years or the year when the inheritance was received. It is possible that the insignificant response in 2004 has to do with insufficient adjustment time for labor income. We find that the response in 2005 is positive and statistically significant at the 1 percent level. This is consistent with our predictions.

The coefficient estimate suggests that capital income in 2005 increases by 27.5 percent of the inherited amount. We consider this response non-trivial. A large immediate response is, however, reasonable if the heirs decide to realize capital gains to increase consumption or to re-optimize the portfolio. The undervaluation of the inherited amount may also partly explain the sizeable effect.

Let us turn to the years 2006–2008. The estimated coefficients are positive and statistically significant on at least the 10 percent level. Capital income responses first decline gradually and then drop sharply in 2008, the last year of the sample period. However, without detailed information on the heirs' asset holdings, it is difficult to say how important the financial crisis is for this drop. We also note that the coefficients on the age polynomials are both individually and jointly insignificant. The stock market return was unusually high during the post-inheritance years, except for 2008. We may, therefore, find estimates that are higher than otherwise if heirs' held stock.

Our estimates, nevertheless, suggest that the heirs' capital income increases substantially for up to three years after the transfers. Suppose that capital income in 2007 reflects a new steady state. The average inherited amount will lead to a SEK 38,000 increase in annual capital income net of tax.

We also extend our empirical specification to include individual specific time-trends. The second column in Table 3 presents the results. Allowing for individual specific trends gives results that differ somewhat from to those in column 1. The estimated responses reported are marginally lower. Also, the coefficient estimates for 2007 and 2008 become statistically insignificant. These results, nevertheless, reinforce the conclusion that the responses in capital income are temporary.

We then estimate separate models of capital income response for young and old (see columns 3 and 4). The prediction follows the same logic as for labor income. Old heirs, compared to young heirs, will consume inheritances at a higher rate, and as a consequence have a higher short term capital income, as capital gains are realized earlier and to a larger extent. We observe that some of the responses are imprecisely estimated. This is probably because the sample sizes are small. Nevertheless, the results suggest that increases in capital income are larger for old heirs than for young.

Table 3: Capital income.

	1	2	3 young heirs, 21−49	4 old heirs, 50−59
Inherited amount*Year				
2000	0.195	0.200	0.271	0.141
	(0.154)	(0.164)	(0.304)	(0.172)
2001	-0.102	-0.098	0.010	-0.168
	(0.111)	(0.109)	(0.036)	(0.177)
2002	-0.019	-0.017	-0.060	0.011
	(0.024)	(0.026)	(0.051)	(0.019)
2003, reference				
2004	-0.013	-0.015	-0.078	0.034
	(0.029)	(0.029)	(0.053)	(0.042)
2005	0.275***	0.270***	0.187***	0.343***
	(0.095)	(0.089)	(0.064)	(0.128)
2006	0.213***	0.207***	0.151	0.256***
	(0.065)	(0.060)	(0.092)	(0.080)
2007	0.182*	0.173	0.152**	0.218
	(0.098)	(0.106)	(0.073)	(0.156)
2008	0.048*	0.037	0.051	0.054***
	(0.026)	(0.042)	(0.060)	(0.019)
$Age^2/100$	7.59	6.04	-57.77	-4,600**
	(76.29)	(74.93)	(96.88)	(2,102)
$Age^3/10{,}000$	-10.29	-9.18	59.98	2,770**
	(66.55)	(65.39)	(85.03)	(1,268)
Constant	-58	-1,764	553	90,904**
	(1,046)	(6,203)	(1,048)	(41,493)
Individual fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Individual specific time trends	No	Yes	No	No
Number of heirs	374	374	150	224
Number of obs	3,310	3,310	1,326	1,984

Notes. Amounts are measured in SEK thousands, price level 2004.
Standard errors are clustered on family.
* significant at the 10 percent level, ** significant at the 5 percent level,
*** significant at the 1 percent level

We have also estimated the models in Table 3 with the pre-inheritance years (2000–2003) as reference period. Table 8 in Appendix B reports the results. These results are similar to those in Table 3. The estimates are slightly lower, however, and not statistically significant for 2007 and 2008.

The overall finding from the previous exercises is that there are large effects during the first two years after inheriting, then the effects decline. It is, however, difficult to separate temporary effects from effects from the financial crisis as the 2007 coefficient still is quite large.

It is possible that the rate of return on the inherited amount affects the estimates in Table 3. We follow Joulfaian (2006) and adjust capital income to reflect the change in wealth, less the inherited amount, to account for this. We first assume a uniform 4.67 percent rate of return on inherited assets.[32] Our dependent variable becomes capital income excluding the return in the inherited amount. We then rerun the empirical model (1). Table 9, column 1, in Appendix B reports the results from this regression. These results are almost identical to those presented in Table 3.

The distribution of capital income is less skewed than that of labor income. This is clear from the descriptive statistics in Table 1. We still want to test if our results are robust accounting for the influence of outliers. The estimation results using the logarithm of capital income as dependent variable are both economically and significantly akin to those in Table 3. Table 9, column 2, in Appendix B presents the results.

We obtain a similar result if we omit heirs with capital income deviating more than 1.96 standard deviations of the sample mean; see Table 9, column 3, in Appendix B. Nevertheless, it is reassuring that results except for 2008 reasonable variations in specifications and sample definitions do not alter our main.

We have also varied the sample's age restrictions. The main difference is that the response in 2008 is positive but not statistically significant. Table 9, column 5, in Appendix B report the detailed results.

Following the same reasoning as we did in the analysis with respect to labor income, we have also tested for confounding effects of liquidity constraints. Here too, we use information on capital income in 2000 to distinguish between potentially liquidity constrained heirs and heirs not being liquidity constrained. See Table 9, columns 6 and 7 in Appendix B. We find no statistically significant responses in the pre-inheritance years, or in the year of the receipt, for either of the two groups. Likewise, the coefficient estimates for the first two years following the receipt are similar with respect to statistical significance, but smaller in magnitude for heirs with negative capital income in 2000. The heirs do not seem to be liquidity

[32]This is the average of the official long-term central government borrowing rate during the studied period.

constrained. We conclude that the large short-run responses in capital income are most likely due to the realization of capital gains.

5.3 Anticipations formed before the sample period

The results presented so far do not indicate any behavioral responses during the four years preceding the transfer. Still, it is reasonable to believe that some heirs during a long time may have had a fairly good idea of how much they will inherit and roughly when. They may, therefore, have adjusted their labor supply and savings behavior before the start of our sample period. We would potentially risk overlook important behavioral responses if this is the case.

The empirical model (1)'s fixed effects capture the impact of unobserved factors on the income level. The unobserved factors that are constant over time include the inheritance anticipations formed before the sample period.

Therefore, we can predict the pre-sample period anticipations by correlating the estimated fixed effects and the inherited amount. This procedure would, however, lead to biased estimates if the inherited amount correlates positively with the (unobserved) earnings potential. It is difficult to completely deal with this omitted variable bias by controlling for the heirs' observable characteristics. Our approach, however, yields conservative estimates of pre-sample period anticipation effects. The reason is that the expected bias goes in the opposite direction to the expected income responses.

We regress the estimated individual fixed effects from the regressions presented in Table 2 and Table 3 on the inherited amount. Column 1 in Table 4 reports a negative and statistically significant relationship between the inheritance amounts and the labor income fixed effects. It is a good idea to be cautious in interpreting the magnitude of this relationship. Nevertheless, it indicates that the more an heir has inherited, the lower is the level of the annual gross labor income already from the start of the sample period.

The second column provides the estimates of anticipations formed before the sample period for capital income. The correlation between the estimated fixed effects from the capital income model and the inherited amount is close to zero. It is statistically insignificant at all conventional levels. The level effects in capital income are, in other words, unrelated to the inherited amount. This contrasts with the findings for labor income. It is difficult to tell if there is no effect for capital income or that the estimates suffer from upward bias.

We obtain reasonable values for the estimated coefficients of the control variables in both regressions. This makes us more confident in the results. However, it remains to find more definite answers.

Table 4: Anticipations formed before the sample period.

	1	2
Dependent variable: Estimated individual fixed effect, SEK thousands		
	Labor income	Capital income
Inherited amount, SEK thousands	-0.0735**	-0.0001
	(0.0353)	(0.0400)
Age	105.5	9.5
	(66.4)	(29.2)
$Age^2/100$	-229.6	-46.0
	(164.3)	(72.4)
$Age^3/10{,}000$	188.4	53.4
	(130.4)	(57.5)
Female	-71.2***	4.7
	(23.7)	(20.6)
Married	8.5	4.4
	(25.2)	(17.2)
Children	25.4	1.1
	(26.3)	(12.4)
Stockholm County	97.5***	1.8
	(25.7)	(21.8)
Taxable real estate	108.2***	39.6***
	(23.3)	(12.1)
Constant	-2,023**	-227
	(849)	(381)
Number of observations	374	374

Notes. Standard errors, in parentheses, are clustered on family.
Independent variables are measured in 2004, except
Taxable real estate, which is measured in 2003.
Female, Married, Children, Stockholm County, and Taxable real estate
are binary variables taking the value one if category indicated
by name is satisfied, and zero otherwise.
** significant at the 5 percent level,
*** significant at the 1 percent level

6 Concluding remarks

This paper presents new evidence on the impact of inheritances on heirs' labor income and capital income. We use data from administrative records for a sample of Swedish decedents and their heirs. Our focus is on how the heirs' marginal propensities to earn labor and capital income out of wealth evolve during the years before and after receiving an inheritance.

Labor and capital income responses will, according to theory, critically depend on whether the inheritance is anticipated or not. The behavioral responses to inheritances are likely to take place already before receiving the inheritance if it is anticipated. On the other hand, inheritances that the heir did not anticipate will generate responses after the inheritance is received.

In contrast to previous studies, we find that inheritances have persistent effects on labor income. The effect is negative and considerable in each of the four years following the transfer. It is stronger for old heirs than for young heirs. The corresponding effects on life-time labor income, calculated using some simplifying assumptions, are large relative to the inherited amount. We also show results supporting that heirs have reduced their labor income already before the start of our sample period.

There are several possible explanations for why we find larger and longer lasting responses in labor income than those reported by, e.g., Joulfaian and Wilhelm (1994). First, labor income taxes in Sweden are higher than those levied in the United States. This suggests that the opportunity cost of leisure is higher in the United States than in Sweden. Second, the responses may be larger because the heirs in our sample are significantly older than those in the studies from the United States. Both the theoretical model and previous empirical findings (Imbens et al., 2001) suggest that the magnitude of responses to wealth shocks should increase in age.

Our results show that even relatively small inherited amounts affect economic behavior. This contrasts with the belief that wealth shocks need to be significant to overcome frictions that may intrude on labor supply decisions (see, e.g., Pencavel, 1986, Card, 1994, Blundell and MaCurdy, 1999).

We also find large positive responses in capital income during the three years following the transfer. There is a sharp decline in the response, however, in 2008. It is difficult to say to what extent this is a consequence of the financial crisis that started in 2008.

The temporary increase in capital income is sufficiently large to outweigh the corresponding loss in labor income. The heirs make themselves better off both in terms of leisure and consumption possibilities. We conjecture that the large capital income responses partly arise because previously unrealized capital gains were

realized. The high returns on the stock market during this period may also have contributed. It is, however, necessary to have more detailed data on the assets inherited and the associated rates of return to draw more refined conclusions.

The results in our paper contribute to the literature in several ways. First, the results provide detailed information about the dynamic effects of inheritances. This can be useful for policy makers who want to account for behavioral responses when designing optimal estate or inheritance tax schedules. One important implication is that inheritance taxes are likely to also increase revenue from labor income taxes. On the other hand, revenue from capital taxes might decrease. Second, it is not sufficient to look only at labor income responses when studying the welfare effects of inheritances. Third, it is important to study the effects of inheritances in different institutional contexts to better understand their impact on economic behavior.

Appendix

Appendix A

Table 5 presents summary statistics for the decedents. The average age at the time of death in the sample is 85 years. This is 7 years older than the average age at death in 2004. This suggests that the decedents were healthier than the overall Swedish population. There are fewer men than women among the decedents. This is expected since women live longer than men. We have sampled households where the deceased was a widow(er), divorced, or unmarried.

The number of children of the deceased varies between 2 and 5. We also note that about 20 percent of the decedents in the sample paid wealth taxes in 2003. The corresponding share for the total population of Swedes age 60 years and older was 6.3 percent in 2004. Furthermore, we see that the average estate in 2004 amounts to SEK 960,000 with a median value of SEK 600,000. The average value of labor income in 2003 was rather low. This reflects that the majority of deceased were retired in the last year of their lives. Moreover, we have information on the share in the sample with self-employment income. Self-employment income can be a good proxy for whether the estate included a small business. Table 5 reveals, however, that the share of decedents with self-employment income is negligible.

It is clear that the sampling strategy has resulted in a sample of deceased who were both healthier and wealthier than the deceased Swedes in 2004 in general.

Table 5: Descriptive statistics for the decedents.

	Mean	S.d.	Median
Age, 2004	85.3	8.8	86.5
Male, percent	31		
Widow(er), percent	81		
Number of children	2.45	0.69	2
Labor income, 2003	216.8	139.5	188.2
Capital income, 2003	27.7	100.6	5.3
Share with taxable wealth in 2003, percent	22		
Taxable wealth, 2003[a]	2,608	1,300	2,117
Share with taxable real estate in 2003, percent	26		
Taxable real estate, 2003[b]	858.3	763.7	669.8
Share with self-employment income in 2003, percent	0.5		
Estate, 2004	959.0	978.0	600.0
Number of decedents	194		

Notes. Amounts are measured in SEK thousands, price level 2004.
[a] the value is conditional on having taxable wealth
[b] the value is conditional on having taxable real estate

Appendix B

Table 6: Labor income, alternative reference years.

	1	2	3 young heirs, 21−49	4 old heirs, 50−59
Inherited amount*Year 2000–2003, reference				
2004	-0.005	0.001	-0.008	0.000
	(0.021)	(0.019)	(0.021)	(0.031)
2005	-0.027	-0.019	-0.023	-0.026
	(0.020)	(0.018)	(0.025)	(0.028)
2006	-0.071**	-0.060**	-0.107	-0.047
	(0.030)	(0.028)	(0.066)	(0.029)
2007	-0.064***	-0.050**	-0.044	-0.070**
	(0.024)	(0.024)	(0.028)	(0.035)
2008	-0.047**	-0.030	-0.040	-0.045
	(0.021)	(0.026)	(0.028)	(0.030)
$Age^2/100$	-134	-116	-147	-16,724
	(790)	(781)	(1,425)	(14,306)
$Age^3/10{,}000$	-0.331	-0.468	-0.707	98
	(5.666)	(5.589)	(12.02)	(87)
Constant	638	2,564	538	30,981
	(1,130)	(3,593)	(1,419)	(25,862)
Individual fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Individual specific time trends	No	Yes	No	No
Number of heirs	374	374	150	224
Number of obs	3,310	3,310	1,326	1,984

Notes. Amounts are measured in SEK thousands, price level 2004.
Standard errors are clustered on family.
* significant at the 10 percent level, ** significant at the 5 percent level,
*** significant at the 1 percent level

Table 7: Sensitivity analyses, Labor income.

	1 extended Labor income[a]	2 log Labor income[b]	3 Labor income ± 1.96 sd from mean[c]	4 inheritance at market values[d]	5 no age restrictions	6 heirs with Capital income <0 in 2000	7 heirs with Capital income >0 in 2000
Inherited amount * Year:							
2000	-0.0414	-0.000066	-0.00438	-0.0248	-0.0318	-0.011	-0.043
	(0.0294)	(0.000088)	(0.0197)	(0.0276)	(0.0276)	(0.031)	(0.049)
2001	-0.0493*	-0.000103	-0.0126	-0.0339	-0.0449	-0.009	-0.066
	(0.0288)	(0.000074)	(0.0179)	(0.0280)	(0.0282)	(0.031)	(0.051)
2002	-0.0160	-0.000007	-0.00867	-0.0112	-0.00556	-0.010	-0.013
	(0.0182)	(0.000065)	(0.0183)	(0.0162)	(0.0159)	(0.032)	(0.021)
2003, reference							
2004	0.0625	-0.000083	-0.0147	-0.0263	0.00826	-0.012	-0.036
	(0.0848)	(0.000107)	(0.0166)	(0.0175)	(0.0313)	(0.029)	(0.026)
2005	-0.0548**	-0.000209*	-0.0422*	-0.0410*	-0.0152	-0.041	-0.053*
	(0.0218)	(0.000108)	(0.0218)	(0.0208)	(0.0418)	(0.028)	(0.028)
2006	-0.101***	-0.000248**	-0.0715***	-0.0865***	-0.0834***	-0.062**	-0.123**
	(0.0289)	(0.000103)	(0.0254)	(0.0286)	(0.0244)	(0.028)	(0.050)
2007	-0.0805***	-0.000352**	-0.0652***	-0.0815***	-0.0803***	-0.072**	-0.096***
	(0.0244)	(0.000140)	(0.0212)	(0.0235)	(0.0222)	(0.032)	(0.035)
2008	-0.0655***	-0.000438**	-0.0632***	-0.0641***	-0.0827***	-0.070**	-0.067**
	(0.0206)	(0.000180)	(0.0211)	(0.0202)	(0.0227)	(0.031)	(0.029)
Age^2/100	-51.7	-0.148	-35.0	-9.7	-24.7	14.0	-32.4
	(72.4)	(0.641)	(75.0)	(79.8)	(46.2)	(79.4)	(101.0)
Age^3/10,000	24.7	0.092	17.1	-5.9	6.7	-23.9	11.8
	(52.5)	(0.435)	(52.3)	(57.1)	(29.3)	(56.4)	(74.4)
Constant	1,279	8.047	927	625	941	264	966
	(1,129)	(10.345)	(1,187)	(1,250)	(873)	(1,246)	(1,567)
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of heirs	374	374	359	374	552	197	177
Number of observations	3,310	3,310	3,183	3,310	4,891	1,765	1,545

Notes. Amounts are measured in SEK thousands, price level 2004. Standard errors are clustered on family.
[a]the sum of Labor and Self-employment incomes. [b]Labor income in natural logarithms.
[c]heirs with incomes within 1.96 s.d. from the sample means.
[d]inherited amount is market value adjusted with respect to inherited taxable real estate wealth.
* significant at the 10 percent level, ** significant at the 5 percent level,
*** significant at the 1 percent level

Table 8: Capital income, alternative reference years.

	1	2	3 young heirs, 21−49	4 old heirs, 50−59
Inherited amount*Year 2000–2003, reference				
2004	-0.034	-0.138	0.037	-0.026
	(0.061)	(0.098)	(0.095)	(0.058)
2005	0.254***	0.127	0.347***	0.264***
	(0.071)	(0.084)	(0.087)	(0.064)
2006	0.192***	0.091	0.260***	0.205***
	(0.062)	(0.120)	(0.062)	(0.054)
2007	0.160	0.090	0.221	0.177
	(0.114)	(0.113)	(0.182)	(0.118)
2008	0.026	-0.013	0.058	0.046
	(0.057)	(0.100)	(0.077)	(0.059)
$Age^2/100$	55	801	-46,632**	77
	(776)	(1,109)	(20,892)	(746)
$Age^3/10{,}000$	-0.858	7.874	281**	-1.019
	(6.758)	(9.625)	(126)	(6.518)
Constant	-47	777	84,556	2,342
	(986)	(1,122)	(37,810)	(5,811)
Individual fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Individual specific time trends	No	Yes	No	No
Number of heirs	374	374	150	224
Number of obs	3,310	3,310	1,326	1,984

Notes. Amounts are measured in SEK thousands, price level 2004.
Standard errors are clustered on family.
* significant at the 10 percent level, ** significant at the 5 percent level,
*** significant at the 1 percent level

Table 9: Sensitivity analyses, Capital income.

	1 adjusted Capital income[a]	2 log Capital income[b]	3 Capital income ± 1.96 sd from mean[c]	4 inheritance at market values[d]	5 no age restrictions	6 heirs with Capital income <0 in 2000	7 heirs with Capital income >0 in 2000
Inherited amount * Year:							
2000	0.192	0.00108*	0.021	0.163	0.140	-0.019	0.343
	(0.154)	(0.00056)	(0.036)	(0.139)	(0.135)	(0.018)	(0.236)
2001	-0.104	0.00028	0.000322	-0.102	-0.111	0.018	-0.226
	(0.111)	(0.00036)	(0.0203)	(0.110)	(0.0825)	(0.030)	(0.232)
2002	-0.0196	0.00021	-0.0265	-0.0155	-0.0317	-0.061	0.018
	(0.0240)	(0.00036)	(0.0281)	(0.0213)	(0.0242)	(0.042)	(0.020)
2003, reference							
2004	-0.0127	-0.00011	-0.0133	-0.0179	-0.0236	-0.048	0.015
	(0.0290)	(0.00046)	(0.0348)	(0.0277)	(0.0301)	(0.041)	(0.038)
2005	0.275***	0.00179***	0.205***	0.241***	0.236***	0.148**	0.371***
	(0.0952)	(0.00042)	(0.0558)	(0.0915)	(0.0854)	(0.058)	(0.123)
2006	0.214***	0.00166***	0.224***	0.190***	0.198***	0.152**	0.257***
	(0.0650)	(0.00045)	(0.0731)	(0.0646)	(0.0581)	(0.061)	(0.087)
2007	0.184*	0.00149***	0.114**	0.162*	0.155*	0.167*	0.184
	(0.0980)	(0.00049)	(0.0572)	(0.0826)	(0.0846)	(0.086)	(0.163)
2008	0.0519*	0.00090	0.0482	0.0414*	0.0375	0.049	0.041
	(0.0264)	(0.00056)	(0.0309)	(0.0242)	(0.0262)	(0.048)	(0.031)
Age^2/100	7.6	2.12	14.7	4.2	-23.5	31.5	-65.1
	(76.3)	(1.75)	(35.6)	(76.7)	(45.3)	(62.1)	(131.2)
Age^3/10,000	-10.3	-1.86	-7.8	-7.3	16.8	-20.8	40.3
	(66.5)	(1.22)	(28.5)	(66.8)	(30.2)	(45.3)	(114.0)
Constant	-72	-27.2	-265	-13	415	-527	1,112
	(1,046)	(28.2)	(520)	(1,052)	(834)	(960)	(1,804)
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of heirs	374	308	365	371	552	197	177
Number of observations	3,310	1,502	3,237	3,283	4,891	1,765	1,545

Notes. Amounts are measured in SEK thousands, price level 2004. Standard errors are clustered on family.

[a] Capital income is net of the return on the inherited amount.
The annual rate of return on inherited capital (2000–2008) is 4.67 percent.

[b] Capital income in natural logarithms.

[c] The sample is limited to heirs with incomes within 1.96 s.d. from the sample means.

[d] Inherited amount is market value adjusted with respect to inherited taxable real estate wealth.

* significant at the 10 percent level, ** significant at the 5 percent level,
*** significant at the 1 percent level

References

Abel, A. and M. Warshawsky (1988): "Specification of the joy of giving: Insights from altruism," *Review of Economics and Statistics*, 70, 145–149.

Angelini, V. (2009): "The strategic bequest motive: Evidence from SHARE," Working paper, University of Padua, draft.

Barro, R. J. (1974): "Are government bonds net wealth?" *Journal of Political Economy*, 82, 1095–1117.

Becker, G. S. (1974): "A theory of social interactions," *Journal of Political Economy*, 82, 1063–1093.

Behrman, J. R. and M. R. Rosenzweig (2004): "Parental allocation to children: New evidence on bequest differences among siblings," *Review of Economics and Statistics*, 86, 637–640.

Bennedsen, M., F. Pérez-González, and D. Wolfenzon (2010): "Do CEOs matter?" Working paper.

Berg, L. (2006): "Förmögenhetskällan: De svenska hushållens förmögenhetsutveckling," Rapport, Nordea, Stockholm.

Bernheim, B. D., R. J. Lemke, and J. K. Scholz (2004): "Do estate and gift taxes affect the timing of private transfers?" *Journal of Public Economics*, 88, 2617–2634.

Bernheim, B. D., A. Shleifer, and L. H. Summers (1985): "The strategic bequest motive," *Journal of Political Economy*, 93, 1045–1076.

Blanchflower, D. G. and A. J. Oswald (1998): "What makes an entrepreneur?" *Journal of Labor Economics*, 16, 26–60.

Blinder, A. (1976): "Intergenerational transfers and life cycle consumption," *American Economic Review*, 66, 87–93.

Blomquist, S. (1979): "The inheritance function," *Journal of Public Economics*, 12, 41–60.

Blomquist, S. and H. Selin (2010): "Hourly wage rate and taxable labor income responsiveness to changes in marginal tax rates," *Journal of Public Economics*, 94, 878–889.

Blundell, R. and T. MaCurdy (1999): "Labor supply: a review of alternative approaches," in O. Ashenfelter and D. Card, eds., *Handbook of Labor Economics*, volume 3A, Amsterdam: North-Holland, 1559–1695.

Bolin, K., B. Lindgren, and P. Lundborg (2008): "Your next of kin or your own career? Caring and working among the 50+ of Europe," *Journal of Health Economics*, 27, 718–738.

Brattström, M. and A. Singer (2007): *Rätt arv: Fördelning av kvarlåtenskap*, Uppsala: Iustus Förlag, 2 edition.

Brown, J. R., C. C. Coile, and S. J. Weisbenner (2010): "The effect of inheritance receipt on retirement," *Review of Economics and Statistics*, 92, 425–434.

Card, D. (1994): "Intertemporal labour supply: An assessment," in C. A. Sims, ed., *Advances in Econometrics: Sixth World Congress*, volume II, Cambridge University Press, chapter 2, 49–80.

Cheng, I.-H. and E. French (2000): "The effect of the run-up in the stock market on labor supply," *Economic Perspectives*, 24, 48–65.

Coile, C. C. and P. B. Levine (2006): "Bulls, bears, and retirement behavior," *Industrial & Labor Relations Review*, 59, 408–429.

Coronado, J. L. and M. G. Perozek (2003): "Wealth effects and the consumption of leisure: Retirement decisions during the stock market boom of the 1990s," FEDS Papers 2003-20, Board of Governors of the Federal Reserve System, Washington, D.C.

Cox, D. (1987): "Motives for private income transfers," *Journal of Political Economy*, 95, 508–546.

Eliason, M. and H. Ohlsson (2010): "Timing of death and the repeal of the Swedish inheritance tax," Working Paper 2010:2, Uppsala Center for Fiscal Studies, Department of Economics, Uppsala University.

Elinder, M., O. Erixson, and H. Ohlsson (2010): "The effect of inheritance receipt on labor and capital income: Evidence from Swedish panel data," Working Paper 2010:3, Uppsala Center for Fiscal Studies, Department of Economics, Uppsala University.

Engelhardt, G. V. (1996): "House prices and home owner saving behavior," *Regional Science and Urban Economics*, 26, 313–336.

Ettner, S. (1995): "The impact of "parent care" on female labor supply decisions," *Demography*, 32, 63–80.

Faria, J. R. and Z. Wu (2012): "From unemployed to entrepreneur: The role of the absolute bequest motive," *Economics Letters*, 114, 120–123.

Feldstein, M. (1995): "The effect of marginal tax rates on taxable income: A panel study of the 1986 tax reform act," *Journal of Political Economy*, 103, 551–572.

Feldstein, M. (1999): "Tax avoidance and the deadweight loss of the income tax," *Review of Economics and Statistics*, 81, 674–680.

Fevang, E., S. Kverndokk, and K. Røed (2012): "Labor supply in the terminal stages of lone parents' lives," *Journal of Population Economics*, 25, 1399–1422.

Gruber, J. and E. Saez (2002): "The elasticity of taxable income: Evidence and implications," *Journal of Public Economics*, 84, 1–32.

Guiso, L., M. Haliassos, and T. Jappelli (2002): *Household portfolios*, Cambridge, MA: MIT Press.

Holtz-Eakin, D., D. Joulfaian, and H. S. Rosen (1993): "The Carnegie conjecture: Some empirical evidence," *Quarterly Journal of Economics*, 108, 413–435.

Holtz-Eakin, D., D. Joulfaian, and H. S. Rosen (1994a): "Entrepreneurial decisions and liquidity constraints," *RAND Journal of Economics*, 25, 334–347.

Holtz-Eakin, D., D. Joulfaian, and H. S. Rosen (1994b): "Sticking it out: Entrepreneurial survival and liquidity constraints," *Journal of Political Economy*, 102, 53–75.

Horioka, C. Y. (2009): "Do bequests increase or decrease wealth inequalities?" *Economics Letters*, 103, 23–25.

Hurst, E. and A. Lusardi (2004): "Liquidity constraints, household wealth, and entrepreneurship," *Journal of Political Economy*, 112, 319–347.

Imbens, G., D. Rubin, and B. Sacerdote (2001): "Estimating the effect of unearned income on labor earnings, savings, and consumption: Evidence from a survey of lottery players," *American Economic Review*, 91, 778–794.

Joulfaian, D. (2004): "Gift taxes and lifetime transfers: time series evidence," *Journal of Public Economics*, 88, 1917–1929.

Joulfaian, D. (2006): "Inheritance and saving," NBER Working Paper No. 12569, National Bureau of Economic Research, Cambridge, MA.

Joulfaian, D. (2011): "The federal estate tax: History, law, and economics," Working paper, Office of Tax Analysis, US Department of the Treasury, Washington, DC, draft.

Joulfaian, D. and M. O. Wilhelm (1994): "Inheritance and labor supply," *Journal of Human Resources*, 29, 1205–1234.

Juster, F. T., J. P. Lupton, J. P. Smith, and F. Stafford (2006): "The decline in household saving and the wealth effect," *Review of Economics and Statistics*, 88, 20–27.

Juster, F. T., J. P. Smith, and F. Stafford (1999): "The measurement and structure of household wealth," *Labour Economics*, 6, 253–275.

Kessler, R. (1997): "The effects of stressful life events on depression," *Annual Review of Psychology*, 48, 191–214.

Kimball, M. (1990): "Precautionary saving in the small and in the large," *Econometrica*, 58, 53–73.

Kopczuk, W. (2005): "Tax bases, tax rates and the elasticity of reported income," *Journal of Public Economics*, 89, 2093–2119.

Kopczuk, W. (2007): "Bequest and tax planning: Evidence from estate tax returns," *Quarterly Journal of Economics*, 122, 1801–1854.

Kopczuk, W. (2009): "Economics of estate taxation: A brief review of theory and evidence," *Tax Law Review*, 63, 139–157.

Kopczuk, W. and E. Saez (2004): "Top wealth shares in the United States, 1916–2000: Evidence from estate tax returns," *National Tax Journal*, 57, 445–488.

Kurz, M. (1984): "Capital accumulation and the characteristics of private intergenerational transfers," *Economica*, 51, 1–22.

Lindh, T. and H. Ohlsson (1996): "Self-employment and windfall gains: Evidence from the Swedish lottery," *Economic Journal*, 106, 1515–1526.

MaCurdy, T. E. (1981): "An empirical model of labor supply in a life-cycle setting," *Journal of Political Economy*, 89, 1059–1085.

Nordblom, K. and H. Ohlsson (2006): "Tax avoidance and intra-family transfers," *Journal of Public Economics*, 90, 1669–1680.

Ohlsson, H. (2007): "The equal division puzzle – empirical evidence on intergenerational transfers in Sweden," Working Paper 2007:10, Department of Economics, Uppsala University.

Ohlsson, H. (2011): "The legacy of the Swedish gift and inheritance tax," *European Review of Economic History*, 15, 539–569.

Pencavel, J. (1986): "Labor supply of men: A survey," in O. Ashenfelter and R. Layard, eds., *Handbook of Labor Economics*, volume 1, Amsterdam: North Holland, chapter 1, 3–102.

Pestieau, P. (2003): "The role of gift and estate transfers in the United States and in Europe," in A. H. Munnell and A. Sundén, eds., *Death and Dollars. The Role of Gifts and Bequests in America*, Washington, DC: Brookings, chapter 3, 64–85.

Piketty, T. (2011): "On the long-run evolution of inheritance: France 1820–2050," *Quarterly Journal of Economics*, 126, 1071–1131.

Poterba, J. M. (2000): "Stock market wealth and consumption," *Journal of Economic Perspectives*, 14, 99–118.

Saez, E., J. B. Slemrod, and S. H. Giertz (2012): "The elasticity of taxable income with respect to marginal tax rates: A critical review," *Journal of Economic Literature*, 50, 3–50.

Schulz, R., A. Mendelsohn, W. Haley, D. Mahoney, R. Allen, M. S. Zhang, L. Thompson, and B. Belle (2003): "End-of-life care and the effects of bereavement on family caregivers of persons with dementia," *New England Journal of Medicine*, 349, 1936–1942.

Umberson, D. and M. Chen (1994): "Effects of a parent's death on adult children: Relationship salience and reaction to loss," *American Sociological Review*, 59, 152–168.

Umberson, D., C. B. Wortman, and R. C. Kessler (1992): "Widowhood and depression: Explaining long-term gender differences in vulnerability," *Journal of Health and Social Behavior*, 33, 10–24.

Weil, D. N. (1994): "The saving of the elderly in micro and macro data," *Quarterly Journal of Economics*, 109, 55–81.

Weil, D. N. (1996): "Intergenerational transfers, aging, and uncertainty," in D. A. Wise, ed., *Advances in the Economics of Aging*, Chicago: University of Chicago Press, chapter 10, 321–342.