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Evidence from inter vivos transfer behavior

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# The relationship between altruism and equal division. Evidence from inter vivos transfer behavior

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## Abstract

Several studies reject the implications of the altruism model. In this study it is argued that parents who transfer resources to their children both are altruistic and influenced by an equal division fairness norm. Under such motives, the degree of income compensation should be stronger in one-child families and we expect the altruism motive to dominate the fairness norm when income differences between siblings are large. The results suggest that equal divisions are intentional and weighted against altruistic motives.

JEL: D64, D91, H21

## 1 Introduction

The motivation behind transfers from parents to grown children has important implications for public policy. Central to the discussion is the question of whether parents behave according to the altruism model. Do they tend to compensate their children and divide transfers unequally between children whose needs are different? Empirical analyses find weak support for the predictions of the altruism model and that parents often transfer equal

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amounts to their children. How should one interpret this finding? One would reasonably assume that most parents are essentially altruistic towards their children in the sense that they care about their children's welfare and consumption possibilities. However, it is also reasonable to assume that they would like to treat their children fairly. If equal sharing is a fairness norm in society, parents will have to weigh their "pure altruism" against an equal division norm. In this case findings of equal division should not necessarily be interpreted as evidence of absent altruism and that bequests are non-intentional.

Here we explore the hypothesis that parents are faced with a trade-off between compensating the less well-off children and the desire to treat their children fairly. A modified version of the "pure altruism" model (Barro, 1974; Becker, 1974; Becker and Tomes, 1979) forms the theoretical underpinning of the empirical analysis. Parents are also assumed to act in response to an equal division fairness norm, where unequal division affects parents' utility directly. The trade-off will then be determined by the relative strength of the altruism motive and a fairness norm. This gives at least two testable hypotheses. First, the degree of income compensation should be stronger in one-child families since the fairness norm would not apply in these families. Second, we expect the altruism motive to dominate the fairness norm when income differences between siblings are large.

To test these hypotheses we employ a large dataset on inter vivos transfers between generations in Norway. Of particular salience here is that the respondents were asked questions relating to both their children and parents. We can therefore study the relationship between the respondent and her parents (if they are still alive) and the respondent and all her (grown-up) children. Furthermore, these data makes it possible to compare siblings directly. Both data sets are employed in testing the above conjectures, employing a Tobit model approach. The respondents were also asked to state their transfer motives, and these responses are also reported.

Conducting a standard analysis of inter vivos transfer behavior, we find estimates of the transfer-income derivatives close to results reported in Altonji, Hayashi and Kotlikoff (1997) with respect to the U.S. However, we also find that the recipient income derivative is significantly higher in one-child families than in multiple child families. Furthermore, the income derivative in multiple child families is non-linear, with a larger degree of parental compensation of income when the child's income is lower than mean or median income. We take this as corroborative evidence for the hypothesis that parents are faced with a trade-off between being compensatory and being fair.

Formally, our model shares similarities with those featuring in a number of studies, Menchik (1988), Wilhelm (1996), Stark (1998), Lundholm and Ohlsson (2000), and Bernheim and Severinov (2003), in that they all basically lead to the same predictions. For instance, Wilhelm (1996) includes a vector of observable parental characteristics to represent the psychic cost of unequal division, and discusses altruism empirically by employing data on bequests. Stark (1998) introduces negative utility of unequal division (called relative deprivation) in the child's utility function, and the cost is thus indirectly included in an altruistic parent's utility function. He argues that equal division is consistent with a model where the cost of unequal division emanates from altruism, rather than competes with altruism.

A number of recent papers discuss intergenerational linkages through inter vivos giving behavior instead of addressing information on bequests (see Altonji, Hayashi and Kotlikoff, 1997; Poterba, 2001). The growing awareness of parents' transfer behavior before death appears to have emerged because recent findings, for instance from the U.S., suggest a majority of parents divide their estates equally between children at death, while inter vivos gift behavior to a larger extent results from parents' consciousness of characteristics of children (Dunn and Phillips, 1997; McGarry, 1999). These findings have also prompted explanations in terms of costs of unequal divisions. Lundholm and Ohlsson (2000) assume that the cost of unequal division is only associated with bequests since these are public information, and parents who are worried about their post mortem reputation will use gifts to treat children unequally, as gifts to a larger extent are private information. Bernheim and Severinov (2003) develop equal division norm equilibriums for bequests from altruism, when an element of parental affection is added, affecting well being of children and observed through parental transfer behavior.

One reason for using data on inter vivos transfer behavior in the present study is that the equal division rule is, in fact, part of public policies in Norway. The Norwegian law of transmission limits parents' possibilities to differentiate between the descendants through bequests, as only one third of the estate can be transferred according to bequeathers' preferences. Two thirds of the estate is reserved for equal sharing between children. This means that discriminating between children through transfers at death is possible for only one third of the estate. The same regulations apply to gifts that are advancements of inheritance, and correspondingly they are an integrated part of inheritance tax bases. However, the transmission regulations do not apply for other inter vivos gifts. Thus, we expect that parents who face these restrictive transmission rules and want to transfer resources to

their children in accordance with their preferences, will transfer resources to children *inter vivos*. Such regulations are part of public policies in other European countries as well, and restrict the suitability of bequest data for testing the altruism motive and other transfer motives.

The plan of the paper is as follows: Section 2 reviews the Norwegian inheritance regulations, while Section 3 discusses the altruism model along with fairness considerations. Section 4 describes the data and provides some information with respect to self-reported motives for transfers to children. The econometric specifications and results are presented in Section 5, while Section 6 concludes the paper.

## 2 Norwegian gift and bequest laws

There are at least two sets of laws that impact on transfer behavior of Norwegian parents: the transmission law and the inheritance tax law. As noted above, the law of transmission between generations regulates the opportunity for compensatory activities. It states that children (or other close relatives) are guaranteed two thirds of the estate, for values up till 1 million Norwegian kroner (approx. \$155,000, Oct. 2005) per person. This appears to be similar to what Arrondel and Laferrère (2001) report as the case in France, and which they characterize as "directive altruism", i.e. a legal system which encourages transfers to close relatives. Transmission laws that are directive with respect to transfer to children exist in a number of other European countries (Pestieau 2003).

More important with respect to empirical analyses of altruism, each child is guaranteed an equal share of this mandatory transfer to children. If a parent leaves 750,000 kroner, her two children will receive a mandatory share of 250,000 each, while the bequeather can freely target the remaining 250,000 according to her objectives: to one of them, to charity, etc. Bernheim and Severinov (2003) argue that the equal division norm follows from an equilibrium where bequests signaling parental affection affects the subjective well-being of children. In Norway, unequal divisions are restricted by the law of transmission, making Norwegian bequest data less useful for deriving information about transfer motives, for instance the conjectures of the altruism model, as parents may be constrained from carrying out their true objectives. Parents might also adhere to the equal division rule with respect to the non-mandatory share as well; the equal sharing rule constituting a transfer norm. The fact that only about 25 percent transfer their assets through a will (Ministry of Finance 2000) suggests that a minority of par-

ents act intentionally when leaving bequests.

We assume that parents, under such circumstances, will carry out their intentional transfer arrangements through inter vivos gifts. The law states unequivocally that an equal sharing principle does not exist with respect to inter vivos transfers that are not advanced bequests. Such inter vivos gifts are also tax exempt. From a practical and administrative point of view, parents can transfer about 40,000 Norwegian kroner (approx. \$6,200) per year without the tax authorities becoming suspicious, according to tax-law experts. Inter vivos gifts that are considered as advancement of inheritance are both part of the tax base and limited by transmission laws. However, the real distinction between taxable inter vivos gifts and non-taxable inter vivos gifts is defined by the intention of the donor.

The inheritance tax is progressive and based on aggregated values of taxable gifts and bequests, see Appendix A where the tax scheme is enumerated. There are reasons to assume that a progressive inheritance tax also acts as an incentive to divide bequests equally. In light of these regulations, i.e., the law of transmission and the tax law, we believe information from inter vivos transfer behavior rather than information on bequests and taxable inter vivos transfers, is relevant to our discussion of altruism in intergenerational transfers in Norway. These transfers are as such untainted by provisions set out in the law of transmission and the inheritance tax law.

### 3 The model

The altruism model (Barro, 1974; Becker, 1974; Becker and Tomes, 1979) has been at the heart of recent empirical investigations of transfer motives, see Altonji, Hayashi and Kotlikoff (1997) and Laitner and Ohlsson (2001). Here we present a modified version of the model that incorporates a fairness norm of equal sharing, see Lundholm and Ohlsson (2000) for a related setup. Altruistic parents derive positive utility from own consumption,  $c^p$ , and their children's consumption, where  $c_i$  is the consumption of child  $i$  and  $n$  is the number of children, but they dislike unequal sharing of gifts,  $(b_i - \bar{b})$ , where  $b_i$  is the gift to child  $i$  and  $\bar{b}$  is the sibling average. Consumption of parents and children, respectively, can be seen as

$$c^p = e^p - \sum_{i=1}^n b_i \tag{1}$$

and

$$c_i = e_i + b_i, \quad i = 1, \dots, n, \quad (2)$$

where  $e^p$  is parental earnings, and  $e_i$  is earnings of child  $i$ . Assuming log linear parental utility and introducing a parameter measuring an equal division attitude we get

$$U = \ln c_p + \alpha \sum_{i=1}^n \ln c_i - \sum_{i=1}^n \frac{\gamma}{2} (b_i - \bar{b})^2. \quad (3)$$

The optimization problem can then be formalized as

$$\begin{aligned} \max_{b_1, \dots, b_n} U &= \ln \left( e_p - \sum_{i=1}^n b_i \right) \\ &+ \alpha \sum_{i=1}^n \ln (e_i + b_i) - \sum_{i=1}^n \frac{\gamma}{2} (b_i - \bar{b})^2, \end{aligned} \quad (4)$$

subject to  $b_i \geq 0$ . To illustrate the implications of this model, consider the first order conditions in the case of two children:

$$(b_2 - b_1) \left[ 1 + \frac{2\gamma}{\alpha} (e_1 + b_1) (e_2 + b_2) \right] = e_1 - e_2 \quad (5)$$

If there is no fairness attitudes ( $\gamma = 0$ ) then

$$b_2 - b_1 = e_1 - e_2, \quad (6)$$

This is the standard result of the altruism model. Parents treat their children symmetrically, and taking the  $e_i$ 's as given they balance their gifts in order to equalize children's consumption, net of transfers<sup>1</sup>. However, if  $\gamma > 0$  then

$$\left[ 1 + \frac{2\gamma}{\alpha} (e_1 + b_1) (e_2 + b_2) \right] > 1$$

and

$$b_2 - b_1 < e_1 - e_2 \quad (7)$$

i.e. parents will compensate less than in the case where they did not have a negative utility of dividing unequally. The larger the "fairness" parameter  $\gamma$  is, compared to the "altruism" parameter  $\alpha$ , the less they compensate income

<sup>1</sup>It is important to recognise that parents may well end up at a corner solution, where  $b_i = 0$ .

gaps between children. These results are easily generalized to the case with more than two children. It follows both from the standard altruism model and the modified altruism model above that transfers increase in parents' income

$$\frac{\partial b_i}{\partial e^p} > 0. \quad (8)$$

When it comes to the prediction that transfers are decreasing in the child's income

$$\frac{\partial b_i}{\partial e_i} < 0, \quad (9)$$

we assume that this depends on the relative strength of  $\gamma$  and  $\alpha$ . Generally, (9) holds in cases where there is no fairness considerations, for example when there is only one child.

Moreover, most empirical analyses of the standard model of altruism focus on the transfer-income derivative restriction,

$$\frac{\partial b_i}{\partial e^p} - \frac{\partial b_i}{\partial e_i} = 1 \quad (10)$$

which states that if transfers are positive, a small change in the income distribution, such as parents' income increasing by one unit and child's income falling by one unit, will be cancelled out by the altruistic parents' transfer of one unit. However, as it has been a focal point of many previous analyses, see e.g., Altonji, Hayashi and Kotlikoff (1997) and Laitner and Ohlsson (2001), we also address this derivative restriction and its components in the empirical analysis to follow.

That said, the main focus remains the two predictions of this modified altruism approach: First, that the degree of income compensation should be stronger in families with an only child; and second, that the "pure altruism" motive will dominate the fairness norm when income differences between siblings are large.

## 4 Data and descriptive statistics

This paper uses very detailed data from a survey conducted by Norwegian Social Research (NOVA) in the winter of 2001. The survey was intended to be nationally representative and sample selection used two-stage stratified random sampling. The number of households interviewed was 2,025, but in this study we only use households where one of the household heads was interviewed. This leaves us with a sample of 1,877 households.



The survey collected information on the household and its constituent members, such as wealth, income, employment status including attitudes to intergenerational relations. Both transfers given and transfers received were collected with a recall period covering the previous 12 months. All figures are in 2000 prices. The survey also collected information on educational attainment, economic situation and other characteristics of the interviewed household member's parents, in-laws, and grown children.

For the purpose of our analysis, we use two sub-samples from the basic sample. One sample is confined to all respondents with grown children. Here the dependent variable is transfers given in the last 12 months by the respondent household to their children. Each child-parent pair represents one observation; the number of observations in this sub-sample is therefore greater than the number of respondents. We have detailed information on the donor, and indicative information on each recipient. The second sample consists of all respondents with at least one living parent. The dependent variable is transfers received in the last 12 months, and we have detailed information on the recipient, but only indicative information about the donor. Of course, some of the interviewed households may be present in both sub-samples. Descriptive statistics for the two sub-samples are reported in Table 1 and Table 2.

A gift is defined as any money transfer, payment of regular or extraordinary expenses, payment of travels/holidays, interest on loans or down payments on loans, and financial support through transferring cars/housing or in other ways allowing the children to make free use of cars/housing. According to Table 1, 23 percent of households with grown children have given gifts to their grown children in the last 12 months. The conditional average value of these transfers is 67,000 kroner, although if we exclude four high values above 1 million, this figure is reduced to 30,000 kroner. For comparison, the average value of parent household income is 347,000 kroner. Table 2 shows that 19 percent of households with live parents report that they have received gifts in the last 12 months. The conditional average value of these gifts is 63,000, and again, if we exclude three high values above 1 million the figure is 22,000 kroner. In both samples, 80-85 percent of the amounts are lower than 40,000 kroner, which we previously argued would be the unofficial lower limit of a gift that would have to be reported to the tax authorities.

Table 1: Descriptive statistics for respondents with grown children

	Mean	Std. dev.	Min	Max
Parent characteristics				
Age of respondent	61	12	40	93
Married/cohabitant	.68	.46	0	1
Female respondent	.56	.49	0	1
High education*, father	.47	.50	0	1
High education*, mother	.43	.49	0	1
No of children	3.0	1.4	1	9
Household income**	347	198	0	1200
Respondent's income**	205	131	0	1150
Household net worth**	1729	1537	-245	11400
Yes, given gift <sup>§</sup>	.23	.42	0	1
Gift given in 1000 kroner <sup>§</sup>	12	153	0	5000
Gift given in 1000 kroner <sup>§</sup> > 0	67	355	1	5000
Child characteristics				
Age	43	10	18	73
Female	.49	.50	0	1
Married/cohabitant	.63	.48	0	1
High education*	.33	.47	0	1
Grandchildren	.56	.50	0	1
Unemployed	.18	.45	0	1
Student	.15	.36	0	1
Economic situation: bad	.06	.23	0	1
Economic situation: well	.43	.49	0	1

\* High education is college/university degree

\*\* In 1000 kroner, <sup>§</sup> last 12 months

Number of observations = 2021

Table 2: Descriptive statistics for respondents with live parents

	Mean	Std. dev.	Min	Max
Parent characteristics				
Father's age	65	11	38	105
Mother's age	65	12	35	101
Married/cohabitant	.51	.50	0	1
High education*, father	.41	.49	0	1
High education*, mother	.32	.46	0	1
Number of children	3.3	1.6	1	12
Yes, received gift <sup>§</sup>	.19	.36	0	1
Gift recieved in 1000 kroner <sup>§</sup>	12	225	0	7500
Gift recieved in 1000 kroner <sup>§</sup> > 0	76	556	1	7500
Child characteristics				
Age of respondent	38	10	18	74
Married/cohabitant	.70	.45	0	1
Female respondent	.55	.50	0	1
High education*	.42	.49	0	1
Grandchildren	.56	.49	0	1
Unemployed	.16	.36	0	1
Student	.13	.34	0	1
Economic situation: bad	.10	.29	0	1
Economic situation: well	.54	.49	0	1
Household income**	421	282	0	6600
Respondent's income**	244	135	0	1200
Household net worth**	1290	1234	-740	13020

\* High education is college/university degree.

\*\* In 1000 kroner, <sup>§</sup> last 12 months

Number of observations = 1263

Table 3: Parents' attitudes to inter vivos transfers

What kind of economic obligation do you think parents should have towards their grown children?		
	All parents	Donor parents
Only in emergencies	.68	.64
Education, house and family formation	.26	.33
Same living standard as parents	.04	.02
When parents that have more than one child give economic support, how do you think they should divide the resources?		
	All parents	Donor parents
Equal sharing	.73	.67
According to need	.23	.29
To the most helpful child	.01	.02
To the most able child	.00	.01
No of observations	1512	348

#### 4.1 Reported attitudes

The survey also asked about attitudes towards intergenerational transfers and motives for transfers. Such evidence is also reported by Light and McGarry (2004). Since our claim is based on an assumption of parents' attitude to fairness, it would be useful to see how they stand on these questions. The question "what kind of economic obligations do you think parents should have towards their grown children?" can be related to the degree of altruism since the response alternatives ranged from "they should be helped only in emergencies" to "they should be helped so that they may attain the same living standard as their parents". It is interesting to note that the creators of the survey did not consider "they should not be helped" as an option, and the non-response to the question about objectives is low. As shown in Table 3, a majority of the parents believe children should only be helped in emergencies. The group of parents actually transferring resources to their children is identified as donor parents and the table shows that they are somewhat more inclined to agree about giving children help for purposes of education, house purchase and starting a family, but the difference between donors and the rest is small.

In the present study we employ information on gifts given in the last 12

months. Parents were also asked about the reason for giving: a) to support a child's education, b) help them buy a house, or c) as an advance of their inheritance. Questions like these open up a new set of problems since the answers depend on the parents' age (inheritance advances in particular); we therefore use this information cautiously. We nevertheless see that 50 percent of the parents had helped their children get an education and 26 percent had helped to buy a house. Comparing these figures with the 26 percent who believed in helping children to get an education, there seems to be a discrepancy between theory and practice.

A related question was: "When parents with more than one child want to help them economically, how do you think they should divide the money between them?" Table 3 shows the majority prefer equality. Very few answer that they would want the most helpful child or able/talented child to be treated preferentially. Although a sizeable number believes in preferentially helping the child in most need, equal sharing does seem to be the general norm of fair division. The donor parents are also asked about the actual division of the gifts. Among parents with more than one child, 45 percent believed they had shared equally between them. Calculations of actual behavior show that about 30 percent only approximated equal sharing (within 10 percent of exactly equal sharing). Again there is a discrepancy between theory and practice. We conclude that equal sharing, while often the stated norm, seems difficult to practice when parents face the needs or merits of the children. The next sections probe deeper into this issue.

## 5 Econometric specification and results

In this section we explore the determinants of the transfer amount in the form of a transfer function, using the two datasets above. In the absence of precise information on income and wealth of parent and child households at the same time, we will be employing indicators when detailed information is missing. We estimate the function on both samples in order to compare results and assess the effects of employing proxies for income and wealth. It follows from Section 3 that a general specification of the transfer function can be

$$b_{ij} = g(e_j^p, e_i, X, u_{ij}) \quad i = 1, \dots, N; \quad j = 1, \dots, P;$$

where  $b_i$  is the transfer to child  $i$ ,  $e_i$  is the recipient/child income,  $e_j^p$  is the donor/parent income,  $X$  is a set of controls describing both donor and recipient household characteristics that contribute to determine transfer flows, and  $u_{ij}$  is an error term capturing unobserved factors that influence transfer behavior. There are  $N$  number of children and  $P$  ( $< N$ ) number of parents in the data, which means that some children link up with the same parents. Some variables may be used to proxy permanent income, such as educational level, while proxies for transitory income may be information about the child being unemployed or a student.

As is apparent from Table 1 and Table 2, more than two thirds of the surveyed households neither gave nor received transfers during the surveyed year. As the model in Section 3 predicts, parents may end up with a corner solution with transfers equaling zero. This would explain some of the zero observations, others however may be due to the survey design which only includes gifts made or received over the last 12 months. In other words, zero transfer observations include parents who will make or have made a transfer in other periods and families in which parents who will never make transfers or children that might never receive transfers. Regardless of the explanation, ignoring the presence of the large number of zero values will result in the same type of biased inference produced by censoring. Here we use a Tobit model to account for the presence of non-participant households when analyzing the transferred amount:

$$b_{ij}^* = \eta_1 e_j^p + \eta_2 e_i + X\beta + u_{ij}, \quad (11)$$

where

$$b_{ij} = \begin{cases} b_{ij}^* & \text{if } b_{ij}^* > 0 \\ 0 & \text{if } b_{ij}^* \leq 0 \end{cases}$$

and  $b_{ij}^*$  is the latent transfer to child  $i$ . The corresponding Probit is reported in Appendix B.

## 5.1 Determinants of inter vivos gifts

Table 4 reports the Tobit estimates for inter vivos gifts in the last 12 months, measured in 1,000 kroner. The first four columns show results of the estimation after taking parental level information in the data into account. In the last two columns, the adult child is the unit of observation.

We find a significantly negative effect of recipient income on the amount of inter vivos gifts. This confirms the standard hypothesis that a child with low income will receive a larger transfer from her parents than a child with high income, all other things equal. We replaced the child’s household income with household income per person, without affecting the results. Further, parents’ income and wealth have the expected positive sign. However, the size of the coefficients is small, especially in view of the transfer-income derivative; that a unit’s increase in parental income combined with a unit’s decrease in child income should yield a transfer response of one unit, or

$$\eta_1 - \eta_2 = 1.$$

According to the results in Table 4 the two would sum to 0.09 [0.05-(-0.04)] which is far from 1. We return to this estimate shortly when we examine whether the transfer derivative of recipient income in one-child families deviates from estimates of larger families, because of fairness considerations.

Let us first consider the effects from other variables. The transfer declines as the parent household ages, where age is set equal to the mother’s age in two-parent households. It makes no difference for the results whether we consider the child’s age or the parent’s age. Descriptive statistics show that transfers are smaller and more frequent when children are younger, and conversely larger and less frequent when parents and children are older.

It seems to be of little importance for the size of a transfer whether the parent household comprises one or two persons, since the coefficient of the two parent dummy is both small and insignificant. However, two-parent households’ income is normally larger than the income of one-parent households, and this effect is apparent in column three, where the two-parent dummy is rendered positive and significant when the parents’ household income is omitted from the regression. Similarly, we know that parental education correlates with household income. These variables also become increasingly important when income and wealth is omitted. High education of both mother and father has a significant effect on the size of a transfer,

Table 4: Tobit results for inter vivos gifts in 1000 kroner

	Donor households				Recipient hh.	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Parent characteristics						
Household income*	.050	.021	–	–	–	–
Household net wealth*	.011	.002	–	–	–	–
Age	-.407	.423	-.477	.351	-.715	.247
Couple	2.60	13.3	38.3	11.2	-2.56	6.07
Number of children	-14.6	2.81	-15.7	2.56	-4.43	1.71
College/university, father	11.9	7.64	21.3	7.20	22.1	5.28
College/university, mother	10.6	8.21	22.6	7.83	12.0	5.42
Child characteristics						
Household income*	–	–	–	–	-.041	.015
Female	-6.59	6.29	-4.11	5.94	-1.29	4.65
Couple	.752	13.1	-3.28	12.1	-5.41	6.07
College/university	15.8	6.88	21.1	6.57	9.40	4.90
Grandchildren	-8.13	8.14	-12.5	7.69	-4.08	5.10
Unemployed	19.1	14.1	14.5	13.1	3.71	6.44
Student	20.9	8.72	24.6	8.27	12.4	6.15
Economic situation: bad	37.9	10.9	39.1	10.4	1.89	7.16
Economic situation: well	-22.8	7.41	-17.2	6.95	-12.1	5.22
Constant	-73.2	31.3	-67.8	25.7	22.7	16.3
<i>se</i>	84.4	3.53	85.7	3.49	48.8	2.81
Log likelihood	-2333.4		-2553.2		-1254.9	
PseudoR <sup>2</sup>	0.05		0.04		0.04	
Number of obs.	1667		2016		1105	

\* in 1000 kroner



but note that the effect of having a mother with high education is stronger than that of a father with high education.

Not surprisingly, the size of the transfer declines with the number of children, or the number of potential recipients. The proxies for the child's permanent income, such as being a couple/married and having completed higher education (previous versions of the model included a dummy for home ownership, but this variable proved consistently insignificant), does not seem to affect the chance of getting a transfer, especially after controlling for household income.

## 5.2 The transfer derivative with fairness considerations

In section 3 we proposed an alternative model where parents with more than one child face a trade-off between compensating one child's income and giving equally to all children (acting fairly). We would therefore expect the income compensation to be smaller in families with two or more adult children than in families with only one child. In other words, parental altruism is more accurately described in one-child families, since these parents do not have to struggle with the equal division norm.

Table 5 presents results of separate regressions for families with one child and families with two or more children, using the recipient data set. We remember from Table 4 that the overall estimate was -.04. Table 5 shows a big difference in the estimated transfer derivative, dependent on number of children: -.27 for one-child families, and only -.03 for children with siblings. The difference between the two is significant at a 5 percent significance level, confirming the hypothesis that an only child receives more income compensation from her parents, indicating the effect of an equal division norm, competing with "purely" altruistic motives.

Although the estimated transfer derivatives for recipient income do differ depending on the number of children, the number of observations is low in the sub-sample of one-child families. Note also that all other explanatory variables are insignificant in the regression reported in the first two columns, except recipient income and the dummy for high education of mothers.

## 5.3 A non-linear response to child income?

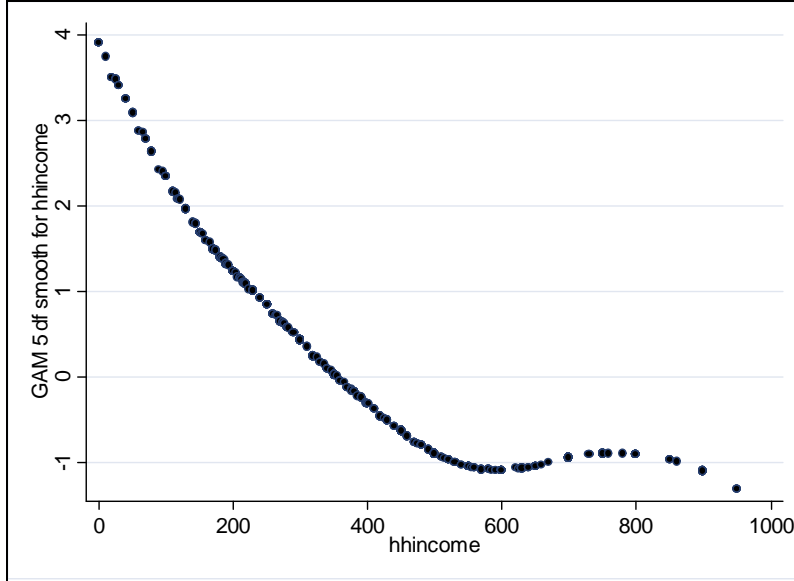
As stated above, parents that weigh altruism against equal division considerations might be involved in unequal gift behavior when differences between children exceed a certain level. In other words, parents will only compensate a child with an income substantially below the sibling average. We would

Table 5: Tobit results for inter vivos gifts by number of children

	One child		Two or more children		All.	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Parent characteristics						
Age	-.039	.616	-.880	.237	-.715	.247
Couple	22.3	16.8	1.71	4.98	-2.56	6.07
Number of children	–	–	-4.26	1.91	-4.43	1.71
College/university, father	-6.42	13.5	23.9	5.67	22.1	5.28
College/university, mother	44.5	16.4	9.69	5.79	12.0	5.42
Child characteristics						
Household income*	-.266	.089	-.034	.016	-.041	.015
Female	-2.61	14.1	-1.94	4.91	-1.29	4.65
Couple	19.7	22.5	-6.94	6.39	-5.41	6.07
College/university	24.1	14.2	8.79	5.20	9.40	4.89
Grandchildren	11.4	16.2	-4.56	5.36	-4.08	5.10
Unemployed	12.3	24.8	4.39	6.74	3.71	6.44
Student	-1.49	18.4	13.2	6.49	12.4	6.15
Economic situation: bad	-42.1	26.8	4.59	7.51	1.89	7.16
Economic situation: well	-7.69	16.9	-10.9	5.52	-12.1	5.22
Constant	6.90	47.5	25.5	17.2	22.7	16.3
<i>se</i>	31.4	6.16	49.7	2.99	48.8	2.81
Log likelihood	-85.6		-1163.3		-1254.9	
PseudoR <sup>2</sup>	0.11		0.04		0.04	
Number of obs.	64		1041		1105	

\* in 1000 kroner

Figure 1: Fitted spline for inter vivos gifts by recipient household income



therefore expect to find compensating transfers below a certain level of income. Graphically we investigate this hypothesis by using a semi-parametric regression method, which has the advantage of not imposing any restrictions on the functional form when relating income to gift amounts. The profile in Figure 1 is a fitted spline to the variable recipient household income, while the parametric part of the equation consists of the other variables in the model. According to the figure, inter vivos gifts seems to be negatively related to household incomes lower than 500,000 kroner, and approximately flat or zero for incomes above that level. If we compare this to the average income in recipient households, which is 420,000 kroner in the sample, we see that a child's income is negatively related to transfers when the child has lower than average income.

In light of the plot in Figure 1 the transfer derivative could probably be approximated by a piecewise linear function, where the transfer derivative is allowed to change at the lower quartile (250,000 kroner) and the upper quartile (550,000 kroner) of the recipient income distribution. Table 6 shows the results of replacing recipient income with a piecewise linear function

Table 6: Tobit results with non-linear transfer response to income

	Two or more children	
	Coefficient	Std. Err.
Low household income* (<250)	-.167	.056
Medium household income* (250-550)	-.083	.035
High household income* (>550)	-.009	.066
Other controls as in table 3 & 4		yes
<i>se</i>		49.88
Log likelihood		-1186.15
PseudoR <sup>2</sup>		0.04
Number of obs.		908

\* in 1000 kroners

defined as

$$\begin{aligned}
 \text{low income} &= \begin{cases} e_i & \text{if } e_i \leq 250 \\ 250 & \text{if } e_i > 250 \end{cases} \\
 \text{medium income} &= \begin{cases} e_i & \text{if } 250 < e_i \leq 550 \\ 550 & \text{if } e_i > 550 \end{cases} \\
 \text{high income} &= \begin{cases} 550 & \text{if } e_i \leq 550 \\ e_i & \text{if } e_i > 550 \end{cases}
 \end{aligned}$$

The sample used is child respondents with siblings and the other variables are the same as in Tables 3 and 4. Given the size of the standard errors, the estimated coefficients for the three income segments in Table 6 are not significantly different from each other. Nevertheless, they strongly suggest non-linearity in the transfer derivative: -0.17 for low-income households and zero for high-income households. Alternatively, we could have chosen median household income as the knot. The estimated transfers derivatives would then have been -.10 (.02) for incomes lower than the median and -.02 (.03) for incomes above the median (with standard errors in parentheses). For incomes above the mean or median income in the sample, the relationship between gifts and income is not significantly different from zero.

Cox, Hansen and Jimenez (2004) also find a non-linear relationship when using data from the Philippines, but they offer a different interpretation, arguing that exchange motives dominate altruism above a threshold level.

In our interpretation, parents with more than one child face a trade off between a child’s need and the fairness norm of sharing equally between their children. When the income of a child is above average, we assume the economic situation of the child is adequate, and parents can give preference to equal sharing.

#### 5.4 Sibling comparisons

One of the advantages of our dataset is the opportunity it gives to examine the relationship between unequal treatment and the level of income by comparing siblings directly. In the two previous subsections we used the subset of data with the child as the unit of observation, and with detailed information about the child’s income. Here we employ data with parents as the respondents. This enables us to exploit information on transfers to children with the same parents, to address the question of income differences and transfers.

In the previous subsections we were forced to evaluate the child’s income in relation to the overall sample mean or median, since the incomes of the child’s siblings were unknown to us. Here, we use accurate information of transfers together with indicator information about the economic situation of children in a family. The empirical model is

$$(b_{ij} - \bar{b}_j) = \gamma Z_j^p + \beta_k (x_{kij} - \bar{x}_{kj}) + \varepsilon_{ij}, \quad (12)$$

where  $(b_{ij} - \bar{b}_j)$  is child  $i$ ’s transfer measured as a deviation from the total sibling mean,  $Z_j^p$  is a set of controls concerning the parents’ characteristics, and the  $x_k$ ’s are different indicator variables describing the child’s economic situation. We denote these variables with subscript  $k$  as these variables are derived from information about siblings, choosing one child as the reference. Some of these variables are dummy variables, such as the existence of grandchildren, sex (where 1 denotes female), and being a student or unemployed. Since we use one child as reference, differences yield variables that range from 1 to -1. Education is reported at three levels, primary school, high school and college/university. Economic situation assessed by the parents also takes three values (bad, ok, good). In order to evaluate our results in light of an alternative hypothesis about inter vivos gifts, i.e., the exchange motive (Bernheim, Shleifer and Summers, 1985; Cox, 1987), we included variables for the degree of contact between parents and child and services provided. The degree of contact ranges from 1 to 5 and the higher the value, the more extensive the contact; service levels take three values where 1 is none, 2 is some and 3 is often.

Table 7: Deviation from sibling average

	Tobit		Tobit	
	Coef.	S.E.	Coef.	S.E.
Parent characteristics				
Age	-.012	.170	–	–
College/university, father	4.01	3.04	4.54	4.10
Household income*	.022	.008	.031	.010
Number of children	-3.26	2.00	-5.47	2.71
Sibling differences				
Age	-1.15	.510	-1.64	.636
Sex	-4.28	3.44	–	–
Educational level	6.71	3.48	7.57	4.60
Grandchildren	1.22	4.29	–	–
Economic situation	-17.8	4.01	-23.0	5.32
Student	-.047	3.79	–	–
Unemployed	6.51	3.03	8.08	3.79
Contact with parents	2.78	2.30	3.10	3.06
Service provided	-11.2	6.94	-15.7	9.31
Constant	-33.1	13.2	-42.3	9.30
<i>se</i>	18.2	1.93	24.7	2.56
Log likelihood	-377.2		-403.6	
Pseudo R2	0.10		0.09	
No of observations	853		912	

\* in 1000 kroners

Table 8: Probabilty of unequal sharing

	Probit	
	Marg. effect	S.E.
Parent characteristics		
Age	-.025	.009
College/university, father	.132	.159
Household income*	-.147	.046
Number of children	.591	.135
Constant	.998	.691
Log likelihood	-198.2	
Pseudo R2	0.08	
No of observations	355	

\* in 100,000 kroners

Table 7 shows the result of a Tobit based on equation (12).

The only variable to significantly affect the size of unequal gift distribution (at the 5 percent level) is the child's relative economic situation and unemployment status. Parents pass on more gifts to a child that is worse off than her siblings, or an unemployed child with working siblings. Again, we find evidence of altruistic motives among parents, in accordance with results presented above. Information about siblings holds the promise of describing such relationships very accurately

At a lower significance level we find that older children get less than their younger siblings and that higher education seems to favor above average transfers. Removing studying children from the sample makes no difference here. As mentioned above, students receive a significant amount of income compensation, but the results given in Table 7 suggest that parents do not treat their children differently when one of them happens to be a student. There is a lower correlation between student status and the parents' evaluation of economic situation than one might expect. As the same goes for unemployment, a child's circumstances may not always be representative for his or her household situation. Finally, results reported in Table 7 suggest that frequent contact with parents does not increase parental generosity. Strangely, it seems the more a child helps his or her parents relative to their brother or sister, the less gifts he/she gets, although the effect is only sig-

nificant at a 10 percent level. The controls for parent characteristics may be difficult to interpret since one parent has given characteristics, and if he gives more than average to one child he must necessarily give less than average to another child and the total effect of parent characteristics on the deviation may be unclear.

We therefore include the Probit results in Table 8: the probability of unequal sharing is conditional on a gift being given as a function of parental characteristics

$$\text{Prob}(y = 1) = \Phi\left(\theta Z_j^p\right) \text{ where } y = 1 \text{ if } \begin{cases} \frac{b_{ij}}{\bar{b}_j} > 1.1 \\ \frac{b_{ij}}{\bar{b}_j} < 0.9 \end{cases}$$

We find that the probability of unequal sharing declines significantly with age and income and increases with number of children.

## 6 Concluding remarks

Information on the transfer behavior of Norwegian parents is important from a public policy perspective, not the least since a recent tax commission (Ministry of Finance, 2003) suggested eliminating wealth taxation in Norway and widening the scope of gift and inheritance tax regulations. As discussed for instance by Gale and Slemrod (2000) and Kaplow (2001), an inheritance tax is expected to distort behavior when parents are altruistic. If parents behave in accordance with the altruism model, taxes on intergenerational transfers are likely to deplete donors' savings (Kotlikoff and Summers, 1981; Kopczuk and Slemrod, 2001) and lower the incentive to work. No such harmful tax effects on donors' behavior exist if bequests are unintended, that is, follow from death before donors have been able to consume all their wealth (Davies, 1981).

In this perspective it is of key importance to interpret the behavior of parents that divide transfers equally between children. Here we present the hypothesis that parents are faced with a trade-off between compensating income and being fair. As evidence we find that the recipient income derivative is significantly higher in one-child families than in multiple child families; the income derivative in multiple child families is non-linear, with a larger degree of parental compensation of income when the child's income is lower than mean or median income; and in a comparison of sibling characteristics, economic situation seems to be the main determinant of unequal division of inter vivos gifts. Usual estimates of average transfer-income derivatives



are therefore in danger of concealing important indications of parental involvement. The evidence presented here indicates that Norwegian parents are more concerned about children's utility than traditional measures lead one to believe. In light of this, average measures of the transfer-income derivative may suppress important evidence of altruistic behavior.

We would also like to point out that Norwegian transmission laws have had strong effect on our choice of empirical strategy, i.e., that we employ information on non-taxable inter vivos transfers. Such considerations might be relevant to data analyses of information from other countries as well, when data are obtained from individuals that act under strong transmission regulations. Finally, we need to emphasize that we focus on financial transfers from parents to children in this analysis. A more comprehensive approach would add other types of transfers and permit transfers in both directions, i.e., from children to parents as well.

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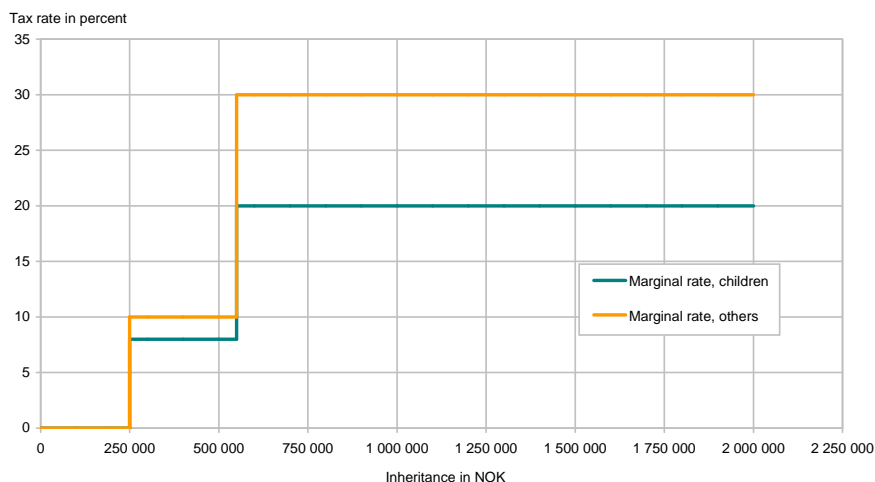
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## A The Norwegian inheritance tax system

The aggregation of gifts and bequests to establish the tax base is in accordance with the taxation of bequest in a number of other countries, as Sweden, France, U.K, and the U.S. Spouses are considered as two donors, which means that the value of an asset that is owned by both parents (matrimonial asset) is divided into two parts, one for each parent, when calculating the tax base. As the statutory tax rate system is progressive this is advantageous for the tax-paying child. As shown in Figure 1 the inheritance tax rate scheme (at the time of data collection) implies that inheritances below 200,000 kroner (approx. \$23,000 in 2000) is tax exempt, while a two-tier rate system applies to inheritances above that, commencing at a rate of 8 percent, while transfers above 500,000 kroner (\$57,000) are taxed at a rate of 20 percent. This scheme also applies to parents of the deceased.

Figure 2: The Norwegian inheritance tax rate system, 2004



The figure also shows that the rates for other relatives and other heirs under a will are 10 percent and 30 percent in the two brackets, respectively. Inter-spousal gifts and bequests are not taxed. The general valuation rule is that assets should be valued at the market value. However, there are some important exemptions. For non-listed shares and interests in partnerships, firstly, the value of the company is calculated by excluding values of most intangible assets, as goodwill, by setting real estate values very low, and, secondly, only 30 percent of the total value is included in the tax base. The

main purpose of this rule is to facilitate the transfer of family businesses. Moreover, as taxation in most cases is based on values reported by tax-payers to tax authorities, there are incentives to report low values.

## B Probit results

We use a standard Probit model to account for participation

$$\Pr(b_i > 0|X) = \Phi(\eta_1 e^p + \eta_2 e_i + X\gamma)$$

The functional form and explanatory variables correspond to the Tobit in equation (11) and table (4).

	Donor households				Recipient hh	
	Marg. effect*	S.E.	Marg. effect*	S.E.	Marg. effect*	S.E.
Parent characteristics						
Age	-.003	.001	-.004	.001	-.004	.001
Couple	.026	.036	.105	.025	.012	.022
Number of children	-.053	.009	-.050	.007	-.019	.007
Household income**	.026	.008	–	–	–	–
Household net wealth**	.003	.000	–	–	–	–
High education, father	.048	.028	.078	.025	.044	.027
High education, mother	.126	.029	.147	.026	.047	.029
Child characteristics						
Female	-.022	.021	-.025	.018	-.009	.022
Couple	-.053	.043	-.067	.038	-.028	.029
Household income**	–	–	–	–	-.020	.007
High education	.016	.023	.154	.022	.046	.024
Grandchildren	-.012	.027	-.030	.023	-.033	.024
Unemployed	.051	.046	.043	.040	.022	.033
Student	.121	.036	.132	.032	.104	.040
Economic situation: bad	.271	.059	.245	.051	.062	.040
Economic situation: well	-.073	.022	-.047	.020	-.067	.025
$E \Pr [b_i > 0]$	.200		.191		.180	
Log likelihood	-723		-879		-441	
PseudoR <sup>2</sup>	.22		.20		.15	
Number of obs.	1671		2021		1108	

\* Marginal effect for dummy variables is a discrete change from 0 to 1

\*\* In 100 000 kroner