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# THE INTERACTION OF PRIVATE INTERGENERATIONAL TRANSFERS TYPES

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## Abstract

The rapid ageing of the population, particularly in the developed world, accentuates the importance of both the family and of private intergenerational transfers, whether this be due to the longer periods of coexistence resulting from longer life expectancy or the threat posed to the very sustainability of the welfare state. While the magnitude of intergenerational transfers is well documented, and the motives underlying them have received broad attention, we focus on a much less studied topic: the way the different forms of private transfers – time, money and space - interact with each other. In order to understand the complete effects of decisions, the costs and benefits to donors and recipients of transfers, it is crucial to take into account the full set of options for family transfers. We survey the literature to ascertain current knowledge on the extent to which a) the provision of one form of intergenerational family transfer is related to the provision of another form by the same person; b) the modes adopted by different generations are interrelated. We then put forward suggestions for future research and conceptual refinement.

*Keywords:* Intergenerational transfers, support, family, population ageing.

## **Introduction**

The generalization of population ageing in the developed world has driven attention on the relations ongoing between generations. Just as the weightings of different age groups are changing so do the flows of resource transfers between them. A wide reaching debate has centered on the challenges that population ageing poses to the financial sustainability of the welfare state and its public intergenerational transfers, particularly the pension system and the public healthcare system. Another type of intergenerational connection with a sizeable presence both in people's lives and in the economy is private transfers. Private intergenerational transfers are not exclusive to the family, but it is particularly within this context that they tend to take place.

The study of private intergenerational transfers tends to reassure us of the importance of the family in the functioning of modern societies, despite the many transformations shaping this social unit. In an evolving context of increasing presence of women - the traditional care providers - in the labour market, people working until later in life, low number of children per woman, budgetary pressures jeopardising the sustainability of the welfare state and its social transfers in some countries, it is important we understand what to expect from the family as a provider of support. Intergenerational transfers supplementing the receiver's income are the mechanisms deployed by families to help generations deal with crises, transitions and even long lasting needs. They thus function as a safety net.

Intergenerational private transfers may flow up and down the family lineage and take several forms or currencies that may be generalized as money, time and space. This very multiplicity represents a source of research complexity.

We cannot convey an accurate picture of the global dimensions of intergenerational private transfers without considering every possible type and respective interactions.

The redistributive role of private transfers, their effect on labour market effort, on aggregate saving and on overall wellbeing are affected by the linkages between transfer currencies. If one wants to understand the effects of a policy or of a change in the economic conditions on the welfare of individuals, it is necessary to correctly estimate the supply of support that family will provide, taking into account the existence of interactions between the different types of transfers. Location choice is another decision that is influenced by the substitutability or complementarity of the different types of transfers (Konrad *et al.* 2002). If the different forms of assistance are mistakenly taken as independent in empirical modeling, the findings will not be reliable (Hogan *et al.* 1993).

The main objective of this paper is to revisit the empirical literature while maintaining a focus on the interaction ongoing between the different private transfer types and thereby stimulate interest in further developing this subject. The two articles taking the interdependence of the three modes of transfers as their main concern are Boaz *et al.* (1999) and Koh and MacDonald (2006) even while other studies provide relevant information on this field without it being their main focus.

The structure of the paper is as follows. First, we define the three categories of private transfers before exploring the various possible interactions between the transfer categories, seeking relations of substitution or complementarity between them from the donor's perspective. Are particular forms of transfers commonly associated so that

those who provide one form of currency do or do not provide another? In the following section, we study the existence of relations of reciprocity between the generations and the patterns of interaction between the transfer categories involved. Are the various modes of transfers associated so that giving one type is linked with receiving the same or another type of transfer? Finally, we set out our conclusions.

### **The three modes of private intergenerational transfers**

Private financial transfers convey income or wealth to someone in another generation. This may happen either during the life-time of the donor – the *inter-vivos* transfers or gifts - or after death – the bequest or inheritance. A well-known and intense debate about the real dimension of financial transfers evolved in the research community during the 1980's (Kotlikoff and Summers 1981, Kotlikoff 1988, Modigliani 1988, Ando and Kennickell 1987), based on data for the United States of America (USA). Were it always simple to recognize a financial transfer, researchers would be able to agree. However, the quantification of financial intergenerational transfers raises many practical questions and the diverse values that are encountered result from different approaches and assumptions.

Another transfer type that frequently occurs between members of different generations in a family is time. Once again, not all researchers count the same actions as time transfers. We may identify care, help or contact in this category. Care refers to time devoted to personal activities like dressing, eating, bathing or showering. Help is concerned with household tasks, transportation, shopping or paperwork. Contact is sometimes viewed as a by-product of a time transfer but is nevertheless frequently considered a time transfer in its own right. Identifying the direction of a contact transfer

is potentially hard work and flowing both ways in many situations. Lennartsson *et al.* (2010) argue that, despite the probable mutual benefits of social contact between generations, it is more likely that they represent net upward (from the younger generation to the older generation) transfers because the younger members tend to be working while the older tend to be retired thus attaching different values to the same transferred time. Another argument is that there is an asymmetry in the emotional rewards of contact with the older generations valuing the contact to a greater extent than the younger (Harwood 2001, Bengtson and Kuypers 1971, Giarrusso *et al.* 1995).

The third large category of intergenerational transfers is space. In the literature, this is typically identified with co-residence. Co-residence emerges as a composite good (Ermisch 1981, Burch and Matthews 1987), combining different elements. The benefits from co-residence derive from the sharing of expenses while other benefits may include safety or the enhancement of the conditions for time transfers. Naturally, there are also negative aspects to this category: loss of independence, need to adapt to different lifestyles -which are potential inducers of conflict – as well as the division of space. The lifetime probability of co-residence of parents and adult children is fairly high, even in western societies (Grundy 2000).

There are problems with identifying the space transfer category with co-residence. The transfer flow direction is difficult to observe, particularly when decided by considering the party deemed most interested in its existence. The fact is that the attribution of certain types of time transfer to one of the members or his/her financial need are deemed evidence of the interest in the shared living arrangement, and therefore applied to determine the direction of the space transfer flow. However, this does not adequately separate the transfer types and confuses that which represents a space transfer with the interaction between the space transfer and other types of transfer. The pure space

transfer should be the imputed rent that the owner is not demanding from the other party.<sup>1</sup> In this case, knowledge on the ownership of the home would be enough to determine the transfer direction. If a middle-aged couple with children moved into their parents' house because that was the easiest way to provide care, co-residence falls into the interests of the oldest generation because of the interaction of space transfers with time transfers, even while there is still a downward space transfer because the younger generation is making free recourse to their parent's living space.

Additionally, this way of accounting for space transfers would incorporate something otherwise usually overlooked: the transfer of non-shared space. Living in a separate dwelling that is owned by members of another generation also needs counting as a form of space transfer, albeit with different characteristics and with possibly different patterns of interdependence with the other transfer categories. Arrondel and Masson (2001) account for such circumstances as financial transfers (p. 430), despite being in-kind.

Throughout the rest of this paper, we identify space transfer with co-residence as this is the current practice in empirical studies.

### **Interactions in transfer decisions**

Microeconomic modeling of family based transfer decision making goes back to Becker (1974) and Barro (1974). They picture the donors as altruistically motivated. However, several other motivations for intergenerational transfers have since been posited – exchange and reciprocity, demonstration, joy-of-giving.

We deploy the results of empirical research that stem from different underlying models. Transfers may directly enter the utility function of the receiver and of the donor - when the act of giving or the joy of receiving is that valued – or they may also enter the utility function through the utility of the counterpart (in altruism), and they also may be a factor in budget constraints and/or in time constraints.

Laferrère and Wolff (2006) provide a thorough survey on the modeling of private transfers. This deep reaching study on the formation of preferences and decision making in the family also includes a review of empirical tests of the models. There are also other studies that present reviews of the literature concerning the motivations for intergenerational transfers (Schwarz 2006, Bianchi *et al.* 2006, Lüth 2001, Laferrère 1999). The prevailing idea is that giving derives from a mix of motives. Here, we are not so much interested in the motivation for transfers as in the lesser discussed topic: the interaction between the various transfer types, although the two aspects naturally overlap. Whenever, for example, the decision to transfer time depends on having received or expecting to receive money from the other generation, this motivation bears direct consequences on the interaction in both transfer types. The network of potential relations results from a combination of the three transfer modes amplified by the interaction between the decisions taken by both parties. This diversity of possible interactions greatly increases the complexity of research on private intergenerational transfers with Figure 1 detailing the potential influences that the decision of generation  $i$  to provide a certain transfer type may generate or wield.

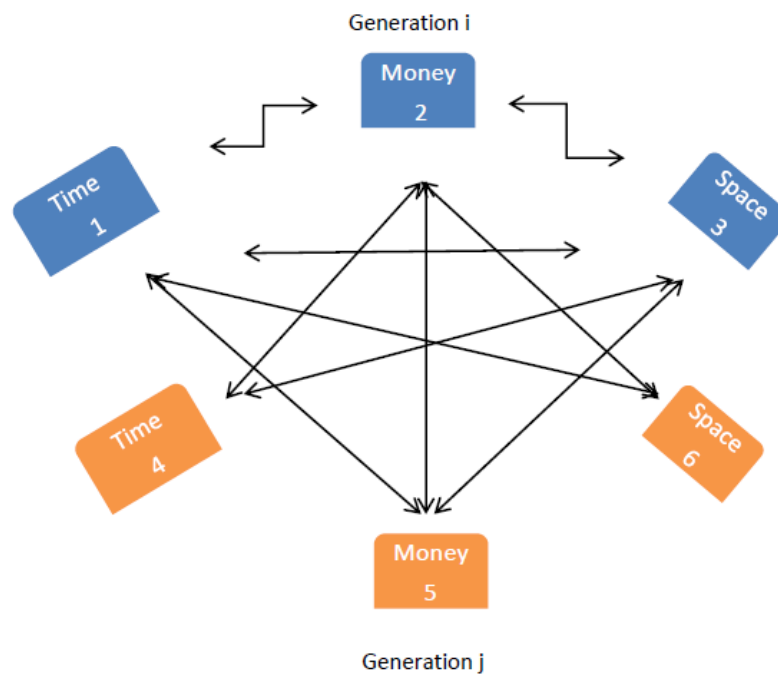
The decision of generation  $i$  to provide one transfer type may relate to its decision to provide another type of transfer. That relationship may be positive, with the provision of one type increasing the probability that the same generation provides another transfer type. For example, when a couple transfers space to their adult child, this may be



associated with the child's economic needs and the couple may also choose to help out with some additional financing. On the contrary, the relationship may be negative: the couple chooses to transfer space instead of transferring money. These sorts of interactions are depicted in the upper section of the Figure 1 diagram, involving 1, 2 and 3.

Another dimension of the interactions among transfers links the actions of both generations: the reception of one type of transfer by one generation may have an effect on its own provision of a transfer, either of the same kind or of another. For example, a person who receives a transfer of space from a younger generation may reciprocate with a transfer of time in the form of childcare or help with household chores. These sorts of interactions are depicted in the diagram, in the arrows linking 1, 2 or 3 to 4, 5 or 6.

**Figure 1 – Interdependences of Transfers**



There are additional complications to the scheme in Figure 1: there may be more than two generations interacting simultaneously, and there may be more than one decision

unit in each generation, typically, siblings or more than one household of parents.

Dyadic studies may be misleading (Mancini and Blieszner 1989, Arrondel and Masson 2001) and, while difficult, the analytical inclusion of the influence of other family members proves enriching.

Siblings and more than one parent-households may act as competitors in the attraction of resources or as collaborators in the provision of transfers. On the one hand, reductions in the receipt of transfers resulting from increased competition for limited resources are reported by several studies (Aldous & Klein 1991, Cox and Rank 1992, Keister 2003). The larger the number of parent-households, the larger the extent of transfers made and received, both of money and of time (Schoeni 1997). On the other hand, the existence of siblings allows for the division of responsibility for CTP (child to parent) transfers (McGarry and Schoeni 1995, Spitze and Logan 1991, Arrondel and Masson 2001, Wolf *et al.* 1997). Bonsang (2007) and Deindl and Brandt (2011) find this holds true for time transfers, but not with respect to money transfers. When parents co-reside with one sibling the probability of time transfers (care) by another sibling decreases (Sloan *et al.* 2002).

The inclusion of more than two generations has been particularly explored in research on the sandwich generation, in which a middle aged generation is confronted with an accumulation of need for care transfers by an older generation of elderly parents alongside a younger generation of children (Miller 1981, Soldo 1996, Nichols and Junk 1997, Künemund 2006, Fingerman *et al.* 2011). Furthermore, the consideration of three generations enables the study of indirect reciprocities, that is the issuer of the transfer, in generation  $x$ , acts in return for having previously received a transfer from someone in generation  $w$ , but the transfer beneficiary is someone else, in generation  $y$ . (Stark 1995,

Cox and Stark 1996, Goldscheider and Lawton 1998, Arrondel and Masson 2001, 2006).

### **Interactions in one generation's transfers**

Table 1, in the appendix, provides some details on twenty empirical studies, referenced throughout this current section, analyzing the existence of interactions between the types of transfers provided by one member of a particular generation.

#### *Interactions in financial transfers and time transfers (1 and 2 in the diagram)*

If “time is money”, we should naturally expect some substitutability – in the sense of replaceability - between these two forms of transfers. In order to be transferred, time has to be subtracted from something, whether work or leisure. The optimal allocation depends on the value of time in each activity and that results both from the opportunity cost of that time and from the preferences of individuals in the family (Couch *et al* 1999). For someone who has a high opportunity cost of time, the incentive to pay for market substitutes, as with the case of formal care, also becomes higher. Thus, such a person would have a preference for financial transfers instead of time transfers.

Geographical distance is another mediating factor that may justify the existence of the substitution of time transfers by money transfers. Several forms of time transfers cannot be made at a distance.

On the contrary, one may expect the two forms of transfers to be complements if people providing more of one type, also provide more of the other type, for example, because they possess traits that make them “providers” or because a certain need develops and they cannot provide the necessary assistance using only one of the currencies.

A partial substitution regarding income or wealth is found in most studies: individuals with higher wages or higher wealth deploy more financial transfers and less time transfers (Schoeni 1997, Couch *et al.* 1999, Ioannides and Kan 2000, Sloan *et al.* 1997, 2002, Zissimopoulos 2001, Cardia and Ng 2003: USA; Attias-Donfut *et al.* 2005: Europe). In the same line, labor supply facilitates the provision of money transfers and hinders the provision of time transfers (Boaz *et al.* 1999).

Nevertheless, it is possible to find studies where there is no evidence of such interaction in upward transfers (McGarry and Schoeni 1995 and Koh and MacDonald 2006, using US data, and Arrondel and Masson 2001, with French data). Bonsang (2007), with European data, even finds that a higher household income increases the probability of providing upward time transfers, as well as financial transfers.

Substitutability with regard to geographical distance is empirically confirmed, with distance lowering the probability of making a time transfer and both increasing the probability of making a money transfer (Schoeni 1997: downward transfers, USA; Bonsang 2007 and Deindl and Brandt 2011: upward transfers, Europe) or the amount of time provided (Zissimopoulos 2001: USA). There are a few exceptions to these results. Fokkema *et al.* (2008), with European data, find that distance decreases the probability of time transfers between the two generations, but does not affect PTC (parent to child) financial transfers. Aldous and Klein (1991) report something similar through calculating the sum of CTP and PTC transfers, with American data.

Tastes, values, culture, personality are traits that may be related with complementarity in both types of transfers. They are potentially captured by the correlation between the terms of error for the time and financial assistance equations, estimated with bivariate probits. A positive correlation indicates that the unobserved characteristics of individuals influence both time and money transfers in the same direction. That is what Bonsang (2007) finds, for Europe, upward time transfers and upward financial transfers, indicating complementarity. The same methodology is used by Ioannides and Kan (2000), applying US data for both upward and downward transfers. Contrary to Bonsang (2007), they do not find that the unobservables that influence filial transfers of one mode of assistance to their non-co-resident parents tend also to influence them into transferring the other mode, but they find that complementarity in PTC transfers.

The connection between the two transfer modes is multidimensional. For example, there may be substitutability with respect to income, with respect to distance, and complementarity with respect to affection or to the intensity of the needs. If it is observed, in the aggregate, that when time transfers increase, financial transfers decrease – that is, that they are substitutes - this means that the mediating factors between the two modes that act in such a way dominate other possible mediating factors that act in the opposite way. This kind of aggregate effect is captured by the models that use the transfer of one type as an explanatory variable of the provision of the other type. Since there is a potential simultaneity problem, the models should combine simultaneous equations.

Although CTP financial transfers are not very frequent in western societies, those parents who receive them also tend to receive time transfers, and children who provide income are also more likely to be caregivers. In the British Household Panel Survey of 2001, of the 3 per cent of parents aged 60 and over that receive financial transfers, 91

per cent also receive time transfers (Ermisch 2006). Boaz *et al.* (1999), with data for the USA, in a simultaneous equations model, report that the existence of financial transfers positively affects the hours of caregiving to functionally dependent parents, although the time transferred does not show a significant effect on the probability of financial transfers: the positive association appears to be unidirectional. In turn, Caputo (2002) states that American adult daughters who provided money transfers are more than twice as likely than not also to be caregivers. For Europe, the estimates from Deindl and Brandt (2011) indicate a positive and significant association between both types of transfers given by children to parents but not in the inverse direction.

On the other hand, Fokkema *et al* (2008), for Europe, find that the provision of downward financial transfers is positively associated with the existence of downward time transfers, that is, parents that transfer one mode to their children also tend to transfer more of the other mode. They apply logistic regression to PTC transfers to non-co-resident children.

In conclusion, although time transfers and money transfers appear to be substitutes with regard to financial resources and to geographical distance, the evidence of complementarity with regard to unobservables or looking at the direct effect of one mode of transfers on the other mode is still scarce and needs further investigation.

*Interaction between financial transfers and space transfers (2 and 3 in the diagram).*

While it may be reasonable to expect that financial transfers in the co-residence context differ from financial transfers to non-resident kin, in just what way do they diverge?

Space transfers may prove an alternative for those who cannot afford to transfer money. This substitutability with regard to financial resources becomes apparent in the results of Rosenzweig and Wolpin (1993), who find that a rise in parent income increases the probability of downward money transfers and decreases the probability of co-residence. This is also consistent with the increase in affluence representing the main argument for explaining the long-term decline in rates of co-residence.

However, individuals might be more willing to transfer money to a close family member in addition to complementing space transfers with money. Or financial transfers contingent on co-residence may be deployed as an incentive for intergenerational co-residence when parents adopt a strong preference for this kind of living arrangement. When co-residence takes place in the parental home, this would also justify some complementarity between the two types of transfers. Sakudo (2007) observes that, in Japan, the percentage of single young adults living with parents who received PTC financial transfers was more than double the percentage for those living alone. Sakudo (2007) also reports a much larger prevalence of CTP financial transfers among young adults that co-reside with their parents than from young adults living alone, seen as a positive association between both modes of transfers. However, this is only a bivariate analytical study and it is therefore not possible to identify the direction of the space transfer and hence not guaranteed this provides evidence of interdependence between the two transfer types from the perspective of the donor. With findings that leave no doubt about the direction of the space transfer, Eggebeen and Hogan (1990) report that having once ever transferred space to parents also positively impacts on the probability of transferring money.

In Koh and MacDonald (2006), both co-residence and CTP financial transfers are rare, which therefore precludes strong conclusions. Nevertheless, the fact that they do not

encounter observations of co-residence together with CTP financial transfers may indicate a lack of association between the two transfer types.

In conclusion, there is insufficient evidence to draw clear conclusions about the interactions in financial and space transfers.

*Interactions in space and time transfers (1 and 3 in the diagram)*

Does living at the parent's or the adult child's home mean one is probably also receiving time transfers? Some studies find that the relationship between co-residence and upward time transfers, particularly caregiving, is strong (Lang and Brody 1983, Koh and MacDonald 2006, Campbell and Martin-Matthews 2000). Due to ignorance about the direction of space transfers, we cannot ascertain whether the relation is 1-3 or 4-3 or 1-6.

We do know that parents residing in nursing homes receive fewer time transfers from children and that parents needing help positively determines the probability of co-residence (Börsch-Supan *et al.* 1992, Sloan *et al.* 2002). Although the flow of the space transfer is not known for certain, the fact that parent need motivates co-residence suggests a CTP flow. Furthermore, in Sloan *et al.* (2002), the conviction is reinforced by the negative influence of parental home ownership on the probability of co-residence. Taking the need for help as a proxy for time transfers, we may reasonably interpret the results as evidence of complementarity in time and space CTP transfers.

There is also evidence of the accumulation of the two transfer types flowing downward.

For a sample in which 83 per cent of the older generation (parents) are homeowners,



Ward *et al.* (1992) report that, on average, parents perform over 100 household tasks whereas co-resident adult children perform only about 20. Meanwhile, Spitze and Ward (1995) and South and Spitze (1994) conclude for the case of home owning parents that parents transfer more time to adult sons than to adult daughters. Therefore, at least in the case of sons, PTC time and space transfers seem to be cumulative.

In conclusion, the evidence from the few studies that examined the interactions in space and time transfers point to complementarity.

### **Interactions in transfers between different generations (Reciprocities)**

In this study, we do not consider reciprocity as a signal for an exchange motive to transfers. The motive may mainly be altruism with different family member types of needs leading to an exchange of transfers between them. This may also result from the existence of an implicit “family constitution” (Cigno 1993) or from equity concerns such as the “gift exchange” behavior of Ermisch (2006). We deploy “reciprocity” to express the existence of transfers in the two directions between generations.

The intergenerational exchange process involves receiving as well as giving. It is important to note that reciprocity in intergenerational relations may not be recognized should not all modes of transfers be observed or whenever researchers focus only on current exchanges. Intergenerational transfers should be observed as support both given and received throughout the life course of several generations (Lin 2004). That may prove difficult because of data availability issues. Information about transfers is collected over a period of time and answers are probably more accurate when current

transfers are inquired. Nevertheless, because many transfers occur at certain points in time, surveys referring only to current transfers inevitably miss out on some instances.

Studies analysing the existence of reciprocities adopting aggregate measures of support including both time and money (Mutran and Reitzes 1984, Lee *et al.* 1994, Silverstein *et al.* 2002, Lowenstein and Daatland 2006) are concerned with the reciprocating pattern but not with interdependences among the different transfer types and therefore broadly irrelevant to this discussion.

We seek to ascertain whether reciprocities in certain types of transfers are commonly observed. Are time transfers usually reciprocated with time transfers? Are the associations between the transfer types used for giving and that are received dependent on the flow direction?

As far back as 1992, Ward and Spitze pointed to the scarcity of knowledge about the exchange conditions in situations of co-residence, that is, the financial contributions by non-householders and the exchange of in-kind support. The panorama has not greatly changed. Several reasons cause the exclusion of co-resident individuals from these analyses: the absence of surveys reporting information on transfers within households, the difficulty in recognizing the direction of space transfer flows, enhanced by the sometimes blurred frontier between space transfers and time transfers. However, this exclusion precludes the understanding of the relationship between the provision/reception of space transfers and the reception/provision of other transfer types.

Appendix table 2 summarizes the results and data sources of the various studies mentioned in this section.

*Interactions in financial transfers (2 and 5 in the diagram)*

A stylized fact for developed western countries is that financial transfers weigh far more heavily in terms of PTC than from CTP (Cox and Rank 1992, Gale and Scholz 1994, Furstenberg *et al.* 1995, Kohli 1999, Masson 1999, Grundy 2005, Attias-Donfut 1997, Attias-Donfut *et al.* 2005, Fritzell and Lennartsson 2005, Albertini *et al.* 2007, Fokkema *et al.* 2008), even excluding inheritances. We usually do not encounter regular CTP payments (Cox and Rank 1992, Chan and Ermisch 2011b).<sup>2</sup> Looking only at this mode of transfer, we do not observe reciprocity. Koh and MacDonald (2006) find no association between PTC financial assistance and CTP financial assistance. In their study, the children are aged at least 50 years old but PTC financial transfers are reported as having taken place since the children's graduation from high-school. Having received mortgage assistance from parents does not necessarily increase the probability of providing financial assistance to non-co-resident parents (Eggebeen and Hogan 1990).

*Interactions in financial transfers and time transfers (either 1 and 5 or 2 and 4 in the diagram)*

A different picture emerges when time transfers are included. Several studies identify much stronger CTP participation in time transfers than in financial transfers (Koh and MacDonald 2006, Fokkema *et al.* 2008, Leopold and Raab 2011). Most of the studies analysing the existence of a two way relationship in intergenerational transfers seek to identify a relationship between PTC financial transfers and CTP time transfers.

In some studies, there is no apparent relationship (McGarry and Schoeni 1997, Fokkema *et al.* 2008, Eggebeen and Hogan 1990). Although that could be a consequence of short windows of time used in survey questions, Eggebeen and Hogan (1990) find no relationship between CTP time transfers (care) measured for the previous 12 months and PTC financial transfers provided anytime during the past 5 years with McGarry and Schoeni (1997) also reporting a non-significant correlation coefficient between PTC financial transfers and CTP time transfers after analysis of information on financial transfers over a 10- year period.

A positive relationship between the occurrence of both is nevertheless frequently identified (Cox and Rank 1992, Henretta *et al.* 1997, Koh and MacDonald 2006 and Caputo 2002<sup>3</sup> for the USA; Leopold and Raab 2011, Deindl and Brandt 2011, and Brandt 2013 for Europe).

Albertini *et al.* (2007) make a distinction between levels in the amount of CTP time transferred, and they only find a weakly statistically significant positive relation between contemporaneous – during the last year - occurrences of PTC financial transfers and CTP time transfers for the lowest level of CTP time transfers. Taking a different approach, Ermisch (2006) and Chan and Ermisch (2011a) find that the unobserved attributes increasing the probability of PTC financial transfers also raise the probability of CTP time transfers.

In an Asian context, financial assistance to parents proves more frequent. Furthermore, Verbrugge and Chan (2008), studying data from Singapore, find that older parents regularly in receipt of financial support provide more PTC help with household chores. In the European context, Brandt (2013) reports that CTP financial transfers do positively influence PTC time transfers, although this influence is not as strong as that

of financial transfers. In addition, the influences extend only to the probability of transfer occurrence and bear no influence on its intensity.

The consideration of adult grandchildren as potential support providers usually returns an absence of reciprocity, with grandparents providing financial transfers without receiving financial or instrumental assistance (Hoff 2007: Germany).

In summary, with exceptions, the evidence suggests that there is some reciprocity between financial and time transfers, particularly PTC financial transfers and CTP time transfers.

*Interactions in time transfers (1 and 4 in the diagram)*

Are reciprocal time transfer exchanges frequent and probable? In Ikkink *et al.* (1999), reciprocity is clearly identified in instrumental support ongoing between Dutch parents and adult children and including situations of co-residence and of non-co-residence.

Albertini *et al.* (2007) report a positive relationship between PTC time transfers and low levels of CTP time transfers. That positive relationship is not observed for large amounts of CTP time transfers, possibly because when children provide such high levels of time transfers this may mean their parents are no longer in a position to reciprocate. Boerner and Reinhardt (2003) study elderly parents with health disabilities and still find that receipt of time transfers relates positively to the provision of time transfers. However, the nature of transfers does vary with age. Getting older – and less able – increases both the level of receipt of instrumental support and the provision of emotional support. Chen (2006b) takes data on Taiwan, which, while rather

westernized, may exhibit traits of traditional Asiatic culture. In this study, reciprocity in time transfers is reported: the reception of care, household chores, advice, and childcare was related to receipt of these support types.

*Interactions in time transfers and space transfers (3 and 4 or 1 and 6, in the diagram)*

Several studies identify a significant positive association between co-residence and the probability of CTP time transfers, either directly (Koh and MacDonald 2006, Boaz *et al.* 1999) or through the recognition that co-residence is proportionately higher among parents with physical limitations (Crimmins and Ingegneri 1990, Lee and Dwyer 1996, Brody *et al.* 1995). In the case of PTC time transfers, Grundy (2005) finds that PTC time transfers were greatly reduced when the nearest child was not co-resident, which indicates a positive association between co-residence and PTC time transfers.

Thus far, we are not able to identify the direction of the space transfer flow, so we correspondingly cannot determine whether these results result from relationships prevailing between 1-3 or 4-3 or 1-6. Eggebeen and Hogan (1990) do specify the space transfer flow direction: co-residence provided to parents. They do not find that space transfers have any significant effect on time transfers in the form of help (household assistance), but this may stem from co-residence being measured as having occurred at any time in the past whereas time transfers were measured for only the previous month.

*Interactions in space transfers (3 and 6 in the diagram)*

One factor specific to space transfers is that reciprocity in the same mode only makes sense when taking place at different points in time. However, to the best of our knowledge, no such study exists. Although Goldscheider and Lawton (1998) study attitudes – not actions -, their results are relevant to understanding the interactions between space transfers: women leaving the parental home early on, in young adulthood, display lower co-residence support levels for physically dependent parents compared with those remaining in their parent's households until marrying while this result does not hold for male descendents.

Studies identifying indirect reciprocities in space transfers can be included in this category: the probability of adult children living with their parents is higher for those who had lived with their grandparent(s) when children (Stark 1995, Cox and Stark 1996, Goldscheider and Lawton 1998).

*Interactions in financial transfers and space transfers (3 and 6 or 2 and 5, in the diagram)*

The relationship between co-residence and PTC financial transfers does not appear to attain statistical significance (Koh and MacDonald 2006, Eggebeen and Hogan 1990: USA). Both studies adopt long-term perspectives. In Eggebeen and Hogan (1990) the space transfers are upwards, whereas in Koh and MacDonald (2006) it is unknown. Kohli and Albertini (2007) find that in Europe, co-residing children are less likely to receive financial transfers than those reporting frequent contact but living separately from their parents.

Co-residence emerges as positively associated with CTP financial transfers in Koh and MacDonald (2006), but not in Boaz *et al.* (1999). As the Boaz *et al.* (1999) sample incorporates only dyads where the parent is functionally limited, this may bias the result in that the co-residence situations captured are motivated mainly by the need for time transfers (help and care) and not by financial motives.

### **Summary and directions for future research**

Private intergenerational transfers may take many forms but are commonly aggregated into three categories: money, time and space. While what category a transfer falls into is clear enough, in some cases there is disagreement. Space transfers, for instance, are either identified with co-residence, flowing in the direction of their overall beneficiaries, or not even recognized as a separate mode of transfer. In this article, we include a discussion on the definition of space transfers and argue that their definition should correspond to the imputed rent that the homeowner is not demanding from the other party. Nevertheless, we cannot actually apply this definition when analyzing the existing literature as it is not currently deployed in empirical studies.

If we seek to provide a complete view of the scope and scale of intergenerational private transfers in conjunction with a correct evaluation of the effect of policies on family welfare, the variety of transfer modes and the interactions among them need duly recognizing and incorporating into analytical approaches.

There are two distinct ways in which interactions in transfer modes may take place: i) the provision of one transfer type by one member of a generation may be positively or



negatively associated with the provision of another transfer type by the same member and ii) the provision of one transfer type by one member of a generation may be positively or negatively associated with the reception of the same type or another type of transfer from a peer member in the other generation, that is, reciprocities may exist.

Considering the association between different transfer types provided by the same person, most evidence – with some exceptions - confirms that there is substitutability between financial transfers and time transfers with regard to income or wealth and with respect to geographical distance. When focusing on the direct link between the two transfer types - instead of linkage mediated by financial resources or by distance - individuals who provide more financial transfers to the other generation also tend to provide more time. Evidence about the association between space and other forms of transfers is scarce and unclear but suggests complementarity between space and time transfers.

In the case of reciprocities between the same types of currencies, they are not recognized in financial transfers but they are to some extent present in time transfers. Most works studying the interactions between time and financial transfers consider the first as upwards and the second as downwards. Although not unanimous, the evidence suggests that there is some reciprocity between financial and time transfers, particularly between PTC financial transfers and CTP time transfers.

It is commonly held that co-resident parents and children engage in higher levels of time transfers. When it comes to reciprocities involving space transfers, the results are insufficient: in most studies, only co-residence is analyzed, with no indication of the space transfer flow direction. The few articles identifying the direction of the space transfer flow, do not find evidence of a relationship between financial transfers in one

direction and space transfers in the other direction when looking at asynchronous transfers. Further results and findings are important as well as setting up to samples that are not a priori biased as to the type of association expected, for example, when all parents have health problems.

Having provided a sense of the current state of the literature on interactions in the different modes of transfers, we conclude the field requires enriching and deepening with more studies on all interaction types. Studies on the relationship between space transfers and other forms of transfers are particularly needed, preferably deploying a definition of such transfers that is not overly ambiguous. That, of course, requires the existence of data on intra-household transfers, whose collection through surveys should be encouraged. When only transfers between non-co-resident generations are surveyed, it is not only space transfers that get ignored but also potentially important dimensions to the other two transfer types.

It would be interesting to investigate whether there is any relationship between space transfers heading in one direction and space transfers in the other direction later in life. To our knowledge, no such studies exist. These would require not only data on space transfers identifying the respective direction but long series or surveys with questions covering long periods of past history.

The importance of co-residence is recognized as much more important in East and South Europe than in North Europe or North America. Accordingly, interactions between space transfers and other transfer categories potentially also differ. It would be interesting to approach these issues based on data from more countries than is currently the case.

In this paper, we look at the relations between parents and children. Depending on the databases accessed, the age distributions of subsamples differ greatly in their makeup with “adult children” ranging from including individuals aged 18 or over in some cases, to individuals aged 50 or over in other cases. Of course, the interdependences of transfers may be distinct and this matters when population samples are ageing. However, it is still early to seek stylized facts of behaviours based on age categories. More research adopting the same age groups is needed to allow for generalizations providing answers to the question: “how does the change in the demographic composition of the population influence recourse to each transfer type?”.

Applying the three broad categories is common but remains a simplification with a finer disaggregation possible with some articles achieving this, for example, by separating care and help in the time transfers category. Patterns of interaction could be sought out in more detailed transfer categories.

In the current context of economic crisis in many developed countries, associated with the strain imposed by population ageing on public finances, private intergenerational transfers are deemed more important to supporting the effective functioning of families. However, despite more need, they may also become more difficult to generate due to diminished resource levels. Will this prove sufficient to change patterns of interactions between the types of transfers?

## Notes

<sup>1</sup> Ideally, the price of food should be included whenever part of the living arrangements. As McGarry and Schoeni (1995) illustrate, the lack of information on the contributions of the respective different parties inside the household renders obtaining a clear picture of intergenerational transfers difficult.

<sup>2</sup> Something different occurs in other societies. See, for example, Chen (2006a).

<sup>3</sup> Caputo (2002) considers only daughters in his study.

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## APPENDIX

**Table 1: Studies analysing substitution or complementary relations among transfers**

Authors	Data	Method	Transfers	Empirical findings
Lang & Brody 1983	USA, Collected for a study, no date. Women with a mother and a daughter.	Regression	Up TTr and Co-residence	CTP TTr (intensity) positively associated with STR (co-residence).
Eggebeen & Hogan 1990	USA 1987-1988 National Survey of Families and Households ( <b>NSFH</b> )	Logistic regressions	Up and Down FTr (gift or loan of at least \$200 in the previous 5 years) and TTr (household assistance, childcare, companionship and advice, last month). Up STR (ever given).	Co-residence is positively associated with CTP FTr (occurrence) and to CTP TTr (occurrence).
Rosen-zweig & Wolpin 1993	USA, National Longitudinal Survey ( <b>NLS</b> ), 1967-1981. The older generation is not necessarily old; the younger generation sample is sons.	maximum likelihood logits	Down FTr and Coresidence	Probability of PTC FTr is larger for those that do not co-reside.
McGarry and Schoeni 1995	USA, Health and Retirement Survey ( <b>HRS</b> ), 1992, non-co-resident	Logit	UP/Down; FTr (\$500 or more in past 12 months) and TTr (100 hours or more of care last 12 months)	Higher income and wealth of children associated with higher probability of CTP FTr but with no relationship to the probability of CTP TTr.

Couch et al. 1999	USA, Panel Study of Income Dynamics (PSID), 1988, non-co-resident generations	2-stage approach to the estimation of 4 tobit equations	Up TTr and FTr, last year	Higher FTr made with higher wage rates, but lower TTr made with higher wage rates (except for married women). A positive correlation between the equation errors estimating TTr and FTr for married couples, and indicates that unobservables (like tastes) similarly influence both types of transfers. For unmarried individuals, no correlation is observed.
Boaz et al. 1999	USA, HRS, 1992, functionally limited elderly parents	2-stage approach to the estimation of 4 tobit and logit equations	Up TTr (at least 100 annual hours, previous 12 months), Up FTr (at least \$500, previous 12 months), Co-residence	29% of households with a parent in need of help provided a transfer. Only 3% provided both time and money transfers. Less than 1% provided all three transfer types. FTr and STr increase TTr (caregiving) but TTr has no effect on FTr or on STr. STr and FTr (both UP) are not interdependent.
Campbell & Martin-Matthews 2000	Canada, Work and Family Survey - Canadian Aging Research Network, 1991-1993, employed men who provide care to one parent or parent-in-law	OLS regression	Co-residence (current), TTr	Co-residence is positively related with certain types of CTP TTr (meals and personal care), although not with other CTP TTr (home maintenance, managerial assistance, yard work).
Ioannides & Kan 2000	USA, PSID, 1988	Tobits and Bivariate Probits	Up/Down FTr, TTr, previous 12 months, any amounts.	Positive association between CTP FTr (amount) and geographical distance. Geographical distance is interpreted as a proxy for lack of TTr, therefore, a substitution between CTP FTr and TTr. For the same reason, a negative association between PTC FTr and geographical distance should signal complementarity between PTC FTr and TTr. No significant association between CTP FTr and TTr (probabilities), measured through the correlation coefficients in the disturbances in Bivariate Probits. Positive association between PTC FTr and TTr.

Zissimopoulos 2001	USA, <b>HRS</b> , 1994, married couples with at least one non-co-resident parent	Tobit	Up TTr (care and household tasks above 50 hours past year) and FTr (above \$100 past year)	Individuals with higher wage rates transfer more money and less time than individuals in the lowest wage rate quartile.
Arrondel & Masson 2001	France, 1992, INSEE wealth survey, Caisse Nationale d'Assurance Vieillesse ( <b>CNAV</b> ) survey; Independent-living generations	Bivariate Probit	Up TTr (current support, not contact) FTr (last 5 years, includes housing help and loans)	No significant association between CTP FTr and TTr (probabilities), measured through the correlation coefficients in the disturbances in Bivariate Probits. Result based on CNAV data.
Ingersoll-Dayton 2001	USA, data collected for a study, 1994. Middle-generation with children in the household	Correlation coefficients	Down TTr (help, care, emotional support), FTr. Up TTr (care). Current transfers	PTC TTr positively correlated with PTC FTr.
Sloan et al. 2002	USA, <b>HRS</b> , 1992-1998	Logit and OLS.	Up FTr (\$500 or more, last 2 years), Up TTr (100 or more hours of care or help, last 2 years, frequency of contact, last year), Co-residence (current)	Wealthier children transfer more money but time transfers show little relationship with wealth. Wealthier children co-reside less with parents.
Caputo 2002	USA, <b>NLS</b> , Non-co-resident, 1993, 1997	Logistic regression	Up; FTr (in 1993), TTr (current – 1997 - care and help);	American adult daughters providing money transfers were more than twice as likely also to be caregivers.
Attias-Donfut et al. 2005	10 countries in Europe, Survey of Health, Ageing and Retirement in Europe ( <b>SHARE</b> )	Country ranking; Bivariate Probit	UP/Down FTr (at least 250Eur, inside or outside the household), TTr (outside the household last 12m);	Macro level analysis -Classifying countries according to the importance of each transfer type, they find partial substitution between TTr and FTr in some countries but not in others. Bivariate probit: correlations between residuals of transfer equations show significant positive associations between TTr

				and FTr. No distinction between CTP or PTC.
Koh & MacDona Id 2006	USA, Winsconsin Longitudinal Study (WLS), 1992/93	Multivariate Logistic Regressions	UP; TTr (care – past year, and help – past month), FTr (\$1,000 or more ever transferred) , Co-residence;	Co-residence positively related to CTP FTr and to CTP TTr. No interdependence between CTP FTr and CTP TTr.
Bonsang 2007	10 European countries SHARE, 2004, non-co-resident, children at least 50 years old	Bivariate Probit	TTr (care and help, last 12 months), FTr (at least €250 last 12 months)	Higher household income increases the probability of providing CTP TTr, and the probability of FTr. Additionally, the correlation coefficient of the error terms of the equations for TTr and for FTr is significantly positive.
Fokkema et al. 2008	10 European countries SHARE, 2004, Non-co-resident generations	Logistic regression	UP/Down TTr (care, help, last 12 months), Down FTr (last 12 months);	PTC TTr positively associated with PTC FTr
Deindl & Brandt 2011	14 European countries, SHARE, 2006-7, non-co-resident, children aged 50+	Multivariate logistic random intercept models	UP/Down; TTr (help); FTr (at least 250 Eur last 12 months)	CTP TTr positively associated with CTP FTr.

Note: “TTr” denotes “Time transfers”. “FTr” denotes “Financial transfers”. “STr” denotes “Space transfers”. “CTP” denotes “Child to Parent”. “PTC” denotes “Parent to Child”.

**Table 2: Studies that investigate reciprocities in transfer types**

Authors	Data	Method	Transfers	Empirical findings
Eggebeen & Hogan 1990	USA, National Survey of Families and Households ( <b>NSFH</b> ), 1987-88	Logistic regressions	Up and Down FTr (gift or loan of at least \$200, the previous 5 years) and TTr (household assistance, childcare, companionship and advice, last month). Up STTr (ever given).	No evidence of reciprocity in FTr or between CTP TTr and PTC FTr. Parents who have given FTr to children are not more likely to receive TTr from them. Parents who have received TTr or STTr are not more likely to provide FT or TTr in return.
Cox & Rank 1992	USA, NSFH, 1987-88	Probit, Tobit	FTr (more than \$200 last 5 years); CTP TTr (help and advice; contact)	CTP TTr positively related to propensity to receive PTC net FTr, although not to the amount of net FTr. The FTR measure is net: the difference between that received and that given.
McGarry & Schoeni 1997	USA , Asset and Health Dynamics Among the Oldest Old ( <b>AHEAD</b> ) 1993-94. Parents 70+ Non-co-resident.	Correlation Multivariate model	Down FTr (\$500 or more, last 12 months, last 10 years), Up TTr (care and help, last month and last 10 years)	CTP care is negatively correlated with the occurrence of PTC FTr both referring to last year and to the last 10 years. The amounts are not correlated. In a multivariate model, there is no relation between CTP current TTr and PTC current FTr.
Henretta, Hill, Li, Soldo, & Wolf 1997	USA, AHEAD , 1993, unmarried parents with two or more children; parents 70+	Conditional logit	UP/Down FRr (last 10 years except the last) TTr (current care and help)	Probability of CTP TTr is larger for children who have previously received PTC FTr .
Ikkink et al. 1999	Netherlands, data from a study, 1992-93, co-resident or not.	Multi-level analysis	UP/Down TTr (help, contact and advice, last year)	Reciprocity in TTr: mutual interdependence between giving and receiving support.
Caputo 2002	USA, National Longitudinal Survey ( <b>NLS</b> ), 1993, 1997 Non-co-resident	Logistic regression	Up; FTr (in 1993), TTr (current – 1997 - care and help);	Daughters receiving FTr during the previous year had a larger probability of providing TTr.

	generations			
Boerner & Reinhardt 2003	Data from a study on a US region, elderly parents with health disability (vision)	Multilevel analysis	UP/Down TTr (affection, help and care)	Reciprocity in TTr.
Koh & MacDonald 2006	USA, Winsconsin Longitudinal Study ( <b>WLS</b> ), 1992/93, children aged 50+	Multivariate Logistic Regressions	UP; TTr (care – past year, and help – past month), UP/ Down FTr (\$1,000 or more ever transferred) , Co-residence;	PTC FTr are reciprocated with CTP TTr. The relationship does not exist between PTC FTr and CTP FTr or Co-residence. Co-residence is positively associated with CTP FTr and with CTP TTr.
Ermisch 2006	UK, British Household Panel Survey ( <b>BHPS</b> ) - 2001, parents 60+, non-co-resident	Joint estimation of two equations, one for PTC FTr and the other for CTP TTr	UP TTr (frequent help), Down FTr (regular)	Parents with unobserved attributes that increase the probability of PTC FTr are more likely to receive regular or frequent CTP TTr.
Kohli & Albertini 2007	9 European countries Survey of Health, Ageing and Retirement in Europe ( <b>SHARE</b> ) – 2004	Logistic regression	Co-residence and Down FTr (at least 250 Eur, last year)	Co-residence is associated with lower probability of PTC FTr.
Fokkema et al. 2008	10 European countries SHARE, 2004, Non-co-resident generations	Logistic regression	UP/Down TTr (care, help, last year), Down FTr (last year);	No relationship between CTP TTr and PTC FTr. Reciprocity between PTC and CTP TTr. PTC TTr increases with contact but not with instrumental CTP TTr. CTP TTr increases with PTC TTr and contact.
Lennartsson et al. 2010	Sweden, Swedish Panel Study of Living Conditions of the Oldest Old ( <b>SWEOLD</b> ), 2002, 2004, non-co-resident	Logistic regression	UP/Down; FTr ( SEK5,000 or more, last 12 months) TTr (contact on weekly basis in the previous year)	PTC FTr increases with CTP TTr (contact) And assumes that contact is a net upward time transfer.
Deindl & Brandt	14 European countries, SHARE, 2006-7, non-co-	Multivariate logistic random	UP/Down; TTr (help); FTr (at least €250 last year)	CTP TTr and PTC FTr positively associated.



2011	resident, children aged 50+	intercept models		
Leopold & Raab 2011	12 European countries, SHARE, 2004; single-living parents aged 50+ with between two and four living children	Conditional logistic regression	Down FTr (€250 or more, last year); UP TTr (last year)	A parent that provides PTC FTr (but not PTC TTr) has a larger probability of receiving CTP TTr. Additionally, a parent receiving CTP TTr returns a larger probability of providing PTC FTr. However, there is no information if PTC transfers were made to children providing CTP transfers.
Chan & Ermisch 2011	UK, BHPS, 2001-2006, parents 60+	Correlations of the residuals of Seemingly unrelated regressions	UP/ Down FTr, UP TTr (help), Down TTr (help and care), contemporaneous transfers	PTC FTr is not contemporaneously reciprocated with CTP FTr or CTP TTr. PTC TTr positively associated with PTC FTr.
Brandt 2013	11 European countries, SHARE, 2004, respondents 50+, with children 18+ and parents 64+ , non-co-resident	Logistic and linear four level models	UP/ Down TTr (last 12 months) and Down FTR (unclear period of measurement)	CTP TTr and FTr positively influence the occurrence of PTC TTr, although not the number of hours that are transferred. PTC FTr positively influences the occurrence of CTP TTr, although not the number of hours transferred.

*Note: "TTr" denotes "Time transfers". "FTr" denotes "Financial transfers". "STr" denotes "Space transfers". "CTP" denotes "Child to Parent". "PTC" denotes "Parent to Child".*

## APPENDIX

**Table 1: Studies analysing substitution or complementary relations among transfers**

Authors	Data	Method	Transfers	Empirical findings
Lang & Brody 1983	USA, Collected for a study, no date. Women with a mother and a daughter.	Regression	Up TTr and Co-residence	CTP TTr (intensity) positively associated with STR (co-residence).
Eggebeen & Hogan 1990	USA 1987-1988 National Survey of Families and Households ( <b>NSFH</b> )	Logistic regressions	Up and Down FTr (gift or loan of at least \$200 in the previous 5 years) and TTr (household assistance, childcare, companionship and advice, last month). Up STR (ever given).	Co-residence is positively associated with CTP FTr (occurrence) and to CTP TTr (occurrence).
Rosen-zweig & Wolpin 1993	USA, National Longitudinal Survey ( <b>NLS</b> ), 1967-1981. The older generation is not necessarily old; the younger generation sample is sons.	maximum likelihood logits	Down FTr and Coresidence	Probability of PTC FTr is larger for those that do not co-reside.
McGarry and Schoeni 1995	USA, Health and Retirement Survey ( <b>HRS</b> ), 1992, non-co-resident	Logit	UP/Down; FTr (\$500 or more in past 12 months) and TTr (100 hours or more of care last 12 months)	Higher income and wealth of children associated with higher probability of CTP FTr but with no relationship to the probability of CTP TTr.

Couch et al. 1999	USA, Panel Study of Income Dynamics (PSID), 1988, non-co-resident generations	2-stage approach to the estimation of 4 tobit equations	Up TTr and FTr, last year	Higher FTr made with higher wage rates, but lower TTr made with higher wage rates (except for married women). A positive correlation between the equation errors estimating TTr and FTr for married couples, and indicates that unobservables (like tastes) similarly influence both types of transfers. For unmarried individuals, no correlation is observed.
Boaz et al. 1999	USA, HRS, 1992, functionally limited elderly parents	2-stage approach to the estimation of 4 tobit and logit equations	Up TTr (at least 100 annual hours, previous 12 months), Up FTr (at least \$500, previous 12 months), Co-residence	29% of households with a parent in need of help provided a transfer. Only 3% provided both time and money transfers. Less than 1% provided all three transfer types. FTr and STr increase TTr (caregiving) but TTr has no effect on FTr or on STr. STr and FTr (both UP) are not interdependent.
Campbell & Martin-Matthews 2000	Canada, Work and Family Survey - Canadian Aging Research Network, 1991-1993, employed men who provide care to one parent or parent-in-law	OLS regression	Co-residence (current), TTr	Co-residence is positively related with certain types of CTP TTr (meals and personal care), although not with other CTP TTr (home maintenance, managerial assistance, yard work).
Ioannides & Kan 2000	USA, PSID, 1988	Tobits and Bivariate Probits	Up/Down FTr, TTr, previous 12 months, any amounts.	Positive association between CTP FTr (amount) and geographical distance. Geographical distance is interpreted as a proxy for lack of TTr, therefore, a substitution between CTP FTr and TTr. For the same reason, a negative association between PTC FTr and geographical distance should signal complementarity between PTC FTr and TTr. No significant association between CTP FTr and TTr (probabilities), measured through the correlation coefficients in the disturbances in Bivariate Probits. Positive association between PTC FTr and TTr.

Zissimopoulos 2001	USA, <b>HRS</b> , 1994, married couples with at least one non-co-resident parent	Tobit	Up TTr (care and household tasks above 50 hours past year) and FTr (above \$100 past year)	Individuals with higher wage rates transfer more money and less time than individuals in the lowest wage rate quartile.
Arrondel & Masson 2001	France, 1992, INSEE wealth survey, Caisse Nationale d'Assurance Vieillesse ( <b>CNAV</b> ) survey; Independent-living generations	Bivariate Probit	Up TTr (current support, not contact) FTr (last 5 years, includes housing help and loans)	No significant association between CTP FTr and TTr (probabilities), measured through the correlation coefficients in the disturbances in Bivariate Probits. Result based on CNAV data.
Ingersoll-Dayton 2001	USA, data collected for a study, 1994. Middle-generation with children in the household	Correlation coefficients	Down TTr (help, care, emotional support), FTr. Up TTr (care). Current transfers	PTC TTr positively correlated with PTC FTr.
Sloan et al. 2002	USA, <b>HRS</b> , 1992-1998	Logit and OLS.	Up FTr (\$500 or more, last 2 years), Up TTr (100 or more hours of care or help, last 2 years, frequency of contact, last year), Co-residence (current)	Wealthier children transfer more money but time transfers show little relationship with wealth. Wealthier children co-reside less with parents.
Caputo 2002	USA, <b>NLS</b> , Non-co-resident, 1993, 1997	Logistic regression	Up; FTr (in 1993), TTr (current – 1997 - care and help);	American adult daughters providing money transfers were more than twice as likely also to be caregivers.
Attias-Donfut et al. 2005	10 countries in Europe, Survey of Health, Ageing and Retirement in Europe ( <b>SHARE</b> )	Country ranking; Bivariate Probit	UP/Down FTr (at least 250Eur, inside or outside the household), TTr (outside the household last 12m);	Macro level analysis -Classifying countries according to the importance of each transfer type, they find partial substitution between TTr and FTr in some countries but not in others. Bivariate probit: correlations between residuals of transfer equations show significant positive associations between TTr

				and FTr. No distinction between CTP or PTC.
Koh & MacDona Id 2006	USA, Winsconsin Longitudinal Study (WLS), 1992/93	Multivariate Logistic Regressions	UP; TTr (care – past year, and help – past month), FTr (\$1,000 or more ever transferred) , Co-residence;	Co-residence positively related to CTP FTr and to CTP TTr. No interdependence between CTP FTr and CTP TTr.
Bonsang 2007	10 European countries SHARE, 2004, non-co-resident, children at least 50 years old	Bivariate Probit	TTr (care and help, last 12 months), FTr (at least €250 last 12 months)	Higher household income increases the probability of providing CTP TTr, and the probability of FTr. Additionally, the correlation coefficient of the error terms of the equations for TTr and for FTr is significantly positive.
Fokkema et al. 2008	10 European countries SHARE, 2004, Non-co-resident generations	Logistic regression	UP/Down TTr (care, help, last 12 months), Down FTr (last 12 months);	PTC TTr positively associated with PTC FTr
Deindl & Brandt 2011	14 European countries, SHARE, 2006-7, non-co-resident, children aged 50+	Multivariate logistic random intercept models	UP/Down; TTr (help); FTr (at least 250 Eur last 12 months)	CTP TTr positively associated with CTP FTr.

Note: “TTr” denotes “Time transfers”. “FTr” denotes “Financial transfers”. “STr” denotes “Space transfers”. “CTP” denotes “Child to Parent”. “PTC” denotes “Parent to Child”.

**Table 2: Studies that investigate reciprocities in transfer types**

Authors	Data	Method	Transfers	Empirical findings
Eggebeen & Hogan 1990	USA, National Survey of Families and Households ( <b>NSFH</b> ), 1987-88	Logistic regressions	Up and Down FTr (gift or loan of at least \$200, the previous 5 years) and TTr (household assistance, childcare, companionship and advice, last month). Up STR (ever given).	No evidence of reciprocity in FTr or between CTP TTr and PTC FTr. Parents who have given FTr to children are not more likely to receive TTr from them. Parents who have received TTr or STR are not more likely to provide FT or TTr in return.
Cox & Rank 1992	USA, NSFH, 1987-88	Probit, Tobit	FTr (more than \$200 last 5 years); CTP TTr (help and advice; contact)	CTP TTr positively related to propensity to receive PTC net FTr, although not to the amount of net FTr. The FTR measure is net: the difference between that received and that given.
McGarry & Schoeni 1997	USA , Asset and Health Dynamics Among the Oldest Old ( <b>AHEAD</b> ) 1993-94. Parents 70+ Non-co-resident.	Correlation Multivariate model	Down FTr (\$500 or more, last 12 months, last 10 years), Up TTr (care and help, last month and last 10 years)	CTP care is negatively correlated with the occurrence of PTC FTr both referring to last year and to the last 10 years. The amounts are not correlated. In a multivariate model, there is no relation between CTP current TTr and PTC current FTr.
Henretta, Hill, Li, Soldo, & Wolf 1997	USA, AHEAD , 1993, unmarried parents with two or more children; parents 70+	Conditional logit	UP/Down FRr (last 10 years except the last) TTr (current care and help)	Probability of CTP TTr is larger for children who have previously received PTC FTr .
Ikkink et al. 1999	Netherlands, data from a study, 1992-93, co-resident or not.	Multi-level analysis	UP/Down TTr (help, contact and advice, last year)	Reciprocity in TTr: mutual interdependence between giving and receiving support.
Caputo 2002	USA, National Longitudinal Survey ( <b>NLS</b> ), 1993, 1997 Non-co-resident	Logistic regression	Up; FTr (in 1993), TTr (current – 1997 - care and help);	Daughters receiving FTr during the previous year had a larger probability of providing TTr.

	generations			
Boerner & Reinhardt 2003	Data from a study on a US region, elderly parents with health disability (vision)	Multilevel analysis	UP/Down TTr (affection, help and care)	Reciprocity in TTr.
Koh & MacDonald 2006	USA, Winsconsin Longitudinal Study ( <b>WLS</b> ), 1992/93, children aged 50+	Multivariate Logistic Regressions	UP; TTr (care – past year, and help – past month), UP/ Down FTr (\$1,000 or more ever transferred) , Co-residence;	PTC FTr are reciprocated with CTP TTr. The relationship does not exist between PTC FTr and CTP FTr or Co-residence. Co-residence is positively associated with CTP FTr and with CTP TTr.
Ermisch 2006	UK, British Household Panel Survey ( <b>BHPS</b> ) - 2001, parents 60+, non-co-resident	Joint estimation of two equations, one for PTC FTr and the other for CTP TTr	UP TTr (frequent help), Down FTr (regular)	Parents with unobserved attributes that increase the probability of PTC FTr are more likely to receive regular or frequent CTP TTr.
Kohli & Albertini 2007	9 European countries Survey of Health, Ageing and Retirement in Europe ( <b>SHARE</b> ) – 2004	Logistic regression	Co-residence and Down FTr (at least 250 Eur, last year)	Co-residence is associated with lower probability of PTC FTr.
Fokkema et al. 2008	10 European countries SHARE, 2004, Non-co-resident generations	Logistic regression	UP/Down TTr (care, help, last year), Down FTr (last year);	No relationship between CTP TTr and PTC FTr. Reciprocity between PTC and CTP TTr. PTC TTr increases with contact but not with instrumental CTP TTr. CTP TTr increases with PTC TTr and contact.
Lennartsson et al. 2010	Sweden, Swedish Panel Study of Living Conditions of the Oldest Old ( <b>SWEOLD</b> ), 2002, 2004, non-co-resident	Logistic regression	UP/Down; FTr ( SEK5,000 or more, last 12 months) TTr (contact on weekly basis in the previous year)	PTC FTr increases with CTP TTr (contact) And assumes that contact is a net upward time transfer.
Deindl & Brandt	14 European countries, SHARE, 2006-7, non-co-	Multivariate logistic random	UP/Down; TTr (help); FTr (at least €250 last year)	CTP TTr and PTC FTr positively associated.

2011	resident, children aged 50+	intercept models		
Leopold & Raab 2011	12 European countries, SHARE, 2004; single-living parents aged 50+ with between two and four living children	Conditional logistic regression	Down FTr (€250 or more, last year); UP TTr (last year)	A parent that provides PTC FTr (but not PTC TTr) has a larger probability of receiving CTP TTr. Additionally, a parent receiving CTP TTr returns a larger probability of providing PTC FTr. However, there is no information if PTC transfers were made to children providing CTP transfers.
Chan & Ermisch 2011	UK, BHPS, 2001-2006, parents 60+	Correlations of the residuals of Seemingly unrelated regressions	UP/ Down FTr, UP TTr (help), Down TTr (help and care), contemporaneous transfers	PTC FTr is not contemporaneously reciprocated with CTP FTr or CTP TTr. PTC TTr positively associated with PTC FTr.
Brandt 2013	11 European countries, SHARE, 2004, respondents 50+, with children 18+ and parents 64+ , non-co-resident	Logistic and linear four level models	UP/ Down TTr (last 12 months) and Down FTR (unclear period of measurement)	CTP TTr and FTr positively influence the occurrence of PTC TTr, although not the number of hours that are transferred. PTC FTr positively influences the occurrence of CTP TTr, although not the number of hours transferred.

*Note: "TTr" denotes "Time transfers". "FTr" denotes "Financial transfers". "STr" denotes "Space transfers". "CTP" denotes "Child to Parent". "PTC" denotes "Parent to Child".*