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Evidence on Estate Planning and Bequests

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Giving With a Warm Hand: Evidence on Estate Planning and Bequests

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Abstract

In the present study we use Dutch administrative data to investigate the bequest motive for saving. To do so, we build on the previous work by Kopczuk (2007) and study whether individuals start transferring part of their estate to the heirs in the expectation of a near death. First, we distinguish between expected and unexpected deaths according to whether they were caused or not by a previously diagnosed illness. Second, controlling for age, lifetime income, gender, and marital status, we investigate whether expected deaths are associated with lower wealth at time of death. Employing quantile regression, we find that having a terminal illness of above ten years has a negative impact on net financial wealth at death. The effect is only significant however for married males, and especially for those who are at the top of the wealth distribution. Among this group, we find that the effect is specially strong for younger individuals (below 65 years), and for individuals with children who are below the 75th percentile of the lifetime income distribution. We follow Kopczuk (2007) and argue that the effect we find reflects an underlying bequest motive for saving.

Keywords: Saving, Estate Planning, Bequest Motive, Intergenerational Transfers.
JEL Codes: D10, D14, D31, D91.

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1 Introduction

It is widely recognized in the literature on retirement savings that retirees, especially those with a high lifetime income, tend hold on to their previously accumulated wealth even though they are in the last phase of their lifetime.[1] The economic literature has proposed three main explanations for this stylized fact: precautionary saving related to longevity risk (*e.g.* De Nardi *et al.*, 2009; and Post and Hanewald, 2013), precautionary saving related to uncertain out of pocket medical expenditures (*e.g.* Coile and Milligan, 2009; and De Nardi *et al.*, 2010), and the bequest motive (*e.g.* Kopczuk, 2007 and De Nardi and Yang, 2014). In the present study we contribute to this body of literature by empirically studying the bequest motive using Dutch administrative micro data.

The Dutch context is especially interesting since in the Netherlands out of pocket medical expenditures do not play a major role due to widespread insurance coverage.[2] Furthermore, longevity risk is covered to a large extent by mandatory annuitization of fully funded occupational pensions.[3] However, in this context we still do not observe a relevant decrease in wealth levels during retirement, as pointed out by van Ooijen *et al.* (2015) and Suari-Andreu *et al.* (2018). This suggests the bequest motive as a suitable alternative to explain the wealth holdings of retirees. Investigating the bequest motive is especially relevant nowadays since, as reported by Alvaredo *et al.* (2013) and Piketty and Zucman (2014) among others, the share of inherited to aggregate wealth has been increasing in the past decades in developed countries, and is expected to keep doing so in the future.

To study the bequest motive we build on and expand the previous work by Kopczuk (2007). The latter attempts to identify the bequest motive by studying whether terminally ill individuals start transferring part of their estate in the expectation of a near death. To do so, Kopczuk employs US administrative data on a sample of deaths occurred between 1976 and 1977. He classifies these deaths as expected or unexpected according to whether they are caused or not by a previously diagnosed illness. Controlling for gender, marital status, age, and lifetime income, he compares wealth at time of death between expected and unexpected deaths. He argues that if expected deaths are associated with lower wealth at the moment of death, it is due to individuals transferring part of their estate in the expectation of a near death.

The assumption underpinning Kopczuk's strategy is that transfers to heirs resulting from deathbed estate planning reflect the presence of a bequest motive for saving. Given a bequest motive, there are two reasons for individuals to engage in early bequest giving in the expecta-

[1] For thorough literature surveys on this stylized fact, see van Ooijen *et al.* (2015); De Nardi *et al.* (2016); and Suari-Andreu *et al.* (2018).

[2] In the Netherlands there is universal coverage of both curative and long-term care. For a detailed description of the Dutch health care system, see Bakx *et al.* (2016).

[3] Fully funded occupational pensions form the main pillar of the Dutch pension system. For a thorough description of the Dutch pension system, see Bovenberg and Meijdam (2001). For how it compares to other countries, see OECD (2017*b*).

tion of a near death. First, as proposed by Kopczuk (2010) and McGarry (2013), the purpose may be inheritance tax avoidance.[4] Second, as proposed by McGarry (2000, 2013), the purpose may be to exert control over recipiency and use of the assets transferred. In contrast to these two reasons, these transfers may have a cost if they imply relinquishing control over assets that individuals could need were they to live longer than expected, or encountered unexpected expenditures (McGarry, 2000).

Due to missing data on income, Kopczuk focuses most of his analysis on married males, for whom he indeed finds a negative effect of expected death on wealth at death. However, his analysis suffers from several shortcomings that we address, thereby expanding his work in a number of ways. First, since Kopczuk uses estate tax data, he only observes individuals above the minimum estate tax threshold. We have access to the whole wealth distribution and thus we are able to investigate whether the effect has a wealth gradient. Second, we refine the definition of expected death by accounting for the time between diagnosis of an illness and the time of death. We assume that the longer the illness, the more likely is the individual to engage in estate planning. Third, we generate a more accurate measure of lifetime income. Fourth, a novel feature of our data is that it allows connecting deceased individuals to their children, for whom we have access to demographic variables as well as income and wealth. Fifth, we expand Kopczuk's analysis to demographic groups other than married males.

An additional and very relevant aspect is that the Dutch healthcare system shields the effect of medical expenditures, which could otherwise interfere in the effect of expected death on wealth at the end of life. This issue is specially problematic in the American context, where several studies find significant wealth drops related to medical expenditures during the last years of life (*e.g.* French *et al.*, 2006; Poterba *et al.*, 2015), while van Ooijen *et al.* (2015) show that this is not the case in the Netherlands.[5] Furthermore, the Dutch disability insurance system prevents any major identification problem caused by the presence of income shocks. The latter may pose an identification problem if individuals are working when their illness is diagnosed, since that may cause an income shock resulting in lower wealth at time of death. In the Netherlands, when an individual becomes disabled, the employer must guarantee two years of full salary, after which a disability benefit comes into place with a replacement rate of 70%.[6] These features make the Dutch context especially interesting for answering the question at hand.

[4] In some countries regulations ensure that transfers made in the years before death are considered as part of the estate for tax purposes. In the Netherlands only transfers within the last half a year of life are considered. For more details on the Dutch inheritance tax system, see Appendix E. For how it compares to other countries, see the Worlwide Estate and Inheritance Tax Guide by Ernst and Young (2017).

[5] Bakx *et al.* (2016) show that between 1998 and 2014 out of pocket medical expenditures in the Netherlands constituted only 5% of yearly healthcare expenditures, which is the lowest proportion among OECD countries (OECD, 2017*a*).

[6] For a detailed description of the Dutch disability insurance system, see Koning and Lindeboom (2015) and Koning and van Sonsbeek (2017). The latter show how the Dutch system prevents large drops in income caused by disability. For how the Dutch disability insurance system compares to other countries, see OECD (2010).

In our study we employ about ten thousand deaths occurred in the Netherlands between 2006 and 2010. Using administrative data on causes of death, hospital visits and medical diagnoses, we distinguish whether a particular death was caused by a previously diagnosed illness. If so, we measure the time length between diagnosis and death. Using tax register data and municipal administration records, we follow Kopczuk and investigate whether, controlling for the same variables as he does, expected death has an effect on wealth at death. Our study has two shortcomings compared to Kopczuk's. First, our data on income and wealth are given at the household level instead of at the individual level. We overcome this issue by stratifying the sample by gender and marital status and thus controlling for household structure. Second, our wealth measurement is not given at the exact time of death but on the 31st of December of the year before death. However, we know the exact date of every death in our sample, thus we measure this delay and control for it in our regressions.

Applying quantile regression, we find that indeed expected death has a negative impact on net financial wealth at the end of life. However, the effect is only statistically significant and large for married males who's death is preceded by a very long illness (ten years or more). We estimate significant effects around the median and at the top of the net financial wealth distribution. At the top of the distribution, we find that the effect is stronger for younger individuals (below 65), for those with children, and for those with children who are below the 75th percentile of the income distribution. It is reasonable to find an effect only for married individuals since most singles in our sample have experienced widowhood or divorce.[7] It is reasonable as well to find an effect only for males since, due to their lower life expectancy, most individuals who die while married are males. Furthermore, finding strong effects at the top of the wealth distribution coincides with a recurrent view in the literature that classifies bequests as a luxury good (*e.g.*, Alessie *et al.*, 1999; Kopczuk and Lupton, 2007; and De Nardi and Yang, 2014).

Following Kopczuk, we interpret our results as early bequests that result from estate planning in the expectation of a near death. This suggest that wealth holdings among retired individuals reported by van Ooijen *et al.* (2015) and Suari-Andreu *et al.* (2018) respond to a bequest motive for saving. This interpretation relies on out of pocket medical expenditures not being a mediator in the relation between expected death and wealth at death. Even though the institutional context in the Netherlands prevents any major role of out of pocket medical expenditures, our results could be driven by wealthy individuals incurring additional expenses to receive especial treatment. There is also the chance that, given an increase in the probability of death, individuals adjust their rate of time preference and thus increase non-medical consumption. However, there is a large debate in the economic literature on whether bad health increases or decreases non-medical consumption. The effect could go both ways since, as argued by Finkelstein *et al.*

[7]Sevak *et al.* (2003) and Poterba *et al.* (2015) for the US, and van Ooijen *et al.* (2015) for the Netherlands show that widowhood and divorce are associated with considerable drops in wealth.

(2013) among others, bad health may decrease the marginal utility of consumption.[8] In fact van Ooijen *et al.* (2016) find using Dutch survey data that bad health decreases non-medical consumption. Therefore, we can argue that we find a negative effect of expected death on wealth at death *despite* the negative effect of bad health on non-medical consumption.

The rest of the paper is structured as follows. Section 2 describes the data sources and explains the sample we employ in our analysis. Section 3 provides descriptive statistics for the most important variables and some preliminary evidence. Section 4 explains the methodology we employ to estimate our regressions. Section 5 provides the results of the analysis. Section 6 rounds up the paper with a conclusion.

2 Data Sources and Sample Selection

To conduct the present study we use Dutch data from different administrative sources which we merge into one single dataset. All the data are provided by Statistics Netherlands. We use the death register to randomly select a sample of 9670 deaths out of all the deaths occurred in the Netherlands between 2006 and 2010, both included, which is about 1.5% of all deaths occurred during that period. Through an encrypted social security number, we merge the data from the death register with individual demographic characteristics available from municipal administration records. In addition, we merge the sample with household level data on income and wealth available from the tax register, and with data on hospital visits available from the hospital discharge register.

After merging, we are left with a data set of individual deaths containing the following information for each decedent: date of death, cause of death, age, gender, marital status, household net worth on the 31st of December of the year previous to death, yearly household disposable income from 2003 until the year previous to death, and hospital visits back since 1995.[9] The data on hospital visits contain date and diagnosis for each hospital visit taking place between 1995 and time of death.[10] Causes of death and hospital diagnoses are classified according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10), which is assembled by the World Health Organization. Net worth equals total assets minus total liabilities.[11] Assets can be disaggregated into financial and non-financial assets. The former can be disaggregated into deposits, saving accounts, stocks and bonds, while the latter can be disaggregated into housing (primary residence) and other non-financial assets

[8]For a thorough review of the debate on the link between health status and non-medical consumption, see Finkelstein *et al.* (2009).

[9]Household net worth data are available for all years between 2005 and the year previous to death. However, to follow Kopczuk's strategy, we only need the observation closest to death for each individual.

[10]For every hospital visit we know whether there is an associated diagnosis or whether it is related to a previous diagnosis.

[11]For additional description and applications of the wealth data we employ, see de Bresser and Knoef (2015) or Knoef *et al.* (2016).

(housing wealth other than the primary residence plus business wealth). Liabilities can be disaggregated into mortgage debt and non-mortgage debt. Due to income and wealth data, after the merging process the number of observations is reduced from 9670 to 9625.

A very interesting and novel feature of our data is that we can link all individuals in our sample to their children, and we have access to exactly the same variables for the children as we do for their parents. Therefore we can generate variables indicating the number of children at death, as well as age, gender, marital status, household income, and household wealth for each child. For practical reasons, we set the maximum number of children equal to seven, which implies the additional loss of five observations. After this selection, we have a total of 9620 parental observations and 23127 children observations.

3 Summary Statistics and Descriptive Evidence

3.1 Length of Illness

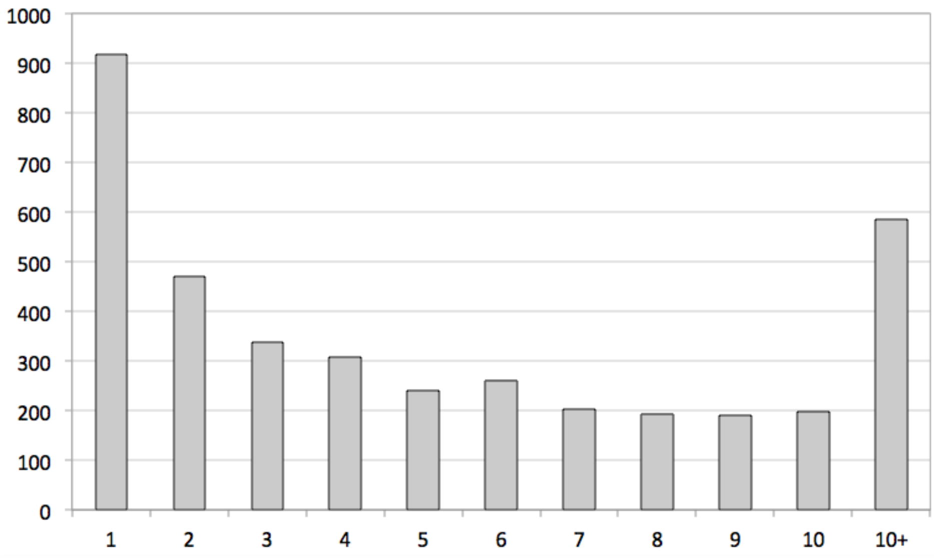
Kopczuk classifies deaths between expected and unexpected according to where caused or not by a previously diagnosed illness. Among expected deaths, he is able to distinguish between short and long illnesses. He thus comes up with three categories for death: instantaneous (not caused by a previous illness), short illness (caused by an illness diagnosed hours, days or weeks before death), and long illness (caused by an illness diagnosed months or years before death). We follow his approach and further refine the measurement of the time between between diagnosis of an illness and the eventual death that it leads to. We believe it is important to take this into account since the longer the illness, the more time has the individual to engage in deathbed estate planning.

To measure length of illness we combine data from the death register with data from the hospital discharge register. We classify each individual death into one of the 22 general cause of death (COD) categories given in ICD-10.[12] For this purpose, we use the main underlying cause of death, which according to the WHO is defined as the disease or injury that initiated the chain of events leading to death. We then use the same 22 categories to classify the diagnoses associated to each hospital visit in our sample. We are thus able to know whether someone who died due to a particular COD category, previously had a hospital visit for a reason within that same category, as long as that visit took place not earlier than the year 1995.

With this information, we generate a measure consisting of the difference in days between the 31st of December of the year previous to death and the first COD-related hospital visit. We take the 31st of December of the year previous to death, and not the date of death itself, because the former is the date of the household wealth measurement we have available. Due to this delay between date of death and date of the wealth measurement, our measure of length

[12]For a list of all COD categories in the ICD-10 and their frequency in our sample, see Appendix B.

Figure 1 Histogram Length of Illness in Years



Notes: Observations with a zero in length of terminal illness are excluded from the figure. Their frequency in the sample is 5719.

of illness is not totally accurate. However, since for each deceased individual in our sample we know the exact date of death, we are able to generate a delay-in-measurement variable. This variable essentially indicates the day in the year that a particular individual died, and thus takes values between one and 365. Controlling for it in our regressions makes the analysis more meaningful, since then we compare always individuals with the same time gap between wealth measurement and death.

Since the awareness of an illness may actually start before the first hospital visit, our length of illness measure may be systematically understating actual length of illness. To deal with this, we transform the variable to express it in years, instead of in days. In that way, those whose first COD-related hospital intake took place within a year before the wealth measurement get assigned one year in length of illness, those whose first COD-related intake took place between one and two years before the measurement get assigned two years, and so on until a maximum in our sample of 15 years.[13] For observations with illnesses from 11 to 15 years long, is likely that the first intake took place before 1995, and thus we might be understating length of illness in those cases. To deal with this inaccuracy, we put all terminal illnesses longer than ten years under one same category.

Figure 1 shows a histogram of the resulting variable conditional on being larger than zero.[14] Out of a sample of 9620 deaths, 5719 (59%) have a zero in length of terminal illness. These are the deaths classified as unexpected. Out of the deaths classified as expected, Figure 1 shows a distribution of length of illness that is positively skewed. The frequencies go from 916

[13]This transformation also allows a better interpretation of the effect of length of illness on wealth at time of death.

[14]For the distribution of length of illness by gender and marital status groups, see Appendix C.

Table 1 Average Length of Terminal Illness by Age, Gender and Marital Status

	Single				Married			
	Females		Males		Females		Males	
Age Category	Length	Obs.	Length	Obs.	Length	Obs.	Length	Obs.
<50	1.80	1.8%	0.80	5.3%	2.36	5.4%	1.26	2.7%
50-60	2.17	2.6%	1.21	7.6%	2.24	14.4%	1.52	7.1%
60-70	2.35	5.8%	1.73	12.0%	2.43	23.5%	1.85	18.5%
70-80	2.27	13.9%	2.08	22.5%	2.13	26.4%	2.40	33.7%
80-90	1.87	43.8%	2.18	35.9%	2.05	26.7%	2.65	32.1%
>90	1.40	32.1%	1.68	16.8%	2.19	3.4%	2.03	6.0%
All	1.81	2658	1.87	1402	2.21	1717	2.27	3843

Notes: To compute averages, individuals above ten years in length of terminal illness are assigned a value of eleven.

for one year gradually down to 197 for ten years in length of illness. We see then a spike of 586 observations (6%) for the category capturing length of illness above ten years. Out of the 5719 observations with zero in length of illness, there are 1752 observations that correspond to individuals who had at least one non-COD-related hospital visit during the same year of death, or during the year previous to death. We consider these individuals to be potentially frail during the last years of life, which does not allow to classify their death as purely unexpected. For that reason, we generate for them a frailty dummy that we include in our regressions.

In addition to Figure 1, Table 1 shows average length of illness classified by age, gender and marital status. The table shows that most deaths occur after the age of 70, and that, as expected, females tend to live longer than males. Length of illness is relatively low for individuals in the younger age categories, specially among males, indicating that deaths in this category are more likely to be unexpected. Among all groups, length of illness increases with age up to the age of 80, and then decline slightly for the older categories. Pooling all ages together, length of illness is in general higher for married individuals compared to single individuals, which is essentially because there are few married individuals who pass away within the oldest age category.

The patterns in Table 1 seem reasonable and generally in line with the evidence reported by Kopczuk (2007). They are thus consistent with our measure containing information about actual length of illness. Our measure is however rather different from that one used by Kopczuk. Due to the time delay in our data between wealth measurement and date of death, we are not able to fine-tune as much as Kopczuk does among illnesses with a short span. However, we are able to better classify the span of illnesses deemed as long by Kopczuk. According to his own results, the latter are the only ones that actually matter when it comes to triggering estate planning type of behaviour. We believe that is because individuals will only engage in estate panning if they have enough time to do so, which is why it makes sense to measure length of illness more accurately.

Table 2 Net Financial Wealth at the End of Life (thousands of €)

	Mean	p10	p25	p50	p75	p90	p95	p99	Obs
Single Females	70	0	5	18	48	157	263	856	2658
Single Males	66	0	3	18	50	152	289	768	1402
Married Females	75	1	7	24	75	193	320	687	1717
Married Males	108	1	9	27	80	205	338	1026	3843
All	85	1	6	23	66	183	308	876	9620

3.2 Wealth at the End of Life

As mentioned in Section 2, through the tax register we obtain data on assets and liabilities at the household level, which are given on the 31st of December of the year previous to death. For our analysis, we focus net financial wealth (NFW) since liquid wealth is arguably the most likely to be passed on as early bequests. We compute this variable by subtracting non-mortgage debt from the sum of all financial assets (deposits, saving accounts, stocks and bonds). Table 2 shows how NFW is distributed by gender and marital status of the decedent. The first thing to note is that, as pointed out by the literature on retirement savings, individuals still hold considerable amounts of wealth at the very end of their life (De Nardi *et al.*, 2016). Look at singles, both males and females have on average a net financial wealth position of about 70 thousand Euros at the end of life. If we look at married individuals, we see that married males have on average about 108 thousand Euros of household net financial wealth at the end of life, a notably higher position in comparison to married females, whose average is about 75 thousand Euros.

The second aspect to note about Table 2 is that, as expected, net worth at the end of life shows a high degree of positive skewness. For both single females and males, the average is between three and four times larger than the median, while the p75/p25 ratios are 9.6 and 16.66 for females and males respectively. For married individuals, the average is for both genders as well between three and four times the median, while the p75/p25 ratios are 10.71 and 8.88 for females and males respectively. If we look at the values in the 99th percentile column, we see very high values for all demographic groups. Especially for married males, which explains the relatively high average for this group. The possibility to capture this percentile accurately is a strong advantage of administrative data, since the top 1% is usually underrepresented in survey data. Furthermore, observing the whole distribution allows investigating to what extent the bequest motive has a wealth gradient. This implies an advantage *vis-à-vis* Kopczuk's study since he only observes individuals above the minimum estate tax threshold.[15]

[15]This threshold corresponded in 1977 to 360 thousand 2007 US Dollars. Kopczuk's sample includes 29407 individuals who's estate tax returns were filled in 1977, which represents 6% of all adult decedents in the period covered by his sample.

3.3 Lifetime Income

There are two crucial variables to control for in the present study: age and lifetime income. That is because both are very likely related to health status and wealth simultaneously.[16] To measure lifetime income, Kopczuk uses as a proxy personal labour income observed for one period between five and ten years before death. In the present study, we observe yearly total income at the household level for the period between 2003 and the year previous to death. Additionally, for every year we know which is the main source of income of the household. With this information, we generate a proxy for lifetime income by applying the following rule: if the main source of income in the year previous to death is not pension income, we take the average of equivalized household income between 2003 and the year previous to death; if the main source of income in the year previous to death is pension income, then we just take equivalized household income corresponding to that particular year.[17] This strategy is based on Knoef *et al.* (2013), who using data for the Netherlands argue that pension income is a particularly good proxy for lifetime income.[18] To account for the two different methodologies employed to measure lifetime income, we generate a dummy variable indicating which methodology is used for each decent and include in our regressions.

4 Econometric Model

Following Kopczuk (2007) we estimate the effect of length of illness on wealth using a cross-section of deaths occured between 2006 and 2010. The regression equation we estimate is the following

$$NFW_i = \beta_0 + \boldsymbol{D}_i'\boldsymbol{\beta}_1 + \boldsymbol{X}_{1i}'\boldsymbol{\beta}_2 + \boldsymbol{X}_{2i}'\boldsymbol{\beta}_3 + \boldsymbol{t}_i'\boldsymbol{\beta}_4 + \varepsilon_i, \qquad (1)$$

where NFW_i is household net financial wealth at the end of life for individual i; $\boldsymbol{D}_i$ is a vector including variables that distinguish between expected and unexpected deaths and measure length of illness; $\boldsymbol{X}_{1i}$ is a vector of controls including age dummies (the age groups are: younger than 65, between 65 and 80, and older than 80), our proxy for lifetime income, and the delay-in-measurement variable described in Section 3.1; $\boldsymbol{X}_{2i}$ is a vector containing children variables; $\boldsymbol{t}_i$ contains a set of dummies controlling for the year of death, and ε_i is the individual-specific error term. Since we control both for age and year of death, we are indirectly controlling as well for cohort effects. We estimate Equation (1) for each age and marital status group as defined

[16] It has been well documented in the economic literature that there is a link between wealth and health (*e.g.* Attanasio and Emmerson, 2003). However, as argued by Kopczuk (2007), properly controlling for lifetime income should allow to clear the direct effect of wealth on health status at the end of life.

[17] We equivalize household income by dividing yearly income by the square root of the number of members in the household in that year. We apply this transformation because in many cases household structure experiences changes during the years previous to death.

[18] Knoef *et al.* (2013) show that the variance of income shocks is smaller for retirees than for working individuals, and that income shocks are more persistent for retirees. For these reasons they argue that pension income is a specially good proxy for lifetime income.

in Tables 1 and 2.[19] Appendix A provides variable definitions and summary statistics by demographic group for all variables we use in our analysis.

The vector $\boldsymbol{D}_i$ is composed of three elements, *i.e.* $\boldsymbol{D}_i = (D_{1i},\ D_{2i},\ D_{3i})$, where D_{1i} is a discrete length of illness variable that takes values from zero to ten years (see Figure 1); D_{2i} is a dummy variable taking value one for observations with more than ten years in length of illness (if $D_{2i} = 1$, $D_{1i} = 0$); and D_{3i} is a a frailty dummy (described in Section 3.1). The latter takes value one for those for whom $D_{1i} = 0$ but had at least one non-COD-related hospital visit during the year of death or the year previous to death. The control group (unexpected deaths) is thus given by those with $D_{1i} = D_{2i} = D_{3i} = 0$, while the treatment group (expected deaths) is given by those with either $D_{1i} > 0$ or $D_{2i} = 1$. We are interested in estimating the coefficients for D_{1i} and D_{2i}, for which we expect find negative signs indicating the presence of deathbed estate planning triggered by the expectation of a near death.

The vector with children variables, $\boldsymbol{X}_{2i}$, is one of our main additions with respect to Kopczuk's model. It contains the number of children of the decedent, as well as the average lifetime income of the children, and their average age. To compute the lifetime income of the children we follow the same methodology described in Section 3.3.[20] First of all, we estimate Equation (1) assuming $\boldsymbol{\beta}_3 = \boldsymbol{0}$ and thus excluding $\boldsymbol{X}_{2i}$. In that way, we start with a model the most similar possible to Kopczuk's. Upon including the children variables, we do not expect the estimates of $\boldsymbol{\beta}_1$ to change substantially.[21] Besides controlling for $\boldsymbol{X}_2$ we check for its interactions with $\boldsymbol{D}_i$ to study whether the presence, the number of children, and their economic situation are factors that trigger early bequests.

Since sample is composed by random draws from the Dutch population, we assume that the error term ε_i is independent across observations. However, since the net worth distribution is highly skewed, we do not assume homoskedasticity of ε_i. To deal with the skewness of our our dependent variable and the heteroskedasticity of ε_i, we apply quantile regression with bootstrapped standard errors to estimate the coefficients in Equation (1). In that aspect, our analysis substantially differs from Kopczuk's. Since he only observes individuals above the minimum estate tax threshold, he relies on truncated regression techniques to estimate average effects. Compared to OLS, quantile regression has the advantage that is not sensitive to outliers. More interestingly, it allows focusing on particular segments of the net worth distribution when estimating the effect of interest.[22] This last aspect is specially relevant since we expect estate planning to gain importance as we move up the net worth distribution. Therefore, we expect to

[19] In the singles regressions, the vector $\boldsymbol{X}_{1i}$ also contains a set of dummy variables controlling for marital status within singlehood, *i.e.* never married, divorced/separated, or widowed.

[20] We compute life time income only for children that live outside of the parental household.

[21] The only reason to think the addition of $\boldsymbol{X}_{2i}$ in the set of control variables could change the estimate of $\boldsymbol{\beta}_1$ is a potential relationship between fertility and health outcomes later in life

[22] For more on the motivations behind the use of quantile regression in a context of skewness and heteroskedasticity, see Koenker (2005) and Angrist and Pischke (2009).

estimate different effects across quantiles.

5 Results

5.1 Baseline

Table 3 shows the baseline results of our analysis. The first two rows provide the OLS estimates for the impact of variables D_1 and D_2, described in Section 3 and in Appendix A.[23] Column 4 shows that OLS estimates yield a significant effect only of D_2 for married males. The estimated effect is -30.10 thousand Euros (about 27% of the average net financial wealth at death for married males as reported in Table 2), indicating that a length of terminal illness of more than ten years decreases average net financial wealth at death by that amount. However, as explained in Section 4, due to skewness of the dependent variable, quantile effects are more interesting than average effects. We estimate the effects at the 10th, 25th, 50th, 75th, 90th, 95th and 99th percentiles of the distribution. The estimates are reported in Table 3.[24] We estimate these quantile effects simultaneously for each demographic group and test for differences in coefficient estimates across quantiles. We find that only D_2 has significantly different effects across quantiles and only for married males. Therefore, in what follows we focus on the results for that particular demographic group.

Quantile regression results in Table 3 show that only the effect of D_2 is statistically significant, indicating that length of illness has to be larger than ten years to have an impact.[25] Figures 2 and 3 complement Table 3 showing the estimates for D_1 and D_2 across the hole net financial wealth distribution. Column 4 in Table 3 and Panel (d) in Figure 3 show that the estimated effect of D_2 becomes increasingly large with net financial wealth. From the 10th up to the 90th percentile the effect increases moderately but persistently. Above the 90th percentile there is a smooth but sharp increase leading to an estimate for the 99th percentile of -255.81 thousand Euros. That estimate means that for the richest 1% having a terminal illness longer than ten years implies a decrease in net financial wealth of around 25% of the 99th percentile cut-off value in Table 2.

Note that we find clear statistical significance only around the median and at the top of the distribution. That is because quantile regression requires sufficient observations around the percentile of interest. The median effect is significantly estimated since many observations cluster

[23]Appendix D provides full estimation results for the median regression. Results for OLS estimation and for other quantiles do not differ substantially from those reported in Appendix D. The only remarkable feature is that the pseudo-R^2 increases for the higher quantiles of the distribution. Full results are available upon request.

[24]For Economy of space, the 10th and the 25th percentiles are excluded from Table 3. For those percentiles the estimated effects are not statistically significant. Results are available upon request.

[25]We find that D_1 has a significant impact in a few regressions for some of the demographic groups. For example, p50 for singles females and at p90 for married females Table 3 shows significant effects. However, these effects are usually very small and are not significantly different across quantiles. Therefore, they do not lead to a clear conclusion.

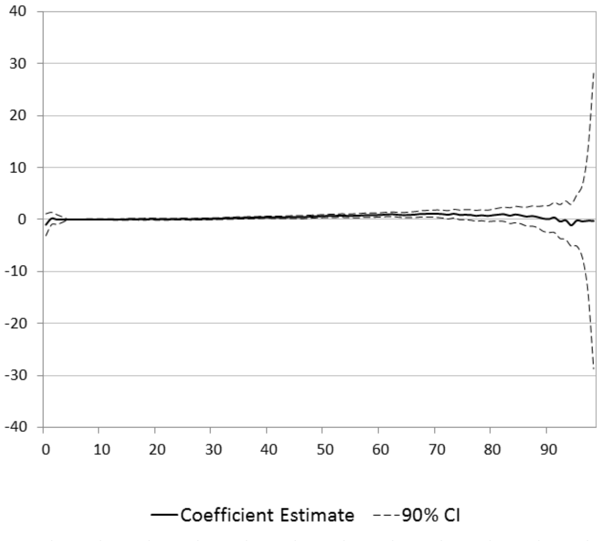
Table 3 Results: Baseline

		Dependent Variable: Net Financial Wealth at the End of Life			
		Single Females	Single Males	Married Females	Married Males
		(1)	(2)	(3)	(4)
OLS	D_1	1.51	-1.28	-1.70	-0.37
		(1.84)	(1.61)	(1.48)	(2.81)
	D_2	-6.51	-23.34	-18.07	-30.10*
		(10.80)	(15.29)	(13.42)	(17.38)
p50	D_1	-0.63***	-0.23	-0.08	-0.20
		(0.170)	(0.23)	(0.52)	(0.29)
	D_2	-0.12	-3.88	-0.95	-6.60***
		(2.12)	(2.72)	(3.24)	(2.20)
p75	D_1	-0.90	-0.90	-1.09	-0.68
		(0.56)	(0.76)	(0.92)	(0.83)
	D_2	-6.45	-5.30	-10.96	-13.30**
		(4.87)	(8.93)	(10.90)	(6.09)
p90	D_1	-0.19	-2.00	-5.19**	0.42
		(1.49)	(2.52)	(2.66)	(1.51)
	D_2	-9.36	-18.99	-19.67	-23.57
		(10.19)	(35.76)	(29.23)	(31.22)
p95	D_1	1.10	-3.94	0.49	-3.16
		(2.47)	(5.97)	(5.31)	(4.22)
	D_2	-26.10	-7.94	-38.56	-53.21**
		(16.42)	(53.90)	(39.69)	(23.14)
p99	D_1	0.27	17.60	-2.51	-11.69
		(17.27)	(23.45)	(15.49)	(16.00)
	D_2	18.74	-77.24	43.93	-255.81***
		(61.46)	(86.88)	(122.53)	(106.33)
Obs.		2658	1402	1717	3843

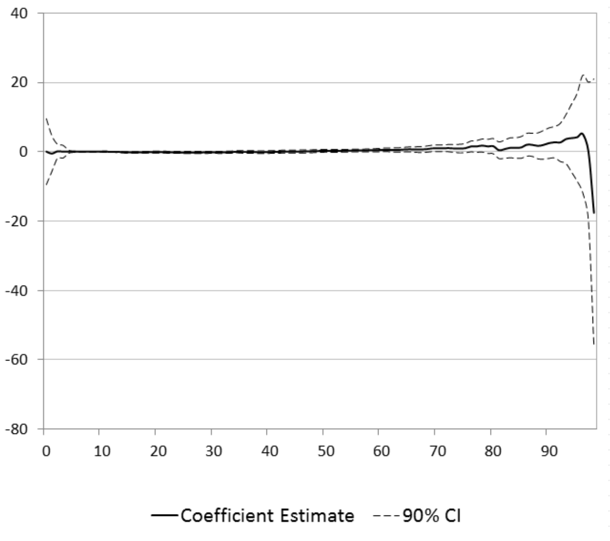
Notes: All coefficients are given in thousands of Euros. For the OLS estimates, robust standard errors are reported in parenthesis. For the quantile regression estimates, bootstrapped standard errors (with a thousand bootstrap replications) are reported in parenthesis. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

Figure 2 Quantile Regression Estimates D_1

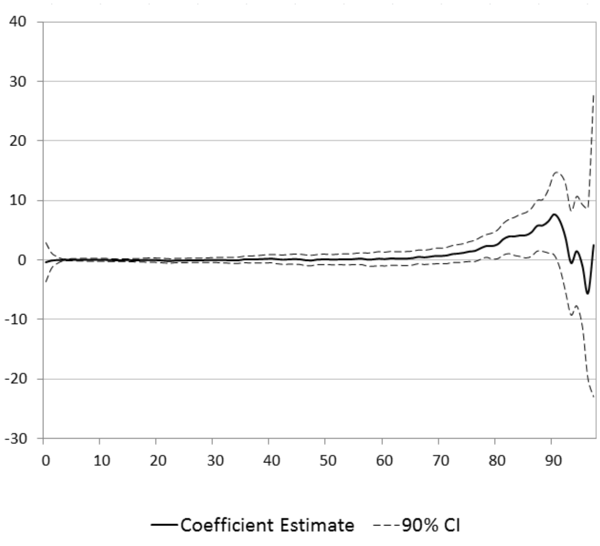
(a) Single Females



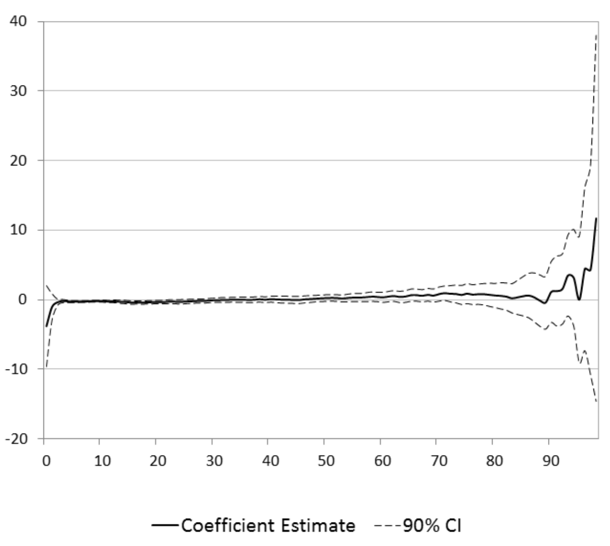
(b) Single Males



(c) Married Females

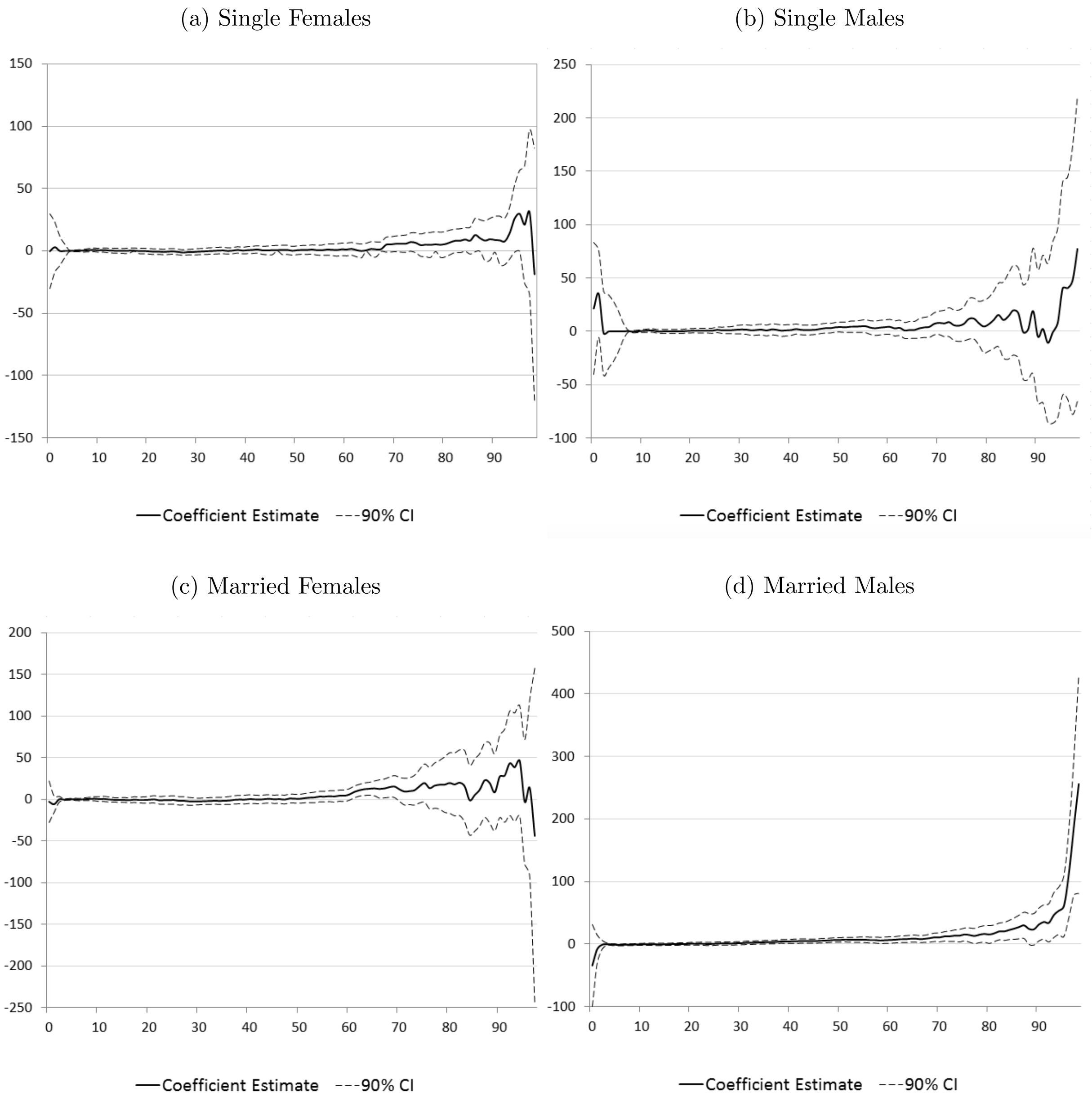


(d) Married Males



Notes: The horizontal axis indicates the percentiles of the net financial wealth distribution, while the vertical axis indicates the size of the coefficient estimate. All coefficients are given in thousands of Euros. For the sake of exposition, the sign of the coefficients is reversed.

Figure 3 Quantile Regression Estimates D_2



Notes: The horizontal axis indicates the percentiles of the net financial wealth distribution, while the vertical axis indicates the size of the coefficient estimate. All coefficients are given in thousands of Euros. For the sake of exposition, the sign of the coefficients is reversed.

around the median. Towards the top of the distribution observations are more dispersed and thus we obtain larger standard errors. That is why at the 90th percentile there is no statistical significance even though the point estimate is substantially larger compared to the median. Nevertheless, at the top of the distribution, the effect is large enough so that we can obtain statistical significance even when observations are highly dispersed.

Following Kopczuk, we interpret these results as early bequests that result from estate planning triggered by the onset of a terminal illness. Since we expect estate planning to be pursued especially by the very rich, this interpretation of the result is strengthened by the fact that we indeed find a strong and statistically significant effect at the top of the distribution. It is reasonable that we only find an effect for married individuals if we consider that most singles in our sample are either widowed or divorced, which implies they have been through a shock that may have already reduced their wealth considerably.[26] It is reasonable as well that, within the married category, we only find an effect for males if we consider that most individuals dying while married in our sample are in fact males. That is consequence of the fact that females have a higher life expectancy than males. These results match with those in Kopczuk's study since he also finds a stronger effect among married males. However, due to missing data on income his results on other demographic groups do not lead to a clear conclusion.

5.2 Age Interaction

Table 4 shows the results we obtain for married males when we interact D_1 and D_2 with the three age dummies included in our baseline regression (the age groups are: younger than 65, between 65 and 80, and older than 80). Kopczuk (2007) argues that, since younger individuals have a longer expected lifetime horizon, when contracting a terminal illness they are less likely to have engaged in any previous estate planning. This implies that they may react more strongly when contracting an illness compared to older individuals. Furthermore, for younger individuals the control group is more meaningful, since those who die young and unexpectedly are less likely have engaged in any estate planning compared to older individuals who die unexpectedly.

Table 4 shows the same regressions as in Column 4 of Table 3, but decomposed into the three age groups. We interact D_1 and D_2 with the age dummies and compute the corresponding effects for each age group.[27] Once again we find only clearly significant effects across the net financial wealth distribution for D_2. Comparing the three columns in Table 4 shows that at the median we find a significant effect only for the middle aged and older groups. However, at the top of the distribution, the effect of D_2 is clearly larger and more significant for the younger

[26] Table A1 in Appendix A shows that out of those who die single in our sample, 46% of women are either widowed or divorced, while that is the case for 62% of men. Sevak *et al.* (2003) and Poterba *et al.* (2015) for the US and van Ooijen *et al.* (2015) for the Netherlands show that divorce and widowhood are often associated with substantial drops in wealth. Table D1 in Appendix D shows that in our sample singles who are divorced or widowed die with significantly less wealth compared to those who never married.

[27] This means estimates for each percentile in Table 4 correspond to one single regression with 3843 observations.

Table 4 Results: Age Interaction for Married Males

		Dependent Variable: Net Financial Wealth at the End of Life		
		Age<65	65≤Age<80	Age≥80
		(1)	(2)	(3)
OLS	D_1	-1.65	2.48	-2.77
		(5.55)	(4.79)	(4.17)
	D_2	-5.10	-19.26	-45.68*
		(55.24)	(26.06)	(25.46)
p50	D_1	0.60	0.03	-0.74*
		(0.80)	(0.37)	(0.45)
	D_2	-1.37	-6.01*	-8.10*
		(7.13)	(3.22)	(4.57)
p75	D_1	-1.40	-0.03	-1.40
		(1.10)	(1.12)	(1.25)
	D_2	-2.47	-16.32**	-9.94
		(13.81)	(7.16)	(15.03)
p90	D_1	-1.20	2.76	-1.20
		(3.96)	(3.59)	(4.10)
	D_2	-3.27	-15.88	-35.00
		(28.07)	(25.21)	(28.41)
p95	D_1	-0.54	-0.12	-2.55
		(6.43)	(7.41)	(6.26)
	D_2	-59.68*	-22.18	-58.90
		(33.81)	(41.38)	(41.96)
p99	D_1	-50.90	1.61	-11.61
		(50.49)	(40.08)	(18.01)
	D_2	-544.99**	-368.27**	-244.82
		(242.99)	(158.31)	(162.95)
Obs.		687	1694	1462

Notes: All coefficients are given in thousands of Euros. For the OLS estimates robust standard errors are reported in parenthesis. For the quantile regression estimates, bootstrapped standard errors (with a thousand bootstrap replications) are reported in parenthesis. Each row reports one regression in which D_1 and D_2 are interacted with the three age groups. Marginal effects are provided by net worth percentile and age group. Each regression includes 3843 and number of observations for each subgroup are given in the last row. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

group. More specifically, at the top of the distribution we find that, for the younger group, having a terminal illness of more than ten years reduces net financial wealth at death by close to 0.55 million Euros. At the 99th percentile, we find as well a significant effect for the middle aged group of -368.27 thousand Euros, which is substantially smaller compared to the effect estimated for the younger group but still large. We find the effects around the median difficult to interpret. However, the results at the top of the distribution are consistent with Kopczuk's argument stating that the effect will be stronger for younger individuals, and with the idea that estate planning is specially relevant among the very rich.

5.3 Children Interactions

Table 5 shows the results we obtain for married males when including the children variables (*i.e.* number of children, average age of children, and average lifetime income of children) as controls in the regression, and when interacting D_1 and D_2 with the number of children. The first row in that table shows that when we introduce the children variables the results change slightly but not substantially. The coefficient estimates for the effect of D_2 become generally somewhat smaller and less statistically significant compared to those in Column (4) of Table 3. This change may be due to the presence of a relation between fertility and health outcomes later in life. However, investigating this issue is beyond the scope of the present study. To interact the number of children we generate three dummy variables dividing the sample into three groups: those with no children, those with one child, and those with two or more children. We interact the dummies with both D_1 and D_2 and report the estimated effects for each group.

Table 5 shows that the estimated effect is strongest for those individuals who have one child at time of death. For this group we estimate a significantly negative effect of D_2 at the median and at all other percentiles above it. At the 99th percentile, we find that a terminal illness of above ten years long triggers a decline in wealth of about 525.81 Euros. At that same percentile, we also find an effect for those who have two or more children at the moment of death. This effect is however less strong and less statistically significant compared to the one for the group with only one child. This results is difficult to explain. However, it shows that the effect we estimate comes solely from those individuals who die with at least one child.

Table 6 shows the results we obtain for married males when interacting D_1 and D_2 with average lifetime income of children. To that end, we take the average lifetime income of children at time of death, divide the distribution of this variable into quartiles, and generate a dummy variable for each quartile. Average lifetime income of children is only computed for those who have at least one child outside of the household at time of death. Table 6 reports thus the estimated interaction effects for married males conditional on at least having one child living outside of the household at time of death.

Table 5 Results: Number of Children Interaction for Married Males

		Dependent Variable: Net Financial Wealth at the End of Life			
		No Interaction	N. Children=0	N. Children=1	N. Children≥2
		(1)	(2)	(3)	(4)
OLS	D_1	-0.34	10.21	8.47	-2.27
		(2.71)	(21.03)	(11.78)	(2.92)
	D_2	-28.74	-121.54	-56.40	-17.80
		(18.03)	(86.96)	(43.58)	(18.61)
p50	D_1	-0.21	0.07	-0.25	-0.27
		(0.29)	(1.18)	(0.81)	(0.31)
	D_2	-5.54***	-15.21	-9.93*	-4.48**
		(2.11)	(21.58)	(-4.48)	(2.26)
p75	D_1	-0.73	2.25	-0.87	-0.88
		(0.85)	(4.08)	(2.66)	(0.90)
	D_2	-14.75***	-8.50	-28.28***	-10.27
		(5.42)	(50.13)	(50.14)	(7.25)
p90	D_1	-0.633.11	-4.37	1.60	-0.41
		(2.64)	(6.87)	(7.09)	(2.97)
	D_2	-34.29**	-47.32	-55.37**	-27.78
		(16.05)	(142.42)	(23.01)	(20.63)
p95	D_1	-2.98	-30.40*	-4.88	-0.33
		(4.04)	(1.68)	(8.89)	(4.56)
	D_2	-49.53**	-216.04	-107.65**	-34.61
		(21.96)	(140.72)	(33.95)	(23.26)
p99	D_1	-9.37	-16.82	-13.41	-14.35
		(14.59)	(185.37)	(157.46)	(16.36)
	D_2	-206.00*	-1477.39	-525.81***	-184.44*
		(111.00)	(99.23)	(185.97)	(104.94)
Obs.		3843	316	447	3073

Notes: All coefficients are given in thousands of Euros. For the OLS estimates robust standard errors are reported in parenthesis. For the quantile regression estimates, bootstrapped standard errors (with a thousand bootstrap replications) are reported in parenthesis. All quantile regressions are estimated simultaneously. Each row in Columns 2 to 4 report one regression in which D_1 and D_2 are interacted with the three subgroups. Marginal effects are provided by net worth percentile and number-of-children group. Each regression includes 3843 observations and number of observations for each subgroup are given in the last row. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

Table 6 Results: Lifetime Income of Children Interaction for Married Males

		Dependent Variable: Net Financial Wealth at the End of Life			
		1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
		(1)	(2)	(3)	(4)
OLS	D_1	1.88	3.28	-1.62	2.04
		(3.30)	(3.54)	(3.92)	(7.23)
	D_2	17.56	1.40	-26.98	-26.68
		(30.35)	(25.84)	(26.39)	(51.60)
p50	D_1	-0.05	0.48	-0.81	0.12
		(0.40)	(0.47)	(0.52)	(0.81)
	D_2	-0.73	-6.01*	-4.94	-1.32
		(3.50)	(3.55)	(3.54)	(8.91)
p75	D_1	-0.50	0.15	-2.56*	-0.54
		(1.70)	(1.13)	(1.44)	(2.17)
	D_2	-8.89	-20.50**	-24.40**	22.56
		(7.60)	(9.48)	(11.27)	(19.61)
p90	D_1	2.92	1.66	-0.98	-1.40
		(4.42)	(4.32)	(7.24)	(6.16)
	D_2	-5.08	-32.91	-62.81***	-18.28
		(38.99)	(30.31)	(23.78)	(40.53)
p95	D_1	-0.75	5.03	6.87	-4.95
		(7.20)	(9.92)	(12.90)	(9.99)
	D_2	-27.17	-65.61	-121.65***	-23.78
		(49.92)	(49.26)	(39.13)	(145.58)
p99	D_1	-28.31	-8.79	10.54	-8.23
		(30.85)	(30.67)	(54.82)	(68.57)
	D_2	-432.58***	-351.08**	-500.98***	-68.10
		(137.18)	(139.44)	(136.80)	(126.61)
Obs.		795	795	795	795

Notes: All coefficients are given in thousands of Euros. For the OLS estimates robust standard errors are reported in parenthesis. For the quantile regression estimates, bootstrapped standard errors (with a thousand bootstrap replications) are reported in parenthesis. Each row reports one regression in which D_1 and D_2 are interacted with the each quantile group. Marginal effects are thus provided by net worth percentile and income quartile of children. Each regression includes 3843 observations and the number of observations for each subgroup are given in the last row. Results for the group of individuals with not children outside of the household are not provided. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

The results in Table 6 show that D_2 has only an effect for individuals with children whose average lifetime income is within the three bottom quartiles of the distribution. Between the median and the 95th percentile of the net financial wealth distribution we find significant effects only for those with children in the second and third quartiles of the income distribution. However, at the 99th percentile, we also find a very strong effect for those with children at the bottom quartile of the income distribution. In all cases we do not find an effect for individuals whose children are at the top quartile of the distribution, *i.e.* those with children with relatively high incomes. This result is consistent with individuals caring about the income level of their children when making decisions about estate planning and early bequests. This is in line with a branch of the economic literature which indicates that parental transfers have a strong negative correlation with income of the children (*e.g.*, Laitner and Juster, 1996; Laitner, 2002; and McGarry, 2016).

6 Conclusions and Discussion

In this paper we use Dutch administrative data to empirically identify the presence of a bequest motive for saving. To do so, we follow Kopczuk (2007) and compare net financial wealth at time of death between expected and unexpected deaths. Splitting our sample by gender and marital status and employing quantile regression, we do find a negative effect of expected deaths on wealth at death. However, we only find an effect for married males whose death is preceded by an illness above ten years long. We estimate significant effects around the median and at the top of the net financial wealth distribution. Since we control for age and lifetime income, and the Dutch setting prevents any major role of medical expenditures and income shocks interfering in our analysis, we follow Kopczuk (2007) and interpret this result as early bequests that result from estate planning in the expectation of a near death. According to Kopczuk's interpretation, this behaviour reflects the presence of a bequest motive for saving.

The effect we estimate at the top of the wealth distribution is specially strong for those who are younger than 65 years at the moment of death. Following Kopczuk's interpretation, since younger individuals have a longer expected remaining lifetime horizon compared to older individuals, upon contracting a terminal illness they are less likely to have engaged in any previous estate planning. Therefore, finding a stronger effect for that group is consistent with our results responding to estate planning. Furthermore, finding evidence at the top of the wealth distribution coincides with a recurrent view in the literature that classifies bequests as a luxury good (*e.g.*, see Kopczuk and Lupton, 2007; and De Nardi and Yang, 2014).

Regarding the interaction with children and their characteristics, we find that the effect comes solely from individuals who have at least one child at time of death. Furthermore, conditional on having children living outside of the household, the effect is only significant for individuals whose children are below the 75th percentile of the lifetime income distribution. This result suggests that individuals do care about the economic situation of their children when making decisions about saving and bequests. This is in line with a branch of the economic literature (*e.g.* Laitner and Juster, 1996; Laitner, 2002; and McGarry, 2016) which finds that income negatively correlates with recipiency of parental transfers.

It is reasonable that we only find an effect for married individuals if we consider that more than 50% of singles in our sample are either widowed or divorced, implying that they have been through a shock that is likely to have already reduced their wealth considerably.[28] An additional possible explanation for finding an effect only for married individuals is that, in the Netherlands, intestacy implies that all wealth is left to the spouse. Therefore, if individuals want to make sure that part of the wealth is left to the children, they might start transferring that wealth in the expectation of a near death. It is reasonable as well that, within the married category, we only find an effect for males considering that most individuals dying while married in our sample are males, which is a consequence of their lower life expectancy compared to females.

Given a bequest motive for saving, there are two reasons to think why individuals would start transferring part of the estate in the expectation of a near death. The first is tax avoidance, while the second is exertion of control over recipiency and use of transfers. As shown in Appendix E, in the Netherlands, there is a progressive inheritance tax system that allows avoiding taxes if the estate is split into parts and transferred over time. This suggests tax avoidance may play an important role in explaining the results that we find. However, investigating whether tax avoidance plays a role or not is beyond the scope of the present study. Regardless of the set of conditions necessary to trigger bequest planning, we follow Kopczuk and interpret that this behaviour responds in any case to a bequest motive for saving. The Dutch inheritance tax code described in Appendix E experienced a significant reform in 2010 which made it less progressive. Exploiting this reform to investigate the extent of inheritance tax avoidance is an interesting venue for future research.

The interpretation of our results relies on out of pocket medical expenditures, as well as non-medical consumption, not playing a mediating role in the relation between expected death and wealth at the end of life. Even though the Dutch health care system prevents any major role of out of pocket medical expenditures, Bakx *et al.* (2016) show that in a given year the latter represent around 5% of total medical expenditures. Even though this is a very low proportion, it still could imply that our results are partially driven by wealthy individuals incurring additional medical expenditures to receive treatment in special conditions. Furthermore, our results can also be explained by individuals adjusting their rate of time preference and thus increasing non-medical consumption at the end of life. However, there is a large stream of literature, surveyed by Finkelstein *et al.* (2009), which argues that bad health has actually a negative effect on non-

[28]Several studies (*e.g.* Sevak *et al.*, 2003; Poterba *et al.*, 2015; van Ooijen *et al.*, 2015) find a negative effect of divorce and widowhood on wealth.

medical consumption since it reduces it's marginal utility. In fact, van Ooijen *et al.* (2016) show using data on Dutch retirees that sickness diminishes non-medical consumption. Therefore, we can argue that we find a negative effect of expected death on wealth at death *despite* the negative effect of bad health on non-medical consumption.

In future work, we intend to further clarify these issues by enlarging the sample to the whole universe of deaths occurred between 2006 and 2010, and by expanding the present study in two ways. First, by refining the distinction between expected and unexpected deaths taking into account causes of death and types of disease. This will allow applying the definition of sudden death employed by Andersen and Nielsen (2010),[29] as well as identifying certain illnesses that are more or less likely to cause death in the short term. Second, we will expand the present study by investigating how the wealth of decedents evolves during the last years of life. Our wealth data go back only to 2005. However, they can at least be exploited to study whether the decline in wealth we observe takes place between 2005 and the year of death. We will investigate whether such declines coincide with increases in children's wealth, which would potentially allow separating the role of transfers and consumption in explaining the results we find.

In addition, future work is required to further clarify the role of length of illness. Our results show that only deaths preceded by a very long term illness (above ten years) are associated with lower wealth at time of death. However, they way we codify length of illness does not rule out an effect when length of illness is slightly shorter than ten years. Therefore, in future work we will examine in further detail what is the exact length of illness above which we find an effect. Regardless of all the alternative explanations that require further investigation, the present study represents a meaningful expansion of the work by Kopczuk (2007), and suggests the bequest motive as a potential explanation for the wealth holdings retirees.

[29] Based on medical literature Andersen and Nielsen (2010) define a set of causes of death that they classify as sudden deaths.

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Appendices

A Variable Definitions and Summary Statistics

Table A1 Variable Definitions

Variable	Definition
Net Financial Wealth	Sum of deposits, saving accounts, stocks and bonds, minus non-mortgage debt. Measured at the 31st of December of the year previous to death.
D_1	Discrete variable measuring length of illness in years. Length of illness is defined as the time between diagnosis and death. Takes values from zero to ten and years are rounded upwards.
D_2	Dummy variable taking value one for decedents with more than ten years in length of illness.
D_3	Dummy variable taking value one if $D_1 = 0$ but the decedent had at least one non-cause-of-death-related hospital visit during the year of death or the year previous to death
Marital Status	Marital status of single decedents. 1: Never Married; 2: Divorced or Separated; 3: Widowed.
Age	1: age<65; 2: 5≤age<80; 3:age≥80.
Permanent Income	If main source of income the year previous of death is not pension income: average of yearly equivalized household income between 2003 and the year previous to death. If main source of income the year previous to death is pension income: equivalized household income at the year previous to death. Income is equivalized by taking by diving it by the square root of the number of members in the household.
Delay	Measure in days of the delay between wealth measurement and time of death. Wealth measurement corresponds to the 31st of December of the year previous to death.
Number of children	Number of children at time of death.
Avg. age of children	Average age of the children of the decedent.
Avg. permanent income of children	Average permanent income of the children of the decedent. Permanent income is comupted using the same method as for the permanent income of the decendent.

Table A2 Summary Statistics

Variable	Mean	Median	Std. Dev.	Min	Max.
Single Females (2658 observations)					
Net Financial Wealth	69523.02	17631.50	283354.90	-3009721	6493235
D_1	1.19	0	2.49	0	10
D_2	0.06	-	-	-	-
D_3	0.21	-	-	-	-
Marital Status					
Never Married	0.54	-	-	-	-
Divorced or Separated	0.07	-	-	-	-
Widowed	0.39	-	-	-	-
Age					
Age$<$65	0.07	-	-	-	-
65$\leq$Age$<$80	0.17	-	-	-	-
Age$\geq$80	0.76	-	-	-	-
Permanent Income	18607.79	15772.55	10354.15	-6507.03	190946.90
Delay	177.74	178	107.90	0	365
Number of children	2.46	2	1.96	0	7
Avg. age of children	53.29	54.50	9.50	2	76
Avg. permanent income of children	16197.66	147774.11	7627.00	-445.11	116679.60
Single Males (1402 observations)					
Net Financial Wealth	65746.97	17714	215836.20	-460750	3951640
D_1	1.31	0	2.55	0	10
D_2	0.05	-	-	-	-
D_3	0.19	-	-	-	-
Marital Status					
Never Married	0.38	-	-	-	-
Divorced or Separated	0.19	-	-	-	-
Widowed	0.43	-	-	-	-
Age					
Age$<$65	0.19	-	-	-	-
65$\leq$Age$<$80	0.29	-	-	-	-
Age$\geq$80	0.53	-	-	-	-
Permanent Income	20205.23	17396.83	11266.89	0	187194.10
Delay	177.169	176	108.42	0	365

Table A2 Summary Statistics (Continuation)

Variable	Mean	Median	Std. Dev.	Min.	Max.
Number of children	1.91	2	1.82	0	7
Avg. age of children	47.54	48.90	11.11	2	73
Avg. permanent income of children	15119.58	13772.12	7474.74	279.66	71080.92
Married Females (1717 observations)					
Net Financial Wealth	74841.89	24244	209718.80	-2257787	3782059
D_1	1.62	0	2.70	0	10
D_2	0.05	-	-	-	-
D_3	0.17	-	-	-	-
Age					
Age<65	0.30	-	-	-	-
65≤Age<80	0.40	-	-	-	-
Age≥80	0.30	-	-	-	-
Permanent Income	20830.78	18102.88	9930.91	-5409.67	93819
Delay	183.56	187	107.35	0	365
Number of children	2.39	2	1.49	0	7
Avg. age of children	41.19	43.20	11.94	0	68
Avg. permanent income of children	14333.08	13538.58	6712.44	-69849	62394.33
Married Males (3843 observations)					
Net Financial Wealth	107532.50	27178.50	686820.70	-1646262	10357899
D_1	1.49	0	2.60	0	10
D_2	0.07	-	-	-	-
D_3	0.16	-	-	-	-
Age					
Age<65	0.18	-	-	-	-
65≤Age<80	0.44	-	-	-	-
Age≥80	0.38	-	-	-	-
Permanent Income	21115.93	18220.02	12247.52	-1583.33	378403.90
Delay	181.74	180	109.21	0	365
Number of children	2.53	2	1.53	0	7
Avg. age of children	42.15	43.50	10.68	0	71.33
Avg. permanent income of children	14850.47	13492.88	7808.69	-5649.73	201285

Notes: All summary statistics are based on the number of observations reported in Table 2. Except for the variables Avg. age of children and Avg. permanent income of children, which are given conditional on having children, and conditional on having children outside of the household, respectively.

B Cause of Death Classification

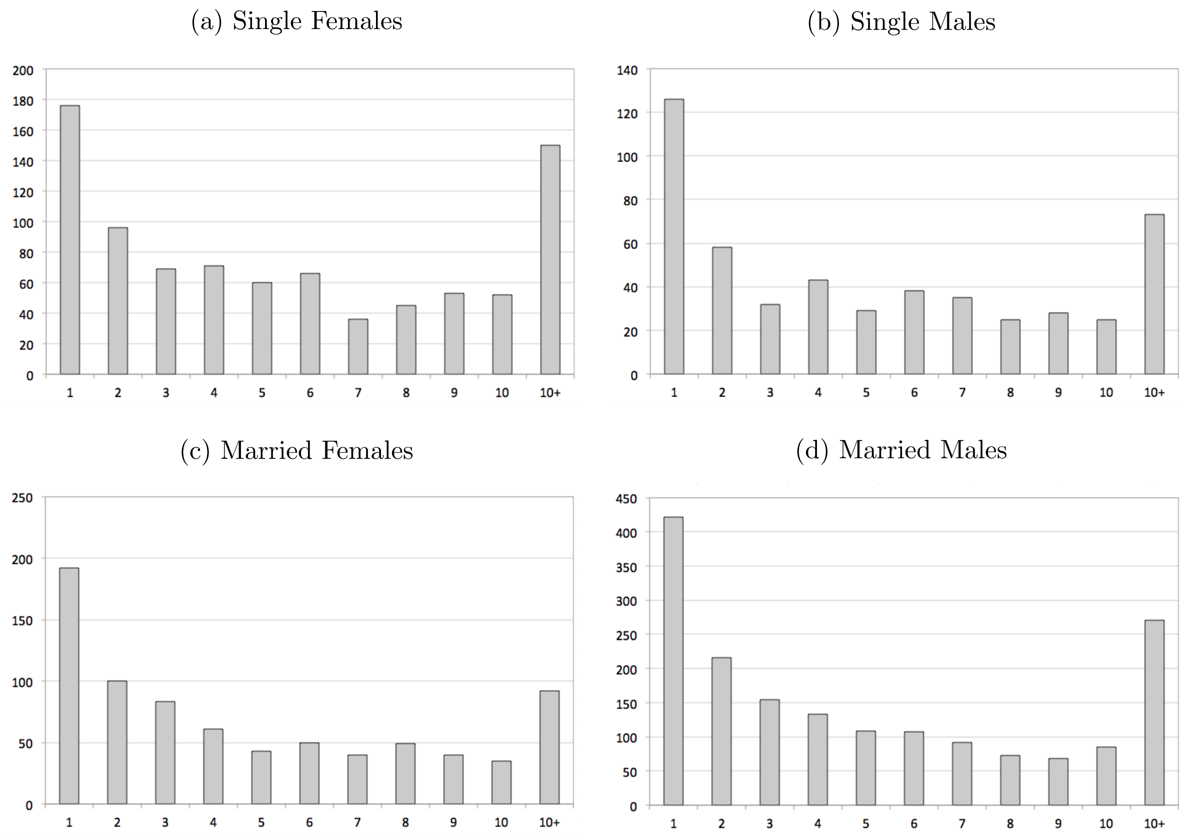
Table B1 Cause of Death Categories ICD-10

Category	Frequency	Percentage
Infectious diseases	129	1.3%
Neoplasms	3430	35.7%
Blood diseases	24	0.3%
Endocrine, nutritional and metabolic diseases	276	2.9%
Mental and behavioural disorders	423	4.4%
Diseases of the nervous system	272	2.8%
Diseases of the circulatory system	2816	29.3%
Diseases of the respiratory system	916	9.5%
Diseases of the digestive system	370	3.9%
Diseases of the skin	25	0.3%
Diseases of the musculoskeletal system	55	0.6%
Diseases of the genitourinary system	231	2.4%
Congenital malformations	6	0.1%
Ill-defined conditions	328	3.4%
External causes of morbidity and mortality	318	3.3%

Notes: Causes of death are classified according to the 10th revision of the International Classification of Diseases and Related Health Problems (ICD-10), put together by the World Health Organization. For more information, see WHO (2016).

C Length of Illness by Gender and Marital Status

Figure C1 Histogram Length of Illness in Years



Notes: Zeros are excluded from each of the figures. Their frequency is 1784 in Panel (a), 890 in Panel (b), 932 in Panel (c), and 2113 in Panel (d).

D Full Regression Results

Table D1 Full Results: Median Regression

	Dependent Variable: Net Financial Wealth at the End of Life			
	Single Females (1)	Single Males (2)	Married Females (3)	Married Males (4)
D_1	0.63***	-0.23	0.42	-0.21
	(0.16)	(0.28)	(0.41)	(0.26)
D_2	0.12	-3.88	2.31	-6.70***
	(2.08)	(3.14)	(2.83)	(2.25)
D_3	-0.12	-1.20	-4.13	0.23
	(1.49)	(1.71)	(3.45)	(1.98)
Divorced	-3.31*	-8.98***		
	(1.85)	(1.50)		
Widowed	-0.35	-4.34**		
	(1.21)	(2.15)		
Age2	0.53	4.12***	11.78***	16.68***
	(2.15)	(1.56)	(2.23)	(1.96)
Age3	8.34***	11.40***	29.49***	31.73***
	(2.11)	(2.38)	(2.84)	(2.31)
P. Income	3.87***	1.93***	3.24***	3.66***
	(0.51)	(0.27)	(0.36)	(0.23)
Delay	0.01*	-0.03	-0.04	-9.39*
	(0.00)	(0.06)	(0.08)	(5.53)
2007	-3.78**	0.31	-2.10	0.23
	(1.46)	(2.17)	(2.79)	(2.03)
2008	-5.73***	-3.39*	4.36	1.24
	(1.53)	(1.76)	(2.66)	(2.24)
2009	-4.52**	-1.16	-2.70	-5.12***
	(2.01)	(2.14)	(2.84)	(1.90)
2010	-4.79**	-0.25	1.99	-2.79
	(2.01)	(2.44)	(3.30)	(1.81)
Pseudo-R^2	0.08	0.05	0.08	0.06
Obs.	2658	1402	1717	3843

Notes: All coefficients are given in thousands of Euros. *Permanent Income* is rescaled to thousands of Euros. Bootstrapped standard errors (with a thousand bootstrap replications) are reported in parenthesis. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

E Inheritance and Gift Taxation in the Netherlands

The inheritance and gift tax schedule described here was in place in the Netherlands until 1st of January 2010, a new less progressive schedule was put in place. For more details on the current tax schedule, see Ernst and Young (2017).

Table E1 Gift and Inheritance Tax Rates

Brackets (thousands of €)	Partners and children	Grandchildren	Siblings and parents	Non-relatives
0-22	5%	8%	26%	41%
22-45	8%	13%	30%	45%
45-90	12%	19%	35%	50%
90-180	15%	24%	39%	54%
180-360	19%	30%	44%	59%
365-900	23%	37%	48%	63%
Above 900	27%	43%	53%	68%

∗ Exemptions for gifts (thousands of €):

Children: 4.5

Children from 18 to 35 years (one-time): 23

Others: 3

∗ Exemptions for inheritances (thousands of €):

Partners (married): 530

Partners (not married): 100-530 depending on the length of cohabitation

Children $\geq$ 23 years: 10 provided that inheritance < 27

Children $<$ 23 years: 4.5 per year below 23, with a minimum of 10

Handicapped children $\geq$ 23 years: 10

Handicapped children $<$ 23 years: 4.5 per year below 23, with a minimum of 14

Parents: 45

Grandchildren: 10 provided that inheritance < 10

Others: 2

Any gift made within the 180 days preceding the death of the donor is considered as inheritance.

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