No. 79

UNIVERSITY OF COLOGNE

WORKING PAPER SERIES IN ECONOMICS

BEQUESTS AND INFORMAL LONG-TERM CARE: EVIDENCE FROM THE HRS EXIT INTERVIEWS

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

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December 22, 2014

Abstract

Informal care of children for their frail elderly parents may induce parents to compensate their children for their help. To test this hypothesis, we use the Exit Interview from the Health and Retirement Study. Our results show that caregiving has a significant positive impact on the incidence and the amount of received bequests both at the extensive and intensive margin of help. Three pieces of evidence suggest exchange motives rather than altruism to be the main source for this outcome. First, financially more well off children are more likely to receive an inheritance. Second, we find that a positive impact of help on bequest requires a written will as a contract between the parent and the helping child. Third, our results are even more pronounced when employing a fixed effects model to control for family altruism.

JEL Classification: D13, D19, J14.

Keywords: Intergenerational Transfers, Strategic Bequest Motive, Informal Long-term care, Altruism

*We thank Oleg Badunenko, James Banks, Mariacristina De Nardi, Eric French, David Jaeger, Alexander Ludwig, Matthias Schön and participants of seminars at CUNY, New York, University of Cologne and the IFS, London, as well as the ILPN conference at LSE, London, for helpful comments and suggestions. Part of this project has been realized while Max Groneck was visiting the economics department at University of Pennsylvania. He is indebted to Dirk Krueger for his invitation.

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1 Introduction

The risk of becoming in need of long-term care (LTC) constitutes one of the largest yet insufficiently insured risks of the elderly 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 get professional formal care which can be home health care, assisted living, or care in a nursing home. Yet, in most OECD countries the largest share of LTC is still provided informally. According to official estimates for the United States, 58 percent of the total long-term care costs are borne by the informal care sector, cf. CBO (2008). Although, determinants of long-term care and associated living arrangements have been extensively studied in the literature, there is no consensus about the quantitative importance of monetary rewards for informal care.[1]

In this paper, we empirically assess whether parental bequests and their distribution among children are positively affected by children's caregiving. In addition, we study potential reasons for the positive impact of help on inheritance. To this end, we employ data from the so-called Exit Interview from the Health and Retirement Study (HRS) which has not been studied for this purpose so far. The Exit Interview is conducted after the respondent's death with the closest relative or friend. It 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 an individual must master to organize its life. The use of this data allows us to study the informal care sector in much more detail than previous studies. In particular, we have information on the hours of help with (I)ADL from *each* child as well as the actual inheritance given *to each* child without having to rely on proxy variables. We thus employ the distribution of bequests for a sample of single elderly households among their children conditional on their help with long-term care.

One important concern with regressing parental bequests on children's help is the endogeneity problem. Children might help strategically if they expect higher inheritance (reverse causality), and children's help and parental bequest might be influenced by family ties (unobserved variable bias). Hence, we estimate models under the assumption that children's help is endogenous. Since specification tests draw mixed conclusions about the existence of the endogeneity of children's help, we also estimate the model assuming that children's help is exogenous, i.e., uncorrelated with the error term.

Our findings confirm a strong and significant correlation between children's caregiv-

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

ing and bequests, suggesting a large market size of informal care in terms of monetary turnover. This is in contrast to previous studies that were either not able to directly measure the effect of increased care on parental bequest decisions or did not find sizable effects.[2] Children who provide any help have a 9 to 17 percent higher probability to receive positive bequests depending on specifications. In addition, providing any care significantly increases received bequests by 15 thousand Dollars according to our point estimate. Quantile regression results point to increasing effects throughout the distribution. At the intensive margin, we find that an additional hour of provided informal care per month implies an increase in bequest of $294.

As a next step, we ask for the underlying reason for the strong impact of caregiving on bequest. Bequests as a compensation for children's help has been labeled as the 'strategic bequest motive', cf. Bernheim et al. (1985), or more broadly the 'exchange motive', cf. Cox (1987) and Cox and Rank (1992) who study inter-vivos transfers. However, models of altruism are also consistent with this outcome. Discriminating between the two motives is not an easy task. We present three different pieces of evidence that further support exchange rather than altruistic motives. First, we find that relatively wealthier children receive significantly higher inheritance. However, the altruistic model implies just the opposite: poorer children should receive higher transfers to (partially) equalize marginal utilities of the household members. Second, we find that the positive correlation between help and bequest is only present if the parent has made a will. We interpret the will as a necessary contract between the parent and the child for the exchange motive to work. Third, we specifically zoom in on those families who bequeathed unequally among their children to explore within-family differences in help and bequests among children. In this sub-sample we employ a family-fixed effects model that allows us to control for family altruism and show that the positive correlation between help and bequest is even more pronounced.

Our reading of the empirical literature on bequest motives lead us to conclude that existing studies are confronted with problems of data availability. For example, using parental wealth as a proxy for inheritance, as done in the vast majority of studies, does not reveal sufficient information about the inheritance that each individual child receives due to the possibility of unequal division in the presence of more than one child. However, data on actual bequests and their distribution among the children as well as the provision of care at once is usually not available. In addition, studies with a focus on the informal long-term care sector are scarce. Brown (2006) focuses on children's informal caregiving behavior as the explanatory variable for *expected* inheritance. She calculates potential end-of-life transfers by using information about which child is included in life-insurance

[2]See Brown (2006), Norton and Taylor (2005) and Norton and Van Houtven (2006), for examples.

policies and will, which limits her sample considerably.[3] Norton and Van Houtven (2006) focus on whether informal care by children has (negatively) affected the propensity to equally divide bequests. Again, their data does not contain detailed information about help and monetary transfer to each child. Norton and Taylor (2005) is the only study we are aware of that analyze *actual* bequests.[4] However, they employ co-residence with their parents as a proxy for children's help without finding significant effects. In addition, they use bequest data from court records which is a imperfect proxy for actual bequests. Hurd and Smith (2001) find that inheritances from estate tax files or information from wills that pass through probate, at most cover one third of 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 find evidence broadly in favor of the exchange motive. But again, only some studies examine the long-term care sector, see Henretta et al. (1997), Norton and Van Houtven (2006), Norton et al. (2013) and McGarry and Schoeni (1995, 1997).

The paper proceeds as follows. In Section 2 we discuss the theoretical literature which guides our empirical approach. Section 3 describes the data and provides elaborate descriptive statistics. Section 4 lays out the empirical models and in Section 5 we present our results. Section 6 concludes.

2 Theoretical Framework

Intergenerational economic relations have been studied extensively in the literature, see Laitner (1997) and Laferrère and Wolff (2006) for excellent reviews. Microeconomic models of family transfers differentiate between altruistic models, cf. Barro (1974) and Becker (1974), and transfers as a means of exchange, cf. Bernheim et al. (1985) and Cox (1987).[5] Exchange models almost by definition establish that children's help or attention leads to higher transfers from the parents. However, models of altruism lead to similar results. In

[3]Brown (2006) uses the first wave of the Asset and Health Dynamics Among the Oldest Old (AHEAD). However, neither hours of care provided by children nor the specific amount of bequests per child is available 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.

[4]Further empirical studies on the strategic bequest motive that do not study the long-term care sector are Bernheim et al. (1985) and Perozek (1998). They 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 neglecting children's help altogether.

[5]It should also be stressed that neither the 'pure' altruistic model nor the exchange model can make up for the observed high fraction of equal division of inheritance, cf. (Menchik, 1980; Norton and Taylor, 2005; McGarry, 1999), which is also found in our sample. However, a recent study on 'complex families' with divorces and the presence of stepchildren finds that unequal bequests are much more prevalent in the HRS, cf. Francesconi et al. (2014). We do not directly address the equal division puzzle in this paper.

the following, we review the two models and discuss how they are distinguishable.

2.1 Exchange Models

The crucial feature in 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 our analysis. Parents can transfer resources to the child (both inter-vivos or as bequests) which are contingent on children's help (exchange motive). As a main result, transfers should be positive for children who care about their parents (extensive margin) and it should be higher for children providing more help (intensive margin).

The financial situation of the child has an important impact on the exchange motive. The exchange model implies that 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. At the same time, the price of services that the child demands goes up. Since 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 to the child's services are difficult to obtain, the price effect dominates so that children's income and the parental transfer are positively related. As will be shown below, this is an identifying feature compared to the altruistic model, cf. Cox (1987) and Cox and Rank (1992). Besides income, children's wealth might also positively affect the price of services as children are less in need of receiving a parental transfer.

Bernheim et al. (1985) highlight the necessary potential threat to disinherit the child if they do not comply with helping them. An important element for an exchange motive is thus the presence of a non-revocable will where the parent fixes the amount of bequest and a sharing rule between 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 toward the children. However, Brown (2006) shows that if children are sufficiently altruistic towards their parents, selfish parents can realize a certain amount of care without conditioning their bequests, i.e., without the treat of disinheritance.

One model extension allows for market substitutes for children's services to the parent. Sloan et al. (1997) and Zweifel and Strüwe (1996) model formal care possibilities besides children's informal care. They assume that parents derive utility solely from informal care by children whereas children are only concerned about total care to their parents which is the sum of formal and informal care. As a result, the availability of formal care possibilities reduces informal care provided by children. In addition, Zweifel and Strüwe (1996) show that parents are less willing to buy a private LTC insurance in such a setup because it

would free children from the duty to give care.[6] For our analysis, Medicaid eligibility represents the main formal care possibility that might serve as a substitute for informal care. Generally, Medicaid pays for formal care (e.g. nursing homes) once assets and income are below a certain threshold level. Hence, according to this reasoning Medicaid eligibility is expected to be negatively correlated with informal care from children.

Finally, it is important to notice that, in theory, the exchange motive goes in either direction. Parents can strategically influence children's caring decision by their financial resources, while children can strategically influence financial transfers from the parent by providing care. This problem of reverse causality has to be accounted for in our empirical specification.

2.2 Altruistic Models

Altruistic models generally assume altruistic parents who decide on a transfer to their selfish children. It is common in the literature to assume this one-sided altruism as parents are viewed as the naturally altruistic agent within a family, cf. Laitner (1997) and Laferrère and Wolff (2006). Parental altruism is defined such that the child's utility directly enters the parent's utility function. Altruism in these models ranges from assuming very strong family ties – parents value the utility of their descendants as much as their own – to considering less extreme views of affection across kinship, whereby the utility of a family member is somewhat discounted relative to one's own.

A general result of altruism models is the aim to equate marginal utilities of all family members. In models with multiple children this implies that the parent wants to (partially) equalize marginal utilities of its children. A key result is that the parent transfers resources to the less wealthier child. Hence, models of altruism and exchange differ in their prediction of how children's finances affect the size of parental transfers. Under altruism, it is impossible that higher income from children leads to higher parental transfers while in exchange models transfers might be higher for richer children. This contrasting predictions have been used for empirical tests to discriminate between the two models, cf. Cox (1987) and McGarry and Schoeni (1995).

Incorporating children's action into the one-sided altruism model does not necessarily yield a positive correlation between children's help and parental transfers. There is simply no incentive to help ones parents for a selfish child because parental transfers are not contingent on children's actions. However, Cox (1987) assumes a negative impact of attention/help on children's utility. Under certain assumption, the parent wants to *more*

[6] Sloan and Norton (1997) investigate motives for the purchase of private long-term care insurance but could not find evidence for this motive using the AHEAD data.

than compensate the child for its service to the parent by higher transfers in this setup.[7]

Similarly, if the model is extended by endogenizing children's income there is a further incentive from the parent to bequeath. Assume, that children who help their parents with long-term care have to reduce their working time resulting in income losses. In this case, an altruistic parent aims at compensating the income loss resulting from a shift of working time to informal care of the child. Note, that this compensation is for altruistic reasons to equalize marginal utilities of the children. However, this model requires a negative correlation between children's financial resources and parental bequests which can be tested in our empirical model.

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 the child utility function. 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.

To summarize, according to the exchange model, the decision to help as well as hours of help increase both the probability and the size of inheritance that a child receives. However, a positive correlation does not rule out altruism per se. In order to further isolate the exchange motive, we proceed as follows: first, we use children's income as a control and study its impact on parental bequest behavior, cf. Cox (1987). A positive effect of children's income (and wealth) on parental transfers would further support the exchange rather than an altruistic motive. Second, as suggested by Bernheim et al. (1985), we analyze whether the presence of a will as part of a written contract between the parent and the child has an impact on the relation between bequests and children's help. Third, we employ empirical methods to control for common (two-sided) family altruism.

3 Descriptive Statistics

Our descriptive statistics highlight the overall importance of informal care from children and the high average amount of hours that children spend supporting their parents with (I)ADL limitations. Moreover, we study the bequest distribution as well as the parent's and children's characteristics depending on whether the child was a caregiver, or not.

[7] In the altruistic model version of Cox (1987), parents transfer more to children who help in order to compensate for their utility loss. In the exchange model, however, they want to pay them for their service.

3.1 Data and Sample

Our main data source is the Exit Interview which is a follow-up survey of the Health and Retirement Study (HRS), 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 started 1992 and consist of people who were born in 1923 or earlier. Subsequently, four other cohorts were joined building a representative sample of elderly people in the United States. Typically, the survey is conducted every two years.

The Exit Interviews are released along the core interviews and contain data from 'proxy informants' - in most cases close family members - who are asked about deceased panel members. We denote the respondent who has died as the parent and study his relation to its children. The Exit Interview is a unique data set to obtain information about how the deceased respondent wealth endowment is distributed among the family, friends and others. In addition, there is detailed information about help from children, including demographic and financial characteristics. In cases where information from earlier years is needed, data from RAND, HRS family data, and HRS data are merged.[8] RAND contributions are streamlined and user-friendly data sets based on the HRS core interviews processed by the RAND Center for the Study of Aging.

The questionnaire of Exit Interviews from the years 2000 and earlier differs in several ways compared to later interviews, notably concerning some of the essential control variables such as child's income. Therefore the cross-sectional sample of parent-child pairs is derived from pooling the five Exit Interviews from the years 2002-2010. Several restrictions are imposed on the original sample. First, only parents who don't have any kind of partner at the point of death are included, as couples tend to leave assets to the surviving spouse. We refer to parents as singles, if they are widowed or divorced, i.e. not currently married or partnered to a living person. Second, we only consider families with at least one child to generate a parent-child pair where we focus on biological children because the data only delivers information about the children. Third, only observations that have non-missing values for all variables are included. Exemptions from this are categorial variables, where a dummy for missing values is included. Table 1 summarizes the effects of the imposed requirements on the sample size. The restrictions result in a final sample size of 2007 parents with 6925 children in total.[9]

[8] Some time constant variables, such as education are not included in the Exit Interviews. Furthermore, in order to diminish information loss from missing values, we update the variables with data from previous waves.

[9] We do not use weights from the HRS data to account for oversampling of certain groups (e.g. Blacks and Hispanics) because there are no weights available for people living in nursing homes for all waves we use.

Table 1: Sample Restriction

	Original sample	Single parents	biological child(ren)	Nonmissing values	Selected Sample
Children	22,984	-10,342	-2155	-3562	6925
Parents	6765	-2816	-713	-1229	2007

Notes: HRS Exit Interviews, pooled sample 2002-2010.

The two main variables of our interest are the value of bequests to each child as well as the hours of help with (I)ADL from each child to the (single) parent. Received inheritances are a combination of answers to several questions in the questionnaire of the HRS. Our measure of bequest consist of three main components: (1) primary and secondary home, (2) liquid assets and (3) life insurances. For each component, questions were asked about the value and to whom it was given. If one of the children was named, the value is added to the total amount of bequest for that child. In cases where no such kind of bequest was marked, a value of zero is taken. The HRS unfolds questions on ranges 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.[10] Monetary values of the different waves are inflation adjusted to 2012 levels.[11]

Unfortunately, we cannot directly compare our bequest distribution with the asset distribution of the previous waves of the HRS to assess the quality of our collected data.[12] There are several reasons for this. First, we only measure bequests that can uniquely be attributed to each child. Hence, the construction of bequests out of many different questions from the Exit Interviews leaves us with many missing values. According to Table 1, about 15 percent of the sample must be dropped due to missing values. Second, not all HRS respondents who died are covered in the Exit Interviews. Third, we do not account for bequests given to other persons, like the spouse, siblings, friends or to charity. Fourth, there are various high exceptional expenditures at the time before (and after death) that significantly reduces assets before they can be left as bequests. The most important examples are out-of-pocket health expenditures, inter-vivos transfers before death, and death expenses.

Hurd and Smith (2001) analyze the quality of the data on *aggregate* bequests from the first wave of the Exit Interview for the Asset and Health Dynamics among the Oldest

[10]Basically, only transfers that occurred after death are included, with one exception: The Exit questionnaire differentiates between 'who was the home given shortly before death?' and 'who inherited the home?'. We consider both kinds as bequests.

[11]Inflation adjustment is based on average Consumer Price Index for a given calendar year. Source: United States Labor Department, Bureau of Labor Statistics.

[12]Generally, our bequest measure is lower than total asset holdings from the previous HRS wave. If we sum our collected bequests at the household level, mean bequests are on average only around two thirds of previous family asset holdings.

Old (AHEAD) cohort of the HRS.[13] They present two important facts. First, mean inheritances of single respondents from the Exit Interview closely match the mean of net worth from the last AHEAD wave in 1995 prior to death, implying that bequests from the Exit Interview are not fundamentally different from net worth of the prior core interviews. Second, attrition does not seem to be a serious concern: Hurd and Smith (2001) note that the Exit Interviews were conducted with more than 90 percent of the 'proxy informants' of respondents who died between the first and second waves of the AHEAD. This is also confirmed by Francesconi et al. (2014) who report that 85 percent of the individuals that have died in their sample period between 1995 and 2010, are also included in the Exit Interviews. Nevertheless, the high fraction of missing values in our sample as well as response rates of around 90 percent in the Exit Interview point to a potential selection bias in our chosen sample.

The main explanatory variable in our empirical specification is children's help with (I)ADL of the parent. 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 to use the telephone or maps, managing money, taking medications or shopping for groceries and preparing hot meals. We employ the variable asking for help with at least one of these activities. It should be noted that the questionnaire does not specify the exact duration of help. Rather, the questions we use ask for the amount of help 'in a typical month'. The explicit amount of hours is either given per day, per week or per month. We restrict maximum time spend for informal care per month to 744 hours. Children, who are not included in the helper files of the HRS did not provide any informal care by definition.

3.2 Parent's Characteristics and LTC Arrangements

Although our empirical model focuses on the children's perspective we start by showing descriptive statistics for the parents. Table 2 shows care prevalence and the chosen care arrangements and contrasts the statistics of our sample with the full sample of all respondents. On average, around 80.5 percent of the parents in our sample were in need of long-term care prior to their demise. Long-term care is defined as either helping with ADL or IADL. The rather high fraction of parents in need of LTC is due to the fact that these statistics are drawn from a situation closely before the respondents death. The number does not differ much between samples.

Turning to the care arrangements, a sizable fraction of parents in need received any informal care: 91.1% (74.2%) in the restricted (full) sample. However, only about one

[13]The AHEAD study was merged with the HRS later and is now representing a specific cohort of the HRS.

Table 2: Long-term Care Arrangements

	Full Sample	Selected Sample
Fraction in Need of Care	78.8%	80.5%
Informal Care		
Spouse	30.8%	0.0%
Children	57.9%	83.6%
Person Same Generation	1.9%	2.0%
Other Relative	9.7%	8.2%
Other Individual	15.9%	16.9%
Any Informal Care	*87.8%*	*91.1%*
Exclusive Informal Care	*41.6%*	*35.8%*
Formal Care		
Nursing Home	36.9%	44.9%
Home Care	17.7%	17.2%
Any Formal Care	*54.6%*	*62.1%*
Exclusive Formal Care	*8.5%*	*7.2%*
LTC parents	5331	1616
All parents	6765	2007

Notes: Shares of care arrangements as a fraction of all parents in need of long-term care. Multiple responses possible for informal care; In need of care is defined as having at least one ADL or IADL limitation; 3.9% (1.9%) in the full (restricted) sample report need with (I)ADL without any help.

Table 3: Parent Characteristics by LTC Arrangements

	Excl. Informal	Formal and Informal	Excl. Formal
Age	81.8	84.6	86.7
Female	70.6%	73.2%	73.7%
Nr. of Children	3.7	3.3	2.9
Years of Schooling	10.8	10.8	10.1
Nr. ADL Lim.	2.4	2.8	2.0
Nr. IADL Lim.	2.7	1.7	0.7
Hrs. Care /Month	150.3	106.9	0.0
Equal Division of Estate*	62.5%	68.7%	85.2%
Written Will	56.3%	58.1%	45.4%
Total Wealth	174,143	158,710	128,892
Income	21,847	19,776	19,024
OOP Health Expenditures	1872	7597	5158
Medicaid Eligibilty	27.4%	40.0%	57.7%
Long Term Care Insurance	7.1%	6.5%	6.3%
Observations	605	1756	175

Notes: Mean values of parent's characteristics depending on care arrangements in our selected sample. Exclusive (in)formal care is defined as (in)formal LTC without any informal (formal) care.
* Conditional on positive bequests and excluding families with only one child. Observation numbers are: 232 (exclusive informal), 556 (formal and informal) and 27 (exclusive formal)

third of care is provided exclusively informal, i.e., without additional formal care. In our restricted sample with single parents, the vast majority of 83.6% receive informal care from their children. In the full sample, the spouse is the caregiver in one fourth of the cases. Surprisingly, also in the full sample the majority of caregivers are children.[14]

Formal care is generally less often chosen as an arrangement: 62.1% (54.6%) in the restricted (full) sample receive any formal care and only 7.2% (8.5%) of parents receive formal care without any additional informal help from family members or friends. Formal nursing home care is the predominant care arrangement while formal long-term care at home is chosen less than half as much.

Table 3 gives an overview of important characteristics on the parent level in our selected sample depending on the chosen care arrangement.[15] The data aims to detect differences between agents with different care arrangements.

Parents receiving (exclusive) informal care are around 5 years younger at the time of death and have more children on average than parents with formal care arrangements.

[14]Note, that for informal care multiple caregivers are possible so that the sum of the fractions of individual helpers does not add up to the fraction of any informal care.

[15]The full set of control variables for the parents that is used in our empirical model is given in Table A.1 in the Appendix.

Parental education does not vary much over care arrangements. Over all care arrangements, about 70 percent of single parents in need of care are female.

Surprisingly, the number of ADL limitations as a measure for the severity of help needed, does not show a clear pattern over different care arrangements. We expected more severe ADL limitations in the sample with formal care. However, this is not reflected in the data. For IADL Limitations we observe that parents receiving exclusive informal care have a higher number of limitations. Note, that IADL are less fundamental tasks than ADL.

On average, frail elderly parents with exclusive informal care received 150 hours of help per month from their children which is 43 hours more than those who had additional formal care. Turning to the division of estates among its children, equal division is much less likely when long-term care is provided informally. The difference to the sample with exclusive formal care is 22.7 percentage points. However, the sample size is rather small for this specific statistic. The presence of a will is generally higher if informal care is provided: parents receiving exclusive formal care are 10.9 percentage points less likely to have a written will.

Parents receiving exclusive informal care have higher financial resources (total wealth) and pay only about one fourth out-of-pocket (OOP) for health care including formal long-term care expenditures. Thus, informal care saves money which can be left as bequests. Finally, Medicaid eligibility is notably different between care arrangements. 58 percent of parents with exclusive formal care and only 27 percent with exclusive informal care are eligible. Medicaid is a means-tested social program that pays for formal care in nursing homes. Correspondingly, assets and income are lowest for agents receiving exclusive formal care. However, households can also privately pay for formal long-term care implying high out-of-pocket expenditures.

Table 4: Received Bequests by Children

	All Families		Unequal Dividers	
	Help	No Help	Help	No Help
Positive Bequest	42.2%	26.1%	77.2%	41.9%
Bequest per Child - Moments				
Mean	46,779	19,721	98,666	25,207
Standard Deviation	176,578	88,518	353,145	107,591
50th Percentile	0.0	0.0	15,925	0.0
75th Percentile	20,740	428	67,100	12,600
90th Percentile	115,900	36,600	189,866	55,640
95th Percentile	223,125	102,600	342,000	102,400
99th Percentile	610,000	384,000	1,899,810	436,917
Observations (Children)	2026	4899	254	551

Notes: Dollar amount of received bequests by each child (in 2012 Dollars) conditional on children who helped with (I)ADL and those who did not help. Any Bequest as a fraction of caregiving and non-caregiving children, respectively.

3.3 Children's Help and received Bequests

The main dependent variable in our empirical models will be the inheritance that *each* child received from its single parent – both as a binary variable as well as the Dollar amount. Hence, we now turn to variables from the child's perspective.

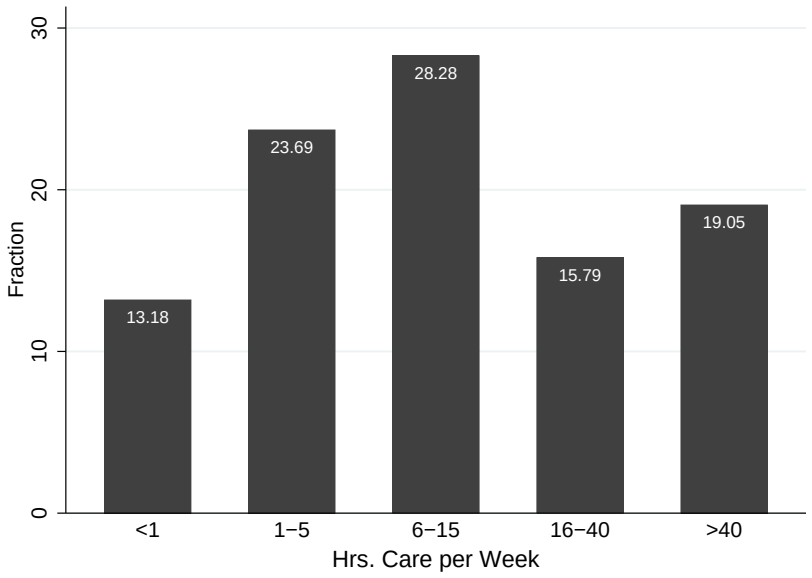
Table 4 presents statistics for received bequest conditional on whether the child helped her parent or not. As we also estimate models within a sample of families where bequests were divided unequally, we additionally present data for this sub-sample. The table reveals strikingly different inheritances for children who provided help with (I)ADL and those who did not help their parents. For all families, 42 percent of children who provided care received any bequest, compared to only 26 percent of those children who did not help. Moreover, caregiving children received $\$46,779$ as bequests on average which is more than twice the value of non-caregivers.[16]

Focusing on the sub-sample of those families who divided bequests unequally, the differences become even more pronounced: 77 percent of children who helped their parents received a positive bequest, compared to only 42 percent of those who did not help. Moreover, in the sub-sample, the average Dollar amount of bequests is almost four times larger for children who helped their parents.

Table 4 also shows percentiles of the bequest distribution. The data reveals a large difference of the overall size of bequests.

[16]Note, that the difference between the bequest distribution for helping and non-helping children is just as pronounced, if we focus on positive bequests only. Hence, it is not the case that a higher fraction of zero bequests simply shifts the distribution of non-helping children to the right.

Figure 1: Provided Hours of Care



Notes: Fraction of children relative to all caregiving children who provide < 1, $1-5$, $6-15$, $16-40$, and > 40 hours of care per week.

The hours of help that were provided by children in the last months before the parents death as well as whether any informal care was provided are the main explanatory variables in our empirical analysis. Figure 1 shows that the amount of help for caregiving children is significant. Only 13% provide less than one hour of care per week. The majority of 28% provides 6-15 hours of help. This might still be an amount of caregiving that allows to have an occupation besides helping obligations. However, 19% are heavy helper providing more than 40 hours of help which does not seem to allow any further occupation.

Table 5 shows children's caring time conditional on having received any bequests. The average provided care is about 45 hours per month for children who received bequests and only 26 hours for those with no inheritance. This difference is also reflected throughout the distribution of hours helped.

We also observe huge differences at the intensive margin: 40 percent of the children who received bequests helped their parents with (I)ADL, while only 24 percent of those without bequests.[17] However, analyzing the differences of help between siblings shows only small discrepancies.

Table 6 shows children's characteristics depending on whether the child is a caregiver or not. According to the opportunity costs argument, we would expect caregiving children

[17]In the subsample of families who divided their bequests unequally, this difference is again more pronounced: out of the children who received a positive bequest, 46 percent helped their parents while this fraction is only 15 percent for children who did not receive a bequest.

Table 5: Children's Help with LTC

	Positive Bequest	No Bequest	Total
Any Help	40.1%	24.4%	29.3%
All Children Some Help*	55.4%	56.1%	55.8%
All Children Equal Help*	12.9%	14.2%	13.7%
Hrs. of Help per Child - Moments			
Mean	45	26	32
Standard Deviation	123	96	105
50th Percentile	0	0.0	0.0
75th Percentile	24	0.0	5
90th Percentile	120	60	72
95th Percentile	270	150	180
99th Percentile	720	720	720
Observations (Children)	2137	4788	6925

Notes: Statistics of help with (I)ADL by each child. Any Help and Equal Division as a fraction of all children.
* 'Equal Help' defined as equal hours of (positive) help from all children within the family. 'Some Help' defined as positive amount of help by all children. Excluding families with only one child. Observation numbers are 1,751 (Pos.Beq) 3,874 (No Bequest).

Table 6: Children Characteristics

	Help	No Help
Female	64%	44%
Age	55.4	54.0
Single	32%	36%
Number of Children	2.2	2.2
Years of Education	13.4	12.7
Income Below 35k	28%	29%
Income Above 35k	49%	36%
Income Missing	23%	36%
Owns Home	71%	60%
Observations	2026	4899

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

to have sufficient resources 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 the child for the decision to give help. The table reveals strikingly small differences between helping and non-helping children with respect to important candidates for opportunity costs. Children who help their parents are more likely to have higher income above 35k and are more often home owners which we take as a proxy for wealth.[18] The family characteristics between caregiving and non-caregiving children are similar with respect to the number of their own children and helping children seem to be more often in relationship rather than being single.

However, there are 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, we will use this as an instrument in our 2SLS approach for the potentially endogenous explanatory variable.

4 Estimation Strategy

In our main specification outlined in Subsection 4.1 we aim to estimate the impact of children's informal caregiving on parental inheritances considering a set of control variables for the parent's and children's characteristics.

A positive correlation between these variables is consistent with exchange motives as well as altruism. Hence, we further study the underlying reasons for this outcome in subsection 4.2. We present three approaches which tests the exchange motives against altruism.

4.1 Benchmark Specifications

In our main specification we estimate the following model:

$$Beq_{p,c} \quad = \quad \phi + \alpha Care_{p,c} + \Gamma X_p + \Psi X_{p,c} + \epsilon_{p,c}, \tag{1}$$

where subscript p denotes the parent and c is the index for each biological child. $Beq_{p,c} \in \{AnyBeq_{p,c}, \$Beq_{p,c}\}$ is either the binary variable or the dollar amount of bequests. Analogously, $Care_{p,c} \in \{AnyCare_{p,c}, HrsCare_{p,c}\}$ is either binary, or defined as hours of supplied care within one month. The vectors X_p and $X_{p,c}$ are control variables.

We report results for three different margins. (1) we analyze whether the decision to give any help increases the probability to receive positive bequests, (full extensive margin);

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

(2) we ask how the decision to give care influences the Dollar amount of bequests that each child receives (extensive margin on Dollar amount); (3) we estimate how much one additional hour of care per months increases the amount of bequests (full intensive margin).

Parent's control variables, X_p, contain demographic (age, gender, race) and socio-economic characteristics (education, wealth before death, income) as well as information about health, insurance coverage and out-of-pocket expenditures for health related services. Child-level controls, $X_{p,c}$, also contain children's demographic and socio-economic characteristics, including children's income (in brackets) and home ownership as a proxy for wealth.

As pointed out above, children's help is expected to be endogenous for several reasons. First, help by children might be influenced by expected parental bequests (reversed causality). In our data, reverse causality might be reduced by the fact that children's help has happened *before* they received their inheritance so that help is lagged. Second, our estimation might be biased by omitted variables. An example for such variables are strong family ties that simultaneously leads to higher care from children and higher bequests from parents.[19] We thus estimate the model treating informal help from children as endogenous using a two-stage least squares (2SLS) approach.

For the 2SLS approach, we use an instrument, $Instr_{p,c}$, for children's help, under the assumption that $Corr\left[Care_{p,c}, Instr_{p,c}\right] \neq 0$ and $E\left[\epsilon_{p,c} | \, Care_{p,c}\right] = 0$. We estimate Equation (1) by replacing $Care_{p,c}$ with the predicted value $\widehat{Care_{p,c}}$ estimated in the first-stage regression, given by

$$Care_{p,c} \;\; = \;\; \phi + \beta Instr_{p,c} + \Gamma X_p + \Psi X_{p,c} + \nu_{p,c}. \tag{2}$$

We use the gender of the child as our instrument to predict children's caregiving while controlling for the total number of children. Daughters are generally more likely to help their frail elderly parents than sons which is confirmed by the results from the first-stage regression. Thus, our chosen instrument fulfills the relevance condition. In addition, child's gender is plausibly randomly distributed with respect to heterogeneity, e.g., in preferences. Moreover, it can be argued that parents do not base their bequest decision on the gender of the child.[20] Thus, we claim that child's gender is exogenous and not correlated to the error term of equation (1) when controlling for the total amount of children within the family. Children's characteristics have widely been used as instruments

[19] As a third source of endogeneity, measurement error in the explanatory variable might be of concern. Especially the assessments of care from children is subjective and likely to be imprecise, cf. Section 3.

[20] Although the fertility decision might be viewed as endogenous, we consider it to be unlikely in the US that parents make their fertility choices depending on the potential care probability, i.e., that parents choose to get another child if they gave birth to the 'wrong' gender.

in the literature, see, e.g., Norton and Van Houtven (2006), Brown (2006). It is also used in studies estimating the substitutability between informal and formal care, see Bolin et al. (2008), Bonsang (2009) Charles and Sevak (2005), for example.[21]

The binary bequest variable is estimated via simple linear probability model (LPM), labeled as 'IV LPM', in the 2SLS approach. The continuous variable $\$Beq_{p,c}$ is estimated using a Type I Tobit model –labeled as 'IV Tobit'–, because the distribution of bequests is amassed at zero with a skewed positive tail.[22].

As specification tests about endogeneity of children's help are mixed in our estimations we also present results from a regression model, under the assumption that children's help is exogenous. Exogenous help implies that $E\left[\epsilon_{p,c}|\, Care_{p,c}, X_{p,c}, X_p\right] = 0$. The estimation for the extensive margin is performed with a Logit model, where we report average marginal effects. We again employ a Tobit model, when using $\$Beq_{p,c}$ in the regressions.

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

Studying all families implies that identification comes from two sources: (i) *intra*-family differences of helping behavior and received bequests in families with at least two children and (ii) *inter*-family differences for families where the parents receive help and/or leave an inheritance compared to families where parents receive no help (and leave less bequests).

4.2 Exchange vs. Altruism

In our main specification we focus on the impact of children's help on parental bequests. However, we cannot answer the question as to whether a positive correlation is driven by exchange motives or altruism. In this subsection we lay out three different approaches to shed light on this question.

4.2.1 Children's Financial Resources

Children's income has been widely used in the literature to discriminate between altruism and exchange, cf. Cox (1987), Cox and Rank (1992), and Alessie et al. (2010). According to altruism, parents bequeath more to those children who are financially worse off, i.e. a

[21]Two further instruments that are frequently used are the number of sisters and whether the child lives close by. We refrain from using the other two instruments for the following reasons: The number of sisters is a potentially weak instrument for children's help. We found coefficients in the first stage regression that were close to zero, although significant. Choosing the child's location of residence as an instrument is unlikely to fulfill the exclusion restriction as parents are likely to have a better relation to those children who live close by, see Stern (1995).

[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.

coefficient of children's income (or wealth) should be positive in the regression outlined in equation (1). We draw our focus on two main variables that are contained in X_p in equation (1): Children's income and wealth. Unfortunately, income is only measured in brackets, thus we include the variable 'Income below 35k'. Children's wealth is proxied by the variable 'Owns Home' which is a binary variable whether the child is a home owner.

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 has an impact on children's income and – through this – influences parental bequests. However, including 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 our wealth measure.

4.2.2 Parental Will and Children's Help

The presence of an exchange motive requires some bargaining power of the parent. We conjecture, that a parental will is at least partly a written contract about the exchange relation between the parent and the child, although it does not include the child's obligations to help. To study whether the presence of a written will, $Will_r$, is important for the correlation between children's help and bequests we include an interaction term, $AnyCare_{p,c} \cdot Will_r$ into the regression and estimate the following equation:

$$Beq_{p,c} = \phi + \alpha Care_{p,c} + \beta Will_r + \gamma \left(Care_{r,c} \cdot Will_r\right) + \Gamma X_p + \Psi X_{p,c} + \epsilon_{p,c}. \qquad (3)$$

A significant interaction term would imply that a parental will is an important determinant for the exchange relation between help and bequests. Here, we only focus on the impact of the binary help variable, $AnyCare_{p,c}$, on the Dollar amount of bequests, $\$Beq_{p,c}$. As outlined in the main specification, we estimate the model both treating children's help as exogenous as well as endogenous. To avoid problems of computing marginal effects from interaction terms in non-linear models we only estimate linear models in this subsection, cf. Norton et al. (2004).

For the 2SLS approach we need to include a second instrument as the interaction term is also endogenous. We follow Wooldridge (2010, pp. 121-122) and include $female_c \cdot Will_r$ as an additional instrument to have an identified system.

[23] We compared the coefficients of help from a regression with and without children's income as a control and the results were hardly affected.

It is important to note that also the variable $Will_r$ is potentially endogenous. Similar to the children's income variable discussed above, we have a problem of 'bad controls' because children's help might affect parental bequest through the presence of a will. Thus, if parents write their will *after* they experience help from one child, we have that the will is affected by children's help. If we instead assume that parents write their will *before* they get dependent, having a will is not affected by help. Despite this potential endogeneity problem of the parents will we present results of our regression as a further suggestive evidence for the exchange motive being present in our data. If the positive correlation was simply driven by (two-sided) altruism the presence of a will would be of no importance.

4.2.3 Unequal Dividers and Family Altruism

For another piece of evidence in favor of exchange we focus on those families who treated their children unequally, i.e., we isolate the sub-sample of families with at least two children who received unequal amounts of inheritance. Using this sample allows us to employ a family fixed effects (FE) model to address endogeneity problems stemming from unobserved variables. For example, in altruistic families, we might simultaneously observe more help and higher inheritance than in families with weak family ties. The family FE model controls for these common family characteristics. Further, the fixed effects model accounts for simultaneity.

The model reads:

$$Beq_{p,c} = \phi + \psi_p + \alpha Care_{p,c} + \Psi X_{p,c} + \epsilon_{p,c}, \tag{4}$$

where ψ_p represents the fixed effects on the parent level. Observe, that X_p is not included as controls in the FE model because they are already captured by fixed effects term ψ_p.

The FE-model aims to identify effects from informal care on bequests using within-family differences. However, to additionally account for reverse causality problems we also estimate a family FE approach with instrumented care variables, predicted in the first stage where $\widehat{Care_{p,c}}$ is estimated analogously to equation (2). In the subsample of unequal dividers, we cannot estimate the full intensive margin (hours of care on Dollar amount of bequests) because of too few observations.

5 Results

Our main focus is to study the interaction between children's help and parental bequests, both at the extensive and intensive margin. We present results at the mean of the control

variables and at certain percentiles of the bequest distribution using a quantile regression approach. Subsequently, we present three pieces of evidence that are in favor of exchange motives rather than altruism.

5.1 Main Results

Table 7 summarizes our main results. The coefficients represent the effect of caregiving (or one more hour of help per month) at the mean of the control variables. The coefficient of providing help with long-term care is unanimously positive and significant in all but one specifications. At the extensive margin, we find that under the assumption of exogeneity, the decision to help ones parents increases the probability to receive any bequests by 8.9 percent according to the Logit estimation. Results from the IV estimation (2SLS) reveal an increased probability to receive a bequest of 17.3 percent at the mean. Moreover, the decision to provide help increases children's inheritance by $15,306$ Dollars in the Tobit estimation. With $\$29,753$ the IV estimation yields point estimates that are twice the size of the model treating help as exogenous.

On the intensive margin, cf. Columns 5 and 6, we find that an additional hour of help per month increases bequests by \$294 at the mean, although the coefficient is only significant at the 10 percent level for the IV specification. The Tobit model yields small and insignificant effects at the intensive margin. Note, that the sample size decreases by two thirds as we only study the children who helped their parents with ADL.

In all model variants, the estimated coefficients of the IV approach are higher compared to those of the respective Logit and Tobit estimates.[24] A potential reason for this is that the estimated effects in the IV specifications are local average treatment effects (LATE). In particular, we are measuring the average effects of caring on bequests for persons who would have cared (or increase the amount of care) if they are female, but who would not have cared if they are male. To put it in the words of Imbens and Angrist (1994), we are measuring the average effect for the compliers.

Our findings are sizable compared to the previous literature. The only comparable result of caregiving on *intended* bequest (i.e. parents wealth) comes from Brown (2006). However, her results are quantitatively much smaller. She concludes that the average end-of-life transfer differences between current caregivers and noncaregivers are not large enough to exert meaningful influence on care decisions. Further studies that explicitly focus on the informal care sector do not find significant positive correlations between help and bequests at all, cf. Sloan et al. (1997), or they cannot detect an impact of caregiving on the parent's decision to equally divide their estate, cf. Norton and Taylor (2005)

[24]Note however, that the confidence intervals are also much wider in the IV approach compared to the Logit and Tobit estimates.

Table 7: Main Results

	Any Care on Any Bequest		Any Care on $-Bequest		Hrs. Care on $-Bequest	
Bequest	Logit	IV LPM	Tobit	IV LPM	Tobit	IV Tobit
	(1)	(2)	(3)	(4)	(5)	(6)
Main Variables						
Care	0.089***	0.173***	15,306.163***	29,752.913*	7.450	294.305*
	(0.00)	(0.00)	(0.00)	(0.06)	(0.58)	(0.09)
95%-Confidence Bands	[0.07;0.11]	[0.05;0.29]	[10,150;20,463]	[-948;60,454]	[-18.9;33.8]	[-49.8;638.4]
Child Characteristics						
Age	−0.002	−0.001	−912.053	−1286.543	−2517.747	−2134.968
	(0.71)	(0.81)	(0.34)	(0.30)	(0.44)	(0.56)
Number of Children	−0.002	−0.001	−1592.643	−2416.577	−2700.914	−1217.089
	(0.80)	(0.86)	(0.22)	(0.21)	(0.51)	(0.78)
Single	0.029**	0.027**	6732.446***	7300.989**	17,594.699**	14,133.871*
	(0.02)	(0.02)	(0.00)	(0.02)	(0.01)	(0.07)
Years of Education	0.024	−0.007	1682.543	−6684.721**	4297.005	1544.340
	(0.32)	(0.54)	(0.59)	(0.01)	(0.57)	(0.85)
Income Below 35k	−0.021	−0.029^{+}	−3136.221	−1827.670	−9959.761^{+}	−15,862.675**
	(0.20)	(0.11)	(0.26)	(0.70)	(0.15)	(0.05)
Owns Home	0.060***	0.052***	7867.105***	774.719	3322.945	4457.960
	(0.00)	(0.00)	(0.00)	(0.84)	(0.61)	(0.55)
Respondent Characteristics						
Number of Children	−0.002	−0.015	−6706.146***	−13,292.657***	−7616.433**	−7390.260*
	(0.93)	(0.17)	(0.00)	(0.00)	(0.02)	(0.05)
Nr. of ADL Lim.	−0.002	−0.004	−648.888	−1216.469	−516.112	−705.319
	(0.52)	(0.29)	(0.26)	(0.17)	(0.66)	(0.59)
Nr. of IADL Lim.	0.009^{+}	0.007	1604.104*	1061.001	3183.687^{+}	−5198.617
	(0.14)	(0.28)	(0.10)	(0.49)	(0.12)	(0.36)
Total Wealth	0.000	0.000	0.034**	0.109**	0.060**	0.062**
	(0.43)	(0.20)	(0.02)	(0.02)	(0.02)	(0.02)
Income	0.000	0.000	0.060	0.160	0.505***	0.461**
	(0.82)	(0.54)	(0.36)	(0.38)	(0.00)	(0.03)
Health Insurance Empl.	0.134***	0.150***	19,370.474***	14,987.026**	19,401.508**	13,011.214
	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)	(0.23)
Medicaid Eligibilty	−0.174***	−0.172***	−22,038.493***	−4747.314	−36,389.255***	−36,461.520***
	(0.00)	(0.00)	(0.00)	(0.33)	(0.00)	(0.00)
LTC Insurance	0.005	0.016	3131.656	6171.216	−3463.924	−7947.861
	(0.87)	(0.68)	(0.60)	(0.58)	(0.73)	(0.51)
OOP Health Exp.	0.000	0.000	0.130	0.391	0.121	0.142
	(0.84)	(0.86)	(0.23)	(0.21)	(0.56)	(0.52)
Any Donations	0.119**	0.135***	13,496.889*	4096.329	14,924.302	19,232.836^{+}
	(0.01)	(0.01)	(0.07)	(0.76)	(0.20)	(0.12)
R^2 / Pseudo R^2	0.175	0.187	0.028	0.200	0.022	
Adjusted R^2	6925	6925	6925	6925	2026	2026

Significance Levels: $^{+}$ p < 0.15, * p < 0.1, ** p < 0.05, *** p < 0.01.
Notes: P-values are shown in parenthesis. Further included controls, not shown in the table, are: parental years of schooling and three race dummies, squared variables for age, number of children, and years of education/schooling, as well as four wave dummies and dummies for missing values for children's income and marital status. See Table A.1 in the Appendix for a list of all covariates used. A full set of results are available upon request from the authors. Reported coefficients are marginal effects for the non-linear models. Estimates from the 2SLS model use 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.2.

and Norton and Van Houtven (2006). One potential reason for our pronounced effects compared to the literature is that we are the first study that uses data on actual bequests and actual caregiving behavior.

We tested whether one can reject the hypothesis that children's help is exogenous using a Hausman-Wu-Durbin (HWD) test, cf. Table A.2 in the Appendix. For the estimations at the extensive margin of help, i.e. the binary help variable, we cannot reject exogeneity with a p-value of 17 percent with binary bequest and even 34 percent with continuous bequests.[25] Therefore, the specifications that treat help as exogenous are preferred (cf. Column 1 and 3 in Table 7), as long as our instrument is valid. For the estimations at the full intensive margin we can reject exogeneity with a p-value of 6 percent.[26] Hence, we prefer the IV-estimation in Column 6. In all models, our instrument are statistically significant in the first-stage regression, cf. Table A.3 in the Appendix. This is also confirmed by very high partial F statistics of 255. This is much larger than the rule-of-thumb value of 10 which is suggested as a threshold for relevance of the instrument in IV estimations.

While we discuss the impact of children's financial resources for their received inheritance in the next section, we now turn to the effect of important parental characteristics on bequest behavior. Table 7 shows that more children reduce bequests *for each* child, a potential reason being that bequests have to be distributed among more children. As expected, total wealth and income from the last HRS wave (i.e. at least two years before the Exit Interview was conducted) enter both with positive signs although not always statistically significant. Also, the presence of a health insurance by the employer significantly increases inheritances. It seems that more resources are available if the parent is insured against health risks. However, out-of-pocket expenditures (OOP) for health related goods do not yield significant results.

A strong negative impact on bequests comes from Medicaid eligibility. If the parent is eligible for Medicaid, bequests to the children are both lower and less likely. Medicaid is a means-tested social program which prescribes agents to run down their assets before becoming eligible. However, agents are allowed to keep their primary residence, for example, which still can be used as a bequest to ones children. The presence of a private Long-term care insurance does not seem to affect children's inheritance.

Finally, we included the amount of donations of the parent prior to death as a proxy variable for altruism. We conjecture that this variable can partly account for parental

[25]The previous literature also found mixed results with respect to 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).

[26]Note, that we have to use the Smith-Blundell test (SB) for exogeneity instead of the HWD test in our IV-Tobit model.

Table 8: Coefficients of Any Help at the Distribution of Received Bequests

	Distribution Effects			Quantile Effects	
Range	Logit	IV LPM	Quantile	QR	QTE
[fraction]	(1)	(2)	[value]	(3)	(4)
0	-0.089***	-0.173***	p65	788***	4169***
[0.69]	(0.000)	(0.004)	[0.0]	(0.000)	(0.000)
0-10k	0.019**	0.024	p75	7980***	14,472
[0.10]	(0.022)	(0.575)	[2849]	(0.000)	(0.238)
10k-75k	0.023***	0.092*	p90	41,198***	47,018
[0.12]	(0.001)	(0.054)	[57,557]	(0.000)	(0.365)
$> 75k$	0.0482***	0.055	p95	53,336***	165,900***
[0.09]	(0.000)	(0.11)	[149,450]	(0.005)	(0.000)
			p99	79,333***	176,620
			[480,965]	(0.004)	(0.243)

Significance Levels: $^{+}$ p < 0.15, * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: Distributional treatment effects show coefficients of any help, $AnyCare_{r,c}$, on certain ranges on the bequest distribution. Quantile results are unconditional treatment effects. QR denotes quantile regression under the assumption of exogeneity and QTE is the quantile IV estimation, cf. Frölich and Melly (2013). P-values are given in parenthesis. Standard errors are clustered at the household/respondent level. The full set of control variables on the parent- and child level is used, cf. Table A.1 in the Appendix. The numbers in the square brackets in Column 1 and 4 show the fraction of observations in each bequest bin (Column 1) and the bequest value at the respective percentile (Column 4).

motives to bequeath for altruistic reasons if altruistic parents both donate more and bequeath more to their children. We indeed find positive and sizable coefficients for recieved bequests by children.

Table 8 highlights the impact of children's help at certain percentiles of the bequest distribution.[27] In Columns 2 and 3, the coefficients reflect the effect of caregiving on the probability to fall in (or out of) one of the bequest-bins: zero bequests, less than 10k, between 10k and 75k and above 75k. The square brackets in the first column represent the fraction of children falling in each of these bins. Not surprisingly, the results for the zero-bequest bin show negative coefficients of children's help. The results are exactly the mirror effect of the binary bequest variable presented in Table 7. However, the coefficients of help on the probability to fall into bins with positive bequests are all positive. Further, the probabilities bocome larger for higher bequest-bins. For example, in the Logit model, the decision to give care increases the probability to receive positive bequests of less then 10k by 1.9 percent. Though, the probability to receive more than 75k, is increased by 4.8 percent. The coefficients are generally larger for the IV-specification, albeit not significant in most cases.

The right side of Table 8 shows quantile regressions which provides coefficients for children's help on certain percentiles of the distribution of received bequests by children.

[27] See Angrist (2001) for a discussion of the following approach.

Note, that the number in the square brackets in Column 4 represents the percentile-value at the bequest distribution. We present results under the assumption of exogeneity of help, the quantile regression (QR), and treating help as endogenous in the quantile treatment effects regression (QTE) which is again a 2SLS model. Quantile regressions are positive at all percentiles and, not surprisingly, are higher for higher bequest percentiles. The effects are highly significant for the model treating help as exogenous (QR) and significant at two percentiles in the QTE regression. Interestingly, the point estimates of help, although increasing in absolute size over the distribution, become smaller relative to the respective percentile value. For example, the coefficient of help in the QR regression is around 2.8 times higher than the respective value at the 75th percentile ($7980 versus $2849), while at the 95th percentile, additional bequests due to help amount to $53,335, which is roughly one third of the value of the total bequest at the 95th percentile.

5.2 Evidence in Favor of Exchange

A positive effect of children's help on received bequest from the parent can be driven by exchange motives or altruism. In this section we provide three pieces of evidence that point to the importance of an exchange motive present in the informal long-term care relation between children and parents, rather than family altruism.

5.2.1 More Bequests to the Rich

Theory predicts that altruistic parents support children who have lower financial resources, cf. Section 2. According to the exchange motive, parents must compensate their relatively wealthier children with higher bequests in order to induce informal care from them as they demand a higher price for their service.

Our results in Table 7 on the impact of children's financial resources for their received bequests are more in line with exchange. We find that children with lower income, i.e., yearly income less than 35k, have a *lower* probability to receive any bequest and they receive a lower amount according to our point estimates. However, the coefficients are only slightly significant in half of the models observed. Similarly, we test the impact of the child's wealth on parental inheritance, which is proxied by the presence of a house owned. Here, we find highly significant positive effects at the extensive margin and positive, but insignificant, effects at the intensive margin.[28] Although we view this result as suggestive evidence in favor of exchange we again want to emphasize the problem of our income variable potentially being a 'bad control', cf. our discussion in Section 2.

[28]Note however, that we have mixed signs for children's education variable which is also a proxy for children's wealth (i.e. human capital).

Table 9: Importance of a Written Will

	OLS		IV LPM	
$ Bequest	(1)	(2)	(3)	(4)
Any Care	15,269***	2401	31,054*	4182
	(0.00)	(0.28)	(0.05)	(0.59)
Will	13,249***	6373*	13,319***	−1955
	(0.00)	(0.08)	(0.00)	(0.83)
Any Care · Will		23,226***		51,616*
		(0.00)		(0.08)
Controls Child	*Yes*	*Yes*	*Yes*	*Yes*
Controls Parent	*Yes*	*Yes*	*Yes*	*Yes*
R Sq.	0.207	0.209	0.204	0.202
F-Score[1)]			251.3/-	126.5/58.8
Wald chi2			3.765	3.78
p-val. Wald			0.052	0.151
Part. R Sq.[1)]			0.039/-	0.038/0.035
DMcK			1.043	1.004
p-val.			0.307	0.366
Observations	6771	6771	6771	6771

Significance Levels: $^{+}$ p < 0.15, * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: Columns 1 and 2 are estimations treating Any Care and the interaction term as exogenous and Column 3 and 4 show results for the 2SLS using 'female' and 'female · will' as instruments. P-values are shown in parenthesis. Parent's and Children's Controls variables are included, but not shown, cf. Table A.1 in the Appendix for a full set of controls. The complete results are available from the authors upon request. Davidson-MacKinnon (DMcK) test of exogeneity is used for the 2SLS model.

[1)] IV-Test statistics in Column 4 shows values for the two variables 'Any Care' and the Interaction term.

5.2.2 The Importance of a Written Will

If the positive correlation between help and bequests is driven by an exchange motive, the bargaining power of the parent is important. Hence, we conjecture that a parental will, where the division of bequests between helping and non-helping children is written down, is a an important element for an exchange motive to be present. If in contrast, the positive correlation is driven by (two-sided) altruism, a parental will should be of no relevance.

Table 9 shows results from the model including an interaction term between children's help and parental will, cf. equation (3). Again, we present results both for a model treating help as exogenous as well as endogenous.[29]

As our first result we show that simply including a binary variable whether the parent has a will in our main specification does not have an impact on the importance for children's help on the size of received bequests, cf. Columns 1 and 3. The coefficients are

[29]In this model, we again cannot reject exogeneity of help using the Davidson-MacKinnon test with p-values of 0.31 and 0.37. Hence, we again view the simpls OLS as our preferred specification.

almost identical to the results from our main specification in Table 7, Columns 3 and 4.[30]

In Columns 2 and 4 we include the interaction term between children's help and the presence of a parental will. Remarkably, the interaction term takes up the whole effect of childrens help on bequests. The interaction term is statistically significant and sizable whereas coefficients for help alone render insignificant and small in both equations.

The findings show very clearly, that the presence of a parental will is crucial for the positive correlation between children's help and bequest to be present. We interpret this result as a further suggestive evidence for the exchange motive as there would be simply no need to write down a will if the relation between parents and children would mainly be driven by altruistic motives. However, as outlined above, it should be stressed that the variable 'will' is potentially endogenous, so that our estimates might be biased.

5.2.3 Controlling for Family Altruism

In this section we study a subsample of families in which bequests were distributed unequally among siblings. The focus on unequal dividers allows us to estimate a family-fixed effects (FE) model, that accounts for unobserved common characteristics within a family. We view this approach as a method to isolate the exchange motive as we control for common family altruism with the fixed-effects term. As a drawback, our sample is considerably reduced to 805 observations. As in the previous section we estimate models under the assumption of both exogenous and endogenous help from children.

Regression results are shown in Table 10. Compared to all families, the effect of (binary) help on bequests is much stronger in this subs-ample.[31] The decision to give help increases the probability to receive a positive bequest by 30 percent at the mean and even 49 percent in the IV specification. Measured in Dollars, caregiving increases bequests by $\$79,100$ in the FE model and even $\$131,314$ in the IV-FE model according to our point estimates. Specification tests for the 2SLS model once again cannot reject exogeneity of help from children with p-values similar to the test statistics from Table A.2.

Note, that the large coefficients are partly reflected in the descriptive statistics from Table 4. The table shows that the difference of bequests between helping and non-helping children is $\$73,459$ on average and the difference of the fraction of children receiving positive bequests is 35.3 percentage points. Hence, our coefficients from the FE model are remarkably close to the mean values of the descriptive statistics, although the regression included a fixed effect and a large set of control variables.

[30] Note also the similarity of results despite the fact that we are comparing results from an OLS with a Tobit model.

[31] Note, that we were not able to use hours of care as the explanatory variable as the sample size is only 205 observations and thus, too low.

Table 10: Results for Unequal Dividers

	Any Care on Any Bequest		Any Care on $-Bequest	
Bequest	FE LPM	IV FE LPM	FE	IV FE
	(1)	(2)	(3)	(4)
Any Care	0.303***	0.494***	79,100***	131,314*
	(0.00)	(0.00)	(0.00)	(0.09)
Controls Child	*Yes*	*Yes*	*Yes*	*Yes*
R^2/Pseudo R^2	0.136	0.099	0.053	0.037
F-Score		40.93		44.70
Wald		10.2		2.673
p-val. Wald		0.002		0.102
Part. R^2		0.073		0.073
DMcK		1.934		0.795
p-val.		0.165		0.373
Observations	805	805	805	805

Significance Levels: $^{+}$ p < 0.15, * p < 0.1, ** p < 0.05, *** p < 0.01.

Notes: Columns 1 and 2 are estimations with the binary bequest variable as the LHS variable and Column 3 and 4 are estimates with Dollar Amount of bequests. P-values are shown in parenthesis. Parents controls are already included in the fixed effect term. Children Controls variables, cf. Table A.1 in the Appendix are included, but not shown. The results are available from the authors upon request. Estimates from the Instrumental Variables (IV) regression use 'Female' as an instrument for help. Davidson-MacKinnon (DMcK) test of exogeneity is used for the IV-FE model.

The results from the fixed-effects estimation again point to the importance of exchange as the method controls for common family-altruism. That is, a positive correlation between children's help and received bequest stemming from two-sided altruism, or strong family ties, are all captured in the fixed effects term.

6 Conclusion

We use the Exit Interview of the Health- and Retirement Study to analyze the importance of monetary reward from parents to their caregiving children in the informal long-term care sector. The data allows us to analyze detailed data of actual bequests and their distribution among children while previous studies had to proxy these variables.

Our results indicate that both the presence and the size of inheritance of elderly parents to their children is significantly affected by children's caregiving. We show results at the mean of the control variables and at certain percentiles of the bequest distribution while controlling for unobserved variables and reverse causality.

Subsequently, we study the underlying reason for the strong positive impact on children's caregiving for their received inheritance. In particular, we analyze whether this relation is driven by altruism or exchange motives. We present three pieces of evidence

that support exchange motives. First, we find that financially well-off children receive higher bequests which is consistent with the idea that children demand a higher price for their service. Second, we find that a positive correlation between help and bequests requires a coded will from the parent. We interpret a will as a signal from the parent to the helping child that it will receive higher bequest. Third, using a family fixed-effects model that accounts for two-sided altruism still yields a strong impact of help on inheritance which is a further support for the exchange motive.

The presence of exchange in care and bequest has important implications for dynamic life-cycle decisions, especially saving behavior. Recently, a series of studies have tried to quantify altruistic bequest motives in contrast to precautionary saving motives to buffer against high out-of-pocket expenditures for formal long-term care, cf. De Nardi et al. (2010) and Lockwood (2013). Our study points to the importance to consider the informal long-term care market for the analysis of both insurance decisions and asset decumulation of the elderly. In particular, our results suggest that the strategic bequest motive seems to be a sizable alternative motive for peoples' saving decisions. In ongoing work we estimate the quantitative importance of the strategic bequest motive in a structural model of consumption and saving behavior.

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A Appendix

Table A.1: Control Variables

	Mean	Std. Dev.	Min.	Max.
Respondents Controls, X_r				
Age	82.69	10.1	51.0	109.0
Age Sq.	6938.0	1630.0	2601.0	11,881.0
Female	0.70	0.46	0.0	1.0
White/Caucasian	0.76	0.43	0.0	1.0
Black	0.20	0.40	0.0	1.0
Hispanic	0.11	0.31	0.0	1.0
Nr. of Children	4.9	2.99	1.0	16.0
Nr. of Childr. Sq.	32.3	39.4	1.0	256.0
Years of Schooling	10.2	3.8	0.0	17.00
Years of Schooling Sq.	118.0	70.0	0.0	289.0
Nr. ADL Lim.	2.50	2.58	0.0	6.0
Nr. IADL Lim.	1.64	1.49	0.0	4.0
Health Insurance Empl.	0.11	0.31	0.0	1.0
LTC Insurance	0.06	0.24	0.0	1.0
Medicaid Eligibilty	0.42	0.49	0.0	1.0
OOP Health Expend.	5793.0	21,438.0	0.0	665,802.0
Total Wealth before Death	132,930.0	386,399.0	−69,000.0	9,565,000.0
Income	18,150.0	39,086.0	0.0	2,761,657.0
Any Donations	0.04	0.21	0.0	1.0
Children's Controls, $X_{r,c}$				
Age	54.11	10.8	3.0	98.0
Age Sq.	3045.2	1169.0	9	9604.0
Number of Children	2.2	1.7	0.0	14.0
Number of Children Sq.	7.8	11.7	0.0	196.0
Years of Education	12.9	2.61	1.0	17.0
Years of Education Sq.	173.5	64.41	1.0	289.0
Income Below 35k	0.29	0.45	0.0	1.0
Income Missing	0.32	0.47	0.0	1.0
Owns Home	0.63	0.48	0.0	1.0
Marital Status: Single	0.35	0.48	0.0	1.0
Marital Status: Missing	0.01	0.10	0.0	1.0
General Controls				
Wave 04 Dummy	0.13	0.34	0.0	1.0
Wave 06 Dummy	0.20	0.40	0.0	1.0
Wave 08 Dummy	0.22	0.41	0.0	1.0
Wave 10 Dummy	0.25	0.44	0.0	1.0
Observations	6925			

Notes: Destcriptive statistics of all control variables used in the regressions.

Table A.2: IV-Diagnostics

	IV LPM Binary Bequest (1)	IV LPM Bequest (2)	IV Tobit Hrs.Care (3)
Weak Instrument Diagnostics			
Part. R^2	0.039	0.039	-
F-Score	255.5	255.5	129.3
Wald chi2	8.49	3.70	3.10
p-val. Wald	0.004	0.054	0.078
Endogeneity Diagnostics			
DWH/SB-Test	1.885	0.910	3.550
p-val. Endog.	0.169	0.340	0.060
Observations	6925	2026	6925

Notes: The diagnostics for weak instruments are: Shea's partial R^2 and the Wald weak-instrument robust test. We do not cluster standard errors for the Wald tests. Endogeneity tests are: Durbin-Wu-Hausman (DWH) test for the linear IV model and Smith-Blundell (SB) test for the non-linear Tobit-IV models.

Table A.3: First-Stage Regression

	Hours Care (1)	Any Care (2)
Instrument		
Female	33.427***	0.170***
	(0.00)	(0.00)
Child Characteristics		
Number of children	−7.008	−0.005
	(0.30)	(0.45)
Single	12.174	−0.013
	(0.21)	(0.28)
Years of Education	8.098	0.000
	(0.43)	(1.00)
Income Below 35k	17.465*	−0.015
	(0.09)	(0.33)
Owns Home	−5.964	0.037***
	(0.55)	(0.01)
Respondent Characteristics		
Number of Children	−3.753	−0.078***
	(0.45)	(0.00)
Total Wealth	0.000	0.000
	(0.75)	(0.51)
Income	0.000	0.000**
	(0.36)	(0.03)
Medicaid Eligibilty	−9.281	0.003
	(0.28)	(0.81)
LTC Insurance	15.872	0.006
	(0.31)	(0.80)
OOP Health Exp.	0.000	0.000
	(0.70)	(0.59)
R^2 / Pseudo R^2	0.143	0.143
Adjusted R^2	0.128	0.139
Observations	2026	6925

Significance Levels: $^{+}$ p < 0.15, * p < 0.1, ** p < 0.05, *** p < 0.01.
Notes: (1) Results from the first-stage regression of the IV LPM's of Column 2 and 4 in Table 7. (2) Further included controls are listed in Table A.1. A full set of results are available upon request from the authors. (3) Standard errors are clustered at the respondent level.