Estate Division: Equal Sharing as Choice, Social Norm, and Legal Requirement

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The objective of this essay is to study to what extent parents divide their estates unequally between their children and the determinants of this decision. We use a new dataset based on the estate reports for almost 70,000 Swedish widows, widowers, divorcees and unmarried individuals who died with positive estates and at least two children. Unequal sharing is unusual; depending on definitions only 2–12 percent of the estates are unequally divided. Previous studies for other countries, particularly from the US, find that around 20–40 percent of parents divide their estates unequally. We argue that the relatively low frequency of unequal sharing in Sweden might be explained by contextual factors such as the inheritance law, the transfer tax system, the income distribution, and the welfare state. We also estimate models with family fixed effects to study how the characteristics of children to parents who choose unequal division affect the size of the transfer. The empirical estimates show that bequests are not used to compensate for income differences between children, suggesting that bequests are not guided by altruistic motives. Children who are likely to have provided services to the parent receive more than their siblings however. This suggests that, at least some bequests are guided by exchange motives.

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1 Introduction

This paper is about decisions that deceased Swedish parents made before they died.[1] The objective is to study to what extent parents divide their wealth unequally between their children when transferring the wealth. We are, moreover, interested in what determines if children receives more than their siblings.

Unequal division of parental transfers is, for example, a necessary condition for theories of altruistic (dynastic) behavior to hold (Becker, 1974, Barro, 1974). Simple versions of altruistic models of intergenerational transfers predict that total transfers will be compensatory. Children with less economic resources (consumption possibilities) will receive more transfers than siblings with more economic resources.

There are also other models of intergenerational transfers that predict unequal division. According to the exchange model, transfers from parents reflect the payment of services and visits provided by children (Cox, 1987). Children who provide more of these services will receive more transfers than siblings who provide less.

It is crucial to understand the determinants of parental property transfers for a wide range of economic issues. Some of these are the possible effects of fiscal policy, the determinants of savings and wealth, the equality of opportunity, and the optimal design of tax systems. In macroeconomics, for example, the Ricardian equivalence predictions about fiscal policy inefficiency, rest on the assumption of dynastic altruistic behavior.

Parents can transfer wealth while they are alive by providing *inter vivos* gifts. They can also transfer wealth *post mortem* as bequests. It is also possible to transfer wealth using (life) insurance policies. Parents can directly choose to divide gifts and insurance benefits unequally between their children while unequal bequests require writing a will.

The basic theoretical models of intergenerational transfers predict how the total transfers from parents to their children are divided between the children. They have less to say about if and how the different types of transfers, bequests and *inter vivos* gifts, are unequally divided.

Most empirical studies find that unequal division of bequests is not very common. This has been viewed as a puzzle in light of the theories of intergenerational transfers. Another general finding is that bequests are typically divided equally between children, regardless of their incomes.

The low incidence of unequal bequest division does not, however, necessarily mean that it is uncommon to write wills. Wills may very well

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[1] The essay is related to Ohlsson (2007) which is a pilot study using a much smaller data set with a limited number of variables.

deal with other issues than estate division. A will might, for example, concern who shall get which asset without implying unequal division of the transferred values. Another example is that wills might stipulate that a particular transferred asset should be separate property, and not joint property, of the recipient.

For *inter vivos* gifts other hand, the empirical findings are that these types of transfers tend to be unequally divided. Most studies also find that *inter vivos* gifts are compensatory.[2] This is a second puzzle. Is it possible to give a theoretical basis for why parents choose *inter vivos* gifts instead of bequests to make unequal transfers? There are several different explanations suggested in the literature: psychological costs, social norms, whether information about transfers is public or private, parental affection, the transfers' role as insurance, etc.

We use a new administrative dataset based on the estate reports for almost 70,000 Swedish widows, widowers, and divorcees deceased in 2002–2004 with positive estates and two or more children. There are several advantages with this dataset as compared to previously used datasets:

- The dataset has many observations and many variables. It covers all deceased in a country during several years.
- The deceased's share of the estate can be separated from the estate share of a previously deceased spouse not previously transferred to heirs.
- Taxable gifts during the previous ten years and taxable (life) insurance benefits are also included in the dataset.
- There is information on the family relationship between the donor and donee for each transfer. It is, therefore, possible to calculate the transfer to each family line.
- There is information on the person identity numbers of the donors and the donees. This makes it possible to merge the dataset with other administrative registers that have information on other demographic and economic variables.

The bequests from the deceased are unequally divided between the children in 3 percent of the cases. Disregarding small variations from equal division reduces the frequency of unequal division by definition. Summing the bequests to children, grandchildren, and great grandchildren in each family line gives a frequency of unequal division between family lines of

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[2] Hochguertel and Ohlsson (2009) show that *inter vivos* gifts are motivated by reasons other than allowing children to overcome liquidity constraints and that lifetime poorer children receive higher transfers than their lifetime richer siblings, although the gifts do not make up the entire difference in lifetime incomes.

5 percent. These shares are low compared to what has been found for other countries.

Equal sharing of the estate between legal heirs is the legal default in Sweden if there is no written will. A will is, therefore, necessary for unequal sharing of the estate. Only 17 percent of the deceased in our sample have written wills. This share is considerably lower than what has been found for the United States.

The bequests from the deceased are unequally shared between the children in 12 percent of the cases when there is a will. This shows that most written wills deal with other issues than the division of the estate between the children. Adding the bequests to grandchildren, and great grandchildren in each family line to the bequests to each child gives a (will) conditional frequency of unequal division of 16 percent.

As previously mentioned, there are, however, other ways of transferring wealth and to do it unequally. *Inter vivos* gifts and (life) insurance policies can be used for this. We have information of taxable gifts during the previous ten years and taxable insurance benefits.[3] This information does not, however, covers all transfers using gifts and insurance. Gifts made more than ten years ago, non-taxable gifts (below the annual gift tax exemption level), and non-taxable insurance are not included. Tax non-compliance might also be important.

Still, we believe that the information we have on taxable gifts and taxable insurance benefits is very useful. There are taxable gifts related to slightly more than 2 percent of the estates. In almost half of the cases with taxable gifts, the gifts are unequally shared between the children. This is consistent with the findings of previous empirical studies of *inter vivos* gifts that gifts are unequally shared. There are taxable insurance benefits related to 2.5 percent of the estates. The insurance benefits are unequally divided in one out of five cases with taxable insurance benefits. As far as we are aware this is the first study to study unequal sharing of insurances.

Adding taxable gifts and taxable insurance payments to the bequests increase share of unequal division between children from 3 percent to 4 percent. Unequal division between family lines increase from 5 percent to 6 percent. The corresponding will conditional shares increase from 12 percent to 14 percent and from 16 percent to 18 percent, respectively. The conclusion is that although few cases are affected by taxable gifts and taxable insurance benefits, these cases contribute a lot to unequal division of the transfers from parents to their children.

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[3] There are probably considerable amounts transferred from decedents to heirs via different insurance arrangements. Most of this wealth does not show up in the estate inventory reports. This is particularly true for insurance policies with premia that have been paid for with money that already has been taxed. Some insurance policies are, however, tax-deferred. When an heir received the benefits from such a policy, the benefit amount was added to the inheritance amount when the inheritance tax due was calculated.

The dataset is used to estimate econometric models where we test if a number of different economic and demographic variables significantly affect the parents' decisions. First, we estimate models for the likelihood of unequal sharing and for the likelihood of writing wills. Second, we also estimate models for the inherited amounts, controlling for fixed family effects.

The main results from the estimations are:

- The probability of a written wills is increasing in the size of the estate and in the parent's income. The average permanent income of the children affects the probability of a will negatively while the within-family income dispersion between siblings affects it positively.

- The probability of unequal division of bequests, taxable gifts and taxable (life) insurance benefits is increasing in the size of the estate. The average permanent income of the children affects the unequal division probability negatively while the within-family income dispersion between siblings affects it positively.

- Almost all children inherit the same amount as their siblings.

  For the few estates where the amounts differ, the permanent incomes of the children do not significantly affect the differences in inherited amounts. This suggests that parents do not use transfers at death to equalize differences in consumption possibilities across children. Women, children living in the same municipality as the parent, and firstborns inherit more than siblings without these characteristics. To the extent that geographical proximity, gender and birth order are proxies for the child's ability to provide services to the parent these findings are in line with the predictions of the exchange model.

The paper is structured as follows: We present data and descriptive facts about the deceased, the estates, and the heirs in Section 2. Section 3 presents the descriptive evidence on unequal sharing. The results from estimating probability models for writing wills and unequal sharing are presented in Section 4. Section 5 presents the results from estimations of models with the inherited amount as dependent variable. Section 6 concludes. An appendix provides additional descriptive statistics.

2 Data and descriptive facts

2.1 Data

The number of inhabitants in Sweden was slightly more than 9 million at the end of 2004 according to the *Population Register*. About 91,000 inhabitants had died during that year. The corresponding numbers for the previous two years were 93,000 deceased in 2003 and 95,000 deceased in 2002.

This paper is based on data from the Belinda databases.[4] Statistics Sweden was commissioned to organize data on intergenerational transfers (estates, inheritances, taxable gifts during the previous ten years, and insurance payments) using the *Inheritance Tax Register* of the Swedish Tax Agency as a starting point. Three data sets have been produced.[5]

We use the dataset with information on all estates 2002–2004.[6] The Tax Agency's *Inheritance Tax Register* provides economic information for all these estates.[7] This gives a schematic view of the different aspects of intergenerational transfers. The items of the estate are valued at tax values and not at market values. The information has enough detail, however, to study estate division and the incidence of wills. There are about 90,000 observations per year and more than 80 variables in this dataset. The Swedish inheritance tax was repealed from 2005. There are, therefore, no similar data available from 2005 on.

When creating our working sample we have proceeded in the sequence:

- All deceased during the period 2002–2004.
- There is no surviving spouse, the household is exiting (the deceased was a widow, widower, divorced, or unmarried). The civil law protects surviving spouses which implies that there in most cases is no or only partial estate division when a married person dies. We, therefore, condition the sample on the household exiting which means that there is an estate division.
- The estate is positive; otherwise there is nothing to transfer.

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[4] Henry Ohlsson is project leader for the BELINDA project. Access to the data has been granted to the researchers at the Department of Economics at Uppsala University associated with project *Intergenerational transfers: causes and consequences*. Due to its sensitive and confidential nature, the data cannot be exported from the closed server environment at Statistics Sweden. Data are however available, subject to the usual standard secrecy examination, for interested researchers through Statistics Sweden's remote access system MONA.

[5] The Swedish Research Council has funded the BELINDA project.

[6] One of the other two dataset has data on all taxable gifts during the period 2002–2004. The other dataset has detailed balance sheets at death in 2004 and 2005 for representative samples.

[7] It has been compulsory to file estate reports since 1734. The Tax Agency is responsible for keeping the register since 2001.

- The deceased has two or more children; otherwise there is no division between children.

Table 1 summarizes the implications of the selection criteria.[8] Two thirds are exit households; there is a surviving spouse in a third of the cases. Four out of five deceased leave a positive estate. About half of the deceased have two or more children. This leaves us with a sample of slightly more than one fourth of the total number of deceased. The remaining sample of almost 70,000 deceased is still of considerable size and much bigger than the samples used in previous empirical studies.

Table 1: Selection criteria

total number of deceased		264,715			264,715	
selection criterion:		each criterion:			accumulated criteria:	
	share of total, %	yes	no	share of those kept in previous step, %	kept	dropped
exit households	65.87	174,368	90,347	65.87	174,368	90,347
positive estate	83.85	221,964	42,751	81.52	142,140	32,228
two or more children	55.36	146,546	118,169	48.57	69,039	73,101
will	22.26	58,926	205,789	17.37	11,991	57,048

Equal sharing of the estate between legal heirs is the legal default in Sweden if there is no written will. The civil law, moreover, stipulates that half the estate should be equally shared between legal heirs even if there is a will. The other half of the estate can be freely bequeathed.

The wills can be of any type. Some stipulate unequal sharing, others stipulate that property received should be separate property. Some wills are recent, others are old. Many written wills are mutual between spouses and concern the property rights of a surviving spouse. Such wills are included in the estate report file when the surviving spouse passes away (Ohlsson, 2007).

A will is, therefore, a necessary, but not sufficient, criterion for unequal division of an estate. How common are wills? Slightly more than 17 percent

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[8] One explanation for why the total number of decedents in the database does not match up with the total number of deceased in the Population Register is that it, in some cases takes several years before the estate inventory report becomes definite.

of the deceased in our sample of almost 70,000 estates had written wills.[9] This contrasts the estimates of the incidence of wills in the United States. Approximately 40-50 percent of the population, and as many as two thirds of those older than 70 years, have a will (Rossi and Rossi, 1990; Lee, 2000; Goetting and Martin, 2001; Schwartz, 1993; McGranahan, 2006).

Very few bequests in Sweden go outside the family; to other people and to charities (Ohlsson, 2007). There is strong support for the proverb that blood is thicker than water![10]

The dataset details the names, person identity numbers of the decedents and the heirs, as well as their relationship.[11] For each decedent there is also information on citizenship, marital status, and date of death. Relevant demographic characteristics for the heirs that do not appear in the estate reports, such as date of birth, sex, nationality, have been collected from the Swedish *Birth Register*. We have retrieved information on the level of education of the children and the parents from the *Integrated Database for Labour Market Research*. Information on marital status of the children is also collected from this data source. Data on personal income and wealth are gathered from the *Income Registers* provided by the Swedish Tax Agency. The Tax Agency collects the information directly from the relevant sources, such as personal tax files for incomes, and financial institutions and intermediaries for wealth. Demographic and economic variables are available for each year over the period 1999-2009.[12] Because the Belinda database does not contain information on relationships between heirs across generations we use the *Multi-Generation Register*, which contains information on all parent-child relations in Sweden, to link children with their offspring's (i.e. the deceased's grandchildren).

2.2 The parents and the estates

The average age of the deceased parents was 83.6 years. Figure 1 shows the distribution of age at death.[13] In appendix A, Table A1, Column1, we present descriptive statistics with respect to demographics and economic characteristics of the decedents. More than two thirds of the decedents, 68 percent, were women. Concerning marital status, 79 percent of the deceased parents were widow or widower, while 19 percent were divorced, and about 2 percent was never married. The marital status variable does not inform us

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[9] People without legal heirs are more likely to have written wills.
[10] There is a considerable theoretical and empirical literature on charitable bequests. We find, however, that such bequests are much rarer in Sweden than in the United States.
[11] Decedents and heirs are linked through the case number assigned to each estate inventory in the Inheritance Tax Register.
[12] Information on wealth is only available up to year 2007 because the wealth tax was repealed in that year.
[13] We have estimated the distribution using the kdensity command in the Stata package.

about whether the deceased was cohabiting. We can however use information the heirs' relationship with the deceased to conclude this. It turns out that about 3 percent of the decedents had a cohabitating spouse.
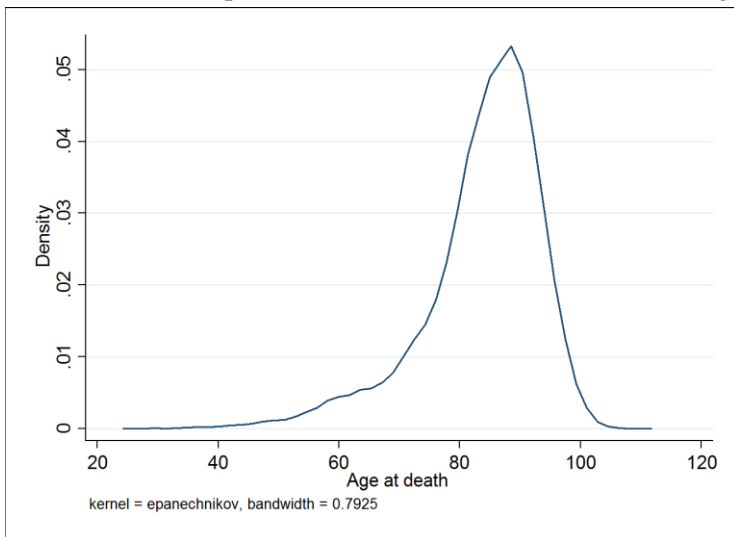

Figure 1: The distribution of the parent's age at death, years

The vast majority (99 percent) of the decedents were Swedish citizens. We have information on level of education for 83 percent of the decedents. The majority (57 percent) had only primary education. Slightly more than 19 percent had lower or secondary education and 6 had upper secondary or post graduate education. Two fifths of the decedents lived in either one of the three big city counties in Sweden (Stockholm, Skåne, and Västra Götaland).

The average number of children is 2.8. There are about equally many sons and daughters.

We have information on deceased's taxable employment income, including pensions, for each of the three years preceding death. The mean of annual employment income averaged of over the available years is SEK 126,000.

Table 2 reports the basic facts about the estates. The average value of the estates of the deceased was SEK 215,000.[14] This is based on the tax values of the different assets and debts. The tax values were lower than the market values for some assets.[15] The inheritance taxation integrated taxable gifts

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[14] This corresponds to EUR 51,000; GBP 35,000; or USD 64,000 using the 2004 exchange rates of 9.13 SEK/EUR, 13.46 SEK/GBP, and 7.35 SEK/USD.

[15] There were several exemptions from the principle of market prices. The most important exception concerned real estates. The tax value of this asset was supposed to be 75 percent of the market value. Any assets that were realized by the estate manager before the actual estate division were valued at market prices.

during the previous ten years from the deceased to the heir and taxable insurance paid by the deceased with the heir as beneficiary. Taxable gifts and taxable insurance benefits add almost SEK 12,000 to the average estate amount.

Table 2: The estates and the inheritances, SEK

	mean	p10	p50	p90	p99	Standard deviation
The parents (n=68,090):						
Estate of the deceased	215,008	14,328	100,247	487,457	1,713,470	482,778
Total transfer made by the deceased: estate of the deceased, taxable gifts, and taxable insurance	226,836	14,622	103,816	514,919	1,809,256	528,436
The children (n=190,163):						
Inheritance from the deceased	73,533	3,894	31,376	171,101	641,171	166,108
Total transfer received from the deceased: inheritance from the deceased, taxable gifts, and taxable insurance	77,211	3,954	32,155	180,192	672,171	178,437

The distributions of the different measures of the estates are skewed. The medians are less than half the means. Figure 2 shows the distribution of the logarithm of the estate of the deceased.
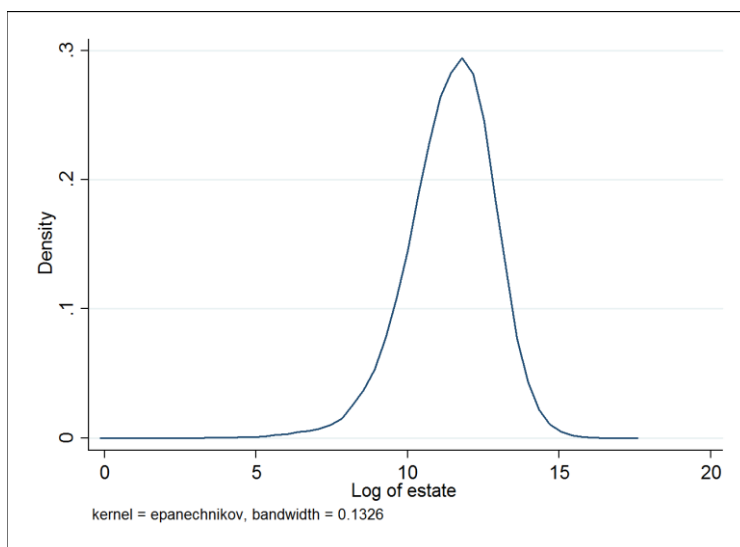

kernel = epanechnikov, bandwidth = 0.1326

Figure 2: The distribution of the logarithm of the estate of the deceased.

2.3 The children and the inheritances

The deceased parents have in total 190,163 children.[16] We use the term *family* to denote the parent-children entity. The average age of the children is 54 years. Figure 4 shows the distribution of the children's age when inheriting.

Column 5 in Table A1, Appendix A, shows that there are about equally many men and women among the children. The vast majority (99 percent) of the decedents were Swedish citizens. Concerning marital status, almost 57 percent of the children are married, while 16 percent are divorced, 22 percent are unmarried, and 3 percent are widow or widower. The education level is higher among the children than among the parents: 26 percent have only primary education, slightly more than 44 percent secondary education and as many as 26.7 percent has upper secondary or post graduate education.[17] About 42 percent of the children lived in either one of the three big city counties and about half of the children resided in the same municipality as the parent. The predictions of transfer theories regarding the connection between bequests and incomes are based on permanent income. Taking the average of taxable employment income over the three years preceding the parent's death gives us a proxy for the child's permanent income.[18] The mean of this variable is almost SEK 234,000. Table A1 also shows that the children are wealthy: the mean value of net worth is SEK 636,000.

The lower panel in Table 2 reports the basic facts about the inheritances. All amounts are before transfers taxes were paid. The average value of the inheritance from the deceased is SEK 73,500. Taxable gifts and taxable insurance add slightly more than SEK 4,000 to this amount. Similarly to the estates, the distributions of the different measures of the inheritances are skewed, as indicated by the small medians relative to the means. Relating the means in Table 2 to the economic variables in Table A1 shows that the transfers are small relative to permanent income and net worth.

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[16] This number refers to the number of surviving children.
[17] Information on education level is missing for three percent of the children.
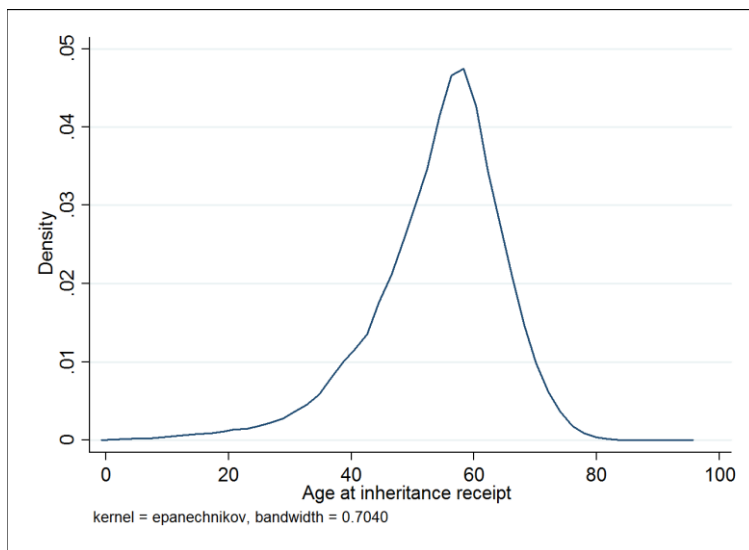[18] We do not include income in the year of the death as it is unclear whether this is observable to all parents.

Figure 3: The distribution of the child's age when inheriting, years.

3 Descriptive evidence on the frequency of unequal sharing

It is possible to calculate several different measures of the frequency of unequal sharing using the present dataset. A first, fundamental, issue is how to think about those who have not written wills. One approach (one extreme) is to view the decision not to write a will as a decision to divide the bequests equally between the children. We should then calculate the frequency of unequal sharing using all 70,000 observations in our sample, hereafter denoted Total sample. Another approach (the other extreme) is to assume that only those who have written wills have made conscious decisions whether or not the divide the bequests equally. We should then calculate the frequency of unequal sharing only using the subsample of 12,000 observations with written wills, hereafter Will sample.

A second issue to decide is which transfers to include. There are two obvious alternatives: inheritances from the deceased and total transfers (inheritances, taxable gifts, and taxable insurance benefits) from the deceased, as these are the amounts that the deceased had the right to decide about.

A third issue is to decide how much the shares may differ before the sharing is considered to be unequal. We define unequal sharing based on the heirs receipt relative to the mean inheritance calculated across the children in the family. The estate is considered exactly equally divided if the standard deviation of the within-family mean inheritance is zero. We also use two broader definitions previously used in the literature. The first classifies

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deviations larger than +/-2 percent of the mean as unequal division. This is the definition used in Wilhelm (1996). The second definition follows Tomes (1988) and considers a difference between the maximum and the minimum inheritance exceeding 25 percent of the within-family mean as unequal division.

A fourth issue is which heirs to include. Are we interested in equal sharing between the children to the deceased? This is one possibility. But is also possible to include bequests to grandchildren and great grandchildren and study how the estate is divided between children including their offspring, or in other words, how the estate is divided between family lines.

Table 3 and Table 4 show how the degree of unequal sharing differs depending on the three first choices, for children and for family lines, respectively. The upper panel is for the total sample whereas the lower panel is for the sample limited to decedents with written wills. Suppose that we only look at the children (as in Table 3), restrict the measure to the bequests from the deceased, and allow for a variation up to $\pm$ 25 percent without considering the division to be unequal. Then sharing is unequal in only 2 percent of the cases in the present example. But if we instead look at total transfers from the deceased to children and include all cases with deviations from exact equal sharing, then sharing is unequal in 4.4 percent of the cases.

It should be noted that the observed sharing patterns reported in Table 3 and Table 4 are not necessarily the most desirable from the perspective of the decedents. This is because the legal system in Sweden puts a boundary on the extent to which the parent can divide his or her estate unequally. Children are always entitled to at least the statutory share of the estate, which is fifty percent of their legal inheritance. Hence, for a parent with two children the most unequal distribution possible is one which leaves one child with three-fourths of the estate and the other child with the remaining one-fourth. Similarly, for a parent with three children, any particular child could not be given less than one sixth of the estate. Unfortunately, we cannot study how the parent would have divided the estate had her or she been granted full testamentary freedom. What we can do however is to study the incidence of cases for which the law is most likely to be a constraint, i.e. those for which at least one child receive the statutory share. Our calculations imply that only 5-7 percent of the unequally divided estates are divided in accordance with the most unequal distribution rule. Given that this corresponds to less than one percent of the total number of estates we can conclude that the legal context has had little influence on the observed sharing patterns.

Table 3: Frequency of unequal sharing, children

	Definition of equal sharing:		
	Exact	+/- 2 %	+/- 25 %
Total sample[a] *(N=68,090)*:			
Estate of the deceased	3.20 (2,177)	2.36 (1,608)	2.02 (1,374)
Total transfer from the deceased: estate of the deceased, taxable gifts, and taxable insurance	4.40 (2,995)	3.37 (2,295)	2.49 (1,691)
Taxable gifts (n=1,525)	45.57 (695)	42.16 (643)	36.98 (564)
Taxable insurance (n=1,734)	21.28 (369)	16.09 (279)	13.26 (230)
Will sample[b] *(N=11,790)*:			
Estate of the deceased	12.22 (1,441)	10.92 (1,287)	9.11 (1,074)
Total transfer from the deceased: estate of the deceased, taxable gifts, and taxable insurance	14.43 (1,701)	12.71 (1,498)	9.78 (1,153)
Taxable gifts (n=546)	52.20 (285)	49.26 (269)	43.96 (240)
Taxable insurance (n=590)	24.24 (143)	19.15 (113)	15.59 (92)

Note. Share, in percent, followed by the number of cases in parentheses. N denotes the total number of estates in the respective sample. n denotes the number of estates in which there are gifts or insurances. [a] Refers to the sample of exit households with positive estate and for which there are two, or more children. [b] Refers to the sample of exit households with positive estate and for which there are two, or more children, and a will.

Table 4: Frequency of unequal sharing, family lines

	Definition of equal sharing:		
	Exact	+/- 2 %	+/- 25 %
Totalsample[a] *(N=68,090)*:			
Estate of the deceased	4.37 (2,975)	3.33 (2,270)	2.54 (1,728)
Total transfer from the deceased: estate of the deceased, taxable gifts, and taxable insurance	5.61 (3,824)	4.38 (2,982)	3.02 (2,057)
Taxable gifts (n=1,553)	45.27 (703)	42.69 (663)	37.41 (581)
Taxable insurance (n=2,004)	17.11 (343)	14.27 (286)	11.73 (235)
Will sample[b] *(N=11,790)*:			
Estate of the deceased	15.99 (1,886)	13.94 (1,644)	10.37 (1,221)
Total transfer from the deceased: estate of the deceased, taxable gifts, and taxable insurance	18.25 (2,152)	15.84 (1,868)	11.09 (1,308)
Taxable gifts (n=563)	52.22 (294)	50.27 (283)	44.58 (251)
Taxable insurance (n=716)	19.97 (143)	17.18 (123)	14.25 (102)

Note. Share, in percent, followed by the number of cases in parentheses. N denotes the total number of estates in the respective sample. n denotes the number of estates in which there are gifts or insurances. [a] Refers to the sample of exit households with positive estate and for which there are two, or more children. [b] Refers to the sample of exit households with positive estate and for which there are two, or more children, and a will.

Taxable gifts are unequally shared. There are taxable gifts reported in connection to 1,500 estates. These gifts are unequally shared in 46 percent of the cases. The higher frequency of unequal sharing of gifts, as compared to bequest, is in line with the results in previous studies. It should be noted however that the taxable gifts we study here are public information in the same way as bequests are and therefore, that the results are not directly comparable to the results based on data on self-reported *inter vivos* gifts, which may have taken place with only the donor's and the recipients knowledge. Moreover, there are taxable insurance benefits associated with 1,700 estates. These payments are unequally shared in 21 percent of the cases.

Regarding the frequencies reported in the lower part of the panel, it can be seen that unequal sharing is more common among decedents with wills. This is expected given that a will is required for unequal sharing of bequest to take place. Around 17 percent of the decedents in the Total sample had a written will when they died. Considering the frequencies of unequal sharing with respect to the bequest from the deceased they imply that between 9 and 12 percent of these wills prescribe that the deceased prescribed unequal division of their estates.

In Table 4 we report frequencies of unequal sharing across family lines. Concerning the share of parents in the Total sample who divide their estate unequally according to the exact definition it is about one percentage point higher than the corresponding share in Table 3. This discrepancy in results is evident also for the total transfer. Interestingly, gifts are unequally divided to a similar extent across family lines as between children, whereas the frequency of unequal sharing of insurances is relatively lower for family lines.

Turning to the frequencies for the sample limited to decedents with wills, in the lower part of Table 4, it can be seen that that these are around 3 percentage points higher compared to the corresponding frequencies in Table 3, implying that the implied percentage differences in unequal sharing across family lines and between children are similar in both samples.

Most empirical studies find that unequal sharing of bequests is not very common. Still, the shares we find are lower than most of those previously reported. Menchik (1980), Judge and Hrdy (1992), and Norton and Taylor Jr (2005) all study estate reports from different parts of the United States. They report frequencies of unequal sharing in the interval 17–46 percent. Tomes (1981, 1988) are the exceptions finding unequal division in 51–79 percent of the estates using a combination of estate reports and a survey. This was, however, questioned by Menchik (1988) who only found unequal sharing in 12–16 percent of the estates reports from the same time and place.

Using French estate data, Arrondel et al. (1997) report that 8 percent of the estates are unequally divided. Wilhelm (1996) uses US federal estate tax data where the frequency of unequal sharing is 23–31 percent, while the corresponding frequency in a US survey based on twin register data used by Behrman and Rosenzweig (2004) is 8 percent.

An alternative source of information is survey data on the intended division of future bequests. Dunn and Phillips (1997), McGarry and Schoeni (1997), McGarry (1999), and Light and McGarry (2004) all use US survey data of this type. They report unequal sharing frequencies in the interval 8–20 percent. Horioka (2009), using Japanese data, reports that 31 percent of the respondents who plan to leave a bequests also plan to make it unequal.

Taken together, it can be noticed that the frequencies of unequal sharing in the current paper are substantially lower than the frequencies reported in previous studies and in particular, those from the United States.

4 Econometric evidence

4.1 The probability of writing wills

We study the characteristics of people who die with written wills in this subsection. This is unlike most previous studies that have primarily focused on the determinants of will adoption among the living. We do not know when the will was executed or its content. Thus, we cannot say anything about the testators' preferences regarding how they want specific assets to be distributed.[19]

We first need to decide which variables to include in the econometric specifications as potential determinants of will writing. As there are no clear theoretical predictions on the determinants of will writing; we let previous empirical literature guide us.[20]

Wealth is perhaps the most obvious potential determinant. There is no point of writing a will if the individual has no wealth. Having wealth, on the other hand, means that the individual has something to decide about. Given that all decedents in our sample have positive estates, we could test for whether the probability of a written will is increasing in the size of the estate.

McGranahan (2006) studies will writing decisions in a sample of individuals who died in Ireland between 1901 and 1905. She finds that having a written will at death is positively correlated with estate size. Marin and Goetting (2001) report similar results with respect to net worth for a sample of elderly Americans. Implicit evidence of will writing being increasing in wealth is reported by Su (2008) who finds that the probability of financial end-of-life planning (as defined as having either a will, joint ownership through which assets are transferred, and/or a trust) among the living is positively associated with the individual's net worth.

Another possible determinant of will writing is *income*. High income individuals are likely to have greater access to legal and financial advice than low income individuals. Palmer et al. (2006) find that (household) income is positively associated with the probability of adopting a will whereas Goetting and Martin (2001) find no effect of income on the probability of holding a will.

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[19] Light and McGarry (2003) use data on mothers' planned division of estates among children and conclude that variety of motives come into play when wills are established.
[20] Table A1 in Appendix A compares the means of the sample characteristics discussed below, across parents and children of families with and without wills.

Age is another candidate likely to determine will writing. It lies close at hand to conjecture that older individuals have had more time to think about matters regarding distribution of assets and also that they know more about end-of-life decisions than younger individuals. This might be a product of their own life experiences as well as those of their spouses and age peers. Another reason for why the probability of holding a written will at death would be increasing in age is that older individuals, as compared to younger individuals, are more likely to have experienced life events which may have caused them to adopt a will, such as retirement, widowhood, and the onset of disease (Palmer et al. 2006).

The empirical evidence on the relationship between age and will writing is, however, less clear. Rossi and Rossi (1990) and McGranahan (2006) for instance find that having a will is positively correlated with age whereas Goetting and Martin (2001) do not find a relationship in their sample of elderly.

Gender may also be an important determinant of will writing. There are studies reporting that men have better financial knowledge and are more able to plan for retirement than women (Lusardi and Mitchell, 2011). Also, Su (2008) finds that the incidence of financial end of life planning is lower among women, compared to among men, suggesting that women would be less likely to have a will. The empirical evidence on will writing, however, suggests that men and women are equally likely to both adopt and have a will (Palmer et al., 2006; Goetting and Martin, 2001).

Moreover, it is reasonable to assume that financial and legal knowledge is related with level of *education* (Lusardi and Mitchel, 2007). Goetting and Martin find that college graduates are 1.5 times more likely to have a will than high school graduates. A similar finding is reported by Palmer et al. (2006) with respect to will adoption and Su (2008) find, similarly, that the probability of end of life financial planning is increasing in the level of education.

Previous work finds that becoming widow/widower increases the probability of adopting a will (Palmer at al., 2006). Marital status, as defined as being married, is however not related with the probability of holding a will (Goetting and Martin, 2001). Before the reform of the Marriage Act in 1988 married persons in Sweden had incentives to write wills to secure the financial situation of surviving spouse.[21] We, therefore, expect widows and widowers to be more likely to have a will than never married individuals and divorcees. Moreover, we expect a higher incidence of wills among cohabiting decedents as they had incentives to write a will to protect the cohabiting spouse from unnecessary financial strains as a result of the estate division.

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[21] See Brattström and Singer (2007)

A written will may be seen by the individual as a tool to reduce conflicts between children in the division of the estate. Support for this hypothesis is found in Lee (2000) and Rossi and Rossi (1990) who document that the presence of children increases the likelihood of will writing. Although the same logic suggests that the likelihood of a will should increase in the number of children the authors find the opposite result.

The characteristics of the testator's children may also influence the decision to write a will. Schwarts (1993) concludes that social influences and, in particular, the influences of the family are the major determinant of the testators' behavior. Models of transfer behavior also predict that characteristics of the potential recipients of transfers are important determinants of the donor's motives regarding the distribution of assets. We would expect children characteristics proposed in this literature to affect the will writing decision to the extent that the will reflects the deceased's desire to divide the estate unequally. Economic and demographic characteristics enter the specifications in the form of within-family (sibling) means and within-family (sibling) coefficients of variation (for continuous variables).[22]

The unit of observation in the estimations is the parent. Each parent contributes one observation to the sample used for the estimation. The model that we estimate is as follows:

(1) $\qquad y_i = \alpha + \beta_1 \boldsymbol{P_i} + \beta_2 \boldsymbol{C_i} + \varepsilon_i,$

where y_i is an indicator variable taking the value one if parent i has a will, and zero otherwise, $\boldsymbol{P_i}$ is a vector of parental characteristics assumed to affect will writing, $\boldsymbol{C_i}$ is a vector containing exogenous characteristics of the children, and ε_i is a random disturbance term. We estimate the model on the Total sample.

Table 6 shows that the probability of having a will is increasing in the size of the estate. Permanent income is also significant and positively associated with will writing and so is age. Women are more likely to have a will than men. This is opposite to what has been conjectured in the previous literature. As expected the likelihood of a will is lower among never married and divorcees as compared to widows/widowers. Also, the indicator for cohabiting is positive and statistically significant.

The results with respect to education are in line with those in the previous literature: individuals with more education have a higher probability of having a will than people with lower levels of education. Having three children, as compared to having two, does not affect the likelihood of having

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[22] The coefficient of variation (cv) is obtained by dividing the standard deviation of the within-family (sibling) mean with the within-family (sibling) mean. For cases where cv is undefined, i.e. because the within-family (sibling) mean is zero, it has been replaced with value zero.

a will but having four or more children reduces the likelihood. These findings are similar to those reported in Rossi and Rossi (1990) and Lee (2000). The gender composition of the siblings is not significantly related to will writing.

Controlling for characteristics of the children does not affect the coefficient estimates on the parental variables significantly, see column 2. A higher average permanent income of the children appears to reduce the likelihood of a will, whereas higher inter-sibling dispersion increases it. The latter finding may perhaps reflect the parent's intentions of reallocating resources towards equalization of differences in consumption possibilities across children.

Somewhat surprisingly perhaps, child wealth does not have an as strong association with will incidence as permanent income. The older the children are the more likely is the parent to have a will. Higher within-family age dispersion is positively related with will holding. Moreover, a higher share of daughters increases the likelihood of a will. The marital status of the children (as defined as the share of married children) is not associated with the outcome.

The exchange model predicts that the transfer will increase in the amount of services, e.g. visits, companionship, and home production, provided by the child to the parent (Cox, 1987). We do not have information on services provided by children; instead we use an indicator for whether the child lives in the same municipality as the parent. The argument here is that services are more easily delivered when parents and children live geographically close. Distance, as a proxy for services, has been used in previous studies on transfer behavior, see e.g. Cox and Rank (1992) and Hochguertel and Ohlsson (2009).

The coefficient estimates indicate that a higher share of children living in the same municipality as the deceased reduces the likelihood of a will. The result could be interpreted as if parents who have more children providing services find it less meaningful to compensate any particular child. It may also indicate the parent and the children have better relationship and that the parent feels that it is unnecessary to write a will to minimize potential conflicts. Lastly, the results show that, parents with more children having upper secondary education or post graduate education are more likely to have a will.

Table 5: Linear probability models for the likelihood of having a written will. Total sample. (page 1/2)

Variables	1	2
Parent:		
Log of estate	0.0354***	0.0339***
	(0.0010)	(0.0010)
Log of permanent income	0.0931***	0.0869***
	(0.0043)	(0.0045)
Age	0.0027***	0.0009**
	(0.0002)	(0.0004)
Woman	0.0299***	0.0224***
	(0.0035)	(0.0037)
Marital status (reference: widow/widower):		
Never married	-0.1135***	-0.1111***
	(0.0111)	(0.0115)
Divorced	-0.0726***	-0.0752***
	(0.0037)	(0.0038)
Cohabiting	0.3591***	0.3641***
	(0.0107)	(0.0111)
Education (reference: primary education):		
Lower secondary	0.0206***	0.0172***
	(0.0040)	(0.0041)
Upper secondary or post graduate	0.0459***	0.0383***
	(0.0076)	(0.0080)
Missing	0.0040	0.0007
	(0.0043)	(0.0044)
Big city county	0.0206***	0.0189***
	(0.0029)	(0.0029)
Number of children (reference: 2 children)		
3 children	-0.0018	-0.0019
	(0.0034)	(0.0035)
4+ children	-0.0232***	-0.0225***
	(0.0038)	(0.0040)
Children are of different sex	0.0032	0.0015
	(0.0031)	(0.0032)

Table 5. Continued (page 2/2)

	1	2
Children:		
Permanent income, mean		-0.0070***
		(0.0020)
Permanent income, cv		0.0080***
		(0.0019)
Wealth, mean		0.0005*
		(0.0003)
Wealth, cv		0.0001
		(0.0002)
Age, mean		0.0016***
		(0.0004)
Age, cv		0.0015**
		(0.0006)
Woman, mean		0.0228***
		(0.0047)
Married, mean		-0.0037
		(0.0045)
Same municipality as parent, mean		-0.0240***
		(0.0042)
Upper secondary or post graduate education, mean		0.0324***
		(0.0050)
Dep. variable, mean	0.1731	0.1715
R^2	0.0740	0.0775
No of observations	68,025	66,360

Notes. The estimation is conducted on the Total sample. Monetary variables are reported in SEK100,000. Each specification includes controls for the deceased's year of death. Education refers to the highest achieved level. Permanent income is calculated as the average of taxable labor income over the three years preceding death. mean refers to within-family mean. cv refers to the coefficient of variation. Robust standard errors in parentheses. * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

4.2 The probability of unequal sharing

In this subsection we report results from estimations of linear probability models for unequal sharing.[23] We consider two measures of transfers: the bequest from the deceased and the total transfer from the deceased. For each transfer we consider the case of unequal sharing between children as well as the case of unequal sharing between family lines. The models we estimate are similar to Model (1) but with the difference that, as dependent variable we now use indicator variables for whether the transfer is unequally divided, as defined by each child (or family line) receiving outside +/- 2 percent of

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[23] We have also considered a non-linear *Probit* model. This is to account for the possibility that the estimated coefficients from the linear model can imply probabilities outside the unit interval. The coefficients estimates from the Probit model are similar to the linear probability estimates in terms of sign and statistical significance. Also, the implied marginal effects are quantitatively similar to the estimates from the linear model.

the average transfer among children (or family lines) in the family. We report results for both the total sample (Table 6) and for the sample restricted to decedents with wills (Table 7). As in the analyses in Subsection 4.1 we use between-family variation and each decedent contributes one observation to the estimation sample.

Starting by examining the results for the total sample, we see that the likelihood of unequal sharing of bequest between children is increasing in the size of the estate. Judge and Hrdy (1992), Table 8, find the same, while the wealth variables are not significant in the estimations reported by McGarry (1999), Table 5. The coefficient estimate, which could be interpreted as semi-elasticity as the estate value enters the model in logarithmic form, suggests that a one percent increase in the estate increases the likelihood of unequal division by around one percentage point, or 43 percent if compared to the baseline probability (2.3 percent).

The finding that the decision to divide unequally is positively associated with the estate holds true also when we consider unequal sharing between family lines as well when we consider the total transfer from the deceased. It lies close at hand to expect that parents find less of a point to divide unequally if the total estate is small. It can also be noted that unequal sharing is increasing in the parent's income. This is expected given the strong correlation between income and wealth.[24]

We also control for other characteristics of the parent that may be correlated with her taste or ability to divide unequally. The impact of these characteristics on the likelihood of unequal sharing can be summarized as follows: Older parents are more likely to divide unequally. This is perhaps expected given that they are likely to have had more time to think about the distribution of their estates. Men and women are as likely to divide their estates unequally but when including previous gifts and insurances we find that women are more likely to divide their total transfers unequally. Marital status seems to be rather unimportant in explaining unequal division of the estate across children, whereas in the case of family lines it appears as if divorcees are more likely to divide unequally than are widows and widowers.[25] The estimate on the indicator for presence of a cohabiting spouse is statistically significant only with respect to unequal bequest across children. Moreover, level of education does not seem to be related with the decision to divide unequally between children, but is positively related with

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[24] To account for the correlation between income and the size of the estate we have estimated the model without the former variable. The results, which are available on request, show that the coefficient on log estate is largely similar to the corresponding coefficient in Table 6.

[25] We have tested for whether distributive decision of widows/widowers has been influenced by the previously deceased spouse by augmenting the econometrical specifications with an indicator taking the value one if a positive bequest from a previous deceased spouse is transferred to the heirs, and zero otherwise. The coefficient on the covariates are largely unaffected by the inclusion of this variable.

unequal sharing across family lines. Parents living in any of the three most populated counties in Sweden are more likely to divide their estates unequally than are parents in other counties. Parents who have four or more children, relative to those who have two children, are less likely to divide unequally. The fact that the children are of different sex is positively associated with unequal sharing of bequest across family lines and with the decision regarding total transfer.

Both the altruistic model and the exchange model predict that characteristics of the children are important determinants of the parent's transfer behavior. Children characteristics enter the specifications as the means calculated among the siblings as in the empirical models for will writing. For continuous variables we also include the coefficient of variation.

We find that mean permanent income of the children is unrelated with unequal division of bequest but that a higher value is negatively associated with unequal division of the total transfer between children as well as across family lines.

A higher inter-sibling dispersion in permanent income is, however, associated with a higher likelihood of unequal sharing of both transfers. These findings accord with McGarry (1999) who finds that a higher dispersion in permanent income, as approximated by the inter-sibling difference in schooling reduces the probability of equal division.[26] Although one may be keen to interpret this as evidence that altruism play a role in transfer decisions, the theory still requires that the parent gives more to the low-income children. Also, the result is consistent with the exchange model, as long as the parent gives more to the low-income children, for whom the price of time of providing time intensive services is low. In Section 5 we use within-family variation in amounts to study whether low-income children receive more or less than high-income siblings.

Regarding wealth, the mean is statistically significant and positive in three of the four specifications and the coefficient of variation is significant and positive in all four specifications.[27]

Moreover, we find that the likelihood of unequal sharing of total transfer is increasing in the average age of the siblings. This may indicate that, the older the children are the better information does the parent have on the earning abilities of the children and hence, better bases to more effectively

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[26] We have tested for heterogeneous responses with respect to the within-family dispersion in permanent income by separating the sample with respect to different values of the coefficient of variation. The results, which are available on request, show that the frequency of unequal sharing is, as expected, more common in families with relatively high income inequality (coefficient of variation>sample median) than in families with relatively low inequality (coefficient of variation<sample median). The patterns of the coefficients on the control variable are however largely similar across the different samples.
[27] Estimating the model without controls for child wealth (income) does not change the coefficients on the child income (wealth) controls.

distribute resources among children. Unequal division, of both transfers, is also more likely when siblings differ more in age, as indicate by the positive estimate regarding the coefficient of variation. The resemblance of these findings with those regarding permanent income suggests that age may act as proxy for permanent income.

The results also indicate that the probability of unequal sharing is lower if more children are married and if more children live in the same municipality as the parent. The latter finding is in line with the exchange model.

Table 6: Linear probability models for the likelihood of unequal sharing. Bequests and total transfers. Total sample. (Page 1/2)

	Bequest from the deceased		Total transfer from the deceased	
	Children	Family lines	Children	Family lines
	1	2	3	4
Parent:				
Log of estate	0.0100***	0.0113***	0.0166***	0.0181***
	(0.0004)	(0.0005)	(0.0005)	(0.0006)
Log of income	0.0121***	0.0156***	0.0234***	0.0272***
	(0.0019)	(0.0023)	(0.0024)	(0.0027)
Age	0.0013***	0.0011***	0.0014***	0.0010***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Woman	0.0006	-0.0001	0.0046**	0.0035
	(0.0016)	(0.0019)	(0.0019)	(0.0021)
Marital status (reference: widow/widower):				
Never married	-0.0026	0.0085	0.0004	0.0119
	(0.0056)	(0.0071)	(0.0070)	(0.0082)
Divorced	0.0005	0.0121***	-0.0027	0.0085***
	(0.0018)	(0.0023)	(0.0021)	(0.0025)
Cohabiting	0.0082*	0.0051	-0.0009	-0.0042
	(0.0043)	(0.0050)	(0.0048)	(0.0055)
Education (reference: primary education):				
Lower secondary	0.0025	0.0054**	0.0029	0.0056**
	(0.0017)	(0.0021)	(0.0021)	(0.0023)
Upper secondary or post graduate	0.0049	0.0108***	0.0087**	0.0124**
	(0.0035)	(0.0042)	(0.0044)	(0.0048)
Missing	-0.0067***	-0.0073***	-0.0036*	-0.0040*
	(0.0018)	(0.0021)	(0.0021)	(0.0024)
Big city county	0.0037***	0.0050***	0.0045***	0.0067***
	(0.0012)	(0.0014)	(0.0014)	(0.0016)
Number of children (reference: 2 children)				
3 children	-0.0018	-0.0033*	-0.0011	-0.0019
	(0.0015)	(0.0017)	(0.0018)	(0.0020)
4+ children	-0.0079***	-0.0060***	-0.0082***	-0.0065***
	(0.0018)	(0.0022)	(0.0021)	(0.0024)
Children are of different sex	0.0020	0.0038***	0.0032**	0.0052***
	(0.0013)	(0.0015)	(0.0015)	(0.0017)

Table 6. Continued (page 2/2)

	1	2	3	4
Children:				
Permanent income, mean	-0.0010	-0.0006	-0.0029***	-0.0028***
	(0.0007)	(0.0009)	(0.0009)	(0.0009)
Permanent income, cv	0.0092***	0.0087***	0.0177***	0.0170***
	(0.0019)	(0.0022)	(0.0024)	(0.0025)
Wealth, mean	0.0001	0.0002***	0.0002*	0.0003***
	(0.0001)	(0.0000)	(0.0001)	(0.0001)
Wealth, cv	0.0083***	0.0086***	0.0067***	0.0070***
	(0.0013)	(0.0015)	(0.0015)	(0.0017)
Age, mean	-0.0001	0.0004*	-0.0003	0.0004*
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Age, cv	0.3002***	0.3632***	0.3370***	0.4068***
	(0.0223)	(0.0236)	(0.0234)	(0.0245)
Woman, mean	-0.0029	0.0012	-0.0044**	-0.0001
	(0.0019)	(0.0022)	(0.0022)	(0.0025)
Married, mean	-0.0083***	-0.0106***	-0.0109***	-0.0130***
	(0.0018)	(0.0022)	(0.0021)	(0.0025)
Same municipality as parent, mean	-0.0032**	-0.0070***	-0.0012	-0.0046**
	(0.0016)	(0.0020)	(0.0019)	(0.0022)
Upper secondary or post grad. education, mean	-0.0007	-0.0017	0.0011	0.0006
	(0.0020)	(0.0024)	(0.0024)	(0.0027)
Dep. variable, mean	0.0236	0.0333	0.0337	0.0438
R^2	0.0281	0.0298	0.0425	0.0434
No of observations	67,684	67,684	67,684	67,684

Notes. Definition of unequal sharing is +/- 2 percent. Monetary variables are reported in SEK100,000. Each specification includes controls for the deceased's year of death. Education refers to the highest achieved level. Permanent income is calculated as the average of taxable labor income over the three years preceding death. mean refers to within-family mean. cv refers to the coefficient of variation. Robust standard errors in parentheses. * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

Moving to the results for the sample of parents who had a will (Table 7) we see that there are some clear differences compared to what we found for the Total sample. Regarding the parental characteristics it can be noted that age, education, place of residence, and number of children, are not significant predictors of unequal sharing. Moreover, women are, relative to men, less likely to divide unequally both between children and across family lines. Cohabiting is, in contrast to previously, negatively associated with unequal division. This may be a consequence of cohabiting parents demanding fewer services from their children, as these are being provided by the cohabiting spouse, and therefore have fewer reasons to divide unequally.

Regarding the characteristics of the children there are three noticeable differences compared to what we found for the Total sample. First, a higher share of daughters (*Woman*) is negatively associated with the likelihood of unequal sharing. Second, the share of children living in the same municipality as the parent is unrelated with the transfer decision. Third, a higher share of children with upper secondary or post graduate education reduces the likelihood of unequal division of bequest.

Taken together, the results in tables 6 and 7 show that: the estate of the parent, the spread of wealth between siblings, and the spread in age among siblings are statistically significant (p<0.01) positive related with the probability of unequal sharing across transfer measures and samples.

Table 7: Linear probability models for the likelihood of unequal sharing. Bequests and Total transfers, Will sample. (Page 1/2)

	Bequest from the deceased		Total transfer from the deceased	
	Children	Family lines	Children	Family lines
	1	2	3	4
Parent:				
Log of estate	0.0249***	0.0312***	0.0359***	0.0428***
	(0.0020)	(0.0023)	(0.0021)	(0.0024)
Log of income	-0.0110	-0.0111	0.0019	0.0038
	(0.0074)	(0.0082)	(0.0081)	(0.0088)
Age	0.0014	0.0009	0.0016*	0.0007
	(0.0009)	(0.0010)	(0.0009)	(0.0009)
Woman	-0.0275***	-0.0327***	-0.0196**	-0.0268***
	(0.0073)	(0.0081)	(0.0078)	(0.0084)
Marital status (reference: widow/widower):				
Never married	0.0573*	0.0770**	0.0475	0.0674**
	(0.0300)	(0.0327)	(0.0312)	(0.0336)
Divorced	0.0671***	0.0849***	0.0623***	0.0795***
	(0.0112)	(0.0122)	(0.0115)	(0.0124)
Cohabiting	-0.1037***	-0.1271***	-0.1109***	-0.1340***
	(0.0109)	(0.0120)	(0.0115)	(0.0125)
Education (reference: primary education):				
Lower secondary	0.0036	0.0093	-0.0004	0.0025
	(0.0077)	(0.0085)	(0.0081)	(0.0088)
Upper secondary or post graduate	-0.0007	0.0126	0.0076	0.0135
	(0.0117)	(0.0131)	(0.0130)	(0.0141)
Missing	-0.0211**	-0.0156	-0.0210**	-0.0171
	(0.0091)	(0.0102)	(0.0097)	(0.0107)
Big city county	-0.0014	-0.0012	0.0005	0.0032
	(0.0057)	(0.0064)	(0.0061)	(0.0067)
Number of children (reference: 2 children)				
3 children	0.0075	-0.0026	0.0105	0.0042
	(0.0071)	(0.0077)	(0.0075)	(0.0081)
4+ children	-0.0053	-0.0111	-0.0052	-0.0121
	(0.0092)	(0.0101)	(0.0096)	(0.0104)
Children are of different sex	0.0089	0.0106	0.0103	0.0117
	(0.0061)	(0.0068)	(0.0065)	(0.0071)

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Table 7. Continued (page 2/2)

	1	2	3	4
Children:				
Permanent income, mean	-0.0040	-0.0044*	-0.0064**	-0.0078***
	(0.0025)	(0.0026)	(0.0026)	(0.0027)
Permanent income, cv	0.0178**	0.0173*	0.0260***	0.0242**
	(0.0080)	(0.0089)	(0.0087)	(0.0094)
Wealth, mean	0.0002	0.0002	0.0003*	0.0003*
	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Wealth, cv	0.0333***	0.0301***	0.0319***	0.0294***
	(0.0063)	(0.0069)	(0.0066)	(0.0071)
Age, mean	0.0005	0.0017	0.0003	0.0022***
	(0.0009)	(0.0011)	(0.0010)	(0.0008)
Age, cv	0.6447***	0.6651***	0.6682***	0.7161***
	(0.0743)	(0.0807)	(0.0766)	(0.0684)
Woman, mean	-0.0307***	-0.0184*	-0.0325***	-0.0189*
	(0.0092)	(0.0102)	(0.0098)	(0.0107)
Married, mean	-0.0371***	-0.0438***	-0.0374***	-0.0436***
	(0.0089)	(0.0101)	(0.0094)	(0.0104)
Same municipality as parent, mean	0.0060	0.0027	0.0071	0.0068
	(0.0076)	(0.0087)	(0.0082)	(0.0092)
Upper secondary or post grad. education, mean	-0.0148*	-0.0177*	-0.0135	-0.0151
	(0.0090)	(0.0101)	(0.0097)	(0.0106)
Dep. variable, mean	0.1093	0.1398	0.1274	0.1590
R^2	0.0497	0.0494	0.0598	0.0618
No of observations	11,706	11,706	11,706	11,706

Notes. Definition of unequal sharing is +/- 2 percent. Monetary variables are reported in SEK100,000. Each specification includes controls for the deceased's year of death. Education refers to the highest achieved level. Permanent income is calculated as the average of taxable labor income over the three years preceding death. mean refers to within-family mean. cv refers to the coefficient of variation. Robust standard errors in parentheses. * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

Table 3 and Table 4 showed that taxable gifts and insurances are unequally divided to a higher extent than are the estates. We have estimated linear probability models for unequal sharing also of these transfers. The analyses are based on the total sample, as a will is not a necessary condition for unequal sharing of the transfers, but limited to cases in which a gift or an insurance benefit has been given to at least one child, or one family line.

The results are reported Table 8. For taxable gifts (columns 1 and 2) it can be noted that the likelihood of unequal sharing is, in contrast to what we found for the bequests and the total transfers, unrelated to the size of the estate. Likewise, the deceased's income has no predictive power. Another difference is that unequal sharing of gifts is decreasing in the parent's age. One possible explanation for this is that we only observe gifts during the last ten years and that; older decedents may have given gifts at an earlier stage. Women are, relative to men, less likely to divide gifts unequally, at least between children, and so are parents who live in a big city county. Moreover, the number of children and their gender composition appears to be important determinants of the decision to divide gifts unequally. In accordance with what we found for bequests, higher within-family

dispersion in permanent income and wealth is positively associated with the probability of unequal sharing. Other child characteristics also display similar pattern to what we found for bequests.

Columns 3 and 4 show how the probability of dividing insurance benefits unequally is related to parent and child characteristics. It should be remembered that the insurance benefits are received at the time of death of the deceased and could therefore be considered more similar to a bequest than to an *inter vivos* gift. However since the decision to assign a person as beneficiary to the insurance policy was made earlier, the motivations may be different than those governing the estate division. On the one hand, the parent may have based the decision on the assumption that the current needs of the beneficiary will remain also in the future. On the other hand, the parent may have preferences for the beneficiary over the other children and may use the insurance as a self-control device to assure that the money is not spent on own consumption or is transferred to the other children as gifts.

We find that unequal sharing of insurance is positively related to the size of the estate. Income is however only a significant predictor for unequal sharing across family lines. Older decedents and women are more likely to divide unequally than young decedents and men. The likelihood of unequal sharing is lower if the deceased had a cohabiting spouse.

Having four or more children, as compared to having only two, is positively associated with unequal sharing of insurance. Moreover, the permanent income of the children is a significant predictor and the direction of the relationship is in accordance with the findings regarding unequal sharing of bequests and gifts. Unlike to what we found for gifts, however, the coefficients on the indicator for living in same municipality as the parent are statistically significant and positive.

Table 8: Linear probability models for the likelihood of unequal sharing, gifts and insurances, Total sample. (Page 1/2)

	Gift		Insurance	
	Children	Family lines	Children	Family lines
	1	2	3	4
Parent:				
Log of estate	0.0169	0.0206	0.0183*	0.0292***
	(0.0145)	(0.0145)	(0.0101)	(0.0095)
Log of income	0.0332	0.0408	0.0328	0.0509***
	(0.0290)	(0.0291)	(0.0205)	(0.0189)
Age	-0.0076**	-0.0073**	0.0037*	0.0027
	(0.0031)	(0.0031)	(0.0019)	(0.0018)
Woman	-0.0520*	-0.0441	0.0363*	0.0496***
	(0.0297)	(0.0297)	(0.0206)	(0.0183)
Marital status (reference: widow/widower):				
Never married	-0.0875	-0.0629	0.1069	0.0288
	(0.2320)	(0.2238)	(0.0824)	(0.0447)
Divorced	0.0333	0.0316	0.0267	0.0424*
	(0.0420)	(0.0417)	(0.0254)	(0.0236)
Cohabiting	0.0285	-0.0860	-0.1078***	-0.2300***
	(0.0908)	(0.0854)	(0.0372)	(0.0249)
Education (reference: primary education):				
Lower secondary	0.0420	0.0332	0.0143	0.0197
	(0.0315)	(0.0316)	(0.0212)	(0.0192)
Upper secondary or post graduate	0.0314	0.0277	0.0050	0.0020
	(0.0455)	(0.0452)	(0.0301)	(0.0263)
Missing	0.1077***	0.1045***	0.0939**	0.0748**
	(0.0404)	(0.0401)	(0.0388)	(0.0355)
Big city county	-0.0686***	-0.0669***	0.0096	0.0107
	(0.0250)	(0.0250)	(0.0180)	(0.0161)
Number of children (reference: 2 children)				
3 children	0.1135***	0.1130***	0.0300	0.0279
	(0.0301)	(0.0298)	(0.0222)	(0.0201)
4+ children	0.1151***	0.1044**	0.0800**	0.0741**
	(0.0407)	(0.0409)	(0.0327)	(0.0304)
Children are of different sex	0.0572**	0.0539**	0.0115	0.0099
	(0.0257)	(0.0256)	(0.0185)	(0.0166)

Table 8. Continued (page 2/2)

	1	2	3	4
Children:				
Permanent income, mean	-0.0037	-0.0050	-0.0139	-0.0167***
	(0.0118)	(0.0117)	(0.0093)	(0.0062)
Permanent income, cv	0.1243***	0.1075***	0.1020***	0.0804***
	(0.0332)	(0.0332)	(0.0252)	(0.0217)
Wealth, mean	0.0001	0.0001	0.0000	0.0000
	(0.0004)	(0.0001)	(0.0001)	(0.0001)
Wealth, cv	0.2174***	0.2107***	0.0013	-0.0020
	(0.0279)	(0.0279)	(0.0190)	(0.0164)
Age, mean	0.0026	0.0031	-0.0061***	-0.0043**
	(0.0030)	(0.0030)	(0.0018)	(0.0018)
Age, cv	0.8627***	0.8709***	0.7556***	0.5941***
	(0.2337)	(0.2380)	(0.1310)	(0.1202)
Woman, mean	-0.0975**	-0.1085***	-0.0076	-0.0055
	(0.0383)	(0.0381)	(0.0287)	(0.0251)
Married, mean	-0.1097***	-0.1031***	-0.0044	0.0002
	(0.0368)	(0.0370)	(0.0260)	(0.0242)
Same municipality as parent, mean	-0.0233	-0.0283	0.0386*	0.0395*
	(0.0342)	(0.0343)	(0.0232)	(0.0213)
Upper secondary or post grad. education, mean	0.0144	0.0248	-0.0136	-0.0207
	(0.0386)	(0.0387)	(0.0242)	(0.0219)
Dep. variable, mean	0.4224	0.4276	0.1638	0.1484
R^2	0.1433	0.1316	0.1366	0.1325
No of observations	1,520	1,548	1,685	1,907

Note. Definition of unequal sharing is +/- 2 percent. Monetary variables are reported in SEK100,000. Each specification includes controls for the deceased's year of death. Education refers to the highest achieved level. Permanent income is calculated as the average of taxable labor income over the three years preceding death. mean refers to within-family mean. cv refers to the coefficient of variation. Robust standard errors in parentheses. * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

5 Inherited amounts and the characteristics of heirs

It is clear from the two previous sections that the overwhelming majority of parents divide their estates equally between children and between family lines. Still, it is interesting to study on what grounds the (few) parents who make unequal transfers treat their children differently. The results in the previous section showed, as predicted by transfer theories, that the parent's decision to divide the estate unequally was related to the economic circumstances of the children, and in particular with the inter-sibling dispersion in income. However, the estimation results did not say anything about to what degree parents use bequests to compensate for inter-sibling differences in income.

The significant explanatory power of the coefficient of variation with respect to children's income could, on the one hand, be seen as support for the altruistic model which predicts that a parent who puts equal weight on

each child's utility would transfer more to less well-off children.[28] It could, on the other hand, also imply that the parent has preferences for a particular child. For example, a parent who has preferences for one child over the other(s) may have invested heavily in that child's education, which in turn has manifested into a higher relative income. If the parent favors the child also with respect to inheritance we would find, consistent with the results in the previous section, that the likelihood of unequal sharing is positively related with the inter-sibling difference in income.

In this section we, therefore, take the analysis one step further and study the connection between the economic circumstances of the children and the transfer that they receive in more detail. We also consider other dimensions along which parent may differentiate between children.

While the previous analyses used the parent as unit observation, the analysis in this section is based on the children. Since we have information the amounts received by all children within the family we can estimate the impact of child's characteristics using a within-family approach with controls for family fixed effects (see e.g. Wilhelm, 1996; McGarry, 1999).[29] This approach will account for unobserved heterogeneity across families and allow us to interpret the coefficients on the variables of interest as deviations from the within-family mean.[30] Using within-family variation rather than between-family variation is also appealing as it is consistent with the predictions of the transfer theories. The models that we estimate take the following form:

$$(2) \qquad y_{i,f} = \alpha + \theta I_i + \delta X_i + \lambda_f + \varepsilon_{i,f},$$

where $y_{i,f}$ is the transfer, in SEK, received by child i of family f. I_i is the child's permanent income, in SEK, X_i is a vector of exogenous child characteristics, and λ_f is a family fixed effect that varies across families, but is common to all children within the same family. The fixed effect does not only control for unobserved heterogeneity at the family level but also observable parent characteristics. The parameter of interest is θ. It measures

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[28] This is the so-called derivative condition, which implies that a child who loses one unit in permanent income, while a sibling gains the same amount, should receive one unit more in transfer relative to the sibling (see Cox, 1987). For tests of this condition with respect to bequests see e.g. Wilhelm (1996), McGarry and Schoeni (1995), and Hochguertel and Ohlsson (2009) with respect to *inter vivos* gifts. Unlike the altruistic model the exchange model makes no prediction about the correlation between transfer amounts and child income. It only predicts that the probability of transfer is negatively related to child income, as a higher income implies a higher cost of the child's time and thus a higher price of services.

[29] Models using within-family variation (twins and siblings) have also been employed to study the returns to education, see e.g. Aschenfelter and Krueger (1994) and Aschenfelter and Zimmerman (1997).

[30] In the case of two children the model reduces to a regression of the difference in incomes between child i and his/her sibling j on the similar difference with respect to the transfer amount.

how the transfer received by child i is related to her income, relative to the within-family averages.[31]

The analysis is based on children whose parents chose unequal division. That is because, if parents give to all children equally, there would be no correlation between the transfer and the income; any deviation would be random (McGarry, 1999). We study children of parents who have divided the estates unequally, either between the children or between family lines, separately.

Two outcomes are considered: the inheritance received from the deceased and the total transfer received from the deceased. We use the "+/- 2 percent" definition of equal sharing. Since the bequest from the deceased can only be unequally divided if there is a will, the analysis with respect to this outcome is based on a smaller sample of children than is the analysis with respect to the total transfer.

The regression results are reported in Table 9. We start by reporting the results from the analyses on children of parents who divided bequests unequally across children (Column 1). The coefficient estimate on the permanent income variable is negative but not statistically different from zero. This is in accordance with the results in Wilhelm (1996). The magnitudes of the estimates increase tenfold when total transfer received is used as dependent variable (Column 2). However, despite that the standard errors are largely the same as for the previous outcome the coefficients remain statistically insignificant. These findings could be seen as evidence against the altruistic model's prediction regarding perfect equalization which requires a negative one-to-one relationship between the differences in incomes and transfer amounts.[32]

One possible explanation for the absence of an effect is that the three year average of income is a poor proxy for permanent income.[33] The child's net worth may perhaps better capture her lifetime consumption possibilities. Also, the assets which comprise net worth may be more observable to the parent. The altruistic model predicts that parents should transfer more to children who are less well off in terms of wealth, implying that we would expect a negative coefficient if the theory holds up. Although the coefficient

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[31] We have also considered a version of Model (2) in which the transfer amount and permanent income enter in logarithmic form rather than in levels. The results in Table 8 are robust to this change in functional form.

[32] We have tested for heterogeneous responses across children from families with high and low income inequality, similarly to what we did in Section 4.2. The hypothesis is that compensatory transfers are more common in families with relatively high income inequality than in families with low income inequality. The results from this exercise, which are available on request, show however that the relationship between transfer amount and permanent income is statistically insignificant in both samples.

[33] The model presented in McGarry (1999) predicts that the relationship between bequests and current income is weak.

estimate is negatively signed it is statistically insignificant on conventional levels, for both transfer measures.[34]

Regarding the effects of the other covariates they could provide us with valuable information about, along which other dimensions parents may differentiate across their children. The results with respect to the bequest and the total transfer may be summarized as follows. Older children receive more than their siblings. This contrasts the findings in McGarry (1999). Daughters receive more than sons. While this could be interpreted as if parents have preferences for daughters over sons (as opposed to the predictions of Wedgewood, 1928 and Blinder, 1973) it could also be explained by the possibility that daughters provide more services than sons and are compensated accordingly (Cox, 1987).[35] An alternative explanation for why parent might give more generously to a daughter than to a son is because the daughter's offspring are certain to be genetic descendants (Cox, 2003).

Marital status does not have an impact on the transfer amount. Moreover, we find that education has significant explanatory power: children with lower secondary and upper secondary or post graduate education receive more than siblings with only primary education. To the extent that education is proxy for permanent income this finding supports the results with respect to income and wealth, that inheritances are not compensatory.

In accordance with what the exchange model predicts, children living in the same municipality as the parent receive more than their siblings. Moreover, being the oldest sibling is positively associated with the transfer amount. This birth order effect suggests that parent's decision confirms to lineal geniture. The interaction between first born and female is, however, negative implying that first born daughters receive less than first born sons, possibly suggesting that within family inequality in heritance is explained by primogeniture. Given the previous findings we would expect women living in the same municipality as the parent to receive larger transfers than their siblings. This is not what we find however. The coefficient on the interaction term of these characteristics is statistically insignificant with respect to bequests and significant negative with respect to the total transfer.

We have also considered cases in which the transfer is divided unequally between family lines (Columns 3 and 4). The samples over which we estimate Model (2) are larger because unequal sharing between family lines is more common than unequal sharing across children. Nevertheless, the results are largely similar to those appearing in Columns 1 and 2. The only

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[34] We have tested for the independent effect of both permanent income and net worth on the transfer amounts. The results, which are available on request, are largely similar to those presented in Table 8.

[35] Studies consistently report than women are more disproportionally involved in provision of parental care (Coward and Dwyer, 1990; Stoller et al., 1992) and that this is probably a result of their lower opportunity cost of time (see Ettner, 1996).

apparent difference is that family lines with married children receive more than family lines with unmarried children.

In sum, the analyses discussed previously indicate that inheritances from parents are not compensatory in the sense that lifetime poorer children receive higher transfers than their lifetime richer siblings. While this finding could be seen as rejection of the altruistic model it also cast some doubts on the exchange model which predicts that the parent will purchase more services from a low-income child because the cost of that child's time is relatively low. However, the fact that parent appear to use post mortem transfers to compensate children who are likely to have provided them with services may be considered as support for the exchange model.

Taken together, the results in Table 9 show that the coefficients on the indicators for *Age*, *Woman*, *Same municipality as parent*, and *First born*, are positive and statistically significant at the one percent level in all reported specifications.

Table 9: Family fixed-effects models of transfer amounts, inheritances and total transfers received.

Dependent variable:	Children		Family lines	
	Inheritance, amount[a]	Total transfer received, amount[b]	Inheritances, amount[a]	Total transfers received, amount[b]
	1	2	3	4
Permanent income	-0.0003	-0.0185	-0.0004	-0.0156
	(0.0255)	(0.0212)	(0.0188)	(0.0181)
Net worth	-0.0008	-0.0007	-0.0016	-0.0012
	(0.0033)	(0.0025)	(0.0024)	(0.0019)
Age	0.0274***	0.0523***	0.0242***	0.0423***
	(0.0063)	(0.0059)	(0.0054)	(0.0048)
Woman	0.2024***	0.2275***	0.1660***	0.1649***
	(0.0750)	(0.0800)	(0.0587)	(0.0592)
Marital status (reference: never married):				
Married	0.0409	0.0708	0.1026*	0.0925*
	(0.0731)	(0.0666)	(0.0569)	(0.0485)
Divorced	0.0206	0.0316	0.0824	0.0691
	(0.0822)	(0.0723)	(0.0636)	(0.0519)
Widow/widower	-0.0380	-0.1171	0.0266	-0.0283
	(0.1516)	(0.1239)	(0.1118)	(0.0898)
Education (reference: primary education):				
Lower secondary	0.1309**	0.1894***	0.1058**	0.1549***
	(0.0572)	(0.0680)	(0.0465)	(0.0503)
Upper secondary or post graduate	0.2270***	0.1628	0.1319**	0.1201
	(0.0848)	(0.1003)	(0.0664)	(0.0753)
Missing	-0.5740***	-0.3502*	-0.5222***	-0.3047**
	(0.1613)	(0.1855)	(0.1455)	(0.1498)
Big city county	-0.0562	0.1704	-0.0285	0.1368
	(0.0684)	(0.1236)	(0.0509)	(0.0866)
Same municipality as parent	0.2093***	0.3779***	0.1856***	0.3158***
	(0.0746)	(0.0845)	(0.0609)	(0.0655)
First born	0.3593***	0.5297***	0.3037***	0.4044***
	(0.1012)	(0.0843)	(0.0727)	(0.0637)
First born*Woman	-0.0672	-0.1921*	-0.0375	-0.1141
	(0.1205)	(0.1058)	(0.0871)	(0.0770)
Same municipality as parent*Woman	-0.0551	-0.1812*	-0.0720	-0.1515**
	(0.1021)	(0.0940)	(0.0808)	(0.0699)
No of children	3,476	6,167	4,367	8,105
No of families	1,285	2,289	1,642	2,973
R^2	0.8654	0.8906	0.9464	0.9215

Notes. [a]Observations are children in Will sample of families with unequally divided bequests. [b] Observations are children in Total sample of families with unequally divided total transfer. Definition of unequal sharing is +/- 2 percent. Family fixed effects are included in each regression. Monetary variables are in SEK 100,000. Education refers to the highest achieved level. Permanent income is calculated as the average of taxable labor income over the three years preceding death. Robust standard errors in parentheses. * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

We have estimated Model (2) with taxable gift and taxable insurance benefits as dependent variables. The analyses are based on children of parents who have given a gift or insurance to at least one child and who have distributed the transfers unequally, either across children or across family lines. The results are reported in Table 10.

Previous studies of gifts have documented that less well-off children benefit disproportionately from transfers (McGarry and Schoeni, 1995; McGarry, 1999; Hochguertel and Ohlsson 2009), results which are in line with the predictions of both altruistic and exchange models.[36] We do not, however, find any indications that the gift amount is related to either the child's permanent income or to her wealth. This contrasts with the results from the specifications using between-family variation (Table B1, Appendix B) as well as with the results reported in previous work. However, since we do not have information on when the gift was given we cannot disentangle the effects of permanent and current income in the determination of the transfers and therefore, test whether transfers are made in response to permanent differences in consumption or in response to liquidity constraints (Cox, 1990; McGarry, 2000).

Concerning the additional covariates these show that children with higher education receive more than their less educated siblings. Moreover, as for inheritance, we find that living in the same municipality as the parent has a positive impact on the gift amount. Likewise, firstborns receive more compared to younger siblings. The coefficients on the interactions between firstborn and woman and same municipality and woman are negative. Overall, our results with respect to gifts display a pattern which is similar to that for inheritances, suggesting that, as opposed to what has been demonstrated in the previous literature, the parent's decision regarding the distribution of these two transfers are similar.

The results from family fixed effects models with respect to insurance benefits are similar to the results from the corresponding specifications with respect to bequest and gift amounts in that neither permanent income nor net worth has statistically significant predictive power. However, unlike the previous transfers none of the coefficients on the demographic covariates are statistically significant. One explanation for the lack of relationship is that there is too little within-family variation, as a consequence of the small sample of children and families, to estimate the coefficient with a sufficient degree of precision.

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[36] In their seminal work on *inter vivos* transfers, Cox (1987) and Cox and Rank (1992) found evidence that parents tend to give more to better-off children, which in turn is inconsistent with altruistic behavior.

Table 10: Family fixed-effects models of transfer amounts, gifts and insurances, total sample

Dependent variable:	Children		Family lines	
	Gifts, amount	Insurances, amount	Gifts, amount	Insurances, amount
	1	2	3	4
Permanent income	-0.0361	-0.0910	-0.0360	-0.0816
	(0.0501)	(0.0963)	(0.0490)	(0.1027)
Net worth	-0.0073	0.0018	-0.0072	0.0018
	(0.0084)	(0.0041)	(0.0083)	(0.0040)
Age	0.0101	-0.0292	0.0087	-0.0269
	(0.0107)	(0.0272)	(0.0106)	(0.0274)
Woman	0.1314	-0.2958	0.1315	-0.2748
	(0.1404)	(0.4284)	(0.1360)	(0.4204)
Marital status (reference: never married):				
Married	-0.0951	-0.0108	-0.0934	-0.0125
	(0.1005)	(0.4638)	(0.0994)	(0.4509)
Divorced	-0.0388	-0.2472	-0.0243	-0.3240
	(0.1327)	(0.2964)	(0.1289)	(0.2859)
Widow/widower	-0.1073	-0.6382	-0.0922	-0.5880
	(0.2558)	(0.6425)	(0.2452)	(0.7007)
Education (reference: primary education):				
Lower secondary	0.1953**	0.2796	0.2037**	0.3248
	(0.0991)	(0.2256)	(0.0980)	(0.2678)
Upper secondary or post graduate	0.2613**	-0.4344	0.2668**	-0.3509
	(0.1295)	(0.4788)	(0.1270)	(0.3896)
Missing	-0.0964	-0.4228	-0.0833	-0.3589
	(0.4509)	(0.4427)	(0.4509)	(0.4348)
Big city county	0.1911	1.3724	0.1784	1.3708
	(0.1236)	(1.1082)	(0.1200)	(1.1106)
Same municipality as parent	0.4145***	0.7855	0.4030***	0.8251
	(0.1270)	(0.6409)	(0.1227)	(0.6792)
First born	0.3207**	-0.1675	0.2920**	-0.1513
	(0.1350)	(0.3755)	(0.1313)	(0.3658)
First born*Woman	-0.3036*	-0.3761	-0.3055*	-0.3408
	(0.1649)	(0.3844)	(0.1615)	(0.3579)
Same municipality as parent*Woman	-0.2423*	0.2781	-0.2259	0.2625
	(0.1435)	(0.2597)	(0.1385)	(0.2606)
No of children	1,669	646	1,717	663
No of families	643	276	663	283
R^2	0.8242	0.5365	0.8240	0.5485

Notes. Observations are children in Total sample of families with a gift/insurance going to at least one child, and who has divided the gifts/insurances unequally. Definition of unequal sharing is +/- 2 percent. Family fixed effects are included in each regression. Monetary variables are in SEK100,000. Education refers to the highest achieved level. Permanent income is calculated as the average of taxable labor income over the three years preceding death. Robust standard errors in parentheses. * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.

6 Discussion and concluding remarks

The objective of this paper is to shed light on the motivations which are at play when parents decide about issues regarding the distribution of their assets when they have passed away. For this purpose we use a new administrative dataset on the estate reports for almost 70,000 Swedish widows, widowers, divorcees, and unmarried individuals deceased in 2002–2004 with positive estates and two or more children, allowing us to study both to what extent parents divide their estates unequally between their children and if characteristics of the children determine whether they receive more than their siblings.

   We find that only 2-11 percent of the parents divide their estates unequally between their children. This finding could be seen as evidence against the two most prominent models explaining bequest motives—the altruistic model and the exchange model—which are both predicated on the idea that parents make unequal bequests. Moreover, we do not find that the transfer amount is correlated with the child's economic circumstances, measured either as permanent income or wealth. This could be seen as further evidence against the altruistic model which assumes that parents aim at equalizing marginal utilities across children by giving larger bequests to their least well-off children. Likewise, we do not find any relationship between the child's economic position and taxable gifts received during the past ten years. Although it should be noticed that parents might have compensated less advantage children earlier, with nontaxable amounts or unreported amounts, this finding strengthens our belief that the altruistic model plays a minor role in explaining the observed transfer patterns. We do find, however, that in families with unequally distributed estates, children who are more likely to have provide services to the parent (either because they are daughters or because they lived close to the parent) receive larger bequests than their siblings and also, that these children benefit disproportionately from taxable gifts. This could be interpreted as if, at least for some parents; transfers are motivated by exchange.

   Should the high degree of equal sharing be interpreted as if parents are indifferent about the division of their assets, or that most bequests are "accidental"? Not necessarily. There are at least four possible reasons for why equal sharing may reflect a deliberate choice.

   First, the estate allocation is public information through the estate inventory report. This allows children to directly see how their shares compare with their siblings' and thereby, might interpret this as if they are loved more or less than their siblings. Disfavored children may have reasons to consider the parent as unjust. If the parent cares about her reputation after death, equal treatment may be considered the most desirable outcome (Lundholm and Ohlsson, 2000 and Bernheim and Severinov, 2003).

Second, parents may choose equal treatment because the alternative, unequal sharing, could lead to jealousy and conflicts among the children and ultimately, a breakdown of the family as a social entity (Menchik, 1988 and Wilhelm, 1996).

Third, parents might distribute their estates equally because it is less costly and requires less effort and, therefore, may be more rational than other distributive principles.[37] The parent does not have to collect and compare information on the financial status of the children and the parent does not have to value the services provided by the children.

Fourth, parental bequests are received by people who are, on average, in their fifties, a stage of life at which the most obvious financial hardships are likely to have been solved. One possible explanation for the finding is therefore that few heirs are dependent on inheritance as a source of wealth to an extent that parents would find it motivated to deviate from equal treatment.

Previous studies also document that equal sharing of bequests is the norm. A noticeable difference, however, is that these studies report frequencies of unequal sharing which are substantially higher than those reported in the current paper, commonly around 20–40 percent. This is particularly true for studies of the United States. Should this be interpreted as Swedes being more equally minded than Americans? Not necessarily. We propose that differences between the countries in contextual factors, such as *inheritance law*, *tax treatment of transfers*, *income distribution*, and *welfare state*, may explain the discrepancy in results.[38]

Inheritance law. In Sweden, as in most other European countries, the default of the succession law is that the estate should be divided equally between the legal heirs. Thus, although the parent has the opportunity to follow her own conceptions of distributive justice, by writing a will, she may feel obliged to comply with the prevailing cultural (formal) norm, even if it contrasts with her own self-interest (see Laitner, 1997). The legal system in the United States on the other hand favors the testamentary freedom over the legal inheritance right. The deceased's property rights and desires are the main focus and children inherit the parent only if there is no will which prescribes differently, so-called intestate succession. In fact, the legislation allows parents to completely disinherit children. American parents may find it less stigmatized to deviate from equality because of the legally sanctioned discretion to dispose wealth according to own wish.

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[37] Parents may economize on decision costs by following a mechanical decision rule as suggested by Elster (1989).
[38] See Pestieau (2003) for an informative discussion on the role of institutional factors in explaining differences in transfer patterns between the United States and European countries.

Tax treatment of transfers. Differences in the taxation of estates, inheritances, and *inter vivos* gifts between the countries may also explain the differential findings. Under a progressive inheritance tax schedule, as in Sweden during the period we study, parents have incentives to allocate the estate equally as it minimizes the total tax burden, whereas under the case of estate taxation, as in the United States, the total tax burden is invariant to the estate division (Menchik, 1980; Laitner and Ohlsson, 2001).

Income distribution. The income distribution in Sweden is more compressed than the income distribution in the United States. This suggests that income inequalities within families are, or at least are perceived to be, smaller in Sweden than in the United States and hence, that Swedish parents may find it less required to divide unequally to achieve, what they consider to be, a fair outcome.

Welfare state. A more extensive egalitarian welfare state in Sweden, as compared to in the United States, may lead children to having to engage less in instrumental care of their parents and hence that, Swedish parents have fewer reasons to discriminate between children on the grounds of equity and reciprocity.

The Swedish society is often portrayed as equal in many aspects. In this study, we have shown that this seems to apply even when it comes to the distribution of wealth within families: equal division of parental bequests is the rule rather than the exception. This rule also seems to be stronger in Sweden than in the United States, which is often characterized as a more unequal society. We propose some potential explanations why this is the case, but we leave it to future studies to investigate which of them best explain the phenomenon. Our results nevertheless suggest that it is important to account for contextual factors when comparing empirical estimates regarding intergenerational wealth transfers across countries.

Appendix

Appendix A: Descriptive statistics

Table A1: Sample means, total sample and will sample, parents and children

	Parents				Children			
	Total sample	No will	Will sample	P-value (2-3)	Total sample	No will	Will sample	P-value (6-7)
	1	2	3	4	5	6	7	8
Age	83.6	83.7	83.5	0.182	54.0	54.0	53.8	0.010
	(9.9)				(10.5)			
Woman	68.0	68.7	64.9	0.000	49.6	49.4	51.0	0.000
Swedish citizen	99.0	99.0	99.2	0.013	99.6	99.6	99.7	0.013
Marital status:								
Married					56.6	56.5	56.9	0.250
Never married	1.7	1.7	1.6	0.196	21.9	22.4	19.6	0.000
Divorced	19.3	20.1	15.4	0.000	15.6	15.3	16.8	0.000
Widow/widower	78.9	78.1	83.0	0.000	3.2	3.3	3.1	0.259
Cohabiting	3.3	2.1	9.2	0.000				
Education:								
Primary	57.4	58.8	50.7	0.000	25.9	27.0	20.8	0.000
Lower secondary	19.6	18.8	23.2	0.000	44.4	44.9	41.6	0.000
Upper secondary or post graduate	5.8	5.0	9.5	0.000	26.7	25.4	33.7	0.000
Missing	17.2	17.3	16.6	0.046	3.0	3.0	4.0	0.000
Live in big city county	43.2	42.2	48.3	0.000	41.8	40.7	47.1	0.000
Live in same municipality as parent					49.6	50.4	45.3	0.000
No of children	2.8	2.8	2.7	0.000				
	(1.15)							
Children are of different sex	65.4	65.5	64.4	0.019				
Permanent income	126,218	121,029	150,992	0.000	233,993	231,596	245,996	0.000
	(77,760)				(161,010)			
Net worth at death (Estate of deceased)	215,008	181,312	375,911	0.000				
	(482,778)							
Net worth at death (Total transfer of the deceased)	278,784	235,476	485,591	0.000				
	(619,944)							
Net worth					636,132	587,816	880,074	0.000
					(2,135,297)			
No of obs.	68,090	56,300	11,790		190,163	158,502	31,661	

Note. Indicator variables are reported in percent. Standard deviations follow from the means for indicator variables and are only reported for continuous variables in parentheses.

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