How do middle-aged children allocate time and money transfers to their older parents in Europe?[1]

Eric Bonsang[2, 3]

CREPP, HEC-Management School
University of Liège

Abstract

The modifications of the demographic structure in Europe are expected to change several aspects of the economic and social landscape. Among the several issues posed by ageing, financing of health care and more precisely long-term care appears as a major challenge for the twenty-first century. Historically, family has always been a non-negligible provider of informal long-term care to elderly. Changes in family structures and the individual roles are likely to influence the provision of informal care to elderly in the future and, by the way, the demand for formal care.

This paper analyses the determinants of financial and time transfers from adult children to their older parents using the Survey of Health, Ageing and Retirement in Europe (SHARE). It is the first survey containing rich comparable interdisciplinary information about 50+ individuals from ten European countries (Austria, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, Switzerland). The first part of the paper highlights the differences in the opinions of the middle-aged children towards assistance to elderly and in the provision of upward intergenerational transfers (both in time and money) across the ten European countries. These inter-country differences are then explained by the differences in culture and institutional settings. The second part shows what are the different determinants in the decision to provide time or money transfers to parents and evaluate whether these two types of assistance are substitutes or complements. Results highlight the existence of substitution between time and money regarding the geographical distance and the existence of a weak substitution regarding employment status of the middle-aged children.

[3] Author adress : CREPP - Université de Liège, Boulevard du Rectorat, 7 (B31), 4000 Liège – Belgium
Tel. : +31 (0)4 366 31 10 ; Fax : +311 (0)4 366 31 06 ; E-mail : Eric.Bonsang@ulg.ac.be

1. Introduction

Europe is an ageing continent where the demand for long-term care will undoubtedly increase during the next decades. For parents, children have always been an important old-age care source. Historically, upstream intergenerational transfers both in cash and in nature have been the most important way for elderly to obtain aid when loosing autonomy. Although the development of social security has presumably reduced this role nowadays, understanding the causes and consequences of these transfers remains an important topic. Moreover, population ageing has generated a growing interest for the welfare of the elderly population. If transfers between children and parents are important, one might think that they should be taken into account for evaluating population welfare.

Several studies have examined substitution between financial and time transfers from adult children to older parents. While there exists some agreements concerning financial transfers, time transfers are more subject to debate. Zissimopoulos (2001) using US data (Health and Retirement Study (HRS)) finds that an increase in an adult child's income and wealth increases transfers to parents while an increase in wage rate leads to an increase in financial transfer and a decrease in time transfer. Ioannides and Kan (1999) estimates from the Panel Study of Income Dynamics (PSID) indicate a positive effect of household head hourly earning on financial transfer to parents and a negative one for time transfer. Sloan and al. (2002) results from the HRS suggest that financial assistance responds positively to an increase in the wage rate while it exhibits no significant effect on time assistance to elderly parents. McGarry and Schoeni (1995) also used the HRS and show that household income of the respondent is positively associated to financial transfers to parents while there is no significant impact on time assistance given. Arrondel and Masson (2001) analyse upward financial and time transfers from French data ("Caisse Nationale d'Assurance Vieillesse" survey) using a bivariate probit and find no sign of substitution between financial and time transfers made by adult children to their parents.

This paper analyses the determinants of financial and time transfers from adult children to their older parents in Europe by using the Survey of Health, Ageing and Retirement in Europe (SHARE). This survey contains rich information about 50+ individuals from ten European countries (Austria, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, Switzerland) in 2004. SHARE provides a unique opportunity to conduct an international comparative analysis of upstream intergenerational transfers across Europe. It is the first survey that has "the advantage to encompass cross-national variations in public policies, cultures and histories in a variety of European countries"[3]. It includes a large amount of information regarding financial and time assistance. In a first step, we compare the importance of time and money transfers across the ten European countries and the opinion of the adult children towards assistance to elderly. In a second step, we analyse what are the different determinants in the decision to provide time or money transfers to parents and evaluate whether these two types of assistance are substitutes or complements.

2. Data

The SHARE data contain a large amount of information concerning various forms of transfers between individuals and households. Respondents were asked about the financial transfers of

---

[3] See http://www.share-project.org/

at least 250€ received and given during the last 12 months. They are asked to report the amount and the relationship with the donor or recipient. This allows us to identify whether financial transfers occur between middle-aged children and their parents and the amount transferred. Concerning assistance in time, individuals report whether they received or gave either of three forms of practical help during the last 12 months. The three forms of help consist in personal care (help with dressing, bathing or showering, eating, getting in and out of bed and using the toilet), practical tasks (home repairs, gardening, help with transport, shopping and household chores), and help with paperwork (filling out forms, or setting financial or legal matters). Information about the relationship with the donor or recipient, the frequency and the number of hours devoted to the help are also available.

Moreover, SHARE is a multidisciplinary survey that provides various information about households and individuals. It includes information about living arrangement, physical and mental health, health care, employment and pensions, children, housing, household income, consumption, assets and expectations. This large amount of information offers us the opportunity to conduct an empirical analysis to determine the different characteristics that explain the occurrence of upstream intergenerational transfers both in money and time. The different variables retained for the analysis comprise both adult children and parent characteristics. Middle-aged children characteristics include gender, age, marital status, work status (not working, working part-time[4], working full-time), health self-reported status[5], education[6], household income, home ownership, household size, number of children (living in the household or not) and the number of siblings. Parents characteristics include age, health status[7], living arrangement[8] (couple, father only, or mother only), distance from adult children and a dummy variable indicating whether parents gave financial assistance of at least 250€ to the respondent during the last 12 months. Unfortunately, SHARE does not provide any information about income or standard of living of parents. If it is positively related to children's income and negatively related to financial transfer made to parents, this could result in an omitted variable bias that is likely to underestimate the impact of children's income on the financial transfer decision. However, we partly control for the standard of living of parents by including a variable indicating the expectation of the adult children concerning the probability that they receive an inheritance more than 50,000€ within the next ten years. We can reasonably assume that this variable is a valid proxy for the resources owned by the parents given that most of the inheritances received come from the parents. Another limitation of the data is that we do not know whether the parents live in an institution or not.

The total sample of the release1 of SHARE 2004 includes 22,777 observations. Our analysis focuses on the adult children's point of view. It consists in individuals who are between 50 and 69 year-old, have at least one parent alive and do not live with them. The survey includes 5,244 observations fulfilling these conditions. The minimum age restriction comes directly

---

[4] Part-time workers are defined as usually working less than 30 hours per week.
[5] The health self-status variable is 1 if the respondent declare having a bad or a very bad health and zero otherwise.
[6] The education variable is harmonized across countries by using the International Standard Classification of Education - 1997 version from UNESCO.
[7] When the father and the mother are still alive, the variable « age » takes the value of the oldest parent and the variable « health status » is a dummy variable that is equal to 1 if at least one parent has a bad or very bad health status.
[8] This information is not directly observable in SHARE data. To compute this variable, we assume that the parents still live together if both are alive and if the geographical distance between the respondent and his father is the same as for the mother.

from the sampling procedure of SHARE. This could represent a limitation for our research but one might think that 50+ individuals are those that are the most likely to have parents requiring assistance from their adult children. Moreover, following McGarry (1999) and Norton and Van Houtven (2005), we exclude adult children living with their parents because the data do not allow us to evaluate the existence, the direction and the importance of the intra-household transfers taking place between the adult children and their parents. "Excluding co-resident children avoids measurement error in both dependent and independent variables, and makes the comparison cleaner" (Norton and Van Houtven (2005)). The drawback of this exclusion is that it might underestimate in-kind transfers if they are positively correlated with cohabitation. Moreover, financial transfers may also be underestimated if wealth of parents is negatively correlated with cohabitation and that financial transfers are also negatively correlated with wealth of the recipient. After having discarded observations with missing or unreliable values[9] for the variables of interest and the explanatory variables, the final sample contains 4,852 observations. Descriptive statistics by country are presented in Table 1.

3. Upstream intergenerational transfers across Europe

Long term care systems across European countries

The development of social policy aiming at providing formal long-term care to elderly is likely to shape the pattern of informal care provided by adult children to their older parents. Before comparing upstream intergenerational transfers across European countries, we sketch a short picture of the institutional landscape of long-term care. In Europe, social protection systems are based on two different models. The first model is that of "Bismarck": compulsory social insurance ensures health care provision for the population. The goal of this system is to insure the worker and his family against social risks that may temporarily or permanently prevent him from working. The social protection guarantees the living standard of the insured individuals by giving them a replacement income financed by wage contributions. Civil law maintains a large food obligation, in particular on children and parents. The second model is the one from Beveridge. The goal of the social protection system is to cover the whole population against social risks. It implements universal rights that are financed by taxes or lump-sum contributions. No resource condition is required. In fact, European countries have diverged from these reference models and differences across systems are subtler. In practice, we can distinguish three main forms of long-term care systems in Europe: the national health services from Northern Europe, the systems articulated around the state-regulated health insurance and the mixed health care systems from Southern Europe (Assous and Ralle, 2000). Countries such as Sweden and Denmark are characterised by a universal-type health care system where the elderly dependency is mainly borne by professional services such as formal home help and institutions. The level of home care services provided to elderly and the proportion of elderly living in institutions are relatively high compared to other European countries (See Table 2). Among those countries, Denmark is the only one where a part of the home care services are provided without offering any compensation. On the opposite, Mediterranean countries – Italy, Spain and Greece – have a mixed health care system that favours the role of the family as caregiver for the elderly. In Spain for example, families that

---

[9] The exclusion criteria adopted in this analysis are :
- The age of the oldest parent mustn't exceed 110 year-old and the parents have to be at least 14 years older than their children.
- All observations included in the first and last percentile of the income distribution are discarded from the analysis.

live with an ascendant aged 70 or older whose resources are below a defined threshold can be partly tax-exempt. The formal assistance to dependent elderly remains limited in those countries (See Table 2). Germany, the Netherlands, France, Austria and Switzerland have an intermediary situation between Northern and Mediterranean countries. Notice however that the Netherlands have about the same level of home care services and the same institutionalisation rate as in Northern countries. Also notice the high rate of elderly receiving home care services in Austria.

The perception of the role of family in long-term care to elderly

In this section, we compare the opinions about the role family has to play to support elderly across European countries. This reflects the cultural perception of intergenerational solidarity and, by the way, the policy undertaken for supporting the elderly. SHARE questionnaire contains the following question:

"In your opinion, who – the family or the State – should bear the responsibility of the following:
   a) Financial support for older persons who are in need?
   b) Help with household chores for older persons who are in need such as help with cleaning, washing?
   c) Personal care for older persons who are in need such as nursing or help with bathing or dressing?"

Table 3 presents the percentage by country of adult children (50 to 69 year-old individuals having at least one parent alive) thinking that the preceding responsibilities should be borne mainly or totally by the family. A minority of individuals think that financial support should be borne by the family in Europe but there exists some large differences across countries. 25 % of Spanish adult children think that financial support should mainly be the responsibility of the family while only 1 % of Danish adult children agree with this point of view. Looking at the opinion about help with household chores, 27.9% of the respondents think it should be the responsibility of the family but once again with huge differences across countries: In Denmark, only 3.5 % agree with this opinion while 52.0 % agree in Greece. The same differences occur for personal care with Greece, Spain and Italy having the highest proportion of adult children thinking that this burden should be borne by family while Denmark and Sweden have the lowest. This result suggests that opinions about the support of the elderly significantly differ across European countries: Northern countries[10] mainly rely on the State while Mediterranean countries prefer the family, Western countries being between these two situations. It also appears from this table that a minority of individuals in European countries think that financial support should mainly come from the family while it is more widely accepted that family has a role to play as caregiver.

---

[10] Throughout this paper, we will refer to three main groups of countries:

-Northern countries: Sweden, Denmark and Netherlands
-Western countries: Germany, France, Austria and Switzerland
-Mediterranean countries: Italy, Spain and Greece

The reason why we include Netherlands in the Northern countries is that this country shares the same main characteristics as Denmark and Sweden regarding the pattern of care to elderly (See below)

Upstream intergenerational transfers

Having looked at the different opinions across countries, we turn now to the actions undertaken by adult children for their elderly parents. Table 4 presents the proportion of middle-aged children transferring time or money to their parents and the amount of time transfer conditional on the fact that transfers take place by country. Only 2.6% of adult children provide financial assistance to their parents in European countries[11]. Some significant differences appear across countries with Switzerland and Greece having the highest proportion of upstream financial transfer (6.1% and 5.5% respectively) and Denmark, the Netherlands and Italy having the lowest (0.8%, 1.2% and 1.3% respectively).

Assistance in time given to parents is much more common than financial transfers. A fraction of 30.8% of adult children provides help in time in European countries. The general pattern that emerges can be described as follows: adult children living in Northern countries are those that are the most involved in giving time assistance to their parents (43.8% in Denmark, 39.8% in Sweden and 37.2% in the Netherlands). On the opposite, Mediterranean countries and Austria have the lowest proportion of adult children providing help in time (22.9% in Italy, 22.3% in Austria, 20.8% in Greece and 16.5% in Spain). Western countries fall between these two situations. Interestingly, this trend is reversed regarding the amount of time assistance given: adult children living in Mediterranean countries are those who offer the highest amount of time assistance while individuals living in Northern countries offer the lowest. Figure 1[12] highlights the impact of living arrangement on time assistance pattern across European countries: a higher proportion of adult children provide time assistance to parents in countries where relatively few individuals cohabit with their elderly parents. The difference in the provision of time transfers across countries can be explained by differences in the way assistance to parents is organised: assistance to parents in Mediterranean countries is concentrated on relatively few individuals, especially on cohabiting adult children, providing large amounts of help while it is spread over more individuals giving occasional assistance in Northern countries.

Pattern of types of time assistance given also differs across European countries. We distinguish three types of help: Personal care, practical tasks and paperwork. Table 5 presents the type of time assistance given conditional on giving any in the SHARE-participating countries. Mediterranean countries are characterised by a higher proportion of time assistance that is devoted to provide personal care to their parents. Conversely, Northern countries exhibit the lowest share of personal cares in time assistance, while practical tasks are much more common. These differences might be explained by the development of formal care. As noted previously, Northern countries have an extended supply of formal services while Southern countries only have a limited one. As a result, adult children in Northern countries do not have to provide personal care to parents and the time devoted to parents mainly consists in providing practical help.

We can distinguish three groups of countries from all these facts:

---

[11] We do not show the amount of financial transfer because of the small sample size.
[12] To construct this figure, we add to our selected sample the adult children living in the same household as their parents. We then assume that cohabiting children are those that live in the same household or the same building as their parents.

- Northern countries - Sweden, Denmark and the Netherlands - that rely more on the State to support elderly, provide a modest amount of informal help and offer a wider range of formal assistance such as home help and institutions.

- Western countries - Germany, France, Austria and Switzerland – that rely on the State to provide long-term care to elderly but do not neglect the role of the family in the provision of care.

- Mediterranean countries - Italy, Spain and Greece – where the role of the family in the provision of assistance to elderly is very important while the State only accounts for a little part of the help.

4. Model specification

Our empirical model relies on several assumptions discussed here. First, we assume that adult children can provide either time or money transfers to their older parents. These transfer decisions depend on the adult children and parent characteristics discussed above. The decision to give financial or time support may depend on each other. We account for this possibility by allowing the disturbances of the equations representing the two decisions to be correlated with each other. Assuming that the probability of both time and financial assistance has a bivariate normal cumulative distribution function, we estimate the following two equations by using a bivariate probit model:

$$\text{time}_i^* = \beta'_1 \, X_i^{\text{child}} + \beta'_2 \, X_i^{\text{parent}} + \varepsilon_i \qquad \text{time}_i = 1 \text{ if time}_i^* > 0 \text{, } 0 \text{ otherwise,} \qquad (1)$$

$$\text{money}_i^* = \gamma'_1 \, X_i^{\text{child}} + \gamma'_2 \, X_i^{\text{parent}} + \eta_i \qquad \text{money}_i = 1 \text{ if money}_i^* > 0 \text{, } 0 \text{ otherwise,} \qquad (2)$$

$$E[\varepsilon_i] = E[\eta_i] = 0,$$

$$\text{Var}[\varepsilon_i] = \text{Var}[\eta_i] = 1,$$

$$\text{Cov}[\varepsilon_i, \eta_i] = \rho$$

where time* and money* are the propensity (or utility) attached to time and money transfer decisions, respectively. X_i^{child} and X_i^{parent} are vectors of explanatory variables regarding the adult child and the parents, respectively. The model analyses the decision about providing time or money transfers to parents but it gives no information about the intensity of such transfers. In order to complete the analysis, we also analyse the characteristics that influence the amount of time transfer (the average number of hours per month) conditional on the fact that such a transfer occurs[13]. We control for the possibility of selection bias in the number of hours of time transfer equation by using the Heckman sample selection model:

$$\text{Hour}_i = \theta'_1 \, X_i^{\text{child}} + \theta'_2 \, X_i^{\text{parent}} + \theta_3 \lambda_i + \mu_i \qquad (3)$$

where Hour_i is the logarithm of the number of hours of time transfers to parents by month and λ_i is the inverse Mills ratio that takes into account the possibility of sample selection. The explanatory variables included in the selection equation are the same as for the number of

---

[13] We do not use a tobit model because the tobit assumes that the impact of the explanatory variables on the decision to make a transfer and its intensity has same sign. However, descriptive statistics on time and financial transfers by country shows that it is not necessarily the case.

hours equation. We do not analyse the intensity of money transfers because of data limitations[14].

Having checked for correlations between the different explanatory variables, the likelihood of multicollinearity issue in the model seems to be very low. The highest correlation coefficients found are 0.58 for age of the adult children and the age of the parents, .34 for working full-time and age and .33 for household size and the number of children.

It is worth noting that our model has some limitations. First, the cross-sectional nature of the data do not allow us to control for the unobserved time-invariant individual characteristics that may be correlated with the explanatory variables included in the model and may thus lead to inconsistent coefficients. Next waves from SHARE will make it possible to take into account for these unobserved time-invariant individual characteristics.

5. Results

5.1. Determinants of financial and time assistance

Results from the equations (1) and (2) are presented in Table 6. Unsurprisingly, women are more likely than men to devote time to their parents. This kind of help tends to decrease with the age of the donors, presumably due to declining physical capacities. Moreover, adult children having poor health have a lower probability to give time transfers to parents. The level of education of the adult children increases the probability to give time assistance to their parents. Turning to the labour status of the donor, no significant difference in the provision of time assistance appears whatever the employment status of the children. At first sight, it contradicts the commonly shared idea that adult children, especially women[15], reduce the time devoted to labour to provide time assistance to their elderly parents. This result is in accordance with other findings that show weak or non-significant impact of work on care giving (Ettner, 1996; Stern, 1995; Wolf and Soldo, 1994; McGarry, 2003). But, our definition of help in time includes all forms of time assistance from the tiny help to the intensive one and labour market status might have no effect on the decision to give a "light" time assistance compared to an "heavy" one. For example, Carmichael and Charles (1998) find from UK data that informal carers who care for less than 20 hours per week are in fact more likely to participate in the labour market than otherwise similar no carers and that informal carers who care for more than 20 hours are less likely to participate in the labour market. The next Section will deal with this issue. Table 6 also indicates that household income significantly increases the probability of providing time assistance to parents. Looking at the offspring of the donor, we find that time assistance declines as the number of children increases. This could be explained by the fact that grandparents and grandchildren compete for the allocation of time of the middle-generation. We find that distance from parents is a crucial determinant of time assistance for adult children. Caregiving to parents decreases sharply as distance increases. However, the location choice of the children may be correlated with unobservable characteristics such as attachment to parents and this may overestimate the impact of geographical distance on time transfers decision (Stern, 1995). The number of siblings of the adult children decreases the probability to give help in time to parents. This shows that siblings are substitute for the provision of time assistance to parents. The probability of time

---

[14] The number of adult children providing financial assistance to their parents is only 125 for the ten European countries.
[15] We estimate the model with women only and found roughly the same results.

transfer is explained by many potential recipients' characteristics: health status of parents plays an important role in the decision to give time assistance. Poor health of parents significantly increases the probability to make time transfers to them. Age of parents also increases the likelihood of time assistance. The probability to give help in time is the lowest when the adult children have only their father alive while it is the highest when only the mother is alive, parents still living together fall between these two situations. The expectations about receiving an inheritance significantly increase the occurrence of time assistance. This result is in accordance with exchange motive, parents compensating their caregiving children by leaving them a bequest. Moreover, the binary variable indicating whether the adult children received any financial transfer from their parents has a significant positive impact on the probability to give time assistance. As Cox (1987) shows, parents compensate their children for services received. Binary variables indicating the country where the donor lives are also included in the model to control for differences across countries. As noted earlier, adult children living in Northern countries (Sweden, Denmark and the Netherlands) are those who are the most likely to provide time assistance. On the other hand, fewer individuals from Mediterranean countries and Austria provide care to their parents.

We now turn to the determinants of making financial transfers to parents. Gender and age of the potential donor have no significant impact on the probability to make financial transfers. Adult children with higher education are more likely to provide money to their parents. Regarding the employment status of the adult children, results show that working full-time is significantly associated with higher probability to give money to parents. Household income and home ownership have also a significant positive impact on the probability of financial assistance but these impacts are likely to be underestimated due to the absence of the parents' income variable in the model[16]. Being in couple tends to decrease the likelihood of financial assistance. The variable indicating the number of children of the potential donor appears with a significant negative coefficient. Similarly to the time transfer decision, money transfers from the "sandwich" generation to parents compete with those devoted to their children. It is worth noting that the distance from parents increases the occurrence of financial transfers from children to parents. The number of siblings has no significant impact on the probability to make financial transfers to parents. Turning to the characteristics of parents, we see that widowers have a lower probability to receive money from their adult children and that parents in poor health are more likely to receive financial transfers. The expected probability to receive an inheritance significantly decreases the likelihood to provide financial assistance to parents. This variable can be interpreted as a proxy of the wealth held by parents. This means that money transfers are more likely to occur when the parents have poor living conditions. Turning to country variables, we see that Switzerland, Greece and Spain are the countries where transfers from adult children to parents are the most frequent while Denmark, Sweden and the Netherlands exhibit a lower probability of such transfers.

5.2. A closer look at time transfers

The preceding section analyses the decision about giving either time or financial transfer to older parents but nothing is said about the intensity of these kinds of assistance. However, Section 3 highlights the fact that countries having the largest share of adult children providing time transfer to parents are not necessarily those where intensity of this help is the highest. Results of the intensity of time transfers equation (3) are presented in Table 7. First, the

---

[16] These coefficients are underestimated if chidren's income is positively correlated to parent's income and that the probability of financial transfer to the parents is negatively correlated to parent's income.

coefficient associated to the λ (the inverse Mills ratio) is not significant, this means that we do not reject the hypothesis of no selection bias. Results indicate that caregivers provide a larger number of hours in Italy, Austria and Greece while it is the lowest in Switzerland, Sweden and Denmark. Female caregivers are likely to provide a larger amount of time assistance. Household income has a negative impact on the quantity of time transfers to parents but the coefficient is only significant at the 10%-level. Part-time and full-time workers provide a lower number of hours of caregiving compared to non-working individuals. Labour market involvement does not affect the decision about providing time assistance to parents but its intensity. Distance significantly decreases the number of hours devoted to parents' assistance. The number of siblings decreases the number of hours devoted to assist parents. This suggests that siblings share the responsibility to care for their older parents. Age and health status of parents have a significant positive impact on the intensity of caregiving.

5.3. Time and financial transfers: substitute or complement?

We now analyse whether time and financial transfers to elderly parents are substitute or complements with respect to the different explanatory variables. Looking at Table 6, we find a significant positive correlation between the error terms of the time and money assistance equations. This highlights the fact that the provision of time and financial transfers from adult children are likely to be complementary to assist their parents independently of the explanatory variables included in the bivariate probit model. One possible explanation is that parents requiring time assistance from their children are likely to need health care that cannot be provided by their own children. Health care is likely to imply an unbearable cost to the parent due to the lack of coverage of private or social insurance. As a result, adult children will have to accompany time assistance by financial assistance. Another explanation is that we have unobservable heterogeneity among individuals that both influence time and money transfers in the same direction. This unobservable heterogeneity could be the degree of altruism of the adult children for example.

Let's now compare the coefficients associated with time and financial transfers to see whether substitution between time and financial transfers exists regarding one or another explanatory variable. Distance from parents appears to be a major source of substitution between these two kinds of assistance. As they live further, adult children tend to substitute time for money. Distance constitutes indeed a non-negligible cost to adult children both in time and money. As a result, children living far from their parents prefer paying formal care for their parents than providing it on their own.

The expectation about receiving an inheritance of more than 50,000€ within ten years increases the probability of time transfer while it decreases the probability of financial transfers. Assuming that this variable reflects the standard of living of the parents, parents having limited resources may require money to live in acceptable conditions while better-off parents may prefer receiving attention from their children.

The probabilities of both financial and time assistance increase as adult children have a higher education. Moreover, higher income households have a higher probability to provide both financial and time assistance but it decreases slightly the number of hours of informal care. Regarding the employment status of the adult children, the probability of giving time assistance does not depend on the labour market involvement but the intensity decreases whereas financial assistance increases as the adult children work more. From these results, we can conclude that adult children working more are likely to substitute time assistance for

financial assistance but this substitution is not exclusive, this means that adult children are likely to reduce their assistance in time to parents and increase their financial contribution to parents if they work more but they continue to provide them time assistance at a lower pace.

6. Conclusion

This paper addresses the issue of informal support from adult children to their older parents in Europe. Both time and financial transfers are analysed. In a first step, we compare opinions about who - the State or the family – should bear the responsibility of these types of assistance to elderly and the occurrences of these types of transfers across ten European countries. It appears that people in Northern countries think that the State has the main role to play while in Mediterranean countries they rely more on family, Western countries falling in-between. Paradoxically, Northern countries, i.e. Sweden, Denmark, and the Netherlands, have the highest proportion of adult children providing time assistance to their parents while Mediterranean countries, i.e. Spain, Italy and Greece, have the lowest. By comparing this results with the proportion of adult children living with their parents across countries, we find a negative correlation suggesting that adult children in Northern countries share the burden of assistance to parents among siblings while in Southern countries, the burden is essentially supported by one of the children and especially by the cohabiting one. Moreover, once we take into account the intensity of the help calculated by the average number of hours per month devoted to this help, Mediterranean countries exhibit the highest number of hours of assistance to parents. Adult children living in Northern countries provide "occasional assistance" to their parents that mainly consists in practical household help while adult children from Mediterranean countries are more involved in personal care. This difference in the pattern of time assistance may be due to differences in the development of formal care across these two regions.

We then analyse in deeper details the decision to give time or money assistance to parents. One of the main results is that the decision about providing time assistance is not influenced by the employment status but the intensity of care giving is reduced when adult children work more. Moreover, the decision about providing financial assistance to parents increases as adult children work more suggesting that adult children substitute financial transfers for time transfers, as they are more active on the labour market. This suggests that those working more are unable to assist their parents as much as necessary and complete their assistance in time by providing them with money to buy formal care. The other source of substitution between time and money transfers is distance from parents. Indeed, distance is a non-negligible cost for time assistance. As a result, adult children living far from their parents tend to substitute time transfers for financial transfers.

Reference

- Arrondel, L. and A. Masson, (2001), Family Transfers Involving Three Generations, *Scandinavian Journal of Economics*, 103(3), 415-443.

- Assous, L. and P. Ralle, (2000), La Prise en Charge de la Dépendance des Personnes Âgées: une Comparaison Internationale, *Etudes et Résultats*, 74.

- Carmichael, F. and S. Charles, (1998), The Labour Market Costs of Community Care, *The Journal of Health Economics*, 17, 747-765.

- Cox, D., (1987), Motives for Private Income Transfers, *Journal of Political Economy*, 95, 508-546.
- Ettner, S.,(1996), The Opportunity Costs of Elder Care, *The Journal of Human Resources*, 31 (1), 189-205.

- Ioannides, Y., and K. Kan, (1999), The Nature of Two-Directional Intergenerational Transfers of Money and Time: an Empirical Analysis. *Tufts University Discussion Paper 99-17*.

- Jacobzone S., (1999), Ageing and Care for Frail Elderly Persons: an Overview of International Perspectives. Series OECD Labour Market and Social Policy – Occasional Papers, No.38. Paris, OECD.

- McGarry, K., (1999), Inter Vivos Transfers and Intended Bequests. *Journal of Public economics*, 73, 321-351.

- McGarry, K. and R. F. Schoeni, (1995), Transfer Behavior in the Health and Retirement Study: Measurement and the Distribution of Resources within the Family, *Journal of Human resource*, 30, S184-S226.

- McGarry, K., (2003), Does Caregiving Affect Work? Evidence Based on Prior Labour Force Experience, Forthcoming in *Health Care Issues in the United States and Japan*, David A. Wise, ed. Chicago: University of Chicago Press.

- Norton, C. N., and C. H. Van Houtven, (2005), Intervivos Transfers and Exchange, Submitted to Southern Economic Journal.

- Sloan, F.A., G. Picone and T.J. Hoerger, (1997), The Supply of Children's Time to Disabled Elderly Parents, *Economic Inquiry*, XXXV, 295-308.

- Sloan, F.A., H.H. Zhang and J. Wang, (2002), Upstream Intergenerational Transfers, *Southern Economic Journal*, 69, 2.

- Stern, S.,(1995), Estimating Family Long-term Care Decisions in the Presence of Endogenous Child Characteristics, *The Journal of Human Resources*, 30 (3):551-580.

- Wolf, D. and B. Soldo, (1994), Married Women's Allocation of Time to Employment and Parental Care, *The Journal of Human Resources*, 29 (4), 1259-1276.

- Zissimopoulos, J., (2001), Resource Transfers to the Elderly: Do Adult Children Substitute Financial Transfers for Time Transfers? *RAND Working paper 01-05*.

Table 1. Descriptive statistics

	All countries	Sweden	Denmark	Netherlands	Germany	France	Austria	Switzerland	Italy	Spain	Greece
N	4,852	783	400	672	621	475	349	230	476	369	477
Time assistance	30.8%	39.8%	43.8%	37.2%	34.3%	26.9%	22.3%	30.9%	22.9%	16.5%	20.8%
Financial assistance	2.6%	1.5%	0.8%	1.2%	3.5%	3.6%	2.6%	6.1%	1.3%	2.2%	5.5%
Adult children characteristics:											
Woman	53.8%	56.7%	50.5%	54.3%	54.9%	52.6%	54.7%	57.4%	53.4%	54.2%	48.6%
Age	56.1	56.5	55.3	55.8	56.0	55.5	56.7	55.5	57.0	56.4	55.5
Bad health	4.9%	5.9%	6.0%	3.0%	4.2%	5.7%	6.3%	3.0%	4.6%	7.6%	3.4%
Years of education	11.5	11.5	13.6	12.0	14.2	10.3	12.0	13.3	9.0	7.7	10.9
Employment status:											
Not working	38.3%	22.7%	24.8%	38.5%	34.6%	39.4%	52.4%	25.7%	56.9%	46.1%	49.9%
Work part-time	14.2%	14.7%	12.8%	22.6%	15.6%	10.3%	8.9%	26.1%	10.3%	8.4%	11.7%
Work full-time	47.4%	62.6%	62.5%	38.8%	49.8%	50.3%	38.7%	48.3%	32.8%	45.5%	38.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gross annual household income ppp-adjusted (median value)	34,069	40,211	47,151	46,185	40,331	32,699	25,303	42,972	23,407	18,351	21,491
Home ownership	52.1%	57.3%	55.0%	50.3%	37.2%	52.0%	46.1%	37.8%	56.9%	65.9%	58.9%
Live with a partner/spouse	83.0%	82.6%	77.8%	89.9%	85.7%	77.9%	71.9%	77.4%	90.3%	88.9%	79.0%
Household size	2.5	2.2	2.1	2.4	2.3	2.4	2.2	2.3	3.0	3.2	2.8
Number of children	2.1	2.5	2.1	2.2	1.8	2.2	2.0	2.1	2.0	2.5	1.8
Distance from parent:											
Same building	3.9%	0.4%	0.5%	0.4%	5.5%	0.8%	4.9%	4.8%	10.1%	3.8%	11.1%
Less than 5km	34.2%	24.6%	28.5%	38.5%	36.4%	20.8%	34.7%	23.9%	45.6%	53.1%	37.3%
Between 5 and 25km	22.0%	21.6%	26.0%	27.7%	22.2%	25.1%	26.1%	17.8%	20.8%	17.3%	11.9%
Between 25 and 100km	17.4%	21.2%	22.8%	17.0%	16.4%	15.4%	20.3%	28.3%	10.7%	11.7%	14.7%
More than 100km	22.5%	32.2%	22.3%	16.4%	19.5%	37.9%	14.0%	25.2%	12.8%	14.1%	24.9%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 1 (continued)

	All countries	Sweden	Denmark	Germany	Netherlands	France	Austria	Switzerland	Italy	Spain	Greece
Number of siblings	2.5	2.0	2.2	3.4	1.8	3.0	2.1	2.5	2.4	2.9	2.1
Characteristics of parents:											
Age of parent	82.9	83.3	82.1	83.5	81.6	82.3	82.3	83.8	84.1	83.5	83.1
Parent in bad health	25.8%	28.9%	28.0%	23.7%	26.2%	28.6%	21.5%	17.8%	31.7%	23.0%	21.4%
Parent status:											
Widow	65.0%	63.7%	63.8%	65.5%	68.4%	62.3%	68.8%	57.0%	66.8%	67.5%	62.7%
Widower	12.2%	13.7%	13.3%	13.8%	10.1%	9.9%	10.3%	14.3%	12.2%	13.3%	11.1%
Couple	22.8%	22.6%	23.0%	20.7%	21.4%	27.8%	20.9%	28.7%	21.0%	19.2%	26.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Receive money from parent	4.6%	7.8%	11.5%	2.1%	5.6%	2.7%	4.0%	4.8%	2.5%	1.1%	2.5%
Probability of receiving an inheritance more than 50.000€	14.7%	14.1%	14.8%	11.6%	14.6%	18.4%	10.0%	31.6%	13.1%	17.2%	11.6%

Table 2. Comparisons of care systems across European countries.

	Share of population aged 65 and over in institutions	Share of population aged 65 and over receiving formal help at home
Sweden	8.7 %	11.2 %
Denmark	7 %	20.3 %
Netherlands	8.8 %	12 %
Germany	6.8 %	9.6 %
France	6.5 %	6.1 %
Austria	4.9 %	24 %
Switzerland	n/a	n/a
Italy	3.9 %	2.8 %
Spain	2.9 %	1.6 %
Greece	1 %	n/a

Source: Jacobzone (1999)

Table 3: Proportion of adult children thinking that the following supports for elderly should be mainly or totally borne by family.

	Financial support	Help with household chores	Personal care
Sweden	7.1%	10.7%	7.3%
Denmark	1.0%	3.5%	1.7%
Netherlands	3.9%	13.1%	3.7%
Germany	13.2%	45.6%	26.4%
France	7.9%	12.7%	8.5%
Austria	8.3%	35.1%	18.8%
Switzerland	6.0%	34.7%	15.7%
Italy	13.0%	40.8%	29.3%
Spain	25.0%	39.8%	34.1%
Greece	7.8%	52.0%	64.6%
All countries	8.9%	27.9%	21.3%

Table 4: Money and time assistance given by middle-aged children to their parents.

	Percentage of adult children providing time assistance	Number of hours of time assistance per month (conditional on providing any)	Percentage of adult children providing financial assistance
Sweden	39.8%	14.5	1.5%
Denmark	43.8%	11.9	0.8%
Netherlands	37.2%	18.2	1.2%
Germany	34.3%	23.8	3.5%
France	26.9%	16.8	3.6%
Austria	22.3%	40.7	2.6%
Switzerland	30.9%	18.7	6.1%
Italy	22.9%	64.4	1.3%
Spain	16.5%	45.2	2.2%
Greece	20.8%	50.0	5.5%
All countries	30.8%	25.1	2.6%

Figure 1
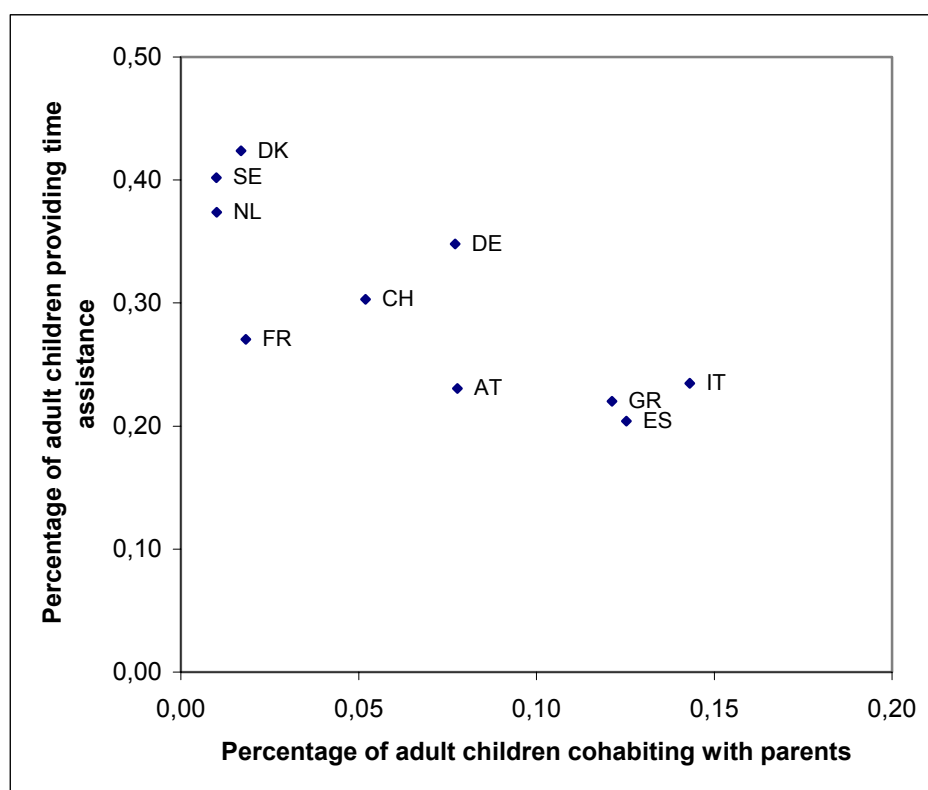
Table 5: Types of time assistance given by country

	Personal care	Practical tasks	Paperwork
Sweden	17.6%	80.1%	44.9%
Denmark	16.6%	86.9%	38.9%
Netherlands	25.2%	83.2%	41.2%
Germany	25.4%	83.6%	58.2%
France	18.8%	75.8%	57.0%
Switzerland	42.3%	83.3%	50.0%
Austria	28.2%	59.2%	57.7%
Italy	54.1%	64.2%	49.5%
Spain	65.6%	63.9%	57.4%
Greece	34.3%	69.7%	44.4%
All countries	27.5%	78.2%	48.2%

Table 6: Coefficients estimates of a bivariate probit of time and financial assistance to parents.

	Time assistance		Financial assistance	
	Coefficient	(Std error)	Coefficient	(Std error)
Intercept	-2.468***	(0.439)	-4.096***	(0.996)
Country:				
Sweden	-		-	
Denmark	-0.019	(0.083)	-0.440	(0.269)
Netherlands	-0.174**	(0.075)	-0.026	(0.201)
Germany	-0.386***	(0.077)	0.323*	(0.171)
France	-0.253***	(0.082)	0.420**	(0.176)
Austria	-0.637***	(0.096)	0.326	(0.207)
Switzerland	-0.388***	(0.107)	0.787***	(0.197)
Italy	-0.673***	(0.090)	0.174	(0.220)
Spain	-0.750***	(0.103)	0.477**	(0.221)
Greece	-0.673***	(0.091)	0.742***	(0.175)
Adult children characteristics:				
Woman	0.316***	(0.044)	0.090	(0.091)
Age	-0.016***	(0.006)	-0.002	(0.013)
Bad health status	-0.272***	(0.103)	0.155	(0.206)
Number of years of education	0.034***	(0.006)	0.040***	(0.013)
Employment status:				
Not working	-		-	
Working part-time	0.022	(0.065)	-0.018	(0.154)
Working full-time	-0.009	(0.053)	0.228**	(0.113)
Log (gross annual household income ppp-adjusted)	0.075***	(0.020)	0.112**	(0.045)
Home ownership	0.069*	(0.041)	0.283***	(0.090)
Live with a partner/spouse	-0.009	(0.063)	-0.275**	(0.126)
Household size	0.009	(0.026)	0.091*	(0.054)
Number of children	-0.059***	(0.019)	-0.210***	(0.046)
Distance from parents:				
Same building	-		-	
Less than 5 km	-0.179*	(0.103)	0.677*	(0.400)
Between 5 and 25 km	-0.384***	(0.108)	0.772*	(0.407)
Between 25 and 100km	-0.709***	(0.112)	0.951**	(0.404)
More than 100km	-1.050***	(0.111)	1.181***	(0.400)
Number of siblings	-0.046***	(0.011)	0.012	(0.023)
Parents' characteristics:				
Age of parent	0.029***	(0.004)	-0.006	(0.009)
Parent in bad health	0.294***	(0.046)	0.269***	(0.095)
Parent status:				
Widow	-		-	
Widower	-0.199***	(0.064)	-0.835***	(0.261)
Couple	-0.098*	(0.051)	-0.112	(0.103)
Receive money from parent	0.355***	(0.092)	0.232	(0.191)
Probability to receive an inheritance more than 50,000€	0.002***	(0.001)	-0.006***	(0.002)
Cross-equation correlation	0.213 ***	(0.056)		
Pseudo-R² (Likelihood ratio index)	0.129			
Number of observations	4,852			

Note: *, **, *** means that the coefficient estimate is significantly different from zero at the 10%, 5%, 1 %-level respectively

Table 7. Determinants of the number of hours of time assistance to parents among care givers children. (Heckman selection model)

	Log (hours of time assistance)	
	Coefficient	(Std error)
Intercept	-1.075	(1.033)
Country:		
Sweden	-	
Denmark	0.089	(0.136)
Netherlands	0.422***	(0.131)
Germany	0.671***	(0.151)
France	0.217	(0.156)
Austria	1.045***	(0.213)
Switzerland	-0.049	(0.202)
Italy	1.075***	(0.208)
Spain	0.601**	(0.247)
Greece	0.960***	(0.211)
Adult children characteristics:		
Woman	0.602***	(0.098)
Age	0.026**	(0.011)
Bad health status	-0.104	(0.212)
Number of years of education	-0.021	(0.013)
Employment status:		
Not working	-	
Working part-time	-0.326***	(0.115)
Working full-time	-0.222**	(0.099)
Log (gross annual household income ppp-adjusted)	-0.073*	(0.041)
Home ownership	0.085	(0.075)
Live with a partner/spouse	0.067	(0.114)
Household size	0.022	(0.049)
Number of children	-0.047	(0.036)
Distance from parents:		
Same building	-	
Less than 5 km	-0.622***	(0.176)
Between 5 and 25 km	-0.824***	(0.195)
Between 25 and 100 km	-1.176***	(0.229)
More than 100 km	-1.264***	(0.272)
Number of siblings	-0.061***	(0.024)
Parents' characteristics:		
Age of parent	0.035***	(0.009)
Parent in bad health	0.405***	(0.095)
Parent status:		
Widow	-	
Widower	-0.003	(0.125)
Couple	-0.110	(0.093)
Receive money from parent	-0.041	(0.150)
Probability to receive an inheritance more than 50,000€	-0.001	(0.001)
Lambda	0.007	(0.257)
Uncensored observations	1,496	

Note: *, **, *** means that the coefficient estimate is significantly different from zero at the 10%, 5%, 1 %-level respectively