Bequests and Informal Long-Term Care: Evidence from HRS Exit Interviews*

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Abstract

Informal long-term caregiving for frail elderly individuals by their children may induce parents to compensate their children for their help. To test this hypothesis, I use the exit interview from the Health and Retirement Study (HRS). My results show that the decision to care for one's parents has a significant positive impact on the incidence and amount of bequests received. In addition, increasing the amount of care relative to one's siblings significantly increases the proportion of bequest within a family. Furthermore, I find that the positive nexus of caregiving and bequest requires a written will as a contract between the parent and the helping child.

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1 Introduction

The risk of needing long-term care (LTC) constitutes one of the largest yet insufficiently insured risks of the elderly and is associated with high individual and social costs; see OECD (2011), Norton (2000) and Davidoff (2013) for reviews. Older people with LTC needs can either rely on informal care by family members at home or obtain professional formal care, which can be home health care, assisted living, or nursing home care. However, in most OECD countries, the largest share of LTC is provided informally.

Although determinants of long-term care and associated living arrangements have been extensively studied in the literature, there is no consensus regarding the quantitative importance of monetary rewards for caregivers providing informal care.[1] However, an understanding of such financial implications is relevant for understanding people's propensity to (self-)insure against late-life risks.[2]

In this paper, I empirically assess whether parental bequests and their distribution among children are positively affected by children's caregiving. In addition, I study potential determinants of the positive impact of help on inheritance. My study focuses on the US, in which most states allow broad testamentary freedom–in contrast to most countries in continental Europe–and in which bequests can be freely distributed among relatives.[3] I employ data from the so-called exit interview of the Health and Retirement Study (HRS), which–to the best of my knowledge–has not yet been studied for this purpose. The exit interview is conducted after the respondent's death with a close relative or friend. The interview contains detailed information about the division of bequests and the intensity of help with (instrumental) activities of daily living, (I)ADL, which are fundamental tasks that an individual must master to organize his or her life. The use of these data allows me to study monetary transactions within the informal care sector in much more detail than was possible in previous studies. In particular, I have information on the hours of help with (I)ADL from *each* child as well as the actual inheritance given *to each* child without needing to rely on proxy variables. I thus employ the distribution of bequests for a sample of individual elderly households among their children conditional on their help with long-term care.

I first present detailed descriptive statistics. According to simple conditional means, it is

[1] Living arrangements and informal care are studied, e.g., in Dostie and Leger (2005), Pezzin and Schone (1999), Byrne et al. (2009).

[2] Recently, a growing body of literature has identified potentially high out-of-pocket expenditures for *formal* long-term care arrangements as an important late-life risk leading people to hold on to their assets in old age, cf. De Nardi et al. (2010) and Kopecky and Koreshkova (2014). If *informal* long-term care also requires significant monetary resources to compensate those who provide care, then there exists an alternative motive for high old-age asset holdings. It is important to note, however, that the two motives to save for formal and informal care are potentially substitutes.

[3] See Tate (2008), who considers a juristic perspective and argues in favor of such freedom precisely to allow the 'competent testator' rather than the government to decide how much to award caregiving children.

shown that both the intensive and extensive margins of received bequests crucially depend on the children's caregiver status: children who helped their parents are 18 percentage points more likely to receive an inheritance with a 54 percent higher amount, on average. Similar statistics are found along the distribution of total bequests within a family. In addition, caregiving children have a higher incidence of receiving inter vivos transfers and receive a higher amount prior to their parent's death. Conditional on caregiving, a higher intensity of caregiving in terms of hours helped is not associated with higher amounts of bequests. However, a higher intensity of care relative to one's siblings comes along with a higher proportion of received bequest within a family.

The main purpose of this paper is to empirically study how children's caregiving behavior affects the bequests that they receive. One important concern is an endogeneity problem because children's help and parental bequests might be influenced by unobserved variables such as family cohesion. In addition, the measurement of data might be biased. Hence, I estimate models under the assumption that children's help is endogenous by employing an instrumental variable (IV) approach and a family fixed-effects model. Because specification tests draw mixed conclusions about the existence of the endogeneity of children's help, I also estimate the model assuming that children's help is exogenous (i.e., uncorrelated with the error term).

The general patterns found in the descriptive statistics are confirmed in my empirical analysis. I find a strong and significant correlation between children's caregiving and bequests, suggesting a large market of informal care in terms of monetary turnover. Controlling for a variety of parental and children's characteristics, I find that children who provide any help have a 5 to 21 percent higher probability of receiving positive bequests depending on specifications. In addition, providing any care significantly increases a child's received bequests by 20-77 thousand dollars conditional on being in a family with positive amounts to bequeath. These values imply an hourly wage of $20 for informal caregiving if the intensity of caregiving was constant and the lifetime duration of caregiving for the child were one year. In addition, the impact of caregiving is present at all quintiles of the bequest distribution.

The effect of an additional hour of caregiving (intensive margin of care) is not significant. However, significant and positive effects at the intensive margin are found when studying relative variables. According to my regression results, increasing the amount of care by 10 percent relative to one's siblings increases the proportion of received bequests distributed to this child by 9-14 percent depending on the specification.

I identify the presence of a written will as an important determinant of the correlation between caregiving and bequests. Employing an interaction approach, I find that the positive correlation between help and bequest is present only if the parent has made a will and that the initial caregiving decision is significantly correlated with bequests only if the parent had recently written a will before death. I interpret the will as a contract between

parent and child that is necessary for the exchange motive to work.

Various robustness checks are employed to support my findings. First, I analyze intergenerational transfers more broadly to account for the concern that non-caregiving children might receive higher inter vivos transfers within a family to offset higher bequests for children who give care. However, I also find a positive correlation between caregiving and inter vivos transfers in the wave before death. Second, I find that the coefficient of caregiving for received bequests is also significantly positive for institutionalized respondents, although it is not as strong. The last two sensitivity checks address the endogeneity problem. I employ an alternative variable for caregiving from the HRS instead of the exit interview. This alternative variable of caregiving was not answered by the same person who gave care which potentially mitigates measurement problems. In addition, I test for the problem of 'overcontrolling' by providing results from regressions with fewer control variables.

After presenting my results, I discuss the theory on bequest motives that is consistent with my findings. Most importantly, the exchange motive by Bernheim et al. (1985) prescribes a positive correlation between children's help and parental bequests. However, my main results are also consistent with altruistic bequest motives. Although some of my findings further support the exchange motive, it is not the ultimate goal of this paper to disentangle the two.

The paper proceeds as follows. In Section 2, I present existing empirical studies on bequests and children's attention or caregiving. Section 3 describes the data and provides detailed descriptive statistics. Section 4 presents the empirical models, and Section 5 presents the main results. Section 6 conducts several sensitivity checks, and Section7 discusses the results in light of the theoretical literature. Finally, I conclude the paper in Section 8. Further results are included in the appendix.

2 Literature

Existing empirical studies on bequest behavior in response to children's attention and caregiving confront problems of data availability. For example, using parental wealth as a proxy for inheritance, as in the vast majority of studies, does not reveal sufficient information about the inheritance that each individual child receives, given the possibility of unequal division in the case of multiple children. However, data on *actual* bequests and their distribution among children and concurrent data on care provision is usually not available. In addition, studies often focus on 'light' attention variables of children, such as phone calls, and only a few focus on the informal LTC sector.

Most closely related to my study is Brown (2006), who analyzes children's (potential) informal caregiving as the explanatory variable for *expected* inheritance using the HRS core data. She calculates potential end-of-life transfers using information about which child is included in life insurance policies and wills, and this method limits her sample consid-

erably.[4] She finds that parents intend to bequeath significantly more to the (expected) caregiver, which is consistent with my findings. Norton and Van Houtven (2006) focus on whether informal care by children has (negatively) affected the propensity to equally divide bequests. Again, their data do not contain detailed information about help and monetary transfers to each child. To the best of my knowledge, Norton and Taylor (2005) is the only study that analyzes *actual* bequests.[5] However, the authors employ co-residence with parents as a proxy for children's help without finding significant effects. In addition, they use bequest data from court records, which is an imperfect proxy for actual bequests. Hurd and Smith (2001) find that inheritances from estate tax files or information from wills that pass through probate cover (at most) one-third of the actual bequests elicited from the exit interview.

Initiated by Cox (1987) and Cox and Rank (1992), studies have used inter vivos transfers rather than bequests and generally find a positive correlation between attention and transfers. Again, however, only some studies examine the LTC sector; see Henretta et al. (1997), Norton and Van Houtven (2006), Norton et al. (2013) and McGarry and Schoeni (1995, 1997).

To the best of my knowledge, this is the first study on actually received bequests based on informal long-term care behavior by care recipients' children. Employing these new data entails several advantages. First, using actual bequests allows me to determine precise estimates of the dollar amount of bequests received as a result of caregiving. Furthermore, employing the number of hours of care provided enables a study of the intensive margin of caregiving (i.e., whether more extensive caregiving is associated with higher bequests). Finally, the data facilitate a detailed analysis of different sibling behavior with respect to received bequests within families.

3 Descriptive Statistics

This section presents an overview of the data from HRS exit interviews. The main goal is to present statistics on children's caregiving and the parental bequest distribution that already indicate a positive correlation between the two variables. Additional descriptive statistics are shown from the parents' and children's perspective. I begin by discussing the sample selection and analyzing the quality of the main variables.

[4]Brown (2006) uses data from the first wave of the Asset and Health Dynamics Among the Oldest Old (AHEAD). However, the specific amount of bequests per child is, of course, unavailable in the HRS core data. She focuses on the extensive margin of help and proxies children's received bequests by dividing net worth by the number of persons named in the will.

[5]Other empirical studies on strategic bequest motives that do not study the LTC sector are Bernheim et al. (1985) and Perozek (1998). These studies use current wealth as a proxy and focus on attention variables rather than informal care. Laitner and Ohlsson (2001) concentrate on the impact of children's resources on inheritances and neglect children's help altogether.

3.1 Data and Sample

The main data source is the exit interview, which is a follow-up survey of the Health and Retirement Study (HRS) that is conducted after the HRS respondent has died. The HRS is a longitudinal study of older US citizens. It contains detailed information about economic status, family relations, health measures and labor market activity. The interviews for the first cohort began in 1992 and consisted of people who were born in 1923 or earlier. Subsequently, four other cohorts were added to form a representative sample of elderly people in the United States. Typically, the survey is conducted every two years.

Sample Selection

The exit interviews are released along with the core interviews and contain data from 'proxy informants'–in most cases, close family members–who are asked about deceased panel members. I refer to the respondent who has died as the parent and study his relationship with his children. The exit interviews provide a unique data set to obtain information about how deceased respondents' wealth endowment is distributed among family, friends and others. In addition, there is detailed information about help from children as well as their demographic and financial characteristics. In cases in which information from earlier years is needed, RAND data, HRS family data, and HRS data are merged.[6]

For the analysis, I use the six exit interview waves from the years 2002-2012.[7] Several restrictions are imposed on the original sample. First, only parents who do not have any kind of partner at the time of death are included, as couples tend to leave assets to the surviving spouse. I refer to parents as singles if they are widowed or divorced (i.e., not currently married to or partnered with a living person). Second, I only consider families with at least one biological child to generate parent-child pairs. Third, only observations that have non-missing values for all variables are included. Exemptions include categorical variables, where a dummy for missing values is included.[8] The restrictions result in a final sample size of 8157 children receiving bequests from 2878 parents in total (cf. Table 1). Focusing on individual parents reduces the size of the original sample by half, and excluding observations due to missing values further reduces the sample by approximately 15 percent.[9]

[6]RAND contributions are streamlined, user-friendly data sets that are based on the HRS core interviews processed by the RAND Center for the Study of Aging. To diminish information loss from missing values, I update the variables with data from previous waves.

[7]The questionnaire for exit interviews from years prior to 2002 differs from those used for later interviews in several ways, with notable differences concerning some of the essential control variables, such as the child's income.

[8]For the descriptive statistics, I exclude all missing variables for those variables used in my main empirical specifications. However, some variables that are used only in the sensitivity analysis might still have missing values such that the total sample size for descriptive statistics with these variables might be smaller than the mentioned size of 8157. In addition, I use some monetary control variables in log form such that all zero and negative entries are omitted in the regressions.

[9]I do not use weights from the HRS data to account for the oversampling of certain groups because there are no weights available for people living in nursing homes for all of the waves that I use.

Table 1: Sample Restriction

	Original sample	Individual parents	biological child(ren)	Nonmissing values	Selected Sample
Children	25,802	-12,081	-1448	-4075	8157
Parents	7273	-3215	-292	-888	2878

Notes: HRS exit interviews, pooled sample 2002-2012.

In my sample, mostly the respondents' children were answering the questionnaire. The proxy respondent of the exit interview was mostly either the daughter (50%) or the son (26%). The remaining fractions are only small including the spouse of the son (3.5%), the respondent's sister (3%) or other relatives or individuals.

Main Variable Definitions and Data Quality

The two main variables of interest are the value of bequests to each child as well as the hours of help with (I)ADL from each child to the individual parent. Received inheritances include a combination of answers to several questions in the HRS questionnaire. My measure of bequest consists of five main components: (1) primary and secondary homes, (2) liquid assets, (3) life insurance, (4) estates in trust, and (5) inter vivos transfers shortly before death. Table 2 gives an overview of the fraction and the amount of each bequest element. For each component, questions about the value of the component and to whom it was given are asked. If one of the children was named, the value is added to the total amount of bequest for that child. In cases in which no such bequest was marked, a value of zero is used. Note that according to US law, there is generally no inheritance of debt.[10] The HRS uses questions on the range of amounts if the exact value is not provided. In these cases, the mean of the lower and upper bound of the given ranges are imputed.[11] Monetary values of the different waves are adjusted for inflation to 2012 levels.[12]

The Survey of Consumer Finances (SCF) and the Panel Study of Income Dynamics (PSID) are two further prominent examples collecting data on inheritances. However, there are two crucial differences compared with the exit interviews: both the SCF and PSID ask the respondent about the amount inherited in the past (either during the last year or during one's lifetime). Hence, there is little or no information available on decedents, as they are not covered in the survey. In contrast, the HRS exit interview contains information on the

[10]Creditors to which the decedent owes money have a certain amount of time–often six months from the date of death–to present their claims against the estate. In most cases, any claim not submitted within this period is barred forever.

[11]Essentially, I define bequests as after-death transfers with two exceptions: first, I include inter vivo transfers reported in the exit interviews that were given shortly before death; second, the exit interview questionnaire differentiates between 'who was the home given to shortly before death?' and 'who inherited the home?', where both values are included as bequests.

[12]Inflation adjustment is based on the average Consumer Price Index provided by the United States Labor Department, Bureau of Labor Statistics.

Table 2: Bequests Received by Children and Their Components

Bequest Components	Mean Value Cond. on Positive	Positive Value
Assets	94,877	20.1%
Housing	89,432	8.5%
Life Insurance	9480	11.1%
Trusts	450,250	0.05%
Transfers before Death	11,726	6.1%
Total	83,761	34.3%
Observations	-	8157

Notes: The dollar amount of bequests received by each child (in 2012 dollars) and the proportion of positive amounts. Components are ordered according to the unconditional mean. Observation numbers for conditional means differ and are calculated by multiplying the proportion of positive amount out of the total observation numbers.

overall bequest of the deceased respondent that is distributed among the descendants. The obvious advantage is that the exit interview contains both information about the party who received bequests (i.e., children) and detailed information about the respondent who leaves the inheritance (i.e., parents).

The value of average received bequests shown in Table 2 is broadly consistent with values reported from other data sources. The conditional mean value of inheritance in the PSID is $\$67,300$ for ages 55-64 (cf. Wolff and Gittleman (2014)), which is close to my value of $\$83,761$. Hendricks (2001) presumes a 'recall bias' as a potential reason for the rather small inheritance values in the PSID, as people are asked retrospectively, which is not the case for the HRS exit interviews.

Further studies collecting data on inheritances using the PSID also report rather low values of $\$33,600$ (cf. Laitner and Ohlsson (2001)) and $\$42,729$ (cf. Gale and Scholz (1994)). Note, again, that these (even) lower values might also be due to differences in the sample because the average age of descendants in my sample is 55, which is considered the prime age for receiving inheritances (cf. Wolff and Gittleman (2014)). Overall, compared with other data sources on received bequests, the average bequest value in my data is higher. These comparisons may de-emphasize concerns of serious underreporting of received bequests in the exit interviews.

To perform a second check of the quality of my data on inheritances from the exit interview, I compare the values with total wealth from the HRS in the previous wave, which has been shown to be representative of the bottom 95 percent of the wealth distribution (cf. Bosworth and Smart (2009)). To this end, I construct a variable for total bequests from the respondent, which can be compared to an appropriately redefined variable for a household's total (net) wealth in the previous HRS wave before death (cf. Table A.1 in the appendix).[13] The overall value of bequests for my sample of single households from the

[13]To obtain a value of net worth comparable to bequests, I subtract out-of-pocket health expenditures,

HRS exit interview is $123,470, which is only a little lower than the approximate value of total wealth prior to death, which amounts to $144,919. The remaining difference might result from expenses prior to death that I cannot account for; furthermore, the variable for total wealth is obtained from RAND, with imputations for all income and wealth data. In addition, the proportion of households with zero bequests is 46%, which is very similar to the 48% of households that have total wealth of less than 25k in the last wave prior to death.[14] Finally, note that there is a high correlation between total wealth and total bequests, with a value of 0.73. Overall, I conclude that my measure of total bequests fits relatively well with a suitable measure of pre-death wealth. However, the lower mean value might indicate some form of under-reporting.

Hurd and Smith (2001) and Francesconi et al. (2014) also report that attrition does not seem to be a serious concern in the exit interviews, with response rates of 85 to 90 percent. Nevertheless, the high proportion of missing values in my sample together with response rates of approximately 90 percent in the exit interview point to a potential selection bias in the chosen sample.

The main explanatory variable in the empirical specification is children's help with parents' (I)ADL. The five major ADL are defined as walking across a room, dressing, washing, eating and getting in and out of bed. Instrumental ADL (IADL) are defined as having difficulties using the telephone or maps, managing money, taking medications, shopping for groceries and preparing hot meals. I employ a variable that represents asking for help with at least one of these activities. Notably, the questionnaire does not specify the exact duration of help. Rather, the questions that I use ask about the amount of help 'in a typical month'. The explicit number of hours is given for each day, week or month. I restrict the maximum time spent on informal care per week to $24 \times 7 = 168$ hours. Children not included in the helper files of the HRS did not provide any informal care, by definition.

3.2 Children's Caregiving, Transfers, and Parental Will

The main dependent variable in the empirical models will be the inheritance that *each* child received from its parent–as a binary variable, the dollar amount, and the proportion of bequests relative to one's siblings. In addition, the importance of a parental will for the nexus between caregiving and bequests will be highlighted.

death expenditures and the average change in assets in the two waves before the exit interview as a proxy for asset decumulation due to consumption expenditures. However, various other expenses after death cannot be considered, such as expenses to maintain property, taxes, administration expenses such as probate court costs, bond premiums and fees charged by, e.g., the administrator.

[14]These variables are compared as the mean asset decumulation between the last wave and the Exit Interview amounts to around $25,000, cf. Table A.1.

Bequests and Inter Vivos Transfers Depending on Caregiver Status

Table 3 reveals strikingly different inheritances for children who provided help with (I)ADL and those who did not help their parents. Caregiving children received $\$49,914$ as bequests, on average, which is more than twice the value received by non-caregivers in families where any informal care was provided.

Table 3: Distribution of Bequests Received by Children

	Families with Informal Care		Families with Positive Bequest	
Bequest per Child	Care-giver	No Caregiver	Care-giver	No Caregiver
Mean	49,914	19,314	94,497	47,181
	(4067)	(1965)	(7817)	(3091)
Median	0.0	0.0	19,000	3800
75th Percentile	25,000	2378	88,746	34,125
90th Percentile	125,400	40.125	219,350	122,610
95th Percentile	231,420	97,714	357,000	223,125
99th Percentile	741,000	333,900	1,174,200	665,000
Observations (Children)	2391	2967	1263	2443

Notes: Dollar amount of bequests received by children including zeroes (in 2012 dollars) conditional on caregiving status. Bootstrapped standard errors in parentheses. Columns 1 and 2 show results for families where any informal care was provided; Columns 3 and 4 show results for children whose parents have overall positive amounts to bequeath.

These differences are observed throughout the bequest distribution and were also present within families with positive amounts to bequeath.

Table 4 shows intergenerational transfers more broadly and reveals higher values for all transfers for (and from) children who provided care to their parents at the both extensive and intensive margins. Almost half of the children who provided help received a positive bequest with a value of 106 thousand dollars, conditional on receiving bequests, while these values are considerably lower for children who provided no help. A similar picture emerges for inter vivos transfers, although the overall proportion of children receiving any transfer is much lower. Interestingly, the proportion and value of transfers *from* children to parents were also higher for caregiving children. However, only 5.1 percent of children transferred wealth to their parents. This seems to contrast with the idea of substitutability between help in time and money that is suggested in the theoretical literature (cf. Pestieau and Sato (2008)).

Intensity of Children's Caregiving and Bequests

Approximately 30 percent of children in my sample helped their parents with (I)ADL limitations, while the average weekly help amounted to approximately 26 hours for those children who helped.

Table 4: Intergenerational Transfers - Margins

	Care-giver	No Caregiver	Total
Received Total Bequest			
Intensive Margin	105,992	68,820	83,763
	(8165)	(3846)	(4091)
Extensive Margin	47.1%	29.0%	34.3%
	(0.96)	(0.59)	(0.54)
Inter Vivo Transfers, Prev. Wave			
Intensive Margin	12,050	7301	9300
	(3185)	(661)	(1301)
Extensive Margin	9.1%	5.2%	6.4%
	(0.60)	(0.30)	(0.026)
Transfers To Parent			
Intensive Margin	5079	3543	4528
	(523)	(660)	(445)
Extensive Margin	11.2%	2.6%	5.1%
	(0.66)	(0.20)	(0.25)
Observations	2391	5766	8157

Notes: Intensive margins: dollar amount (in 2012 dollars) conditional on receiving any positive value of the respective variable. Extensive margin: proportion of children receiving any positive value. Bootstrapped standard errors in parentheses using 500 draws.

The upper part of Table 5 shows results conditional on different intensities of children's caregiving in terms of hours helped. The first column depicts the proportion of children providing these amounts of care. The majority of 27.5% provided 6-15 hours of help per week. This amount of caregiving might still allow individuals to have an occupation in addition to fulfilling their helping obligations. However, more than 19% were heavy helpers providing more than 40 hours of help at least in the period before death, which does not seem to allow time for any other occupation.

Columns 2-4 show how received bequests are correlated with the intensity of caregiving. The major difference in received bequests is found between children who did not help and children who provided some care, defined as $1-5$ hours per week: the proportion of received bequests within the family (relative bequests) and the total amount received are approximately twice as high for light caregivers. However, more intense caregiving is *not* correlated with higher received bequests: the absolute amount of received bequests per child even decreases slightly with more hours of care provided (cf. Column 3). Similarly, the amount of family bequests is lower when children have provided more hours of care.[15]

By contrast, a higher proportion of help *relative* from siblings is associated with a higher

[15]Notice, however, that relative bequests received by the child increase with the intensity of caregiving (i.e., with more hours of care).

Table 5: The Intensity of Hours of Help and Relative Help

	Proportion of Children*	Relative Bequest	$ Bequest per Child	$ Family Bequests
Hrs. of Help per Week				
No Help	70.7%	25.1%	19,991	67,167
Help				
$1-5$ Hrs.	24.0%	40.2%	55,272	134,970
$6-15$ Hrs.	27.5%	45.5%	53,023	106,986
$16-40$ Hrs.	15.6%	44.3%	48,491	92,067
>40 Hrs.	19.2%	50.7%	45,974	87,267
Help Relative to Siblings in Families with Pos. Help				
No Help	55.4%	20.5%	19,314	74,545
Help				
Help<0.25	14.9%	23.5%	31,524	108,436
$0.25 \leq$Help$< 0,5$	12.5%	27.7%	24,816	80,486
$0.5 \leq$Help$< 0,75$	19.4%	36.7%	47,089	122,119
Help$= 1.0$	53.2%	57.1%	62,019	107,661

Notes: Averages for relative help focus on the sample with parents who received some help from their children. Relative variables are defined as the child-specific value divided by the total amount provided within the family. The family bequest is the total amount of inheritance bequeathed to all children.
* Proportions of children providing positive amounts of care are depicted relative to all caregiving children.

proportion of received bequests and a higher absolute amount as depicted in the lower part of Table 5.[16] An important margin is the difference between being the sole caring child (Help= 1.0) and sharing the caregiving responsibility with siblings. Children providing 50-75% of care within a family received 36.7% of family bequests, whereas children who were the sole caregiver received 57.1% of the overall inheritance. In summary, there is not a strong correlation between hours of caregiving and the dollar amount of received bequests, but there is a strong relationship between relative help and the relative amount of bequests received within a family.

Parental Will and Unequal Division

In the empirical specification I will explore whether the presence of a parental will is important for the impact of children's caregiving on received bequests.

In the US, households have no legal restriction concerning the distribution of bequests when writing a will (cf. Tate (2008)).[17] If there is no written will, an administrator will be appointed, and the estate is generally distributed equally among children if there is no

[16]Relative help is defined as the child-specific hours of care divided by the total amount of care provided by all children. Note that the sample is reduced to those children whose parent received help from at least one child.

[17]This testamentary freedom in the US stands in contrast to the situation in most countries in continental Europe, where descendants are often guaranteed a fixed share of the estate.

Table 6: Written Will and Inheritances

	Will	No Will
Positive Bequests	69%	37%
	(1.33)	(1.46)
Total Bequests (in $)*	311,938	81,641
	(22,179)	(10,674)
Equal Division*	63%	53%
	(1.52)	(2.47)
Observations	1317	1101

Notes: The incidence and size of bequests as well as the proportion of equal division among children depending on the existence or nonexistence of a written will. Excluding families with only one child. Bootstrapped standard errors (in %) in parentheses using 500 draws.
* Conditional on positive bequests. Number of observations: 402 (no will) and 912 (will).

surviving spouse.

However, as Table 6 reveals, even if there is no written testament within a family, there is scope for unequal division of bequests. Surprisingly, in the data, equal division between children occurs even *less* often (53%) if there is no will than if there is a will (63%).[18] I define 'equal division' as a binary variable that is zero if the amount of bequests between siblings deviates by a maximum of 5%. The reason for this outcome might be a sign of mutual agreement for unequal division between siblings even if there is no will by the parent.

Analyzing the division of certain bequest components more closely reveals that the lumpiness of assets contributes to this rather low fraction of equal division of bequests between children in my sample. While equal division of liquid assets amounts to 84% conditional on bequeathing positive amounts, an equal division of the house between children amounts to only 57% conditional on inheriting a house.

Finally, note that both the incidence and size of overall bequest is much higher with a coded will (cf. Table 6).

3.3 Parents' and Children's General Characteristics

In the empirical analysis a variety of control variables are employed consisting of general characteristics of the parent and the child. In the following, I describe the parent characteristics including their overall care prevalence and the respective care arrangement. I continue with a descriptions of the control variables for the children's characteristics.

[18]These results are in line with recent findings by Francesconi et al. (2014) showing rising shares unequal division of bequests in recent years in a study of 'complex families' with divorces and the presence of stepchildren using HRS data.

Characteristics of the Parents and Care Arrangements

Before describing the parental control variables, Table 7 shows the care arrangements of the parent. Long-term care is defined as helping with either ADL or IADL. On average, approximately 81.6 percent of the parents in the sample were in need of LTC prior to their death. In addition, 53.7 percent were already in need of LTC in the wave prior to the exit interview, implying more that half of the parents in need of care required help for a period longer than two years.

Table 7: Long-Term Care Arrangements

In Need of Care	81.6%
Care Needed Since Prev. Wave	53.7%
Informal Care	
Spouse	0.0%
Children	83.7%
Other Relative/Individual	23.6%
Any Informal Care	*90.8%*
Exclusive Informal Care	*38.5%*
Formal Care	
Nursing Home	42.8%
Home Care	16.1%
Any Formal Care	*58.9%*
Exclusive Formal Care	*7.1%*

Notes: Shares of care arrangements as a proportion of all parents in need of LTC ($N = 2351$) according to the exit interviews. Multiple responses are possible for informal care; being in need of care is defined as having at least one ADL or IADL limitation. Information on those in need of care from the previous wave is obtained from RAND; 2.3% report needing help with (I)ADL without actually receiving any help.

With respect to care arrangements, 90.8% of parents in need actually received any informal care, while the vast majority (83.7%) was provided by their children.[19] However, only approximately one-third of care was provided exclusively informally (i.e., without additional formal care). Formal care was generally less often chosen as an arrangement: 58.9% received any formal care, and only 7.1% of parents received formal care without any additional informal help from family members or friends.

General characteristics of the parents depending on their care arrangements are shown in Table 8. The hours of caregiving and the financial variables are in line with the results showing in the previous section: overall, respondents are financially more well-off if they receive informal care.

Note, that the equal division of bequests between children is less likely when informal care is provided. The difference in the sample relative to exclusive formal care is 6 percentage points. The presence of a will is generally more likely if informal care is provided: parents exclusively receiving formal care were 15 percent less likely to have a written will.

[19]Note that multiple caregivers are possible for informal care, such that the sum of the proportions of individual helpers does not add up to the proportion of 'any informal care'.

Table 8: Parent Characteristics by LTC Arrangements

	Excl. Informal	Formal and Informal	Excl. Formal
General Characteristics			
Age	81	86	86
Gender (Female=1)	72%	74%	71%
Nr. of Children	3.9	3.5	3.2
Years of Schooling	10.7	10.8	10.0
Nr. ADL Lim.	2.4	3.0	2.2
Informal Care			
Hours per Week	34	22	0.0
Bequests and Will			
Total Bequests (in $)	138,219	123,550	60,356
Positive Bequests	60%	54%	32%
Equal Division*	55%	60%	61%
Parent Has Will	54%	60%	39%
Finances, Expenditures and Insurance			
Total Wealth, Prev. Wave (in $)	181,674	160,684	107,215
Income, Prev. Wave (in $)	26,126	24,896	19,155
OOP Health Expenditures (in $)	2313	12,102	5046
Medicaid Eligibility	27%	43%	51%
Medicaid Eligibility, Prev. Wave	22%	33%	47%
LTC Insurance	6.8%	6.9%	7.2%
Observations	929	1372	249

Notes: Mean values of parent's characteristics depending on care arrangements in the selected sample. Exclusive (in)formal care is defined as (in)formal LTC without any informal (formal) care. Total wealth and income are obtained from the last wave prior to the exit interview.
* Conditional on positive bequests and excluding families with only one child. Number of observations: 465 (exclusive informal), 611 (formal and informal) and 61 (exclusive formal).

Medicaid eligibility is notably different for parents receiving different care arrangements: 51 percent of parents with exclusive formal care and only 27 percent with exclusive informal care were eligible. Medicaid is a means-tested social program that pays for formal care in nursing homes. Correspondingly, assets and income was lowest for those receiving exclusive formal care.[20] However, households can also privately pay for formal LTC, which implies high out-of-pocket expenditures.

Children's Characteristics

According to the opportunity costs argument, caregiving children should have sufficient time available for help and less market income and wealth. Accordingly, being highly educated and having high labor earnings are the classical pecuniary opportunity costs for a

[20]Households on Medicaid can still have substantial values of total wealth, as the (value of the) main residence is not considered in most states; see De Nardi et al. (2012).

child's decision to give help. However, the data depicted in Table 9 reveal small differences between helping and non-helping children with respect to the important candidates for opportunity costs. The proportion of children earning income below 35k is similar. Moreover, caregiving children are more often homeowners, which I use as a proxy for wealth.[21] Observe the significant differences with respect to the child's gender between the two groups. On average, 64 percent of caregivers and only 44 percent of non-helping children are female. As outlined in the next section, I will use this as an instrument in my IV approach for the potentially endogenous explanatory variable.

Table 9: Children Characteristics

	Care-giver	No Caregiver
General Characteristics		
Female	63.7%	44.0%
Age	55.6	53.9
Not Married	32.8%	37.7%
Number of Children	2.2	2.2
Years of Education	13.5	12.7
Finances and Employment		
Income below 35k	28.4%	29.9%
Income Missing	21.8%	34.7%
Owns Home	60.7%	51.7%
Relationship with Parent		
Lives within 10 Miles	53.0%	28.1%
Co-Reside with Parent	10.2%	2.1%
Freq. of Contact per Year	253	111
Observations	2391	5766

Notes: Descriptive statistics at the child level for caregiving and non-caregiving children.

4 Estimation Strategy

In the main specification, I estimate the impact of children's informal caregiving on parental inheritances by considering a set of control variables for the parent's and child's characteristics.

The main estimation equation is given as follows:

$$Beq_c = \phi + \alpha Care_c + \Gamma X_p + \Psi X_c + \Theta X_{p,c} + \epsilon_{p,c}, \quad (1)$$

where subscript p denotes the parent and c is the index for each child. $Beq_c \in \{ AnyBeq_c,$

[21]Note, however, that for those children who did not help their parents, values for income are missing much more often.

$\$Beq_c$, $RelBeq_c$ } is either the binary variable, the dollar amount, or the proportion of bequests received by each child within the family. Analogously, $Care_c \in \{ AnyCare_c$, $HrsCare_c$, $RelCare_c$ }, where $HrsCare_c$ is defined as the hours of care provided weekly by each child. The vectors X_p, X_c and $X_{p,c}$ are control variables.

I report results for various margins. I analyze whether the decision to provide help increases the probability of receiving positive bequests (full extensive margin), which is estimated with a Logit model. For estimation of the impact of any help on the dollar amount of bequests that each child receives (extensive margin on the dollar amount), a Type I Tobit model is used because the distribution of bequests is amassed at zero with a skewed positive tail.[22] A Tobit model is also used to estimate the dollar amount of bequests with respect to the hours of care per week (full intensive margin).

In these specifications, potential endogeneity problems such as unobserved variable bias are controlled for solely by the set of control variables. The parent's control variables, X_p, refer to demographic (age, gender, and race) and socio-economic characteristics (education, pre-death wealth, and income) as well as information about health, insurance coverage and out-of-pocket expenditures for health-related services. Child-level controls, X_c, also represent children's demographic and socio-economic characteristics. In addition, $X_{p,c}$ includes controls for the relationship between the parent and the children by including a variable representing geographical proximity and the number of general contacts and whether the parent and child co-reside. Finally, I include wave dummies to control for common time effects.

To analyze the effect of children's resources for received bequests, I focus on three variables contained in X_c in equation (1): children's income, education and homeownership. Unfortunately, income is measured only in brackets; thus, I study the variable 'Income below 35k'. As a proxy for permanent income, I analyze the 'years of education' of the child. Finally, children's wealth is proxied by the variable 'owns home', which is a binary variable indicating whether the child is a homeowner.

It is important to note that children's income is likely to be a 'bad control' when included on the right-hand side of the regression (cf. Angrist and Pischke (2009)). Bad controls are variables that are part of the causal effect that is estimated (i.e., where the control variable is a channel through which the main explanatory variable of interest influences the outcome variable). This is the case if the decision to help affects children's income and–through this effect– influences parental bequests. However, the inclusion of bad controls might still reduce omitted variable bias; hence, there is a trade-off between these two considerations.[23] The problem of bad controls is less severe for the other two measures.

Additionally, I estimate the same model using relative variables within families. The

[22]The problem with estimating a corner solution with a linear model is the clear violation of the assumption that E(y|x) is linear in x.

[23]The coefficients of caregiving from a regression with and without children's income as a control are similar; see also Section 6.4.

analysis of relative variables addresses the concern that a positive correlation between caregiving and bequests is driven by a wealth effect such that richer families provide more bequests to caregivers. Relative caregiving and bequests are constructed by dividing the value of received bequests and hours of help from each child by the respective sum of help from all children and the overall inheritance to all children within each family.[24]

Similarly, I construct relative measures for the children's financial resources. In particular, I construct a categorical variable of children's income ranging from one to four.[25] To construct the relative variable, I again take the individual value divided by the family sum. Although the value cannot be interpreted in a straightforward manner, the variable captures the relative difference between siblings, but the absolute value is not taken into account. With the same procedure, I construct relative variables for the homeownership status of the children (as a proxy for wealth) and the years of education (as a proxy for permanent income). This procedure is similar to that conducted by McGarry (1999).

For the estimations using relative bequests as the LHS variable, I employ a fractional Logit model as proposed by Papke and Wooldridge (1996).

As noted above, children's help is expected to be endogenous for several reasons. Most importantly, the estimation might be biased by omitted variables. An example of such a variable is the strong family ties that simultaneously lead to higher levels of care from children and higher bequests from parents. Furthermore, measurement errors in the explanatory variable could be a concern. To account for these endogeneity concerns, I propose the various approaches outlined in the following sections.

Instrumental Variable Approach

Following Terza et al. (2008), I employ a two-stage residual inclusion (2SRI) approach that yields consistent estimates in case of non-linearities in the second-stage equation.[26]

For the 2SRI approach, I use an instrument, $Instr_c$, for children's help under the assumption that $Corr\left[Care_c, Instr_c\right] \neq 0$ and $E\left[\epsilon_{p,c} | \, Care_{p,c}\right] = 0$. I estimate equation (1) by including the residuals $\nu_{p,c}$ from the first-stage regression, given by

$$Care_c \;\; = \;\; \phi + \beta Instr_c + \Gamma X_p + \Psi X_c + \Theta X_{p,c} + \nu_{p,c}. \tag{2}$$

I use the gender of the child as an instrument to predict children's caregiving while controlling for the total number of children. Daughters are generally more likely to help their frail

[24]For example, compare a poor household and a rich household with 50k and 200k, respectively, as overall bequests and with each household including three children. In the first family, one child receives 10k as bequests, and two siblings both receive 20k. In the second family, one child receives 40k, and the two siblings each receive 80k. The variable for relative bequests that I construct attributes the same weight to the children in these two families: 0.2, 0.4, and 0.4.

[25]Each value indicates the respective income bracket given by the following: income less than 10k, income between 10k and 35k, income between 35k and 70k and income above 70k.

[26]I am thankful to one of the referees for pointing out the 2SRI method to me.

elderly parents than sons are, which is confirmed by the results of the first-stage regression. Thus, the chosen instrument fulfills the relevance condition. In addition, the child's gender is plausibly randomly distributed with respect to heterogeneity in, e.g., preferences. Moreover, it can be argued that parents do not base their bequest decision on the child's gender.[27] Thus, I claim that a child's gender is exogenous and is not correlated with the error term of equation (1) when controlling for the total number of children within the family. Children's characteristics have been widely used as instruments in the literature (e.g., see Norton and Van Houtven (2006), Brown (2006)). Such information is also used in studies estimating the substitutability between informal and formal care (e.g., see Bolin et al. (2008), Bonsang (2009), Charles and Sevak (2005)).[28]

The binary bequest variable is estimated via a Logit model while employing the 2SRI model. The continuous variable $\$Beq_c$ is estimated using a simple linear probability model, labeled IV-LPM, as proposed by Angrist (2001). For the estimations using relative variables, the second stage is estimated via fractional Logit (cf. Wooldridge (2011)).

Family Fixed Effects

In addition, I employ a family fixed-effects (FE) model that can address endogeneity problems stemming from omitted household characteristics. Using family fixed effects controls for any time-invariant (potentially unobserved) variable that is correlated with informal care. For example, I might simultaneously observe more help and higher inheritance in altruistic families than in families with weak family cohesion. The family FE model controls for these common family characteristics. The method also controls for family-specific components, such as the overall amount of parental bequest, that simultaneously affect the likelihood of caregiving and financial transfers. The model reads as follows:

$$\$Beq_c = \phi + \psi_p + \alpha Care_c + \Psi X_c + \Theta X_{p,c} + \epsilon_{p,c}, \tag{3}$$

where ψ_p represents the fixed effects on the parent level. Observe that X_p is not included in the FE model because parental controls are already captured by the fixed effects term ψ_p. The FE model aims to identify effects of informal care on bequests using within-family differences between siblings.[29] Note that with a fixed-effects model, it is not possible to

[27] Although the fertility decision might be viewed as endogenous, I consider it unlikely that parents in the US would make their fertility choices based on potential care probability (i.e., that parents would choose to have another child if they gave birth to the 'wrong' gender). In addition, I control for the total number of children.

[28] Two other frequently used instruments are the number of sisters and whether the child lives close to the parents. I refrain from using these two instruments for the following reasons. First, the number of sisters is a potentially weak instrument for children's help. I found coefficients in the first-stage regression that were close to zero. Second, choosing the child's location of residence as an instrument is unlikely to fulfill the exclusion restriction, as parents are likely to have better relationships with children who live nearby (see Stern (1995)).

[29] I also estimated a family FE approach with instrumented care variables predicted in the first stage, where $\widehat{Care_{p,c}}$ is estimated analogously to equation (2). However, the Durbin-Wu-Hausman test was

estimate a non-linear model such as Logit or Tobit; hence, a linear probability model (LPM) is employed.

All specifications, if appropriate, are reported with clustered standard errors at the household level, as the errors of each child observation within a family are suspected to be correlated.

Children's Help and Parental Will

The distribution of inheritance among descendants is often coded in a will written by parents. Approximately 68% of respondents with positive amounts to bequeath have written a will. The question is whether a written will is also important for the correlation between caregiving and received bequest. As shown in Table 6, a will is not a necessary condition for unequal division. On the contrary, families without a will are more likely to have an unequal division of bequests. This implies that even without a will, caregiving children can potentially be rewarded.

To study whether the presence of a written will, $Will_p$, is important for the correlation between children's help and bequests, I include an interaction term, $Care_c \cdot Will_p$, in the regression and estimate the following equation:

$$Beq_c = \phi + \alpha Care_c + \beta Will_p + \gamma \left(Care_c \cdot Will_p\right) + \Gamma X_p + \Psi X_c + \Theta X_{p,c} + \epsilon_{p,c}, \qquad (4)$$

where $Care_c \in \{AnyCare_c, \Delta Care_c\}$ and $Will_p \in \{AnyWill_p, \Delta Will_p\}$ is either binary or defined as the positive change between waves. A significant interaction term would imply that a parental will is an important determinant of the exchange relation between help and bequests.

When employing the binary variable of whether there was a written will, $Will_p$, I focus on families with positive amounts to bequeath to diminish simple wealth effects because writing a will requires a positive amount to bequeath in the first place.

To further isolate the impact of a written will on the effect of caregiving on received bequests, I study the *change* in the will and a potential corresponding change in caregiving. Hence, I analyze those parents who wrote their will shortly before death and, correspondingly, those children who began to help before death. To this end, I construct a binary variable, $\Delta Will_p$, which is one if there was no will in the wave before death but there was a will in the exit interview. Similarly, a change-in-help variable, $\Delta Care_c$, is defined to be equal to one if the child did not help in the previous wave but was a caregiver in the exit interview.

As in the main specification, I estimate the model by treating children's help as exogenous and endogenous. To avoid problems associated with computing marginal effects from

rejected at very high levels, suggesting that care does not seem to be endogenous in these specifications. The results are available from the author upon request.

interaction terms in non-linear models, I estimate only linear models in this subsection (cf. Norton et al. (2004)). For the 2SLS approach, I need to include a second instrument because the interaction term is also endogenous. I follow Wooldridge (2010, pp. 121-122) and include $female_c \cdot Will_p$ as an additional instrument to have an identified system.

It is important to note that the variable $Will_p$ is also potentially endogenous. Similar to the children's income variable discussed above, I have a problem of 'bad controls' because children's help might affect parental bequests through the presence of a will. A similar argument applies for the variables indicating a change in caregiving and a will.

5 Results

The main focus is to study the correlation between children's help and parental bequests at both the extensive and intensive margins. In the next section 5.1, I present results for the effect of caregiving on the absolute amount of bequests, and in Section 5.2, I focus on relative variables to study within-family differences. Finally, in Section 5.3, the importance of a parental will for the positive nexus between caregiving and bequests is highlighted.

5.1 Extensive Margin of Caregiving

Table 10 summarizes the main results at the extensive margin of help, both for the probability of receiving any bequest (Columns 1-3) and for the dollar amount of bequests received (Columns 4-6). The coefficients represent the effect of caregiving at the mean level of the control variables. The coefficient of providing any help with LTC is unanimously positive and significant in all specifications.

Bequest and Caregiving

Under the assumption of exogeneity, the decision to help one's parents increases the probability of receiving any bequests by 8.9 percent according to the Logit estimation. The IV estimation (2SRI) results reveal an increased probability of receiving a bequest by 21.1 percent at the mean. On the contrary, the coefficient from the fixed-effects estimation yields a lower estimate of 5.4 percent.

Columns (4) to (6) show results for the dollar amount of bequests based on the receipt of any caregiving. To interpret the results as being the effect of any caregiving on the intensive margin of bequests, I focus on those families that have a positive amount to inherit.[30] The sample is thus reduced to 3575 observations. According to the estimates, the decision to provide help increases children's inheritance by $\$28,129$ for the Tobit estimation. Again, with $\$77,642$, the IV estimation yields much higher point estimates, while the FE model

[30]Note that a positive amount of overall family bequest includes the 24% of children who receive zero bequests.

Table 10: Extensive Margin of Caregiving

	Any Bequest on Any Care			$-Bequest on Any Care		
Bequest	Logit	2SRI	FE	Tobit	2SLS	FE
	(1)	(2)	(3)	(4)	(5)	(6)
Main Variables						
Any Care	0.089***	0.211***	0.054***	28,129.36***	77,641.59**	19,599.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
95%-Confidence Bands	[0.06;0.11]	[0.08;0.35]	[0.03;0.06]	[19,691.3;36,567.42]	[170.93;155,112.3]	[10,196.06;29,001.98]
Child Characteristics						
Age	−0.001	−0.001	−0.002***	−972.86**	−1003.07*	−396.95
	(0.48)	(0.42)	(0.00)	(0.02)	(0.10)	(0.16)
Number of Children	0.004	0.004	0.003*	465.70	−726.71	1088.96
	(0.21)	(0.22)	(0.06)	(0.68)	(0.66)	(0.25)
Years of Education	0.008**	0.006**	0.000	4030.82***	4122.44***	1143.18
	(0.01)	(0.04)	(0.79)	(0.00)	(0.00)	(0.18)
Income Below 35k	0.002	0.004	0.018*	−6250.89	−5280.33	−3925.17
	(0.92)	(0.79)	(0.05)	(0.24)	(0.51)	(0.57)
Owns Home	0.043***	0.035**	−0.007	1058.29	−12,941.99	2730.87
	(0.00)	(0.02)	(0.45)	(0.86)	(0.24)	(0.61)
Parent-Child Relation						
Lives within 10 Miles	0.026**	−0.001	0.012*	6980.83	−6806.27	3291.03
	(0.03)	(0.94)	(0.09)	(0.13)	(0.38)	(0.42)
Co-Reside with Parent	0.030	−0.012	0.031	9849.98	−6543.07	32,355.53
	(0.20)	(0.71)	(0.12)	(0.55)	(0.82)	(0.14)
Freq. of Contact	0.000	0.000	0.000	−0.19	−10.91	4.20
	(0.72)	(0.46)	(0.15)	(0.96)	(0.25)	(0.40)
Respondent Characteristics						
Nr. of Children	−0.020***	−0.018***		−12,234.85***	−9481.22***	
	(0.00)	(0.00)		(0.00)	(0.00)	
Any Formal Care	−0.012	−0.020		904.40	501.23	
	(0.54)	(0.32)		(0.88)	(0.96)	
Nr. ADL Lim.	0.000	−0.002		−1073.22	−2133.02	
	(0.98)	(0.52)		(0.34)	(0.24)	
LTC Insurance	−0.012	−0.013		16,608.79	39,867.30*	
	(0.71)	(0.68)		(0.19)	(0.05)	
Medicaid in Exit	−0.059***	−0.067***		−23,597.82***	−15,631.95	
	(0.01)	(0.00)		(0.00)	(0.11)	
Any Donations	0.112***	0.114***		34,823.76**	45,011.70**	
	(0.01)	(0.00)		(0.01)	(0.04)	
Log OOP Expenditures	0.003	0.002		341.64	−266.43	
	(0.26)	(0.30)		(0.70)	(0.84)	
Log Income	0.023**	0.019*		8934.48***	15,861.71***	
	(0.02)	(0.06)		(0.01)	(0.00)	
log Total Wealth	0.027***	0.025***		6679.96***	8418.93***	
	(0.00)	(0.00)		(0.00)	(0.00)	
R^2 / Pseudo R^2	0.225	0.224	0.030	0.012	0.111	0.022
Observations	7710	7710	8157	3575	3575	3706

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.
Notes: P-values are shown in parentheses. Other included controls that are not shown in the table consist of the following: parental years of schooling, number of IADL limitations, Medicaid eligibility in the previous wave, a race dummy, number of children that the child has, a dummy for missing values for children's income and five wave dummies. See Table A.2 in the appendix for a list of all covariates used. A full set of results is available from the author upon request. Reported coefficients are marginal effects for the non-linear models. Estimates from the 2SRI model use the child's gender as an instrument for help. Standard errors are clustered at the respondent level. Specification tests for the IV models are given in Table A.4.

estimates are somewhat lower. These values appear to be economically meaningful for the decision to provide care. Based on the estimate from the Tobit model, the coefficient implies an hourly wage of $20 if the intensity of caregiving was constant and if the lifetime duration of caregiving for the child were one year.

My findings are substantial relative to the previous literature. The only comparable result of caregiving on *intended* bequest (i.e., parents' wealth) comes from Brown (2006) with effects that are quantitatively much smaller. Further studies that explicitly focus on the informal care sector do not find any significant positive correlations between help and bequests (cf. Sloan et al. (1997)) or cannot detect an impact of caregiving on parents' decision to equally divide their estate (cf. Norton and Taylor (2005) and Norton and Van Houtven (2006)). One potential reason for the pronounced effects found in this paper compared with those reported in the literature is that this is the first study that uses data on actual bequests and actual caregiving behavior, which yields much more disaggregated data.

However, the quantitative impact of caregiving in my estimations differs between specifications. In all model variants, the estimated coefficients are highest for the IV approach and lowest for the fixed-effects model. The Logit/Tobit estimates treating caregiving as exogenous are approximately 50 percent higher than the coefficients from the fixed-effects model. A potential reason for the smaller effect is that the fixed effect captures some unobserved characteristics within the family that simultaneously affect caregiving and received bequests. The IV estimates are more than twice as large as the Logit/Tobit estimates, yet they are also much less precise, as indicated by the much wider confidence intervals in the IV approach. A potential reason for this outcome is that I am measuring a local average treatment effect. In particular, I measure the average effects of caregiving on bequests for persons who would have provided care (or increased the amount of care) if they were female, but who would not have provided cared if they were male. In the words of Imbens and Angrist (1994), I measure the average effect for the compliers.[31]

The instrument chosen for the IV approach seems to be a good predictor of caregiving. Both for the variables of any care and hours of care, the instrument is statistically significant (cf. Table A.3 in the appendix). This result is also confirmed by the high F statistics ranging from 127 and 219 for the 2SRI at the extensive margin. This result is much larger than the rule-of-thumb value of 10 that is suggested as a threshold for the relevance of the instrument in IV estimations.

I tested whether one can reject the hypothesis that children's help is exogenous (cf. Table A.4 in the appendix). For the 2SRI models, this can be determined by the significance level of the coefficient from the included first-stage residuals. For both models, I find significance levels of 10 percent, indicating only weak endogeneity. Similar results are

[31]Note that the higher coefficients might also result from measurement errors. Children who were the proxy respondents in the exit interview might overreport the amounts of caregiving and underreport bequests, which would decrease the positive correlation between the two.

obtained for the IV-LPM using a Hausman-Wu-Durbin (HWD) test with a p-value of 13 percent. Hence, the possible endogeneity of help must be rejected for conventional levels of significance.[32]

To analyze the impact of children's caregiving decision on the bequest received along with the bequest distribution, I split the sample into quintiles of total family bequests and run the main regression, cf. equation (1), within each of these quintiles. The aim is to study whether the effect of caregiving is present for both wealthy and less wealthy families.[33] The results shown in Table A.5 in the Appendix indicate significant effects for the decision to provide care on the amount of bequest received throughout the distribution. For example, the Tobit model predicts an increase of bequests received by \$549 by the decision to provide care at the lowest bequest quintile, while caregiving increases bequests by $\$52,465$ at the highest quintile.

The data also enable examination of the intensive margin of caregiving, i.e., the effect of providing an additional hour of care on the amount of received bequests. However, according to the estimation results presented in Table A.6 in the appendix, hours of caregiving do not significantly increase the dollar amount of received bequests. Hence, there is no significant impact at the intensive margin of caregiving.

More Bequests to the Rich

The impact of children's financial resources indicate that financially better-off children receive higher bequests (cf. Table 10). For the income variable, I find that poorer children are more likely to receive positive bequests, but the amount of bequest is lower. Note, however, that coefficients are not significant. Significant effects are found for the impact of children's education as a proxy for permanent income, again pointing in the same direction. Similarly, homeownership as a proxy for children's wealth increases the amount of bequests in two models, although the coefficients are again non-significant.[34]

Children's income has been widely used in the literature to discriminate between the two main theoretical bequest motives: altruism and exchange (cf. Cox (1987), Cox and Rank (1992), and Alessie et al. (2010)). According to the exchange motive, the probability of receiving a transfer decreases with the size of children's income, as children have higher opportunity costs of helping. However, at the intensive margin, parents must compensate their relatively wealthier children with higher bequests to induce informal care from them, as they demand a higher price for their service (cf. my discussion of the theory in Section 7). My results are consistent with empirical results from Cox (1987) and Cox and Rank

[32]The previous literature also found mixed results with respect to the endogeneity of informal care from children (cf. Norton and Van Houtven (2006) and Houtven et al. (2013) for a discussion in a different context). Other studies do not report results from exogeneity tests (e.g. Brown (2006)).

[33]For the estimations I focus on all families that have positive amounts to bequeath. Results are presented for the models treating caregiving as exogenous as indicated by HWD tests.

[34]Note, again, that the children's income variable might potentially be prone to being a 'bad control' (cf. my discussion in Section 4).

(1992) using inter vivos transfers and children's income from the President's Commission on Pension Policy (PCPP) survey and the National Survey of Families and Households (NSFH), respectively. Both studies find a negative impact of children's income on the incidence of a transfer and a positive impact on its size–which they interpret as the exchange motive being present.

Parental Characteristics and Relationship with the Child

Investigating the impact of further control variables, I find a strong negative impact on bequests stemming from Medicaid eligibility. If the parent is eligible for Medicaid, bequests to children are both lower and less likely. Medicaid is a means-tested social program that requires agents to reduce their assets before becoming eligible. However, agents are allowed to maintain their primary residence, for example, which can still be used as a bequest to one's children. The presence of private LTC insurance does not seem to affect children's inheritance.[35]

I also include three variables that are intended to control for the quality of the relationship between parents and children. Generally, children appear to have a higher probability of receiving bequests and receive a higher amount if they live nearby or if they live with their parents. The coefficients for the frequency of contacts is small and not statistically significant as an additional explanation for bequests received.[36] This finding indicates that the correlation between intergenerational help and transfers is present for help with LTC, whereas 'light' attention variables such as the number of phone calls do not play a significant role in the size of received bequests as an additional explanation.

5.2 Impact of Differences in Caregiving Between Siblings

A crucial dimension when studying the distribution of bequests is the comparison between siblings within a family. In the benchmark specification, I study the importance of caregiving for the probability of receiving bequests and the absolute amount. However, irrespective of the overall size of the inheritance within a family, a parent decides on the proportion distributed to each child depending on their caregiving relative to siblings. The rich information provided by the exit interviews allows me to study relative caregiving and bequests rather than the absolute amount.

I construct the relative variables for children's caregiving, the inheritance received and the financial situation by dividing the child-specific value by the total amount within the family. It is important to note that this procedure studies families for which positive

[35]Note that these insurance variables might be 'bad controls', as the presence of insurance might influence the caregiving decision and, in turn, the inheritance received.

[36]The variable 'frequency of contact' is obtained from the RAND family files for the previous wave and is defined as contact in the last 12 months in person, by phone or by mail. This might explain the rather high maximal reported value of 18,250 contacts per year, implying 50 contacts per day (see Table A.2 in the appendix).

amounts of bequests and caregiving are available. Hence, relative help with a value of zero implies that this child did not help despite the positive amount of help given in this family. As in the main specification above, I differentiate between the extensive and intensive margins of (relative) help.[37]

The impact of caregiving on relative bequests is sizable, as shown in Table 11. The decision to provide care increases the proportion of inheritance by approximately 10 percent. Interestingly, these results do not differ much between the models (cf. Columns 1 to 3). The result for the decision to provide care (extensive margin of help) is well in line with the main results studying the absolute values of bequests (cf. Table 10).

A novel result emerges at the intensive margin of help (cf. Columns 4 to 6). Increasing the level of relative caregiving–conditional on providing positive amounts of care–by 10 percent significantly increases the relative size of bequests by 9 to 14 percent, although the effect is not significant for the IV specification. This finding is in contrast to the estimations for absolute amounts, in which an additional hour did not significantly increase the amount of bequests (cf. Table A.6 in the appendix).

The impact of children's relative financial resources is inconclusive. Only for children's education I find that children who are more educated than their siblings seem to receive a higher share of bequests.

5.3 Importance of a Written Will

Table 12 shows the results of OLS regressions that include an interaction term between children's help and parental will according to equation (4).[38] 25% of the respondents wrote a will shortly before death. On the children's side, 21% of the children did not help in the previous wave but then decided to help before death.

The results in Table 12 highlight the importance of a written will. Simply including a binary variable for whether the parent has a will in the main specification does alter the importance of children's help with respect to the size of received bequests (cf. Column 1). The coefficients are similar to the results from the Tobit model in Table 10, Column 4.[39]

Including the interaction term, $AnyCare \cdot AnyWill$, shows that the interaction term accounts for the full effect of children's help on bequests (cf. Column 2). The interaction term is statistically significant and sizable, whereas the coefficients for help alone are rendered nonsignificant and small.

A similar effect can be shown for the model using variables indicating positive *changes* in help and a written will between the previous wave and the exit interview (cf. Columns 3 and 4). Again, the effect of a change in help has a significant effect of the size of bequest,

[37]Note, that for the intensive margins, I focus on children providing positive amounts of help in families where there were positive amounts to bequeath.

[38]Table A.7 in the appendix presents the results for an IV specification.

[39]Note also the similarity of results despite the fact that I am comparing the results from an OLS with those from a Tobit model.

Table 11: Caregiving and Relative Bequests among Siblings

	Extensive Margin of Help Relative Bequest on Any Care			Intensive Margin of Help Relative Bequest on Relative Care		
Relative Bequest	Frac.Logit	2SRI	FE	Frac.Logit	2SLS	FE
	(1)	(2)	(3)	(4)	(5)	(6)
Main Variables						
Any Care	0.090***	0.084*	0.103***			
	(0.00)	(0.10)	(0.00)			
Relative Care				0.140***	0.113	0.092*
				(0.00)	(0.64)	(0.06)
Child Characteristics						
Relative Education	0.418***	0.418***	−0.048	0.560***	0.560***	−0.216
	(0.00)	(0.00)	(0.76)	(0.00)	(0.00)	(0.50)
Relative Homeowner	−0.005	−0.005	−0.007	−0.025	−0.025	0.023
	(0.78)	(0.79)	(0.81)	(0.44)	(0.45)	(0.78)
Relative Income	0.017	0.017	−0.021	0.015	0.015	−0.118
	(0.58)	(0.57)	(0.74)	(0.77)	(0.78)	(0.44)
Number of Children	0.005*	0.005*	0.004	0.003	0.003	−0.014
	(0.08)	(0.09)	(0.23)	(0.54)	(0.52)	(0.13)
Not Married	0.031***	0.030***	0.036***	0.045***	0.045***	0.050
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.10)
Parent-Child Relation						
Lives within 10 Miles	0.024***	0.025*	0.030**	0.014	0.016	0.039
	(0.01)	(0.05)	(0.03)	(0.34)	(0.48)	(0.20)
Co-Reside with Parent	0.092***	0.094***	0.098**	0.057*	0.062	0.103
	(0.00)	(0.00)	(0.01)	(0.06)	(0.25)	(0.17)
Freq. of Contact	0.000	0.000	0.000**	0.000	0.000	0.000
	(0.14)	(0.16)	(0.03)	(0.14)	(0.16)	(0.27)
Respondent Characteristics						
Nr. of Children	−0.033***	−0.033***		−0.024***	−0.025**	
	(0.00)	(0.00)		(0.00)	(0.04)	
Nr. ADL Lim.	−0.001	−0.001		−0.002	−0.002	
	(0.29)	(0.41)		(0.43)	(0.53)	
LTC Insurance	0.023**	0.023**		0.043**	0.044**	
	(0.01)	(0.01)		(0.03)	(0.04)	
Medicaid in Exit	0.007	0.007		0.032	0.032	
	(0.41)	(0.41)		(0.17)	(0.16)	
Any Donations	0.013	0.013		0.026	0.027	
	(0.12)	(0.13)		(0.30)	(0.32)	
Log Income	0.001	0.002		0.011**	0.011**	
	(0.59)	(0.59)		(0.03)	(0.03)	
log Total Wealth	0.001	0.001		0.005*	0.004	
	(0.31)	(0.31)		(0.09)	(0.13)	
R^2 / Pseudo R^2	0.225	0.224	0.071	0.012	0.111	0.086
Observations	3575	3575	3706	1230	1230	1263

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.
Notes: P-values are shown in parentheses. Other included controls that are not shown in the table comprise the following: parental years of schooling, number of IADL limitations, some formal care arrangements, Medicaid eligibility in the previous wave, log of OOP expenditures, a race dummy, number of children that the child has, age of the child, a dummy for missing values for children's income and five wave dummies. See Table A.2 in the appendix for a list of all covariates used. A full set of results is available from the author upon request. Reported coefficients are marginal effects for the non-linear models. Estimates from the 2SRI model use the child's gender as an instrument for help. Standard errors are clustered at the respondent level. Specification tests for the IV models are given in Table A.4.

Table 12: Importance of a Written Will

	OLS			
$ Bequest	(1)	(2)	(3)	(4)
Any Care	25,529***	-8341		
	(0.00)	(0.26)		
Any Will	19,481***	4039		
	(0.00)	(0.58)		
Any Care · Any Will		46,792***		
		(0.00)		
$\Delta Care$			23,649***	8051
			(0.00)	(0.19)
$\Delta Will$			32,406**	18,237*
			(0.01)	(0.06)
$\Delta Care \cdot \Delta Will$				54,506**
				(0.03)
Controls Child	*Yes*	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.126	0.129	0.198	0.211
Observations	3556	3556	862	862

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: OLS estimations are conditional on any positive amount to bequeath in each family. $\Delta Will$ is a dummy variable that is one if the respondent had a will in the exit interview but had no will in prior waves; $\Delta Care$ is defined correspondingly. Estimations in Columns 3 and 4 rely on a sample of households with positive family bequests that had no will and no caregiving children in the previous wave. P-values are shown in parentheses. Parent's and children's control variables are included but not shown (cf. Table A.2 in the appendix for a full set of controls).

which is rendered nonsignificant when including the interaction term in Column 4. This term again accounts for the entire effect of the impact of the change in caregiving behavior.

The findings clearly show that the presence or change of a parental will is crucial for the positive correlation between children's help and bequest to be present. As discussed in Section 7, I interpret this result as suggestive evidence of an exchange motive, although the result does not rule out the possibility of altruism. However, as outlined above, it should be emphasized that the variable 'will' is potentially endogenous; hence, my estimates might be biased.

Sloan et al. (1997) study whether the impact of caregiving for received inter vivos transfers requires mental awareness of the parents using data from the NLTCS but they do not find significant interaction effects.[40] In contrast, I directly focus on the change in the written will and find positive and significant interaction effects.[41]

[40] As mentioned above, the study has no actual bequests but uses total household wealth as the explanatory variable.

[41] Those authors focus on mental awareness in arguing that "the legal system requires mental competence for changes in bequests", cf. Sloan et al. (1997, p. 298). As a sensitivity check, I analyze the effect of a binary variable indicating serious memory problems of the parent, which I interacted with the care variable. I found significantly negative interaction effects when using the probability of receiving a bequest as the LHS variable. This finding is consistent with my results above. However, the interaction effect was not

6 Sensitivity Analysis

In this section, I present additional results of various robustness checks with the aim of further strengthening my main results. First, I test whether the impact of caregiving is also present when using inter vivos transfers in the wave before the exit interview. Second, I test the importance of formal care arrangements for the positive correlation between informal caregiving and bequests. Third, I show that the main results are qualitatively the same if using lagged caregiving from the previous wave as the main explanatory variable. Fourth, I run regressions using fewer controls to test the potential problem of 'overcontrolling'.

6.1 Bequests and Inter Vivos Transfers

The positive correlation between caregiving and received inheritance is significant and strong. However, within a family, these strong correlations might be offset by inter vivos transfers going to the non-helping child, such that overall intergenerational transfers would not show such a clear pattern.[42] Although I already included inter vivos transfers from the exit interview in my (somewhat broader) definition of bequests, I re-estimate the models using inter vivos transfers and caregiving from the previous wave. I focus on the extensive margin of help.

The descriptive statistics in Table 4 already show that inter vivos transfers are quantitatively much smaller than bequests. Only 6.4 percent of the children in my sample received an inter vivos transfer. The correlation between caregiving and inter vivos transfers is weak in terms of the significance levels (see Table 13). In the logistic regression, caregiving increases the probability of receiving an inter vivos transfer in the previous wave before the exit interview by 2.1 percent. The results are still positive but not significant for the 2SRI and FE models. The results for inter vivos transfers and caregiving from the exit interviews instead of the prior wave are similar and can be found in Table A.8 in the appendix. The results are consistent with the findings of empirical studies on inter vivos transfers (cf. Norton and Van Houtven (2006) and Norton et al. (2013)).

I further include the variables of children's financial resources indicated by children's income below 35k, years of education and homeownership. Similar to the results in Table 10, the coefficient for children's low income is significantly positive in all specifications. Meanwhile, using the dollar amount of bequests as the LHS variable (results not shown) also reveals a significantly positive coefficient for the (low-)income variable of the child. This result points to the conclusion that inter vivos transfers seem to be distributed more according to the altruistic model (i.e., with poorer children receiving higher inter vivos transfers). The results are well in line with (McGarry, 1999), who finds that less wealthy children receive higher inter vivos transfers, while this is not observed for the propensity

significant when using the dollar amount of bequests. The results are available upon request.

[42] I thank one of the referees for addressing this point.

Table 13: Caregiving and Inter Vivos Transfers

	Logit	2SRI	FE
Any Inter-Vivos Transfer (t-1)	(1)	(2)	(3)
Main Variables			
Any Care (t-1)	0.021**	0.065	0.013
	(0.03)	(0.33)	(0.11)
Child Financial Resources			
Years of Education	-0.001	-0.001	-0.004***
	(0.62)	(0.51)	(0.00)
Income Below 35k	0.026***	0.025***	0.023**
	(0.00)	(0.00)	(0.02)
Owns Home	0.001	0.001	-0.004
	(0.85)	(0.85)	(0.61)
Further Controls Child	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*No*
R^2 / Pseudo R^2	0.178	0.174	0.013
Observations	7525	7525	7964

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: P-values are shown in parentheses. Parent's and children's control variables are included but not shown (cf. Table A.2 in the appendix for a full set of controls). The residuals for the 2SRI model are not significant (p-value of 0.49), indicating exogeneity of the care variable.

to equally divide bequests.

6.2 Formal and Informal Caregiving

The importance of caregiving for received bequests might depend on the overall care arrangements, including the place where the parent died.[43] In this subsection, I study the importance of formal care arrangements by including an interaction term of a variable indicating formal care and the variable for informal caregiving by children used in the main specification. I use the binary variable indicating whether the parent lived in a nursing home before death as well as 'Medicaid eligibility' as an indicator of the use of publicly paid nursing homes and interact them with the binary informal caregiving variable to analyze whether the correlation is affected by formal care.

Table 14 shows a negative interaction term for both variables, indicating that formal care arrangements result in lower probabilities of receiving higher bequests from informal caregiving: while caregiving increases the probability of receiving a bequest by 12 percent if the parent did not live in a nursing home, the coefficient is reduced to 7.6 percent if the parent lived in a nursing home before death (cf. Column 2). This effect is even more

[43]In the main specifications, formal care arrangements are controlled for by including a binary variable indicating whether the respondent received any formal care. The coefficient of this variable was highly nonsignificant.

Table 14: Importance of Formal Care Arrangements

	OLS			
Any Bequest	(1)	(2)	(3)	(4)
Any Care	0.101***	0.119***		
	(0.000)	(0.000)		
Nursinghome	-0.035	-0.024		
	(0.288)	(0.470)		
Any Care · Nursinghome		-0.043*		
		(0.066)		
Any Care			0.096***	0.126***
			(0.000)	(0.000)
Medicaid Eligibility			-0.068***	-0.044**
			(0.002)	(0.048)
Any Care · Medicaid				-0.080***
				(0.001)
Controls Child	*Yes*	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.246	0.247	0.245	0.247
Observations	7522	7522	7710	7710

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.
Notes: $Nursinghome$ denotes the binary variable for whether the parent lived in a nursing home before death and $AnyCare \cdot Nursinghome$ is an interaction term with informal caregiving. The procedure is analogous to the estimations described in Section 4. Parent's and children's control variables are included but not shown (cf. Table A.2 in the appendix for a full set of controls).

pronounced when using Medicaid eligibility as a proxy for formal care arrangements. Here, the difference is 8 percentage points. The results are well in line with the literature that generally finds some form of substitutability between formal and informal care (cf. Houtven and Norton (2004)). My results suggest that the correlation between informal care and bequest is less strong with additional formal care arrangements. However, the effect of informal caregiving remains significantly positive for both specifications after including the interaction term.[44]

6.3 Endogeneity of the Caregiving Variable

One concern with the caregiving variable in the exit interview is that (in most cases) the caregiving child is also the person who is answering the questionnaire about the amount of care provided. This might result in measurement errors–presumably in a positive manner (i.e., overreporting of caregiving). To test whether there is any systematic bias that might drive my results, I use lagged help from the previous wave as my main variable. This variable comes from the HRS core files that contains answers generally given by the

[44]Recall, however, that Medicaid eligibility is potentially an endogenous variable because Medicaid is means-tested, implying that only low-asset (and income) households can apply.

respondents rather than their children.

Comparing lagged help with the amount of help indicated in the exit interviews reveals an overall lower caregiving intensity in the previous wave: 15 percent are caregivers with 17 hours of provided care, on average, conditional on providing at least some care. In contrast, in the exit interview, 29 percent of children are caregivers, with an average of 26 hours of care per week. This result is observed (partly) because there is much less need for caregiving two years before the parents' death–both the proportion of parents in need of LTC and the average number of (I)ADL limitations are lower.

In addition, 75 percent of those children who provided care in the previous wave continued to do so at the time of the exit interview. On the contrary, 60 percent of children who reported providing care in the exit interview did not provide care in the previous wave.

Table 15: Any Bequest on Caregiving from Previous Wave

	Logit	2SRI	FE
Any Bequest	(1)	(2)	(3)
Any Care (t-1)	0.052***	0.399***	0.032***
	(0.00)	(0.00)	(0.00)
Controls Child	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*No*
R^2/Pseudo R^2	0.222	0.222	0.021
Observations	7544	7544	7983

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.
Notes: The effect of any care retrieved from the previous HRS wave before the exit interview on any bequest. Parent's and children's control variables are included but not shown (cf. Table A.2 in the appendix for a full set of controls). The residual of the 2SRI is significant with a p-value of 0.01.

However, Table 15 shows that the impact of caregiving on the incidence of bequests received is comparable when using lagged help from the previous wave. The results for the dollar amount of bequests are relegated to Table A.9 in the appendix. For the Logit/Tobit specification, the effect is generally smaller, while the FE model yields a smaller effect for the incidence and a larger effect for the absolute amount of received bequest. The IV approach generates much stronger effects. Note that exogeneity tests for both IV models indicate that lagged caregiving is endogenous.

6.4 Control Variables and 'Overcontrolling'

Because of the large number of covariates in my main regressions, the question of over-adjustment is an issue. It is possible that 'bad controls' in my regression bias the coefficients of interest.

To further investigate this possibility, Table 16 shows the results of a simple regression without covariates in Column 1, with a set of exogenous controls in Column 2 and, as a comparison, with all control variables in Column 3 as used in my main results. The

Table 16: Alternative Sets of Controls

Any Bequest	No Controls (1)	Exogenous Controls (2)	All Controls (3)
Logit Model			
Any Care	0.181***	0.119***	0.089***
	(0.00)	(0.00)	(0.00)
R^2	0.023	0.120	0.225
2SRI Model			
Any Care	0.167**	0.207***	0.211***
	(0.01)	(0.00)	(0.00)
Residuals	0.006	-0.10	-0.13**
	(0.94)	(0.12)	(0.05)
R^2	0.023	0.119	0.224
Fixed Effects Model			
Any Care	0.064***	0.063***	0.054***
	(0.00)	(0.00)	(0.00)
Pseudo R^2	0.020	0.026	0.030
Observations	8157	8157	8157

Notes: Column 1 regresses any bequest on any level of care without control variables. The exogenous control variables in Column 2 are age, gender, race, number of children and years of education of the parent and the child, the marital status of the child, and five wave dummies. All control variables are used in Column 3; they are listed in Table A.2 in the appendix.

controls that are labeled exogenous are age, gender, race, number of children and years of education both for the parent and the child, the marital status of the child only, and five wave dummies.

The overall results show a general tendency for the Logit model and the fixed-effects model: the coefficient of care generally decreases when adding control variables, while the R^2 value increases. Including more control variables improves the model fit and simultaneously decreases the coefficient of caregiving, implying that more covariates contribute to more fully explaining the bequests received.

On the contrary, the coefficients of any care in the 2SRI model become larger when including more control variables. However, as the significance levels of the residuals from the first-stage regression indicate, the care variable is exogenous only in the model using the full set of control variables in Column 3. The model using no control variables in Column 1 yields no significant difference from the model treating care as exogenous.

According to Table 16, my main result does not seem to be systematically biased by potentially endogenous control variables. For all three specifications, the coefficient of 'any care' does not differ much. The results between the model using only exogenous controls and the one using all control variables are similar.[45]

[45]Moreover, I obtain qualitatively similar results when regressing the dollar amount on any care. The

7 Discussion of Results: Underlying Bequest Motives

Two main theoretical models are consistent with a positive correlation between parental transfers (i.e., bequests) and children's help with long-term care.[46] The exchange models proposed (Bernheim et al. (1985) and Cox (1987)) almost by definition establish that children's help or attention leads to higher transfers from parents. The crucial feature of exchange models is that the parent directly enjoys utility from a service or attention provided by the child–which is help with (I)ADL in my analysis. Parents can transfer resources to their child (both as inter vivos and as bequests) that are contingent on children's help (exchange motive). As a main result, transfers should be positive for children who care for their parents (extensive margin), and they should be higher for children who provide more help (intensive margin), both in absolute terms and relative to the siblings of the helping child. However, certain models of altruism initiated by Barro (1974) and Becker (1974) lead to similar results, depending on who is assumed to be altruistic.[47]

The standard altruistic model of intergenerational relations assumes the parent to be naturally altruistic (one-sided altruism) (cf. Laitner (1997) and Laferrère and Wolff (2006)), such that the child's utility directly enters the parent's utility function. According to altruism models, parents aim to equate marginal utilities of all family members. If the child experiences utility losses by helping parents, as assumed by, e.g., Cox (1987), then an altruistic parent wishes to compensate for this by conducting a transfer to the helping child. Similarly, assuming income losses of the child as a result of time-consuming caregiving induces the same behavior in the parent. However, to induce a selfish child to help in the first place, the altruistic parent needs to go beyond compensating the child for his services.

The two-sided altruism model establishes a clear positive correlation between children's help and parental transfers (cf. Laitner (1988) and Laferrère and Wolff (2006) for a discussion). Suppose that the (discounted) utility of the other family member enters positively in both the parent and child utility functions. Parents can increase children's resources (and hence utility) by leaving bequests, and children can increase parents' utility directly by helping them. Such a two-sided altruism model results in both positive bequests and positive help with care depending on the strength of the family altruism parameter that weighs the other members' utility. In conclusion, my main result does not allow for discriminating between altruistic and exchange motives in bequest behavior.

However, the literature has identified indirect proofs for each of the theories. The im-

results are available from the author upon request.

[46] For excellent reviews of intergenerational economic relations, see Laitner (1997) and Laferrère and Wolff (2006).

[47] It should be emphasized that neither the 'pure' altruistic model nor the exchange model can explain the observed high proportion of equal division of inheritance (Menchik, 1980; Norton and Taylor, 2005; McGarry, 1999), which is also found in my sample. I do not directly address the equal division puzzle in this paper.

pact of the financial resources of the children enables discriminating between altruism and exchange (cf. Cox (1987), Cox and Rank (1992)). The exchange model implies that, ceteris paribus, rich children provide less quantity of services to their parents. The reason is an opportunity cost argument: higher market income leads to a reduction in services provided to the parent. Simultaneously, the price of services that the child demands increases. Because parental transfers are equal to the product of the price and the quantity of services, the impact of children's income on the size of the transfer is ambiguous. However, if market substitutes for the child's services are difficult to obtain, then the price effect is dominant, such that children's income and the parental transfer are positively related.

Both the altruistic model and the exchange model predict a negative impact of children's finances on the probability of receiving a bequest, although for different reasons. Altruistic parents want to support children who have lower financial resources, while for those with an exchange motive, the probability of receiving a transfer also decreases with the size of children's income because children have higher opportunity costs of helping. However, the two models differ at the intensive margin. Here, altruistic parents again transfer higher amounts to less wealthy children, while parents with an exchange motive must compensate their relatively wealthier children with higher bequests to induce then to provide informal care because they demand a higher price for their service. These contrasting predictions have been used for empirical tests to discriminate between the two models (cf. Cox (1987) and McGarry and Schoeni (1995)).

As shown in Section 5.1, the results for children's financial resources are more consistent with an exchange, implied by a positive impact of higher financial resources on the amount of bequest received. However, it must be emphasized that only the coefficients using children's education as a proxy for permanent income yields significant effects, while the sign of the coefficient for children's income (measured in brackets) is consistent with an exchange motive, although the result is nonsignificant.

Bernheim et al. (1985) highlight the potential threat of disinheriting the child if he does not comply by offering help, as this is necessary for the exchange motive to work. An important element of an exchange motive is thus the presence of a non-revocable will where the parent fixes the amount of bequest and a sharing rule among the children in advance. Similarly, Sloan et al. (1997) claim that in order to be able to condition bequests on realized informal care from children, the parent must be cognitively aware to have sufficient bargaining power with respect to their children.[48]

In Section 5.3, I find that, indeed, a written will (or the change of it) is crucial for the correlation of caregiving and received bequest. Although the descriptive statistics reveal an even more unequal division if there is no will, the presence of a will seems to be a necessary element for the bequest-caregiving nexus. The result is thus consistent with the

[48]Brown (2006) instead shows that if children are sufficiently altruistic toward their parents, then selfish parents can realize a certain amount of care without conditioning their bequests (i.e., without the threat of disinheritance).

exchange motive. However, altruism again cannot be ruled out. It is also possible that a parent has created a will to assure that the helping child, who has experienced disutility from helping, is rewarded for his loss of utility–rather than to attempt to buy the services of the child.

In conclusion, the results found in this paper do not clearly allow discrimination between the two main theories of bequest behavior. Nonetheless, I am able to establish a clear and sizable correlation between caregiving and received bequests.

8 Conclusion

This is–to the best of my knowledge–the first study using the exit interview of the Health and Retirement Study to analyze the importance of monetary rewards from parents to their caregiving children in the informal LTC sector. The data allow me to analyze actual bequests and their distribution among children as well as actual caregiving by the children, whereas previous studies proxy (some of) these variables.

My results show that both the incidence and size of the bequests of elderly parents to their children are positively affected by children's caregiving. Studying within-family variation, I find that children's help relative to that of siblings significantly increases the proportion of bequest received. Furthermore, my findings highlight the importance of a written will for the bequest-caregiving relationship to be present. To address endogeneity concerns, I present results both from an instrumental variable approach and from a family fixed-effects model.

The underlying motive for the sizable impact of caregiving on received inheritances cannot be answered unambiguously. The correlation is consistent with strategic exchange motives and (two-sided) altruism. However, the finding that financially better-off children seem to receive more bequests might be viewed as weak support for an exchange relationship. Furthermore, the importance of a will seems to suggest that mutual agreements between the helping child and the parent are not sufficient to establish a correlation between caregiving and bequests. Although these findings–at best–seem to hint at exchange motives being present, this implication does not indicate that altruistic motives are not important. In a way, the theoretical difference between the two motives might even be difficult to disentangle from an individual perspective: do parents reward their children because they gain utility from their service (exchange motive), or do they transfer to their children because of the disutility that they perceive that their child experiences in their caregiving efforts (altruistic motive)?[49] The difficulty of disentangling motives for individual decisions is also present in studies of reciprocity and fairness (cf. Fehr and Gächter (2000)). In this literature, the identification of these motives usually comes from controlled

[49] A similar task would be to disentangle the motive for why people donate: do they wish to donate to, e.g., help people suffering from poverty, or do they donate because it makes them feel better?

laboratory experiments rather than from real-world interactions.

Despite the underlying motive, the presence of exchanges in care and bequest has important implications for dynamic lifecycle decisions, especially for saving behavior. Recently, a series of studies have attempted to quantify altruistic bequest motives in contrast to precautionary saving motives to buffer against high out-of-pocket expenditures for formal LTC (cf. De Nardi et al. (2010) and Lockwood (2014)). My study emphasizes the importance of considering the informal LTC market for the analysis of both insurance decisions and asset decumulation of the elderly. In particular, my results suggest that the positive correlation between informal care and bequests seems to be a sizable alternative motive for peoples' saving decisions. A first step in that direction has been made by Dobrescu (2015), who incorporate an informal care insurance possibility within a structural life-cycle model using data from the Survey of Health, Ageing and Retirement in Europe (SHARE).

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A Appendix

Table A.1: Comparing Total Bequest and Wealth

	Wave	Mean ($)
Total Wealth	$t-1$	169,021
- Change of Assets[1]	$t-2/t-1$	9031
- OOP Health Expenditures	Exit, t	7109
- Death Expenditures	Exit, t	7962
= Total Wealth before Death[2]		144,919
Total Bequests	Exit, t	123,470
Proportion of Wealth $<$ 25k		47.9%
Proportion of Zero Bequest		45.9%
Observations[3]		2878

Notes: Pooled sample 2002-2012. Waves $t-1$ and $t-2$ indicate the previous two HRS core files before the exit interview in t. The value of total bequests is calculated by summing all bequests to children described above and by adding bequests to other persons, such as grandchildren or friends.
[1] Change in assets between wave $t-2$ and $t-1$ excluding out-of-pocket medical expenditures reported in wave $t-1$ as an approximation for asset decumulation in $t-1$ due to consumption expenditures.
[2] Approximated value of total wealth in previous wave net of changes in wealth, OOP and death expenditures.
[3] Sample size is only 2537 for the variable 'Change in Assets', 2649 for OOP Health Expenditures and 2297 for Death expenditures.

Table A.2: Control Variables

	Mean	Std. Dev.	Min.	Max.
Parent's Controls, X_p				
Age	82.82	10.11	51.00	111.00
Female	0.71	0.45	0.00	1.00
White/Caucasian	0.75	0.43	0.00	1.00
Nr. of Children	4.87	2.89	1.00	20.00
Years of Schooling	10.26	3.70	0.00	17.00
Any Formal Care	0.54	0.50	0.00	1.00
Nr. ADL Lim.	2.49	2.58	0.00	6.00
Nr. IADL Lim.	1.65	1.49	0.00	4.00
LTC Insurance	0.06	0.24	0.00	1.00
Medicaid in Exit	0.40	0.49	0.00	1.00
Mediciad prev.wave	0.33	0.47	0.00	1.00
Any Donations	0.04	0.20	0.00	1.00
log(OOP Health Expenditures)	log(6348)	log(21,521)	log(0.00)	log(39,0128)
log(Income)	log(22332)	log(111883.15)	log(0.00)	log(544,0160)
log(Total Wealth prev. Wave)	log(145,185)	log(435,315)	log(-129,330)	log(12,243,200)
Children's Controls, $X_{r,c}$				
Age	54.42	10.85	3.00	98.00
Number of Children	2.21	1.68	0.00	14.00
Years of Education	12.95	2.60	1.00	17.00
Income Below 35k	0.29	0.45	0.00	1.00
Income Missing	0.31	0.46	0.00	1.00
Owns Home	0.54	0.50	0.00	1.00
Not Married	0.36	0.48	0.00	1.00
Marital Status: Missing	0.01	0.09	0.00	1.00
Controls for Relationship, $X_{r,c}$				
Freq. of Contact	152.92	391.34	0.00	18,250.00
Co-Reside with Parent	0.04	0.21	0.00	1.00
Lives within 10 Miles	0.35	0.48	0.00	1.00
General Controls				
Wave 04 Dummy	0.11	0.32	0.00	1.00
Wave 06 Dummy	0.17	0.37	0.00	1.00
Wave 08 Dummy	0.18	0.39	0.00	1.00
Wave 10 Dummy	0.21	0.41	0.00	1.00
Wave 12 Dummy	0.16	0.37	0.00	1.00
Observations	6925			

Notes: Descriptive statistics for all control variables used in the regressions. Due to the natural logarihm, all observations with negative total wealth are not used in the regressions.

Table A.3: First-Stage Regressions

	(1) Hrs. Care $ Bequest	(2) Any Care Any Bequest	(3) Any Care $ Bequest	(4) Relative Care Relative Bequest
Instrument				
Female	37.906***	0.150***	0.176***	0.060***
	(0.00)	(0.00)	(0.00)	(0.00)
Child Characteristics				
Number of Children	−0.479	−0.006**	−0.002	0.006
	(0.85)	(0.03)	(0.72)	(0.20)
Not Married	19.807**	−0.024**	−0.014	0.004
	(0.03)	(0.03)	(0.40)	(0.79)
Years of Education	−3.121*	0.009***	0.014***	0.003
	(0.06)	(0.00)	(0.00)	(0.34)
Income Below 35k	11.722	−0.046***	−0.045**	−0.002
	(0.23)	(0.00)	(0.03)	(0.92)
Owns Home	17.078*	0.036***	0.024	−0.031*
	(0.06)	(0.00)	(0.21)	(0.09)
Parent-Child Relation				
Lives within 10 Miles	8.666	0.201***	0.199***	0.076***
	(0.20)	(0.00)	(0.00)	(0.00)
Co-Reside with Parent	147.266***	0.309***	0.293***	0.174***
	(0.00)	(0.00)	(0.00)	(0.00)
Freq. of Contact	0.002	0.000**	0.000***	0.000
	(0.76)	(0.02)	(0.00)	(0.20)
Respondent Characteristics				
Nr. of Children	−1.392	−0.021***	−0.024***	−0.045***
	(0.44)	(0.00)	(0.00)	(0.00)
Any Formal Care	23.842**	0.071***	0.079***	−0.002
	(0.02)	(0.00)	(0.00)	(0.93)
Nr. ADL Lim.	0.024	0.015***	0.018***	−0.010***
	(0.99)	(0.00)	(0.00)	(0.00)
LTC Insurance	20.105	0.026	0.035	0.024
	(0.18)	(0.23)	(0.23)	(0.41)
Medicaid in Exit	−8.314	0.024*	−0.003	0.030
	(0.39)	(0.08)	(0.89)	(0.14)
Any Donations	−3.885	−0.013	−0.033	0.051
	(0.79)	(0.59)	(0.28)	(0.18)
Log OOP Expenditures	0.248	0.005***	0.008***	0.006***
	(0.82)	(0.00)	(0.00)	(0.01)
Log Income	8.393***	0.010**	0.000	0.003
	(0.00)	(0.02)	(0.99)	(0.64)
log Total Wealth	0.515	0.001	0.003	−0.004*
	(0.63)	(0.46)	(0.33)	(0.06)
(Adjusted) R^2	0.186	0.206	0.217	0.189
Observations	2280	7710	3575	2280

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01. *Notes:* Results from the first-stage regression of the IV models. Columns 1 corresponds to the 2SRI model in Column 2, Table A.6. Columns 2 and 3 corresponds to the main results in Table 10, Column 2 and 5. Column 4 is the first stage of the results shown in Table 11, Column 5. Other included controls are listed in Table A.2. A full set of results are available from the author upon request. Standard errors are clustered at the respondent level.

Table A.4: IV-Diagnostics

	Binary Bequest 2SRI	$ Bequest IV LPM	Hrs. Care 2SRI-Tobit
Strength of the Instruments			
Part. R^2	0.032	0.042	0.013
F-Test	219.893	127.834	29.656
Endogeneity Diagnostics			
DWH		2.311	
p-val.		0.129	
2SRI Residuals First Stage	-0.128*		-3098.3*
p-val. .	0.054		0.086
Observations	7710	3575	2280

Notes: The diagnostics for the instruments are Shea's partial R^2 and the F-statistic. The endogeneity tests are the Durbin-Wu-Hausman (DWH) test for the linear IV model and the significance of the residuals from the first stage as a test for the non-linear 2SRI models.

Table A.5: Coefficients of Any Help at Quintiles of Family Bequests

$ Bequest	Tobit (1)	FE (2)
Quintile 1		
Any Care	549***	249*
	(0.001)	(0.064)
Quintile 2		
Any Care	2440***	1711***
	(0.000)	(0.01)
Quintile 3		
Any Care	8812***	3559**
	(0.000)	(0.023)
Quintile 4		
Any Care	27,626***	15,753***
	(0.000)	(0.000)
Quintile 5		
Any Care	52,465**	68,085***
	(0.039)	(0.002)

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: Effect of any care on the dollar amount of bequest at different quintiles of total family bequests conditional on a positive amount of bequests. The mean value of family bequests are given by the following: Q1: $2263 (n=751), Q2: $14,211 (n=733), Q3: $52,275 (n=742), Q4: $139,558 (n=742), and Q5: $662,746 (n=738). P-values are given in parentheses. Standard errors are clustered at the household level. The full set of control variables on the parent and child levels is used (cf. Table A.2 in the appendix).

Table A.6: Intensive Margin of Caregiving

Dollar Bequest	Tobit	2SRI Tobit	FE
	(1)	(2)	(3)
Main Variables			
Hrs of Help per Week	−5.319	781.900	−8.401
	(0.96)	(0.30)	(0.93)
Child Characteristics			
Age	−927.648	−1112.868	−407.156
	(0.40)	(0.32)	(0.34)
Not Married	42,855.544***	39,185.433***	−5741.315
	(0.00)	(0.00)	(0.31)
Years of Education	1394.671	1790.186	−631.849
	(0.45)	(0.35)	(0.52)
Income Below 35k	−17,544.514^{+}	−21,151.154*	7668.553
	(0.14)	(0.10)	(0.25)
Owns Home	−11,326.803	−14,174.693	−10,645.513
	(0.46)	(0.38)	(0.19)
Parent-Child Relation			
Lives within 10 Miles	21,836.931**	22,441.743**	490.363
	(0.04)	(0.04)	(0.95)
Co-Reside with Parent	3843.358	−24,703.093	8412.501
	(0.88)	(0.48)	(0.25)
Freq. of Contact	−1.919	−3.288	2.654
	(0.71)	(0.55)	(0.79)
Respondent Characteristics			
Nr. of Children	−18,006.819***	−18,256.172***	
	(0.00)	(0.00)	
Any Formal Care	10,634.356	4991.632	
	(0.27)	(0.65)	
Nr. ADL Lim.	−2354.072	−2345.491	
	(0.27)	(0.27)	
LTC Insurance	18,084.557	15,197.164	
	(0.38)	(0.45)	
Medicaid in Exit	−29,586.569*	−28,953.083^{+}	
	(0.08)	(0.10)	
Any Donations	28,196.458	29,718.380^{+}	
	(0.16)	(0.11)	
Log OOP Expenditures	3024.391^{+}	2790.419^{+}	
	(0.12)	(0.14)	
Log Income	13,735.658***	12,059.942**	
	(0.01)	(0.01)	
log Total Wealth	11,157.845***	10,726.880***	
	(0.00)	(0.00)	
Residuals		−807.988	
		(0.32)	
R^2 / Pseudo R^2	0.009	0.009	0.047
Observations	1230	1230	1263

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: P-values are shown in parentheses. Other included controls not shown in the table are the following: parental years of schooling, number of IADL limitations, Medicaid eligibility in the previous wave, a race dummy, number of children that the child has and a dummy for missing values for children's income. See Table A.2 in the appendix for a list of all covariates used. A full set of results is available from the author upon request. Reported coefficients are marginal effects for the non-linear models. Estimates from the 2SRI model use the child's gender as an instrument for help. Standard errors are clustered at the respondent level. Specification tests for the IV models are given in Table A.4.

Table A.7: Importance of a Written Will

	IV Aproach			
$ Bequest	(1)	(2)	(3)	(4)
Any Care	78,810.56**	28,260.51*		
	(0.05)	(0.10)		
Will	19,642.07***	−11,464.20		
	(0.00)	(0.63)		
Any Care · Will		136,951.17		
		(0.11)		
$\Delta Care$			77,257.83**	29,723.33
			(0.01)	(0.13)
$\Delta Will$			30,731.08**	−6301.01
			(0.01)	(0.76)
$\Delta Care \cdot \Delta Will$				143,247.25*
				(0.10)
Controls Child	*Yes*	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.113	0.124	0.145	0.135
Part. R^2	0.042	0.061/0.07	0.063	0.052/0.068
F-Test	127.498	24.83/10.05	37.951	19.63/8.95
DWH	2.353	3.360	3.705	3.671
p-val	0.125	0.035	0.055	0.026
Observations	3556	1002	862	862

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: Estimations conditional on any positive amount to bequeath in each family. P-values are shown in parentheses. Parent's and children's control variables are included but not shown (cf. Table A.2 in the appendix for a full set of controls). Estimations shown in Columns 2 and 4 use 'female' and 'female · will' as instruments. IV test statistics in Column 4 show values for the two instruments.

Table A.8: Caregiving and Inter Vivos Transfers, Exit Interviews

Any Inter-Vivos Transfer	Logit (1)	2SRI (2)	FE (3)
Main Variables			
Any Care	0.015**	-0.008	0.020***
	(0.03)	(0.82)	(0.01)
Child Financial Resources			
Years of Education	-0.001	-0.001	-0.003**
	(0.45)	(0.53)	(0.02)
Income Below 35k	0.023***	0.020***	0.019**
	(0.00)	(0.00)	(0.04)
Owns Home	0.011	0.011	-0.012
	(0.11)	(0.14)	(0.11)
Controls Child	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*No*
R^2 / Pseudo R^2	0.163	0.160	
Observations	7710	7710	8157

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: P-values are shown in parentheses. Parent's and children's control variables are included but not shown (cf. Table A.2 in the appendix for a full set of controls).

Table A.9: Results for $ Bequest with Lagged Help from Previous Wave

$ Bequest	Tobit (1)	2SLS (2)	FE (3)
Any Care (t-1)	26,095***	186,918**	30,750***
	(0.00)	(0.05)	(0.01)
Controls Child	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*No*
R^2/Pseudo R^2	0.012	0.056	0.023
Observations	3507	3507	3635

Significance Levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: Effect of any care retrieved from the previous HRS wave before the exit interview on any bequest. Parent's and children's control variables are included but not shown (cf. Table A.2 in the appendix for a full set of controls). The HWD test delivers a p-value of 0.07, indicating the endogeneity of help.