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Parent-Child-Transfers in Germany: A Study of Magnitude and Motivations*

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1. Introduction

In recent years, intergenerational relations have become a field of growing interest among economists. Voluntary resource transfers among family members are increasingly recognised as important aspects of a country's economy. According to Gale / Scholz (1994), the estimated annual flow of financial support given to children, grandchildren, parents and grandparents in the U.S. amounted to approximately 41 billion dollars in 1986, a figure that well exceeds transfers from various government assistance programs (McGarry 1997).

Private transfers are usually differentiated by their timing. While gifts, or transfers inter-vivos, are given during the donor's lifetime, bequests are transfers given after the donor's death. Much of the empirical literature is devoted to the study of bequests (Menchik 1980, Menchik 1988, Tomes 1981), a fact which is perhaps due to the limited availability of data on inter-vivos transfers. Only in recent years has an increasing number of studies from the U.S. focused on inter-vivos transfers (e. g. Altonji et al. 1997, Cox 1987, McGarry / Schoeni 1995, McGarry 1997)

For Germany, however, empirical evidence on private transfers, inter-vivos and post mortem, remains scarce. It is the purpose of this study to estimate the magnitude of inter-vivos transfers in Germany and to analyse the determinants of parent-child transfers. Projections from the German Socio-Economic Panel (GSOEP) show that parent-child transfers amounted to approximately 17 billion DM in 1995, indicating the empirical importance of such transfers. To my knowledge, this is the first time data on inter-vivos transfers from the GSOEP are systematically analysed. Earlier studies using

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the GSOEP have focused on the influence of bequests on household wealth (Schlomann 1990) or remittances of guest workers to their home countries (Merkle / Zimmermann 1992, Oser 1995). Unfortunately, the GSOEP data are not as detailed as the data from some recent U.S. surveys. In particular, the lack of important data on most recipients' characteristics, such as income, age, or education does impede an informative test of alternative hypotheses concerning motives for inter-vivos transfers using the full GSOEP sample. However, data on recipients are available for "split"-households, i.e. households of (mostly) children who lived in their parents' household in the first wave of the panel and were followed after moving out.

From the available data I have constructed two different data sets: one is a "parent" sample which contains information on various characteristics for parent households but no information on the children's characteristics (except for the number living outside the parental home). Even if the latter information is lacking, it is still possible to gain some important insights into the transfer behaviour of German households. For example, one aspect of transfer behaviour neglected in previous research will be addressed: the possibility that inter-vivos transfers are made in response to children's life-cycle events, such as moving out of the parent's household. It is further possible to relate transfer behaviour to the presence of persons in need of long-term care in the donor's household. The other sample used in this study is a "matched" sample, where I matched data on parents and "split"-households.

As in most U.S. studies, altruistic as well as exchange explanations for private transfers are supported to some degree by the data. The results from the parent sample indicate that transfers to children might be altruistically motivated, for example to aid children who form their own household. The matched sample, however, which can be used for more explicit tests of transfer motives, provides strong evidence against purely altruistic transfers.

2. Explaining Parent-Child Transfers

The existing literature on private transfers distinguishes between several explanations for parent-child transfers, the most prominent among them being the altruistic transfer model (Becker 1974) and the exchange model (Cox 1987). In the following, I briefly describe both models and their implications for empirical research.

According to the standard altruistic transfer model, parents derive utility from the well-being of their selfish offspring.[2] If in the eyes of the parents a

[2] The assumption that families can be characterised by altruistic parents with selfish children can be justified in an evolutionary context. The basic idea which dates

child fails to meet a specific level of welfare compared to the parents', they will transfer resources to this child until parents' and child's welfare are in balance. In other words, parents tend to equalise children's and own income. In its strong from, the altruistic transfer model predicts that parents will increase payments to a child by exactly one dollar if their own income is increased by one dollar *and* the child's income is decreased by one dollar. This prediction makes clear why (operative) parental altruism implies Ricardian equivalence (Barro 1974): let the government give one dollar to a parent today and take that dollar from the child tomorrow. An altruistic parent will respond by increasing bequests at the expense of own consumption by precisely one dollar, so that neither the parent's nor the child's consumption will be altered.

A further implication of the altruistic model is that parents should generally not divide their estates equally among their children, as it is common in most developed countries. Inter-vivos transfers and bequests should instead be used to compensate poorer children. However, empirical evidence generally contradicts the hypotheses derived from the strong version of the altruistic model (Altonji et al. 1997, Menchik 1988, Wilhelm 1996).[3] A weaker version, predicting *some* compensation for poorer children by unequal inter-vivos transfers, a weak positive correlation between parent's income and transfers, and a weak negative correlation between children's income and transfers, is corroborated by various studies (McGarry 1997, Dunn / Phillips 1997, Lafferère 1992).

The exchange model claims that relationships between parents and their adult children are defined by reciprocity instead of altruism. It is assumed that children provide personal services for which there may not be good market substitutes, such as care and affection, to their parents and receive money transfers (inter-vivos or after the parents' death) in return. If children's services are a normal good, the parents' demand for services increases as their income increases. The empirical observation of a positive relation between parental income and transfers is thus compatible with the altruistic as well as with the exchange model. The relation between children's income and transfers is ambiguous and depends on the elasticities of demand

back to Ronald Fisher (1952) is that an individual's inclusive fitness can be improved by helping those relatives with a higher expected fertility or reproductive value. The older generation should hence support the younger generation, whereas the younger generation should not support the older one. This idea has recently been formalised by Linster (1998). Unsurprisingly, the described preferences (altruism towards one's children, selfishness towards one's parents) prove to be evolutionary stable.

[3] Recent attempts to explain equal division in an altruistic setting can be found in Stark (1998) or in Lundholm / Ohlsson (1999). Yet, the explanations provided in both papers are quite *ad hoc* since the parents' utility function is simply augmented by some loss term which increases in the difference between transfers to siblings.

and supply for services (Cox 1987). The influence of the children's income on the *likelihood* of receiving a transfer is always negative. But transfer *amounts* and children's earnings are positively correlated if the demand for services is inelastic.[4] This difference should be kept in mind because, in the following, it will provide the basis for a test of altruism versus exchange.

Existing empirical studies provide some support for the exchange model. Cox (1987), for example, finds a positive relation between recipients' income and inter-vivos transfers received, a result which contradicts the altruistic model but which is consistent with exchange. Bernheim et al. (1985) find a positive correlation between the frequency of parent-child interaction (number of visits or telephone calls) and the magnitude of the bequeathable estate. Or, when analysing equal division between siblings, McGarry (1997) reports that parents in poor health are less likely to make equal inter-vivos transfers and bequests.

The debate over altruism vs. exchange is far from being settled. The empirical results provide support for both models, except perhaps for the strong version of the altruistic transfer model, even within the same sample (e. g. McGarry 1997). From a theoretical point of view, there is no reason to believe that both transfer motives are mutually exclusive. Both, heterogeneity within the sample and a mixture of motivations within the same decision unit, may be responsible for mixed empirical findings.[5]

Two other explanations for private transfers besides altruism and exchange are the feeling of a "warm glow" related to the act of giving (Andreoni 1989) and intra-family lending contracts in the presence of liquidity constraints (Kotlikoff / Spivak 1981). The former model is sometimes also called the egoistic transfer model since it claims parents may not so much be interested in their offspring's well-being rather than in the amount they transfer to their children. Accordingly, one should expect no influence of the children's earnings on transfers. The lending model stresses the importance of the family in times of temporary financial strain, e.g. when children start their own household or during periods of unemployment. In contrast to the altruistic model, repayment of the loan is explicitly or implicitly agreed upon.

Although the discussion of the empirical implications of different transfer models concentrates on the effects of parents' and children's financial resources, other characteristics of family members that might determine

4 Of course, Ricardian equivalence does not hold under these circumstances.

5 For example, Arrondel et al. (1997, p. 95) argue that "the profusion of theoretical bequest models ... may also correspond to a real heterogeneity in bequeathing patterns, from one country or social category to another." Moreover, experimental evidence from "dictator games" suggests that giving behaviour is quite varied across individuals (Andreoni / Miller 1998).

transfers can be imagined. For example, elderly parents might be in poor health and in need of help with their housework or even in need of physical care. An altruistic parent who receives no assistance from her offspring will decrease her payments because she has to purchase help from outside the family. If, on the other hand, the marginal utility of consumption is higher for healthier persons, a deterioration of the parent's health might also lead to higher transfers to children. This issue will be taken up again in the empirical analysis.

3. The Empirical Relevance of Inter-Vivos Transfers

As mentioned before, there is a considerable lack of evidence on the magnitude of inter-vivos transfers in Germany. Before proceeding with the empirical analysis of the determinants of parent-child transfers, let us take a short look at some data on this magnitude. One potential source for the estimation of total amounts transferred is the *Erbschaftsteuerstatistik*. This is official data gathered by fiscal authorities from estate and gift tax returns and published by the *Statistisches Bundesamt*. These data were last published in 1985 covering the period 1973 to 1978. They are likely to vastly underestimate the true amount of inter-vivos transfers and bequests, since only those gifts and bequests are reported that are liable to estate and gift tax. Allowances are rather high, especially for close relatives, so that a large proportion of private transfers is not covered by the *Erbschaftsteuerstatistik*. Calculations from the *Erbschaftsteuerstatistik* indicate that the mean annual sum of gifts to children and grand-children during the period 1973 to 1978 amounted to 1.8 billion DM in nominal terms or 3.4 billion DM in 1996 prices.

In the following, survey data from the German Socio-Economic Panel is used to estimate the total amount of inter-vivos transfers in Germany. The analysis is based on the first 13 waves of the GSOEP except waves *I* and *K* (years 1992 and 1994), where transfer questions were not asked. The transfer data stem from answers to personal questionnaires. Each household member of age 16 and above is asked the following question: "Did you personally make payments or give financial aid to relatives or other persons outside your household during the last year?" If yes, the respondent is asked to state the amount transferred to each of five different categories of recipients: "parents / parents-in-law", "children / children-in-law", "divorced spouses", "other relatives" and "other persons". Note that the question does not distinguish between voluntary and non-voluntary payments. For instance, transfers to divorced spouses are very likely to be non-voluntary, but transfers to children (or parents) might or might not be voluntary, even if the recipients are adults. According to German civil law (BGB), relatives are

obliged to financial assistance to (grand-)children and (grand-)parents under fairly specific circumstances. In line with the existing empirical literature on inter-vivos transfers (e. g. Ohlsson / Hochguertel 1999), I will, however, interpret all transfers to adult children as voluntary.

Private transfers are usually defined as transfers between households, and decisions to transfer are commonly analysed as household decisions. However, the GSOEP contains transfer data from answers to personal questionnaires. This is a bit awkward, since in a joint household, payments to a common child can and should not be imputed individually. Take as an example a head of household who reports a transfer of 4000 DM while the head's spouse states to have given 3500 DM. In this case, we cannot determine whether both took the amount from their "personal" budget, so that total amount transferred is 7500 DM, or whether the couple used 3500 DM from their joint budget and the head gave another 500 DM from his individual resources. We therefore have to aggregate data from the personal questionnaires in some reasonable manner. In most cases this is an easy task because only the head of household stated to have made a payment, presumably as a representative of the entire household. However, when both the head and the spouse stated to have made a payment, they reported *exactly* the same amount in 64.8 per cent of the cases. It is unlikely that such a large proportion of equal transfers is a pure coincidence. On the other hand, there are several cases with substantially differing amounts reported by head and spouse, so that separate transfers appear to be a possible interpretation.

In view of this, I used two different measures for household transfers. First, I used the *maximum* of the data of all household members. Obviously, this is the minimum of the true transfer made by a household. The second measure is the *sum* of all payments reported, which is the highest payment a household can have made. Projecting household payments by the sum of individual payments yields about 10 per cent larger amounts than estimation by the maximum of individual payments (except for transfers to divorced spouses where maximum and sum are equal in most cases). I will report projections for the conservative estimate only, i. e. for the household maximum.

Estimates of inter-vivos transfers in Germany are summarised in Figure 1. According to the GSOEP, inter-household transfers amounted to nearly 30 billion DM in 1995, yielding an average of approximately 800 to 850 DM per household and year.[6] Parent-child payments constitute roughly 60 per cent of all inter-household transfers, an estimated 17 billion DM or approxi-

[6] Projections are made using the method of reciprocal sampling probabilities (see Rendtel 1991). The necessary weights for households and individuals are provided with the data. Confidence intervals for the projected values based on rank statistics are rather wide. For example, in 1994 the 93 per cent confidence interval for the sum of intergenerational transfers ranges from 17.9 billion DM to 29.5 billion DM.

mately 500 DM per household and year. Take social security assistance in Germany in 1995 as a standard of comparison: assistance payments totalled 52 billion DM, including about 32 billion DM for people living in institutions, i.e. for handicapped persons or elderly people in need of long-term care living in nursing homes (Statistisches Bundesamt 1996). Hence, the government's permanent or temporary aid to needy people living *outside* institutions has roughly the same magnitude as private transfers to children.

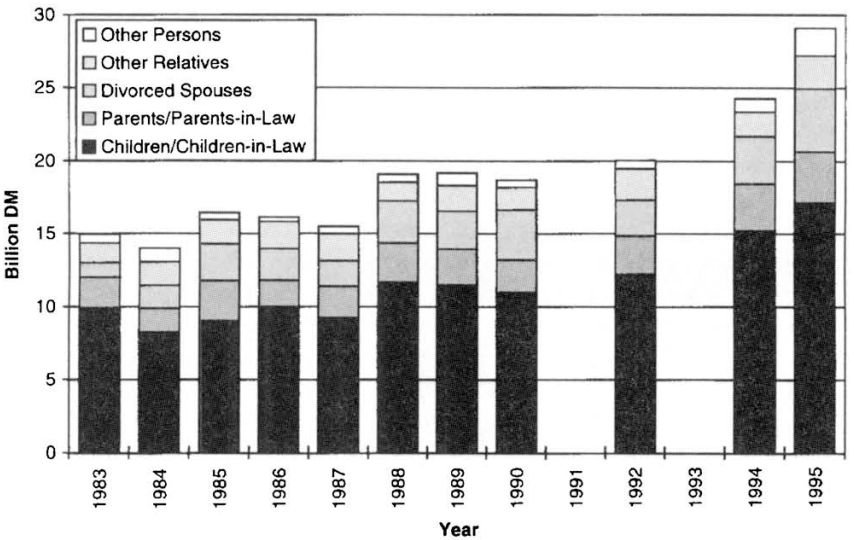

Figure 1: Private Transfers in Germany (by Recipient Group)
(1983 – 1990: Western Germany; 1992 – 1995 Eastern and Western Germany)

The two major groups of transfer recipients besides children are parents or parents-in-law and divorced spouses. The relative magnitude of transfers to parents compared to transfers to children is about one fifth. This may be some evidence against the presumption that a large part of intergenerational transfers is based on intergenerational loan agreements (e.g. Kotlikoff / Spivak 1981), at least for Germany. Transfers to divorced spouses are non-voluntary and cannot be explained by traditional models of transfer behaviour. The same reasoning applies to an unknown fraction of reported parent-child transfers. Payments to minor children outside the household are not always voluntary and hence do not entirely fit the definition of private transfers used in this study. Later, when transfer determinants are analysed, this problem will be accounted for by restricting the sample to households with a household head of age 55 and older and by including control variables for the donor's sex and marital status in the regressions.

The likely underestimation of private transfer in official data from gift tax returns has already been discussed. Yet, survey data might also be prone to an underestimation of the total amount of inter-household payments. As an "internal" validity check of the transfer data quality, I compared aggregate amounts given to aggregate amounts received. In a representative sample survey both aggregates should be equal. However, I found the sum of transfers received to be roughly one third of the sum of transfers given in each sample wave. There are two possible explanations. Firstly, there may be a tendency to understate what one receives from others compared to what one gives to others. Secondly, the proportion of respondents reporting a transfer (given or received) varies substantially with the formulation of question and the question's context in the questionnaire (McGarry / Schoeni 1995). There is some evidence that the more specific the transfer questions and the lower the minimum amount a respondent may report, the higher the proportion of those giving and receiving. The question concerning transfers given cited above is rather unspecific and it contains no lower bound at all (except of course zero). In this case it can be assumed that every respondent has some "internal" minimum value, i.e. respondents do not report transfers below some subjective threshold. Hence the GSOEP will probably suffer from some underreporting of transfers given. Transfers received are asked for even less explicitly in the GSOEP. They only appear as the last item (more or less as a residual category) in a row of eleven different income sources in the monthly income calendar. A comparison of the GSOEP's aggregate transfers received and given is thus raising difficult methodological questions rather than providing good answers.

4. Sample Description and Hypotheses

The analysis of the determinants of parent-child transfers is based on two different subsamples of the GSOEP. The first subsample ("parent") excludes all households without at least one child living *outside* the parents' household.[7] Further, all guest worker households (sample B) have been omitted from the sample because only a very low proportion (<1 per cent) of these households reported transfers altogether. The reason for this finding is not clear. In contrast to those living in households with a German head, members of guest worker households are additionally asked for transfers to their home countries, the so-called remittances. Each year, about 50 per cent of all guest worker households report positive remittances. Together with the

[7] The determination of the number of children living outside the parents' household is a rather tedious task. A detailed account of how this figure was generated in the present study can be obtained from the author upon request.

very low inter-vivos transfer probability, this figure indicates that private transfers of guest workers might be predominantly addressed to recipients in their home countries. Since remittances are not comparable to inter-vivos transfers in many respects, this kind of transfer is not included in this study. An econometric analysis of remittances in the GSOEP can be found in Oser (1995).

Observations from the first wave of the GSOEP had to be omitted as well, because some explanatory variables are not available for the previous year, for which private transfers have been reported by the respondents. Since transfers to children may also include maintenance for minor children, I further restrict the subsample to all households with a household head 55 years of age and older. Although this lower bound is somewhat arbitrary, a reasonable proportion of households with an obligation to pay maintenance for minor children should be excluded from the sample.[8] The remaining (unbalanced panel) sample consists of 1452 West German households with 9 389 observations. Among these are 396 households with 1131 positive observations on transfers. The East German subsample consists of 567 households with 1454 observations (90 households with 132 positive observations).

The second subsample is a "matched" parent-child sample, where children who left their parental home since the start of the GSOEP are matched to their parents. To eliminate minor children from the sample, only those children who are head of household or partner of a household head are matched to their parents' household. Unfortunately, transfers to children are not differentiated by individual recipients, so that I aggregated the data for multiple children in a single wave into one observation. The details of this aggregation are described below. The number of available matches increases with every wave, so that the majority of matches is from the most recent waves. To separate educational expenses from monetary gifts, households with at least one child outside the household known to be still in education (school, university or vocational training) are excluded from the matched sample.[9] In sum, the matched sample has 1828 observations from 488 West German households. Since several characteristics of both parents and children, including earnings, are available in this sample, it is used to directly test the implications of different transfer models as they were discussed in section 2.

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[8] In the regression analysis, transfers to minor children are additionally controlled for by including a dummy variable indicating whether the household head or the spouse have ever been divorced.

[9] For consistency reasons, I also excluded 26 observations where the head of the parent household was under 36 years of age. None of these reported positive transfers.

Each panel year, about 10 to 13 per cent of all households in the parent sample report a transfer. These figures are far below the transfer rates in recent U.S. surveys.[10] This fraction remains rather stable during the whole survey period, although there is a slight decrease towards the end. The difference in transfer probabilities between East and West German households seems to be negligible, except for 1992, where only five per cent of the East German sample households reported a transfer. The average parent-child transfer per household and year ranges from 459 to 809 DM for West German households (in 1991 prices). Not surprisingly, this figure is considerably lower for East German households, ranging from 127 to 289 DM. While a distinct trend in price adjusted transfer amounts cannot be observed for West Germans, East Germans exhibit increasing transfers. For those households who report to have made a positive payment to children living outside the household, the average (median) payment is 5 658 DM (3 330 DM) in Western Germany and 2 388 DM (1 380 DM) in Eastern Germany. The fact that the median is much smaller than the mean indicates a strongly skewed transfer distribution. The range of reported transfers is considerable with the minimum and maximum being 30 DM and 109 170 DM, respectively, but only 10 per cent of the annual transfer payments are larger than 12 440 DM in Western Germany and larger than 4 620 DM in Eastern Germany. In the matched sample, 11 per cent of all households report a positive transfer with a conditional mean (median) of 5 287 DM (3 320) DM and a conditional 0.9-quantile of 12 370 DM. As far as the frequency and the distribution of parent-child transfers are concerned, the matched sample is thus rather similar to the much larger parent sample.

In the regression analysis, the following parents' characteristics are used as explanatory variables: current annual household income, household assets including home ownership, age, education, sex and marital status of the household head, number of non-children and number and age of children in the household, number of children outside the household, whether a child moved out during the observation period, the presence of person in need of care and his/her relation to the household head. The children's characteristics used in this study (available in the matched sample only) are: current household annual income, home ownership, age, sex and marital status of the household head, whether the household receives social assistance, and the number of children (i. e. parents' grand-children). I will describe the generation of these variables in turn.

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[10] For example, in the Health and Retirement Survey, about 29 per cent of all households reported private transfers to children age 18 or older. In the Asset and Health Dynamics Survey, this figure was about 25 per cent (McGarry 1997). In the German *Alters-Survey,* covering respondents from age 45 to 80, the transfer rate is about 31 per cent (Motel/Szydlik 1998). This is probably due to more detailed transfer questions.

The parent's annual household income was generated by first computing the annual personal income of all household members using data from income calendars. The monthly income from all sources was multiplied by the number of months the income was received from the respective source. Further, fringe benefits and nonrecurring bonuses were added. Next, the sum of all household members' earnings was computed and household level transfers (children's allowances, social security assistance) were added. The resulting figure represents gross annual household income. As an alternative measure of household income, I calculated the income of the head of household and his or her spouse plus household level transfers. Since the dependent variable is transfers to children of head and/or spouse, the transfer decision is most likely made by head and spouse, so that the latter measure might be more sensible than total household income. Further, it might be desirable to analyse disposable or net income instead of gross income as a determinant of transfers. Net household income, however, is not coded in the same detail as gross household income, but reported by the respondents as the household income from all sources received in the month preceding the interview. Nevertheless I calculated net annual household income as the monthly income times twelve. For children's households (matched sample only), I generated the gross and net household income, but with one important modification: gross household income was calculated *ignoring transfers* from other households. When aggregating the income data of multiple children, I computed the average as well as the minimum of the respective income values. The minimum could be more relevant, for example if parents are altruistic in the sense that they tend to compensate poorer children. In that case the income of the poorest child will determine whether parents are in corner solutions of no transfers.

Unfortunately, household wealth is available in some detail only in wave E of the GSOEP. This leaves us no direct measure of a household's wealth except for this survey year. I therefore include home ownership as the most important household asset indicating the household's wealth.[11] Further, the head of household is regularly asked whether "stocks/bonds" and "firm capital" are owned by household members. To analyse the influence of asset holdings on private transfers, I additionally create dummy variables for both types of assets.[12]

According to both the altruistic and the exchange model, a positive relation between parents' income or wealth and parent-child transfers is ex-

11 Calculations from Wave E of the GSOEP indicate that the value of owner-occupied housing constitutes more than two thirds of total household net worth.

12 In the following, I ignore available information on "savings accounts", "building savings contracts", and "life insurance policies", because neither has any significant impact in the econometric analysis.

pected. Parents who are motivated by altruism increase their transfers in response to increases in own income and wealth because they tend to equalise consumption among family members. If services are a normal good, exchange-motivated parents spend more on services from their offspring when their income or wealth increases. A common test of altruism vs. exchange uses the recipient's income. As described above, the altruism hypothesis unequivocally predicts a negative influence on transfers, whereas the exchange hypothesis is consistent with increasing as well as with declining transfers in response to increases in the children's income.

The age of the head of household is included in the analysis of the parent sample primarily as a proxy-variable for the children's income, at least in relation to their parents' income. It is assumed that older parents have on average older and, by virtue of a larger human capital, richer children.[13] From this point of view, older parents should exhibit lower transfers to their children than younger parents. Declining health, however, might increase the scope for exchange motivated transfers when parents grow older.

The education level of the head of household is measured by his or her years of education. For East Germans I used the same assignment of years of education to school and university degrees and vocational qualifications as for West Germans (see Diekmann et al. 1993). Although this overestimates years of education for East Germans compared to West Germans, rankings within each group remain comparable. As in most existing transfer studies, education is used as a proxy for permanent income.

I try to exclude parents with dependent children living outside the household by eliminating "young" parents (where the household head is younger than 55 years). In order to account for the possibility of non-voluntary maintenance payments still in the sample, the marital status of the household head has to be controlled for. Note that it is not current marital status which is of interest here. One should rather ask whether a respondent has ever been divorced. This data was recovered from the respondents' retrospective information on marriage. "Divorced" henceforth should be read as "ever divorced". Further, it seems reasonable to differentiate between divorced fathers and mothers. Divorced fathers are expected to exhibit a much higher probability of transferring to children outside their own household than divorced mothers, simply because children of divorced parents almost always live with their mothers. I hence create three dummy variables for sex and marital status of the household head. The baseline is given by households with a male head who never was divorced nor currently lives separated from his spouse.

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[13] In fact, in the matched sample, a regression of the (logged) ratio of parents' to children's average gross (net) income on the age of the parents suggests a 3.6 (2.3) per cent decline in this ratio as the parent's age increases by one year.

The next set of variables contains information on household and family structure. Persons living in the household are differentiated according to their relation to the household head. Children living in the household are further differentiated according to their age. This yields four variables altogether: the number of persons living in the household who are not children of the household head, the number of children $\leq$ 18 years living in the parent's household, the respective number of children >18 years and, finally, the number of children of head and / or spouse living outside their parents' household. The presence of young children in the parents' household should unambiguously decrease the expected transfer amount to children outside the household. Older children who work contribute to the household's income and should hence have a smaller diminishing effect on parent's transfers than younger children. If viewed from an exchange perspective, the presence of adult children in the parent's household may also decrease observed transfers when these children live in their parent's homes to provide (or in exchange for) care and assistance. In that instance, parents need not rely on children living outside their household. In the matched sample, grand-children of the potential donors are also included in the regression. It can be expected that altruistic parents respond to the presence of grand-children by increasing transfers. If parents are altruistic, the number of children outside the household should have an increasing effect on the reported transfer amount. Assuming that parental demand for children's attention does not vary with the number of children, this should not hold for exchange-motivated parents.

A further dummy variable is created for a child's move out of the parent's household during the observation period. The move of a child is expected to increase parent-child transfers if transfers are targeted to help liquidity constrained relatives. Payments may be a pure gift or part of an intra-family loan agreement. Laitner / Juster (1996) report that 85 per cent of the parents in their sample of annuitants rate "helping children when they start their own household" as "very important", "fairly important" or "of some importance". Moreover, parents who are more inclined towards "leaving a significant estate for grown children" (an indicator of altruistic preferences) attach significantly more importance to helping children financially when they start their own household. The conclusion is that inter-vivos transfers to children moving out of the parent's household are motivated altruistically in most instances.

The most important variable that potentially reveals exchange motives could be the presence of a person in the household who is in need of long-term care. It is particularly useful to differentiate these persons by their relation to the household head. If the household member needs long-term care, the household will perhaps face large medical expenses, so that al-

truistically motivated household transfers will decrease. Exchange related transfers may increase when a child provides help to the parent or another relative, e.g. a grand-parent, living in the parents' household. However, when individuals other than the head or spouse are taken into care in the parents' household quite a different interpretation comes into mind: altruistic persons both transfer financial resources to their children and provide care to their elderly parents, perhaps in return for transfers received from their own parents received in earlier periods.

Summary statistics for the explanatory variables in the parent sample show an average gross household income of 43,400 DM for West German households and 28,800 DM for East German households (in 1991 prices). West Germans are more likely to be home owners (54 per cent) than East Germans (31 per cent) or to own other assets, and mean years of education are slightly higher for East Germans.[14] Mean age is 67 years for West German households and 65 years for East German households. The average number of children living outside the household is 2.26 in Western Germany and 2.43 in Eastern Germany. Another interesting observation is that East German households have a much larger proportion of female headed households (52 per cent as opposed to 32 per cent in Western Germany). Although one should not make too much of it, this fact may be explained by high female labour force participation rates in the former GDR. Economic provider roles (and the status of the main breadwinner as the "household head") are perhaps much less sex specific than in Western Germany.

Although the probability of transfer and the average transfer amounts of households in the matched sample are similar to those of the parent counterpart, parents in the matched sample exhibit some noticeable differences in the explanatory variables. First of all, they are on average eleven years younger. This was to be expected since no age limit was imposed on the matched sample. Second, the mean income is ten to twenty thousand DM higher than that of the parent sample (depending on what measure is used). One reason for this difference is that parents in the matched sample are younger and hence less likely to be retired. Parents in the matched sample are also more likely to be home owners (68 per cent), a fact which probably reflects a higher recent income or a higher lifetime income rather than a higher current income.[15] The matched sample might therefore be considered as selective with respect to income. Quite surprisingly, the children in the matched sample have more or less the same average income as their parents, but only 24 per cent of them are home owners. They are on average 29 years

14 This is because the same assignment procedure of degrees to education years is used in both subsamples.

15 Home owners are also less mobile than renters and thus have a smaller probability of panel attrition.

old, better educated than their parents and roughly one half of them are married.

5. Empirical Results

Since the dependent variable is restricted to non-negative values and exhibits a large proportion of null-observations, least squares methods will most probably produce biased estimates. It is a common practice to specify transfer decisions as tobit models, since the continuous latent variable can be interpreted rather nicely as the "desired transfer amount". However, the tobit model is very restrictive. Any variable that increases the probability of positive transfers must also increase the mean transfer amount. This is no desirable property for an analysis of private transfers, especially if a test of altruism versus exchange is intended. As Cox (1987) has shown, the probability of a transfer will decrease in both models when a child's income increases. But the transfer amount conditional on a transfer taking place decreases under altruism, while it can increase under exchange. I will therefore specify transfer decisions as a two-equation model (Heckman 1979), also known as the generalised tobit model:

$$b_{it} = x_{it}\beta + \varepsilon^1_{it} \,, \tag{1}$$

where b_{it} is the logged observed transfer amount given by household i in year t, x_{it} is a vector of explanatory variables, β is a vector of regression coefficients, and ε^1_{it} is an error term, which is assumed to be $N(0, \sigma^2)$, uncorrelated between observations of different households, but not necessarily uncorrelated between observations of the same household. In the present study, a transfer amount is observed in about 10 per cent of the cases only. The probability of household i giving in year t is specified as a probit model:

$$P(b_{it} > 0) = P(-x_{it}\gamma < \varepsilon^0_{it}) = \Phi(-x_{it}\gamma), \quad \varepsilon^0_{it} \sim N(0,1) \,. \tag{2}$$

The generalised tobit model allows for correlations between the error in the regression equation (1) and in the selection equation (2):

$$E(\varepsilon^0_{it}\varepsilon^1_{it}) \neq 0 \,. \tag{3}$$

Note that, if the same set of explanatory variables is used for the regression equation (1) and for the selection equation (2), and if the restrictions $\beta = \gamma$ and $\varepsilon^0_{it} = \varepsilon^1_{it}$ are imposed, the generalised tobit model reduces to the conventional tobit model (see Johnston / DiNardo 1998).

The two-equation model is estimated by maximum likelihood using the pooled samples. Since our data contains repeated observations of the same households, the econometric specification must take into account the fact that observations are not independent. I therefore calculate robust variances using a generalised version of the White "sandwich" formula (White 1982, StataCorp 1999).

$$\tilde{V} = \hat{V}\left(\sum_{i=1}^{N} u_i^{HH} u_i^{HH}\right)\hat{V}\,, \tag{4}$$

where $\hat{V}$ is the conventional variance estimator and

$$u_i^{HH} = \sum_{t=1}^{T} d_{it} u_{it} \tag{5}$$

is the sum of household i's likelihood scores (d_{it} is a dummy indicating whether household i is observed in year t). Note that $\tilde{V}$ is also heteroskedasticity-consistent and that no a priori assumptions about the nature of the within-household correlations are needed.[16]

5.1 Parent Sample

Table 1 below contains the maximum likelihood estimates of the parameters in the selection ($\hat{\gamma}$) and in the regression equation ($\hat{\beta}$). Because of collinearity problems, it was necessary to drop some variables and to run different regressions. The first regression excludes the head's education and ownership of stocks and bonds. The second regression excludes the parents' current income.[17]

Let us first concentrate on the results for West Germans before comparing them to the results for East Germans. Most selection parameters are significantly different from zero and have the expected signs. For example, the probability of a positive transfer increases with the parents' income, the head's education (as a measure of permanent income), and with the parents' wealth measured by home ownership and the possession of stocks and bonds.[18] Firm owners, however, are less likely to give money to their children, an observation that might be explained by the intention to bequeath firm capital instead of giving inter-vivos.

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16 Other estimators for selection correction models in panel data are discussed in Wooldridge (1995) or Vella (1998).

17 Identification and collinearity problems are not uncommon in empirical work on private transfers when researchers try to estimate a generalised tobit model. For examples see Cox (1987) or McGarry / Schoeni (1995).

18 Using the gross or net *household* income instead of the parents' income yields similar results.

Table 1

Sample Selection Models of Parent-Child Transfers (Parent Sample)

Variable	West German Households		East German Households
	Specification I	Specification II	Specification I
Selection Equation			
Annual Household Income (Log)	0.708***		0.564***
Education		0.088***	
Home Ownership	0.226***	0.219***	0.018
Stocks and Bonds		0.242***	
Firm Capital	– 0.210	– 0.061	– 0.136
Age of Household Head × 10^{-1}	– 0.083*	– 0.251***	0.008
Head = Female / Not Divorced	0.078	– 0.100	0.149
Head = Male / Divorced or Separated	0.215	0.287**	– 0.451
Head = Female / Divorced or Separated	0.045	– 0.236	0.133
No. of Non-Children in Household	– 0.191**	– 0.116	0.026
No. of Children ≤ 18 in Household	– 0.220**	– 0.219***	0.397
No. of Children > 18 in Household	– 0.042	– 0.031	– 0.156
No. of Children outside Household	0.015	0.012	– 0.033
Child Moved Out	0.279***	0.335***	0.122
Head or Spouse in Need of Care	0.098	0.031	0.288
Other Person in Need of Care	0.350	0.318	0.071
Intercept	– 7.892***	– 0.450	– 7.592***
Regression Equation			
Annual Household Income (Log)	0.553***		– 0.143
Education		0.084***	
Home Ownership	0.360***	0.362***	0.176
Stocks and Bonds		0.374***	
Firm Capital	0.274*	0.194	1.479***
Age of Household Head × 10^{-1}	0.013	– 0.155**	– 0.192
Head = Female / Not Divorced	0.023	– 0.129	0.078
Head = Male / Divorced or Separated	0.027	0.100	– 0.206
Head = Female / Divorced or Separated	– 0.542**	– 0.729***	– 0.322
No. of Non-Children in Household	– 0.055	– 0.096	0.044
No. of Children ≤ 18 in Household	– 0.042	– 0.174	0.164
No. of Children > 18 in Household	0.180	0.075	– 0.202
No. of Children outside Household	0.013	0.001	0.056
Child Moved Out	0.046	0.101	0.034
Head or Spouse in Need of Care	0.045	– 0.017	– 0.814
Other Person in Need of Care	0.920***	0.953***	– 1.142*
Intercept	1.537	7.435***	10.785
N. of observations	8 458	9 312	1 337
N. of uncensored observations (per cent)	1 044 (12.3)	1 120 (12.0)	127 (9.5)
ρ	0.17	0.27	– 0.50
Ln L	– 4 378.95	– 4 780.55	– 577.30

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

The estimated transfer probability decreases significantly with the household head's age. If the assumption is correct that the head's age serves as a good proxy for the child(ren)'s current income (in relation to parents' current income), the decrease in the probability to transfer with increasing parents' age is in accordance with both main transfer motives. Other models, like the intergenerational lending model, are also supported by this finding, since lending will take place between parents with a high current income compared to the current income of the borrowers, notably young children who are more likely to be liquidity constrained and in need of financial aid than older children.

Households with a male divorced head exhibit the highest propensity to transfer compared to households with female heads, whether divorced or not, and with households with male heads who were never divorced. This was to be expected, given the higher likelihood of divorced fathers having dependent children living outside their own household. The corresponding coefficient in the selection equation clearly indicates that some divorced fathers who pay for dependent children are still in the sample.

The effect of the number of persons living in the parents' household on transfers to children outside the household is negative, independent of the relation to the head of household. There are, however, some remarkable differences in the effects' magnitude. The largest effect is estimated for young children, followed by the coefficient for persons who are not children of the head or spouse (including the head himself and the spouse). The parameter estimated for the number of old children is rather small, at least in comparison to the other coefficients, and it is not significantly different from zero. When total household income (gross or net) is used in the regression, the effect of the number of older children is comparable to those estimated for other household members. One conclusion to be drawn from this observation is that the contribution of older children to the household income is not at the disposal of the parents, at least with respect to transfers to children living outside the household.

As expected, the number of children living outside the household has a positive effect on the probability of a transfer, but this effect is only small and insignificant. The latter observation is not unusual in transfer studies. McGarry / Schoeni (1995), who use the Health and Retirement Survey, find that the proportion of parents giving financial transfers to children is unrelated to the number of non-coresident adult children.

If the child moved out of the parents' household during the transfer period the estimated transfer probability significantly increases. In section 4 it was claimed that this result indicates altruistically motivated transfers. Another explanation would be the existence of an intra-family lending contract.

Since credit rationing is to be expected for most people moving out of the parents' household, loans from parents may provide an easy substitute to taking out a loan from a bank. However, the GSOEP data do not allow to ascertain whether the transfer made at the time of a move will be repaid later.

Finally, having a person in need of care in one's household leads to an increased transfer probability regardless of the relation to the household head, although neither coefficient differs significantly from zero. It is noteworthy that the coefficient is much larger if the respective person is not the head or the spouse. If children provided care to household members (not necessarily the parents) in exchange for monetary transfers from their parents, one would expect both coefficients to be roughly equal. A possible conclusion drawn from this finding is that altruistic parents are more likely to give financial transfers to children *and* to coreside with relatives in need of care. In order to examine this idea more closely I estimated a bivariate probit model of giving and coresiding. A positive correlation between the errors in both regressions would support the idea of unobserved parental preferences (altruism) being responsible for the observed relationship between giving and coresiding. Although I found positive correlations between error terms independent of the choice of the explanatory variables, neither estimate of the correlation coefficient was significantly different from zero.

Let us now turn to the determinants of the transfer amount given a transfer takes place. While most variables measuring the economic position of the parents, such as income, home ownership, ownership of stocks and bonds, or education influence the transfer propensity and the transfer amount in the same direction, the coefficients of other variables show remarkable differences. Firm owners, for example, tend to give more provided they give at all, whereas the amount estimated for divorced fathers is the same as for married fathers. Persons in need of care coresiding with the parents have a strong and highly significant effect on the estimated transfer amount. Together with the virtually non-existent effect of parents who need care, this result provides some support for the conjecture of an altruistic motivation leading to monetary support for children and to coresidence with relatives who need to be cared for.

Estimation results for East German households are presented in the last column of Table 1. The second specification (including education and ownership of stocks and bonds) is not reported because the likelihood function failed to converge. However, even the performance of the estimated regression appears to be rather weak, and the results should be interpreted with care, since the number of positive observations is quite low. For example, income is the only regressor in the selection equation which has a significant impact on the probability to observe a positive transfer. In the regression

equation, we observe an insignificant negative effect of the parents' income on the transfer amount.[19] It is also surprising that the number of minor children in the household has a *positive* impact on transfers to children outside the household. The reason for this finding is unclear. If one assumes that respondents misunderstood the transfer question as a question for transfers to all children (including those living with their parents), one is left with the negative coefficient estimated for West Germans. I can see no reason why East German respondents should systematically misinterpret the transfer question when West German respondents do not. The transfer regression suggests that firm owners, i.e. wealthy households, transfer more to their children than others, provided a transfer takes place. Unlike in the West German sample, persons in need of care living in the household decrease the transfer amount independent of the person's relation to the household head.

5.2 Matched Sample

The results presented so far are unsatisfactory as far as the question of what motivates inter-vivos transfers in Germany is concerned. Although the observations that parents are more likely to give in years where a child moves out of their household, or that parents who coreside with relatives in need of care give more to their adult children are interesting, information on the donors alone proves to be insufficient to answer that question. I will therefore continue by analysing parent-child transfers in the matched sample. Table 2 shows the estimated parameters of the generalised tobit model.

Remember the discussion of the altruistic and the exchange transfer model in section 2. The fundamental empirically testable difference between these two explanations of private transfers is the effect of the children's earnings. The altruistic model predicts a negative effect of children's earnings on the transfer probability *and* on the transfer amount. The exchange model also predicts a negative effect on the transfer probability but is compatible with any effect on the transfer amount. As was to be expected, the probability of a positive transfer declines with the children's earnings. However, the parameter of children's income in the regression equation is positive, although not significant. Since this result is of primary importance, I checked its robustness by using alternative income measures, such as net or minimum income instead of average children's income. When the minimum of the children's (gross or net) income is used, a strong and significant negative impact on the transfer probability can be observed. The parameter in the regression equation also becomes negative, as predicted by the

[19] This result holds for other income measures as well. Ignoring sample selection corrections, the effect of income on transfer amounts is positive, but not significant.

altruistic model. However, the estimates are very small and never significantly different from zero (the absolute t-values are around 0.5). The parents' income coefficients are always positive and significant. In other words, the evidence from the matched GSOEP sample does contradict the altruistic model but it does not contradict the exchange model. Further, since children's earnings significantly decrease the *probability* of transfers in every specification, the "warm glow" model can also be ruled out as a good candidate for the explanation of transfers to adult children in Germany. Because of the double-log specification, the income parameter from the regression equation is also an estimate of the (constant) income elasticity of inter-vivos transfers. The coefficient estimate for *net* household income indicates an elasticity of approximately 0.9. This figure is in close neighbourhood of the value 0.84 found by Tomes (1981) for the income elasticity of bequests.

Table 2

Sample Selection Model of Parent-Child Transfers (Matched Sample)

Variable	Selection Equation	Regression Equation
Parents' Characteristics		
Annual Household Income (Log)	0.350***	0.673***
Home Ownership	0.308**	– 0.176
Age of Household Head × 10^{-1}	– 0.027	0.010
Head = Female / Not Divorced	0.115	0.024
Head = Male / Divorced or Separated	0.192	0.469
Head = Female / Divorced or Separated	0.151	– 0.756**
Household Size	– 0.048	– 0.012
No. of Children outside Household	– 0.059	– 0.047
Child Moves Out	0.439***	[a]
Head or Spouse in Need of Care	– 0.699	– 0.362
Other Person in Need of Care	– 0.008	0.813***
Children's characteristics		
Mean Annual Household Income (Log)	– 0.113*	0.057
Proportion who Owns a Home	– 0.123	– 0.176
Mean Age of Child × 10^{-1}	0.010	0.029
Recieves Social Assistance (Any)	0.029	0.115
Proportion Not Married	0.344***	– 0.230
Proportion Sons	– 0.175	0.085
No. of Grandchildren	0.009	– 0.188
Intercept	– 4.009***	– 2.003
No. of observations	1533	
No. of positive observations (per cent)	169 (10.4)	
ρ	0.62*	
Ln L	-728.01	

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$; [a] omitted due to collinearity problems.

Since most parent's characteristics seem to have a similar effect in the matched sample as in the parent sample, let us finally concentrate on the other children's characteristics used as explanatory variables. Parents are less likely to transfer if the proportion of home owners among their children is high, if the children are married and if the proportion of sons is high. These results are in accordance with findings from other studies (e.g. McGarry / Schoeni 1995). Further, they do not contradict the assumption of intrafamily exchange, since unmarried children and women provide more attention (Davies 1996). Contrary to other studies, the presence of grandchildren has no significant impact on the likelihood of a transfer to the children. Finally, when any of the children in the sample receives social assistance payments, the effect on the likelihood of a transfer and on the estimated transfer amount is positive, but the effect is very small and insignificant. Private altruistic transfers are generally crowded out by public transfers, whereas exchange motivated transfers are not (Cox / Jakubson 1995). The altruism hypothesis is thus not supported by our findings concerning the effect of public transfers.

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Abstract

This paper uses data from the German Socio-Economic Panel (GSOEP) to analyse parent-child transfers in Germany. Projections show that these transfers amounted to approximately 17 billion DM in 1995. The econometric analysis of transfer determinants is based on two different samples generated from the GSOEP: one parent sample with data on donors' households only and one matched sample of parents' and children's' households. Results from the parent sample indicate that transfers to children might be altruistically motivated, for example to aid children who form their own household. The matched sample, however, provides strong evidence against purely altruistic transfers and in favour of exchange motives.

Zusammenfassung

Ziel dieses Beitrags ist die Analyse privater Transfers in Deutschland mit Daten des Sozio-ökonomischen Panels (SOEP). Für das Jahre 1995 wird die Summe lebzeitiger Eltern-Kind-Transfers auf etwa 17 Milliarden DM geschätzt. Die ökonometrische Analyse basiert auf zwei Unterstichproben aus dem SOEP: einem Eltern-Datensatz, der Informationen über eine große Zahl von Elternhaushalten enthält, und einem verbundenen Datensatz, der Informationen über Elternhaushalte und die zugehörigen Haushalte ihrer Kinder enthält. Im Eltern-Datensatz finden sich zwar einige

Hinweise auf altruistisch motivierte Transfers, mit dem verbundenen Datensatz muß das altruistische Transfermotiv jedoch zurückgewiesen werden. Die Daten sind dagegen mit einem Austauschmotiv vereinbar.

JEL-Klassifikation: D10, D64, J14

Keywords: Altruism, Exchange, Intergenerational Transfers