

[DRAFT PAPER – PLEASE DO NOT CITE]

How Public Policies Affect Intergenerational Family Transfers in Europe

Stipica Mudrazija PhD ^a

^a Edward R. Roybal Institute on Aging, School of Social Work, University of Southern California

Address: 1150 South Olive Street, Suite 1400, Los Angeles, CA 90015-2211, USA

E-mail: stipica.mudrazija@usc.edu

Telephone: +1 (213) 821-6822

Abstract

This study uses data on eleven European countries—Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland—to estimate the net value of transfers between parents and adult children and to determine the relationship of the net value of family transfers with some of the constituent elements defining public intergenerational redistribution of resources including social spending, taxation, and legal framework. Data come from the second wave of the Survey of Health, Ageing, and Retirement in Europe and the sample includes 11,234 parent-child dyads that participated in the provision of financial or non-financial support. The results show that larger public intergenerational redistribution of resources is associated with smaller magnitude of family redistribution. Furthermore, the redistribution of resources between parents and children due to various public policies is associated with a secondary redistribution from the public policy beneficiary to the other person.

Keywords: net intergenerational transfers, redistribution of resources, family, public policy, SHARE

Introduction

With the rapid growth of older population and limited public resources available to support their needs, policymakers are increasingly interested in understanding the exchange of support between family generations and the effects of public policies on family-transfer behavior. Such information could potentially help to improve the effectiveness of the public redistribution of resources as it would allow assessing the true impact of public transfers on the overall flow of family intergenerational support and provide answers to key questions of policy interest, such as who the true (as opposed to intended) beneficiaries are of public support or whether public support displaces or encourages private support. Consequently, intergenerational family support and its nexus with public policy have come to the forefront of research in family economics, gerontology, social policy, and many other disciplines.

Previous research has provided us with important insights on family-transfer motives and their relationship with public transfers. *Need-based explanations* of family support are based on the idea that relative needs of family members determine the donors and recipients. As the most well-known among the need-based explanations, the altruism hypothesis (Becker, 1974; Barro, 1974) posits that the family is regarded by its members as an institution where each individual values the consumption of others as much as her own consumption. As an individual's income and wealth increases, transfers to less well-off family members increase as well (Zissimopoulos, 2001). The importance of family members' needs and intrafamilial solidarity has been well documented in the literature (Grundy, 2005; Ikkink et al., 1999; Künemund et al., 2005; McGarry and Schoeni, 1995; Silverstein et al., 2002; Villanueva, 2005). Major alternative to need-based explanations of transfer motives are various *reciprocity-based explanations* (Gouldner, 1960). In a narrow sense, reciprocity is a form of payment for services, generally entailing commensurate values and simultaneity of each party's transfer as proposed by the exchange hypothesis in the context of family transfers (Cox, 1987). More broadly, reciprocity can refer to a repayment that can occur with a time lag, without symmetry in value, and that can be nominally made to a third party. This explanation is found to be particularly salient for the family context (Kohli and Künemund, 2003). While the altruism-exchange dichotomy dominates in the economic literature, in recent years it has been increasingly recognized that reciprocity in its broader form has an important role in intergenerational transfers that goes beyond the notions of exchange or altruism. This is especially true among those who consider "indirect reciprocity", a concept that refers to the exchange among multiple (three or more) generations requiring some level of altruism to be perpetuated in the situations of asymmetric values exchanged between generations (Arrondel and Masson, 2001).

The nature of the relationship between private and public support has long been in the focus of research. While altruism implies substantial displacement (i.e., crowding out) of private by public transfers, thereby rendering relatively ineffective any public transfer targeting particular individuals, reciprocity, in its narrow sense, may encourage (i.e., crowd in) private transfers as only those individuals who have goods or services desired by others can engage in the exchange. Empirical estimates do support some level of displacement, but the magnitudes differ substantially across studies. Kang and Lee (2003) estimate the magnitude of the crowding out of family financial transfers by public transfers in Korea to be between 70 and 100%. Jensen (2003) finds a moderate (25 to 30%) crowding out of child-to-parent financial transfers by public

pensions in South Africa. Studying the effects of the unemployment insurance benefits on family transfers in the United States, Schoeni (2002) found evidence of partial (24 to 40%) crowding out, while Villanueva (2005) found more modest (8 to 11%) effects in his study of the United States, Germany, and the United Kingdom. Looking at patterns of help and care in the last year of life, Hank and Jürges (2010) find exclusive family support more prevalent in the less generous welfare states of Southern Europe, while institutional support characterizes the more generous welfare states of Northern Europe, which is consistent with some level of crowding out of family by public support. More generally, Cox et al. (2006) established that the elderly in countries with more developed and generous public pension systems receive less support through private transfers.

On the other hand, examining the relationship between informal and formal help for the elderly in Norway, England, Germany, Spain, and Israel, Motel-Klingeibel et al. (2005) conclude that increased informal help to the elderly in countries with less generous welfare states is accounted for by different personal and household characteristics, therefore rejecting the crowding-out hypothesis. Künemund and Rein (1999) find evidence of increased intergenerational family solidarity in more generous welfare systems. Several recent studies give further support to the complementary character of public and family support: Leopold and Raab (2011), who explore the relationship of private and public transfers in the study of concurrent financial exchanges across Europe, and Geerts and Van den Bosch (2012), who explore links between formal and informal long-term care.

It seems, then, that the empirical evidence supports both altruism and exchange as the operative transfer motives. However, recent comparative research in Europe may offer an explanation how these seemingly contradictory findings may be reconciled. Brandt and Deindl (2013) find that public assistance is positively associated with the likelihood of parents providing financial and time support to their adult children, yet the intensity of parents' support decreases with more generous public assistance. Furthermore, distinguishing between two types of time support – more intensive care and less intensive help – it is apparent that the generosity of the welfare state (i.e., provision of adequate social and health services) is associated with a decrease in family-provided care and an increase in help (Brandt et al. 2009; Igel et al. 2009). The same relationship holds for grandchild care, where the publicly provided childcare infrastructure is associated with the higher likelihood of grandparents providing sporadic grandchild care, but the lower likelihood of providing intensive care (Igel and Szydlik, 2011). Therefore, family support is neither exclusively displaced nor encouraged by public intergenerational redistribution of resources, but partly modified and rebalanced with the goal of optimizing the support levels provided to different family members. This finding may suggest that families are a complex system that consists of individuals that are interested in both their own wellbeing as well as the wellbeing of other family members, which results in family-support patterns that cannot be described as purely altruistic or reciprocal.

While much important work in this area of research has been done, some of the key questions of policy interest are still unanswered or only partially answered. Particularly important issue in the context of public-private nexus of intergenerational redistribution of resources is relative lack of consideration for the overall balance of family intergenerational support. While exploring the relationships of public transfers with giving of time or money from

parents to children or in the opposite direction provides many important insights, it cannot fully capture the effects of public on family intergenerational redistribution of resources as it may miss the simultaneity of changes in different types of family transfer and is not able to describe the pattern of rebalancing of family intergenerational support over the life-cycle in response to variation in public support. Prior research, however, has established that financial and time transfers can be substitutes (Bonsang, 2007). It has also established that parents are net providers of support to children until old age (Litwin et al., 2008), but the magnitude of parent-child redistribution of resources over the life-cycle is moderated by the generosity of the welfare state (Mudrazija, 2013).

Therefore, tracking the net flow of transfers between family generations may help uncover the true nature of the relationship between public and private transfers. This study uses data on eleven European countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland) to estimate the net value of transfers between parents and adult children—defined as the monetary value of various types of transfers (e.g., money, care and help, and grandchild care) parents give to children, minus the monetary value of transfers they receive from children—as well as to determine the relationship of the net value of family transfers with some of the constituent elements defining public intergenerational redistribution of resources including social spending, taxation, and legal framework.

Furthermore, this study uses a set of indicators aimed at describing the link between the net flow of intergenerational family support and broadly construed public policies aimed at redistributing resources across generations through transfers, taxes or legal obligations. Previous studies have estimated the association of different elements of social policy expenditures with parent-child financial transfers (Zissimopoulos and Smith, 2009) and of total social policy expenditures and social services employment with the provision of financial and non-financial support between parents and children (Brandt and Deindl, 2013; Deindl and Brandt, 2011). Legal obligation, defined as the legal requirement for children to financially contribute to the provision of professional home- or residential-care services for parents who need such support and cannot pay for it, has also been used in the literature to ascertain the association of the legal framework across European countries and adult children's likelihood of provision of practical (i.e., time) support to frail older parents (Haber Kern and Szydlik, 2010; Schmid et al., 2012). However, this research is unique in exploring the public-private nexus of transfers in the context of parent-child net exchange of support, which results in important modifications of country-level indicators included in the study. As the focus is on the intergenerational redistribution of resources, only those elements of social spending that redistribute from one (working-age) to another (either young or old-age) generation are of substantive interest and, therefore, some social policy expenditures (e.g., unemployment benefits) are not part of the analysis. Conversely, due to the nature of tax systems across the countries of interest and their role in intergenerational redistribution of resources that may not be fully captured by major social policy expenditures, the study accounts for the residual impact of taxes on parent-child exchange of support.

In addition to calculating the net value of parent-adult child transfers and introducing a broader set of public policy predictors to capture more fully the influence of public policies on family redistribution of resources, this study introduces several other important novelties aimed at refining the methodological approach to the study of intergenerational transfers. First, the

model of net intergenerational family transfers is estimated with piecewise linear spline regression in order to capture the likely nonlinear relationship of net transfers and age. Furthermore, social spending variables for all countries are standardized to match the population distribution of one country, Germany, which allows capturing more accurately the true redistributive impact of different elements of social spending across countries. Finally, the analytic unit is parent-child dyad given that dyadic analysis allows accounting for the specific characteristics of each child participating in the exchange of support with parents as well as the characteristics unique to that child's relationship with parents.

Theoretical Framework

From the empirical work examining the flow of family intergenerational support we know that financial support mostly flows from older parents to adult children until parents reach very old age (Litwin et al., 2008), and the same is true of non-financial support, especially if grandchild care is taken into account (Albertini et al., 2007). Simultaneously, however, government collects taxes and makes transfers, which are then to large extent reallocated from working-age population to children and older-age population (Mason et al., 2006). Given that relatively more adult children than parents are of working age, this results in an indirect flow of resources from adult children to older parents by means of taxes and public transfers for pensions, healthcare and other social expenditures. This remains true even if one would consider public expenditures on young children (e.g., public education) as transfers benefiting their parents, that is, adult children (Lee and Mason, 2011). These empirical findings are the basis for the formulation of an overlapping-generations (OLG) model of family and public intergenerational transfers as outlined in Figure 1.

[Figure 1 about here]

An underlying assumption of this OLG model is that transferred resources can be considered a consumption item as suggested by Hurd et al. (2007). Consistent with the presented empirical evidence, differences in relative needs of family members are considered to be the key determinant of their transfer behavior. The focus of the model is primarily on the relationship between parents age 50 and older and their adult children age 18-49, but transfer receipts of grandchildren are also included as they are often considered to be indirectly benefits their parents, that is, adult children. The thickness of the arrows represents the assumed approximate magnitude of transfer flows. The most salient feature of the model's stylized representation in Figure 1 is that public redistribution is an integral part of the overall intergenerational flow of resources, which implies that discretionary changes to public policies can affect the patterns of support between family members of different generations to the extent they care for each other's consumption and wellbeing.

Using this general representation of the public-family nexus of transfers as the starting point, it is possible to describe the model of family intergenerational transfers in a more formal fashion. The model description that follows builds on the model of family members' preferences developed by Stark (1993), which is based on the theory of social interactions developed by Becker (1974). While for simplicity purposes the model describes the utility-optimization

process for two individuals, a parent (p) and a child (k), it could be generalized to any number of family members. Its basic assumption is that the utility functions of parents and children are interdependent and therefore given by two simultaneous functions:

$$U_p(C_p, C_k) = U_p[W_p(C_p), \gamma_p, W_k(C_k)],$$

$$U_k(C_p, C_k) = U_k[W_k(C_k), \gamma_k, W_p(C_p)],$$

where U = utility function
 W = subutility function of subjective wellbeing
 C = consumption
 γ = altruism parameter

and subscripts 'p' and 'k' mean "of parent" and "of child," respectively.

Budget constraint for the parent and the child is defined by the income each of them earns, modified by their exchange of support and the effects of public intergenerational redistribution of resources:

$$C_i = I_i + G_i + N_i = I_i + (T_i - X_i) + (R_i - P_i), \quad i = \{p, k\},$$

where I = private income
 G = net transfers from government
 N = parent-child (child-parent) net transfers
 T = government transfers
 X = taxes paid
 R = support received by parent (child)
 P = support provided to child (parent)

Further assumption is that $0 < \gamma_i < 1$ for $i = \{p, k\}$, that is, the parent attaches positive value to her own and her child's consumption, and the same is true for the child. Also,

$$\gamma_p \rightarrow 1 \text{ as } n \rightarrow +\infty,$$

$$\gamma_p \rightarrow 0 \text{ as } n \rightarrow 0,$$

$$\gamma_k \rightarrow 1 \text{ as } \frac{1}{n} \rightarrow +\infty,$$

$$\gamma_k \rightarrow 0 \text{ as } \frac{1}{n} \rightarrow 0,$$

where n represents a parameter of relative needs of a child (n_k) to a parent (n_p), and is defined as

$$n = \frac{n_k}{n_p} = \frac{E_k/(I_k+G_k)}{E_p/(I_p+G_p)},$$

where E represents a mutually agreed desired level of expenditures (i.e., consumption) of children (E_k) and parents (E_p). (1)

Therefore, when $n > 1$ the parent will be the net provider of support to the child, and when $n < 1$ the parent will be the net recipient of support from the child. When $n = 1$, net exchange between parents and children will be in equilibrium.

Under these assumptions, the following model of parent-child utility maximization can be specified:

$$\begin{aligned} U_p(C_p, C_k) &= (1 - \gamma_p)W_p(C_p) + \gamma_p W_k(C_k), \\ U_k(C_p, C_k) &= (1 - \gamma_k)W_k(C_k) + \gamma_k W_p(C_p), \end{aligned}$$

and the first order condition for utility maximization is:

$$\begin{aligned} W_p'(C_p) &= \left(\frac{\gamma_p}{1-\gamma_p}\right) W_k'(C_k), \\ W_k'(C_k) &= \left(\frac{\gamma_k}{1-\gamma_k}\right) W_p'(C_p). \end{aligned}$$

This implies that the utility of the parent is maximized when her marginal utility is equal to the weighted marginal utility of the child, and the analogous interpretation applies to the utility maximizing condition for the child.

Using this model, it is possible to describe how net family transfers change across the adult life cycle in response to discrete variation in the levels of government intergenerational reallocation of resources. Figure 2 depicts this relationship in a stylized manner.

[Figure 2 about here]

In the absence of government intervention through various social policies, tax system, or other elements of the legislative framework, working-age population would be a source of substantial support to family members of other generations including children and older parents. As they age, working-age population starts retiring and their health-related needs increase, while most of their frail old parents die and children transition to adulthood and start working. This results in a sharp decrease in net intergenerational transfers from now largely retired population to other family members, and ultimately they become large recipients of support from the generation of their working-age children who reach the peak of their earning years. However, if government partially assumes the responsibility for intergenerational redistribution of resources from working-age population to children and old-age population, this will result in a decreasing magnitude of net transfers between family generations. Because empirical evidence shows that in developed countries governments reallocate somewhat more to older population than children (Lee and Mason, 2011), partial government intergenerational redistribution of resources is also assumed to increase the average age at which net family transfers become negative, that is, when net-transfer donors become recipients. Finally, if government would fully assume the role of intergenerational reallocation of resources, net family intergenerational transfers over the life cycle would decrease to zero. However, this does not imply that family intergenerational

transfers would cease, but only that whatever their level may be, transfers given and received would approximately be of equal value.

In the context of parent-adult child transfers, the described model gives rise to the following hypotheses:

1. The absolute value of net transfers from parents to children—measured as a percentage of parental annual income—decreases as the intergenerational redistribution impact of public policies increases;
2. The redistribution of resources between parents and children due to public spending and taxation is associated with a secondary redistribution from the public policy beneficiary to the other person; and
3. Legal obligation for adult children to provide care to older parents affects negatively the intensity of parent-child transfers. In other words, legal obligation to provide care to older parents is an effective mechanism of redistribution of resources from children to parents.

Data and Methods

Data for this study come from the second (2006–2007) wave of the Survey of Health, Ageing, and Retirement in Europe (SHARE), a cross-national panel study of individuals aged 50 and over. The sample includes 11,986 parent-child dyads that participated in the provision of financial and/or non-financial support representing eleven countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland. The decision to use the 2006-2007 wave rather than the more recent 2010 wave of SHARE reflects the preference to focus on pre-financial crisis transfer, spending, and taxation patterns given that the crisis had very uneven impacts across European countries, and it is still unknown if the current trends represent only an aberration from the historic trends or rather a new normal. Because SHARE provides detailed information on a maximum of four children per each respondent, 236 observations with only limited information on children available are dropped from the sample. Further 510 dyads are excluded as children's age is less than 18 and the analytic focus is on adult children and their parents. Finally, 6 cases are omitted due to suspect values--age difference between parents and children of 12 years or less--following similar approach in prior research (e.g., Bonsang, 2007), which restricts the final sample to 11,234 parent-child dyads.

Variables

Dependent Variable

The net value of transfers measure includes financial transfers given/received in the twelve months prior to the interview and valued at least at €250, and time transfer of personal care, practical household help, administrative paperwork help, and grandchild care. Grandchild care is included only if provided weekly or more frequently for a total of 500 hours or more per year as only such transfers could plausibly be considered a substitute for formal childcare

services. In the absence of the direct information on the financial value of non-financial support, time transfers are monetized using the national (or, when absent, the appropriate sectoral) legal minimum hourly wage rate in each country. This provides a conservative estimate of the financial equivalent of non-financial transfers.

Information on time transfers is only partially available for co-resident parents and children as household help and administrative paperwork help are missing by design, resulting in non-complete information on approximately 18 percent of all time transfers. This is an important shortcoming as the pattern of co-residence across Europe is non-random and, consequently, limiting the sample to non-co-resident children could substantially bias the analysis. Therefore, following Leopold and Raab (2011), missing information is imputed using multiple-imputations procedure. Furthermore, due to their skewed distribution, net transfers are transformed using the inverse hyperbolic sine (IHS) transformation, an alternative to the more common logarithmic transformation when a substantial proportion of observations (22.3% in this sample) have zero or negative values. This transformation has become increasingly popular in the research focused on estimating net wealth, net income, or other concepts that require log-like transformation, but assume non-positive values (e.g., Georgarakos and Pasini 2011; Pence 2006). Results for IHS-transformed net transfers are comparable to log-transformed values (Burbidge et al. 1988). (2)

Independent variables

The key predictors of interest include each country's share of GDP spent on major social expenditures affecting intergenerational redistribution of resources—old-age and survivors' benefits, healthcare benefits, family policy and education—standardized to match the population structure of Germany. Absolute difference in Gini indexes pre- and post-taxes and transfers captures the redistributive impact of the tax system net of social spending variables included in the model. It effectively represents a segment of the public redistribution of resources that is not already accounted for by the four major social spending items. Finally, legal-framework effects are captured by an indicator of legal obligation for adult children to financially support provision of home or residential care for their frail old parents unable to pay for such care.

The model also controls for various parent, child, and parent-child dyad characteristics. Parental control variables include age, gender, years of education, marital status, number of children, self-rated ability to make ends meet, income and wealth (transformed using IHS transformation), difficulties in the activities of daily living (ADL) and instrumental activities of daily living (IADL), limitation in usual activities during the six months prior to the interview, and receipt of professional homecare. While ADL and IADL difficulties capture health issues that are chronic in nature, the indicator of recent health limitation primarily captures acute conditions, and professional homecare may serve as a substitute for provision of intensive care by adult children.

Children's controls include gender, marital status, indicator of any children they may have, and full-time employment indicator. Unlike their parents, majority of children in the sample did not experience major marital transitions like divorce, separation, or death of a spouse; therefore, children's marital status variable collapses multiple categories. Children's age is not included in the model as it is highly collinear with parent's age (correlation of almost 0.9) and

effectively redundant given the analytic focus is on the simultaneous changes in parent and child's age. Therefore, parent's age represents an approximation of the parent-child dyad's age. Another dyad control variable is the frequency of parent-child contact.

Analytic Strategy

The analysis starts with a description of parent-child net transfer values by age groups (50-69, 70-79, and 80 and older) across the eleven countries. Net transfer values are expressed in euros and adjusted for purchasing power parity (PPP). Alternatively, they are expressed as a percentage of average parents' income in each country. Furthermore, welfare regime characteristics of each country that are considered key for intergenerational redistribution of resources are described. The descriptive section of the analysis concludes with an overview of sample means for parents and children.

Recent research using SHARE data finds that net transfers likely follow a nonlinear age pattern with high positive net transfers from parents to children that decrease only moderately with age for parents younger than 70, followed by sharper decline in net transfers over the next decade, and ultimately reaching moderately high negative transfer value at some point after the age of 80 (Mudrazija, 2013). Therefore, the inferential analysis fits a piecewise linear spline regression of parent-child net transfers with the knots (i.e., threshold points) at the ages of 70 and 80, which allows for changes in the slope of age-net transfers relationship rather than imposing a uniform linear relationship over the whole range of ages. (3) The estimates for individual line segments can be interpreted similar to OLS-regression estimates, except for being limited by the knots that define the age range over which each estimate is relevant (Ahlberg et al., 1967; De Boer, 2001; Hansen, 2000).

Results

The results in Table 1 reveal that net transfers from parents to adult children across the majority of European countries follow similar pattern: they are positive for the age group 50-69, lower, but still positive for the age group 70-79, and for the oldest group of parents (80 and older) they continue decreasing and in most countries become negative. The magnitude of the difference in net transfers between the youngest and the oldest groups of parent-child dyads, measured as a percentage of average parental income, is on average the largest in Southern European countries (ranging from about 28 percentage points in Italy to almost 38 percentage points in Greece), and the smallest in Northern European countries, Denmark and Sweden (around 5 percentage points), with the results for Continental European countries being generally between these two extremes. Therefore, the well-known North-South geographic gradient in family-support patterns in Europe (e.g., Albertini and Kohli, 2012; Brandt et al., 2009; Deindl and Brandt, 2011; Igel and Szydlik, 2011) appears evident once again.

[Table 1 about here]

Table 2 depicts main welfare regime characteristics related with intergenerational redistribution of resources across European countries. Social spending variables reflect spending

levels standardized to match the population distribution of Germany. Compared to unadjusted spending levels, standardized spending levels on education and family support are lower and on health and old-age and survivor benefits higher in countries with younger population structure than Germany, while the opposite is true in countries with older population structure than Germany.

[Table 2 about here]

Results reveal that social spending is generally larger in Northern and Continental Europe than in Southern Europe. The only exception is publicly funded pensions, but the results for this category are somewhat misleading as they are strictly limited to publicly funded component of pensions, although in many countries pension systems include multiple tiers that supplement the basic public pension (e.g., voluntary or mandatory private pension schemes). In these cases, therefore, pension systems may provide a mechanism for redistribution of resources that is not intergenerational (either family-based or public), but rather intertemporal in nature. In fact, in Denmark and the Netherlands only about one third of an average person's pension benefit is from a public pension scheme and the remaining two thirds come from mandatory private schemes (OECD, 2011). Similarly, mandatory private pension schemes are important sources of retirement security in Sweden and Switzerland, whereas voluntary private pension schemes are source of substantial part (over one quarter) of pension benefits in Belgium and Germany. On the other hand, in Austria, France, Greece, Italy, and Spain, public pension schemes are the sole major source of pension benefits (OECD, 2011).

Gini indexes before taxes and transfers do not exhibit any noticeable geographic pattern. However, after taxes and transfers are accounted for, a clear North-South gradient emerges with Gini indexes being the lowest in Northern, somewhat higher across Continental, and the highest in Southern European countries. Obligation for adult children to provide financial support for home/residential care for older parents in need unable to pay for it is featured in legislation of all Southern and some Continental European countries in the sample, whereas neither of the two Northern European countries has such legal obligation, once again consistent with the geographic gradient of welfare regimes in Europe (Esping-Andersen, 1990).

Table 3 presents sample characteristics. Parents' average age is close to 66 years and about 59 percent of them are women. Two thirds of parents are currently married and one fourth is widowed, and they have 2.5 children. On average, parents in the sample have 10.5 years of schooling, annual income of close to €33000 and gross financial wealth of over €60000. About two thirds of them reported some limitation in usual activities during the six months prior to the interview. Over half of adult children in the sample are currently married or partnered, yet over a third has never been married. Approximately 57 percent of children have an offspring and somewhat less than two thirds works full-time. Majority of children (60%) lives separately from their parents, but has frequent (i.e., daily or several times a week) contacts with them. About 17 percent of adult children live with parents.

[Table 3 about here]

Table 4 presents the results of the linear spline regression of parent-child net transfers. The first model specification, which includes country fixed effects, suggest that child-parent net-transfer values are larger in Southern European than Continental and Northern European countries, broadly consistent with the geographic gradient suggested by the descriptive results and prior research. The second specification replaces country fixed effects with a set of variables describing intergenerational redistribution impact of public policies. The results show that spending on old-age and survivor benefits and healthcare benefits as well as the difference between Gini index before and after taxes and transfers are positively related with net transfers from parents to adult children, while the relationship is negative for family and education spending as well as legal requirement for adult children to provide support for frail older parents in need of it. Given that net-transfer values, originally measured in euros, have been transformed using IHS transformation, the correct interpretation of the coefficient estimates depends on the level of net transfers and requires retransforming the estimates back into euros. Estimating the marginal effects of different public policies on net-transfer value can be accomplished using the following expression: $\frac{1}{2}(e^y + e^{-y})\beta_x$, where y is the net-transfer value (i.e., $y = \text{asinh}(t)$) and β_x is the estimated coefficient for different predictors. Therefore, at the 50th percentile of the net-transfer values (€1130) and holding everything else constant, a percentage point increase in old age and survivor benefits is associated with €248 increase in parent-child net transfers, a percentage point increase in healthcare spending is associated with €1347 increase in net transfers, while the equivalent increase in spending on families and education is correlated with €2700 and €903 decrease in net transfers, respectively. An increase in Gini-index difference before and after taxes and transfers of 0.1 is associated with slightly over €16 increase in parent-child net transfers, whereas having the legal requirement for adult children to provide support to frail older parents is associated with €1949 lower net-transfer value. Estimates for other predictors of interest can be retransformed accordingly. (4)

[Table 4 about here]

Age is correlated with a modest decrease in parent-child net transfers before parents reach the age of 70, substantially steeper decline for parent-child dyads where parents are age 70-79, followed again by more moderate decline for dyads where parents are age 80 and older. Results for other predictors in the model are generally consistent with redistribution from those with relatively more resources and/or lower need toward those with less resources and higher level of need. Net giving to adult children is larger for wealthier and better educated parents and smaller for parents in poor health as well as widowed or divorced parents. Parental households with female heads are negatively associated with net transfers suggesting an average female-headed household is likely less well-off than an average couple-headed household. Presence of grandchildren is strongly positively associated with net transfers from parents to adult children. Infrequent contacts between parents and children are associated with the largest parent-child net support. This is likely reflecting the fact that parents and children with rare contacts have the lowest likelihood of exchanging support, and is consistent with the provision of support primarily in times of children's substantial need (Mudrazija, 2013).

Discussion

In the wake of population aging, declining old-age support ratios and related fiscal pressures, researchers and policymakers have started exploring the role of family support on the well-being of individuals and the effects of the interplay of public and family support systems on the intergenerational redistributive effectiveness of public policies. This study contributed to the understanding of the public-family nexus of intergenerational support by exploring the association between various public policies aimed at intergenerational redistribution of resources and net-transfer value of financial and non-financial transfers from parents to adult children. While the research on individual types of transfers and/or unidirectional giving focuses on providing detailed information on the flow of support between family generations (e.g., Albertini et al., 2007; Attias-Donfut et al., 2005; Brandt & Deindl, 2013; Brandt et al., 2009; Deindl and Brandt, 2011; Igel and Szydlik, 2011), the research on net transfers provides information on the balance of intergenerational support, that is, it establishes who family net-transfer donors and recipients are (e.g. Litwin et al, 2008; Mudrazija, 2013). Furthermore, this study modified and expanded the model of family intergenerational transfers to describe the effects of public intergenerational redistribution of resources on parent-child net transfers over the adult life cycle.

Findings provided strong support for the three research hypotheses. Consistent with the first hypothesis, in countries with the strongest redistributive impact of the welfare state like Denmark or Sweden, the magnitude of child-parent redistribution of resources across the life cycle is small, while the opposite is true in countries like Greece or Spain that have more limited welfare state redistribution and larger intrafamilial intergenerational redistribution. Net-transfers model results provided strong support for the second research hypothesis and the prediction of the theoretical model that any public intergenerational redistribution of resources would be associated with a secondary redistribution from the generation benefitting from the public policy to other family generations. Public redistribution of resources toward older individuals (e.g., increase in old-age and survivor benefits or healthcare benefits) is associated with an increase in net transfers parents give to their children, either because parents have more resources to help their children or because their children do not need to provide as much support as they otherwise would. Conversely, public redistribution benefitting adult children (e.g., increase in education or family-policy spending) is associated with lower parent-child net transfers, consistent with either less giving from parents to adult children or increased children's provision of support to parents. Difference in Gini index before and after taxes and transfers is positively associated with net transfers, suggesting public redistribution not already captured by the major items of social spending may primarily be benefitting parents. Finally, adult children's legal obligation to support the provision of care their frail older parents need is strongly negatively associated with the net-transfer value, suggesting such mandate may indeed be an effective tool for intergenerational redistribution of resources, which is consistent with the third research hypothesis.

Model results also provided strong support for the prediction of the theoretical model about the non-linear nature of the age-net transfers relationship. Net transfers from parents to adult children decline at a moderate pace until parents reach approximately age 70, followed by much steeper decline over the next decade of life, and becoming somewhat less steep for parent-child dyads where parents are age 80 and older. This pattern is consistent with large net transfer

from working-age parents to children transitioning to adulthood and facing related costs of higher education or family formation, fast decreasing net transfers as parents transition to retirement and start facing rising health-related costs while children reach middle adulthood and establish their careers, and ultimately negative net transfers once parents reach advanced old age and their frailty further increases (Mudrazija, 2013). Empirical estimates for other model predictors were also consistent with differences in relative needs of parents and children as the key determinant of the direction and the magnitude of parent-child net transfers, consistent with the parent-child utility-optimization process described in the theoretical framework section of the paper. Therefore, transfer behavior of parents and adult children is consistent with a degree of care for other person's well-being, which may be interpreted as a sign of altruistic behavior (e.g. Villanueva, 2002, Jensen, 2003).

This study faces several limitations. The analysis relies on cross-sectional data that do not allow distinguishing between age and cohort effects and can capture only immediate reciprocation between parents and children. In the absence of longitudinal data following parents and adult children over their entire adult life, therefore, it is not possible to fully describe family-transfer behavior. Furthermore, the measure of net transfers is incomplete and partly arbitrary by design. First, it does not account for emotional transfers between parents and children although they are an important component of family support (Temkin-Greener et al., 2004). Unfortunately, SHARE has very limited measures of emotional transfers, but even if it had a comprehensive list of emotional transfers' measures, their monetization would be particularly challenging. Second, monetary value of nonfinancial transfers was approximated using minimum hourly earnings across countries of interest. What is unknown is the elasticity of demand for nonfinancial transfers between parents and adult children. Without this information, it is not possible to make a precise assessment of the economic value of time transfers between parents and children. Third, some of the transfer data, such as transfers of practical help between parents and co-resident children, had to be imputed, thereby introducing a level of imprecision in transfer estimates. Finally, self-reported transfer measures have been found to exhibit systematic bias: survey respondents are likely to systematically over-report transfers they give and under-report transfers they receive (Brown and Weisbenner, 2002; Mason et al., 2006). Consequently, parent-child net-transfers measure may be upward biased.

Despite the limitations, this study makes important contribution to the research on public-family nexus of intergenerational transfers. It introduces a flexible theoretical framework to describe the nature of family transfers and their relationship with public policies affecting intergenerational redistribution of resources. Compared to the prior literature (e.g., Zissimopoulos and Smith, 2009), it introduces a more comprehensive set of public policy variables to capture the effects of public on family intergenerational redistribution of resources. Finally, it highlights the importance of examining net transfers between family generations to estimate the impact of public policies on the intergenerational redistribution of resources. As more data become available, future studies can build on this foundation to identify with higher degree of precision the magnitude of family-transfer changes associated with variation in different public policies and to explore individual and family characteristics that may be modifying this relationship. Together with the findings from this study, such information would be essential for improving the evaluations of the effectiveness of policy intervention and distributional impact of various public policies.

References

- Ahlberg, J. H., Nilson, E. N. and Walsh, J. L. (1967) *The Theory of Splines and Their Applications*. New York, NY: Academic Press.
- Albertini, M. and Kohli, M. (2013) 'The Generational Contract in the Family: an Analysis of Transfer Regimes in Europe', *European Sociological Review* 29(4): 828-40.
- Albertini, M., Kohli, M. and Vogel, C. (2007) 'Intergenerational Transfers of Time and Money in European Families: Common Patterns—Different Regimes?', *Journal of European Social Policy* 17(4): 319-34.
- Arrondel, L. and Masson, A. (2001) 'Family Transfers Involving Three Generations', *Scandinavian Journal of Economics* 103(3): 415-43.
- Attias-Donfut, C., Ogg, J. and Wolff, F.-C. (2005) 'European Patterns of Intergenerational Financial and Time Transfers', *European Journal of Ageing* 2(3): 161-73.
- Barro, R. J. (1974) 'Are Government Bonds Net Wealth?', *Journal of Political Economy* 82(6): 1095-117.
- Becker, G. S. (1974) 'A Theory of Social Interactions', *Journal of Political Economy* 82(6): 1063-93.
- Bonsang, E. (2007) 'How Do Middle-Aged Children Allocate Time and Money Transfers to Their Older Parents in Europe?', *Empirica* 34: 171-88.
- Brandt, M. and Deindl, C. (2013) 'Intergenerational Transfers to Adult Children in Europe: Do Social Policies Matter?', *Journal of Marriage and Family* 75: 235-251.
- Brandt, M., Haberkern, K. and Szydlik, M. (2009) 'Intergenerational Help and Care in Europe', *European Sociological Review* 25(5): 585-601.
- Brown, J. R. and Weisbenner, S. J. (2002) 'Is a Bird in Hand Worth More than a Bird in the Bush? Intergenerational Transfers and Savings Behavior', *NBER Working Paper No. 8753*. Cambridge, MA: National Bureau of Economic Research.
- Burbidge, J. B., Magee, L. and Robb, A. L. (1988) 'Alternative Transformations to Handle Extreme Values of the Dependent Variable', *Journal of the American Statistical Association* 83(401): 123-27.
- Chien, S., Campbell, N., Hayden, O., Hurd, M., Main, R., Mallett, J., Martin, C., Meijer, E., Miu, A., Moldoff, M., Rohwedder, S. and St. Clair, P. (2013) RAND HRS data documentation, version M, available at <http://hrsonline.isr.umich.edu/modules/meta/rand/randhrsm/randhrsM.pdf>.
- Cox, D. (1987) 'Motives for Private Income Transfers', *Journal of Political Economy* 95(3): 509-46.
- Cox, D., Galasso, E. and Jimenez, E. (2006) 'Private Transfers in a Cross Section of Developing Countries', *Center for Retirement Research Working Paper 2006-02*. Boston, MA: Center for Retirement Research.
- De Boor, C. (2001) *A Practical Guide to Splines*. New York, NY: Springer-Verlag.

- Deindl, C. and Brandt, M. (2011) 'Financial Support and Practical Help Between Older Parents and Their Middle-Aged Children in Europe', *Ageing & Society* 31: 645-62.
- Esping-Andersen, G. (1990) *The Three Worlds of Welfare Capitalism*. Princeton, NJ: Princeton University Press.
- Geerts, J. and Van den Bosch, K. (2012) 'Transitions in Formal and Informal Care Utilisation Amongst Older Europeans: the Impact of National Contexts', *European Journal of Ageing* 9: 27-37.
- Georgarakos, D. and Pasini, G. (2011) 'Trust, Sociability, and Stock Market Participation', *Review of Finance* 15: 693-725.
- Gouldner, A. W. (1960) 'The Norm of Reciprocity: a Preliminary Statement', *American Sociological Review* 25(2): 161-78.
- Grundy, E. (2005) 'Reciprocity in Relationships: Socio-economic and Health Influences on Intergenerational Exchanges Between Third Age Parents and Their Adult Children in Great Britain', *The British Journal of Sociology* 56(2): 233-55.
- Haberkern, K. and Szydlik, M. (2010) 'State Care Provision, Societal Opinion and Children's Care of Older Parents in 11 European Countries', *Ageing & Society* 30: 299-323.
- Hank, K. and Jürges, H. (2010) 'The Last Year of Life in Europe: Regional Variations in Functional Status and Sources of Support', *Ageing & Society* 30: 1041-54.
- Hansen, B. E. (2000) 'Sample Splitting and Threshold Estimation', *Econometrica* 68(3): 575-603.
- Igel, C. and Szydlik, M. (2011) 'Grandchild Care and Welfare State Arrangements in Europe', *Journal of European Social Policy* 21(3): 210-24.
- Igel, C., Brandt, M., Haberkern, K. and Szydlik, M. (2009) 'Specialization Between Family and State. Intergenerational Time Transfers in Western Europe.', *Journal of Comparative Family Studies* 40(2): 203-26.
- Ikkink, K. K., van Tilburg, T. and Knipscheer, K. C. P. M. (1999) 'Perceived Instrumental Support Exchanges in Relationships Between Elderly Parents and Their Adult Children: Normative and Structural Explanations', *Journal of Marriage and the Family* 61(4): 831-44.
- Jensen, R. T. (2003) 'Do Private Transfers 'Displace' the Benefits of Public Transfers? Evidence from South Africa', *Journal of Public Economics* 88: 89-112.
- Kang, S. J. and Lee, M. (2003) 'Analysis of Private Transfers with Panel Fixed-Effect Censored Model Estimator', *Economic Letters* 80: 233-37.
- Kohli, M. and Künemund, H. (2003) 'Intergenerational Transfers in the Family: What Motivates Giving?', in V. L. Bengtson and A. Lowenstein (eds) *Global Aging and Challenges to Families*, pp. 123-42. New York, NY: Aldine de Gruyter.
- Künemund, H. and Rein, M. (1999) 'There is More to Receiving than Needing: Theoretical Arguments and Empirical Explorations of Crowding In and Crowding Out', *Ageing and Society* 19: 93-121.

- Künemund, H., Motel-Klingebiel, A. and Kohli, M. (2005) 'Do Intergenerational Transfers from Elderly Parents Increase Social Inequality Among Their Middle-Aged Children? Evidence from the German Aging Survey', *Journal of Gerontology: Social Sciences* 60B(1): S30-6.
- Lee, R. D. and Mason, A. (2011) *Population aging and the generational economy: a global perspective*. Cheltenham: Edward Elgar Publishing Ltd.
- Leopold, T. and Raab, M. (2011) 'Short-Term Reciprocity in Late Parent-Child Relationships', *Journal of Marriage and Family* 73: 105-19.
- Litwin, H., Vogel, C., Künemund, H. and Kohli, M. (2008) 'The Balance of Intergenerational Exchange: Correlates of Net Transfers in Germany and Israel', *European Journal of Ageing* 5: 91-102.
- Mason, A., Lee, R. D., Tung, A.-C., Lai, M.-S. and Miller, T. (2006) 'Population Aging and Intergenerational Transfers: Introducing Age into National Accounts', *NBER Working Paper No. 12770*. Cambridge, MA: National Bureau of Economic Research.
- McGarry, K. and Schoeni, R. F. (1995) 'Transfer Behavior in the Health and Retirement Study: Measurement and the Redistribution of Resources Within the Family', *The Journal of Human Resources* 30(suppl.): 184-226.
- Motel-Klingebiel, A., Tesch-Roemer, C. and von Kondratowitz, H.-J. (2005) 'Welfare States Do Not Crowd Out the Family: Evidence for Mixed Responsibility from Comparative Analyses', *Ageing & Society* 25: 863-82.
- Mudrazija, S. (2013) 'The Balance of Intergenerational Family Transfers: a Life-Cycle Perspective', *European Journal of Ageing* DOI: 10.1007/s10433-013-0302-8.
- OECD (2011) *Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries*. OECD Publishing.
- Pence, K. M. (2006) 'The Role of Wealth Transformations: an Application to Estimating the Effect of Tax Incentives on Saving', *Contributions in Economic Analysis & Policy* 5(1) DOI: 10.2202/1538-0645.1430.
- Schmid, T., Brandt, M. and Haberkern, K. (2012) 'Gendered Support to Older Parents: Do Welfare States Matter?', *European Journal of Ageing* 9: 39-50.
- Schoeni, R. F. (2002) 'Does Unemployment Insurance Displace Familial Assistance?', *Public Choice* 110(1-2): 99-119.
- Silverstein, M., Conroy, S. J., Wang, H., Giarrusso, R. and Bengtson, V. L. (2002) 'Reciprocity in Parent-Child Relations over the Adult Life Course', *Journal Of Gerontology: Social Sciences* 57B(1): S3-13.
- Stark, O. (1993) 'Nonmarket Transfers and Altruism', *European Economic Review* 37: 1413-24.
- Temkin-Greener, H., Bajorska, A., Peterson, D. R., Kunitz, S. J., Gross, D., Williams, T. F. and Mukamel, D. B. (2004) 'Social Support and Risk-Adjusted Mortality in a Frail Older Population', *Medical Care* 42(8): 779-88.
- Villanueva, E. (2002) 'Parental Altruism Under Imperfect Information: Theory and Evidence', *Economics Working Papers 650*. Barcelona: Universitat Pompeu Fabra.

- Villanueva, E. (2005) 'Inter Vivos Transfers and Bequests in Three OECD Countries', *Economic Policy* 20(43): 505-65.
- Zissimopoulos, J. (2001) 'Resource Transfers to the Elderly: Do Adult Children Substitute Financial Transfers for Time Transfers?', *Labor and Population Program Working Paper Series 01-05*. Santa Monica, CA: RAND Corporation Publications Department.
- Zissimopoulos, J. and Smith, J. P. (2009) 'Unequal Giving: Monetary Gifts to Children across Countries and Over Time', *Working Paper 723*. Santa Monica, CA: RAND Corporation Publications Department.

Tables and Figures

Figure 1. Stylized representation of the typical flow of public and family intergenerational transfers for parents (age 50 and older) and their adult children

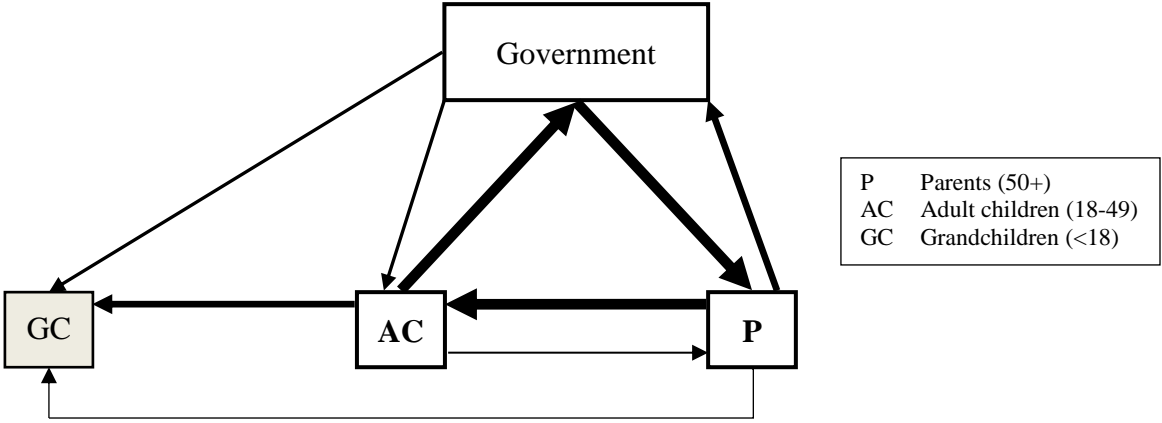


Figure 2. Stylized representation of the relationship of net family transfers and age across the adult life cycle assuming different levels of government intergenerational redistribution

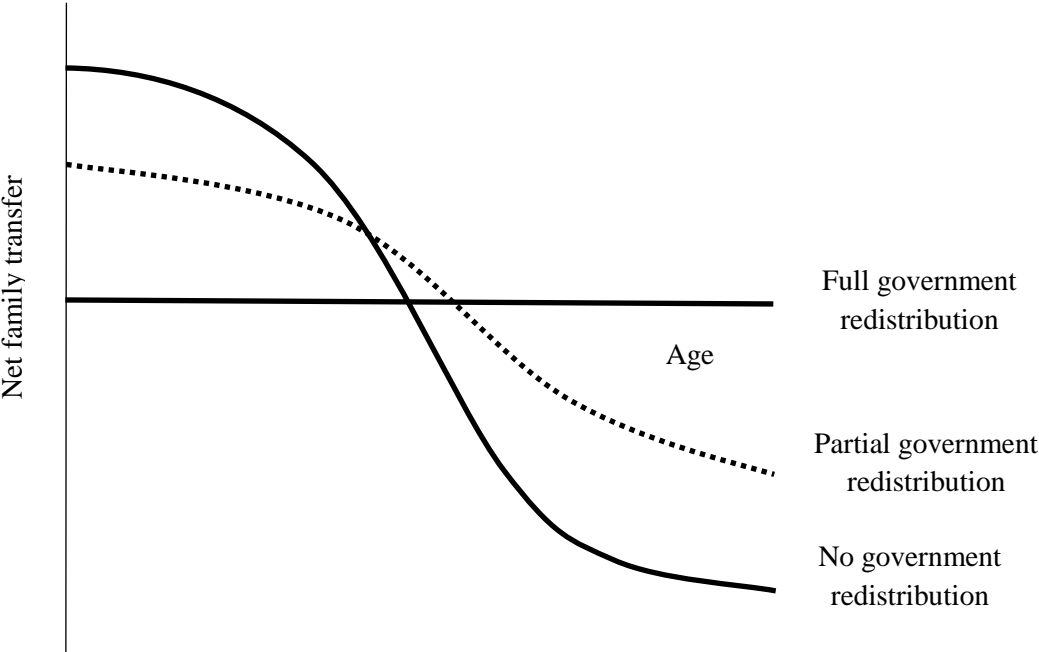


Table 1. Parent-child net transfers, by age groups

	Amount (€, PPP)			% of average parental income		
	50-69	70-79	80+	50-69	70-79	80+
Austria	4487	1550	-570	14.9	5.1	-1.9
Belgium¹	8697	6842	417	24.6	19.3	1.2
Denmark	2802	1975	1038	8.4	5.9	3.1
France	7623	6319	-1183	20.0	16.6	-3.1
Germany	6108	2642	-5063	17.1	7.4	-14.2
Greece	4662	3067	-3684	21.0	13.8	-16.6
Italy	6002	2192	-773	24.4	8.9	-3.1
Netherlands	5244	2941	1328	11.4	6.4	2.9
Spain	4904	628	-3124	19.9	2.6	-12.7
Sweden	2858	2697	1009	8.0	7.6	2.8
Switzerland	5922	12771	1231	13.3	28.6	2.8
N	7737	2202	1295	7737	2202	1295

¹ Average money transfers in Belgium are significantly impacted by 4 influential observations - parents who make net transfers to adult children of over €200,000. Transfer values decrease to €7744 (for age group 50-69) and €4754 (for age group 70-79) once they are excluded. Estimated models use inverse hyperbolic sine transformed values of transfers that decreases the impact of influential observations and skewed distribution.

Table 2. Welfare regime characteristics, by country

	Old age and survivor insurance (% GDP)	Healthcare (% GDP)	Family policy (% GDP)	Education (% GDP)	Gini index (before taxes and transfers)	Gini index (after taxes and transfers)	Legal obligations to help older parents
Austria	15.2	8.1	2.4	4.6	0.43	0.27	Yes
Belgium	10.1	8.2	2.6	4.4	0.49	0.27	Yes
Denmark	9.0	8.1	2.6	5.4	0.42	0.23	No
France	14.7	8.6	2.8	3.8	0.49	0.29	Yes
Germany	10.7	7.8	2.7	4.0	0.50	0.29	Yes
Greece	13.3	6.5	1.1	4.2	0.45	0.32	Yes
Italy	14.0	6.6	1.4	3.9	0.56	0.35	Yes
Netherlands	7.5	8.1	2.3	4.0	0.43	0.28	No
Spain	10.3	7.4	1.5	3.9	0.46	0.32	Yes
Sweden	10.4	7.1	2.7	4.7	0.43	0.23	No
Switzerland	8.1	6.8	1.3	4.5	0.41	0.30	No

Table 3. Sample means

Parents' characteristics	
Age (years)	65.86
Female	0.59
Education (years)	10.47
Marital status	
Married	0.66
Partnered	0.01
Separated	0.01
Never married	0.01
Divorced	0.07
Widowed	0.25
Making ends meet	
Great difficulty	0.10
Some difficulty	0.27
Fairly easily	0.36
Easily	0.28
Annual income (€)	32865
Gross financial wealth (€)	60545
Number of children	2.53
Number of ADLs	0.29
Number of IADLs	0.27
Recent health limitation	0.66
Professional homecare	0.09
Child's characteristics	
Female	0.52
Marital status	
Married or partnered	0.55
Separated, divorced or widowed	0.08
Never married	0.37
Working full-time	0.63
Any grandchildren	0.57
Dyad contact	
Co-resident	0.17
Daily or several times a week	0.60
Once a week to once a month	0.21
Rarely or never	0.02
N	11234

Table 4. Spline regression of parent-child net transfers

	Net value	95% confidence interval	Net value	95% confidence interval
Parents' characteristics				
Age				
Age<70	-0.11 ***	[-0.16 – -0.07]	-0.11 ***	[-0.16 – -0.07]
70<=age<80	-0.40 ***	[-0.53 – -0.28]	-0.40 ***	[-0.53 – -0.28]
Age>=80	-0.20 **	[-0.35 – -0.05]	-0.20 *	[-0.35 – -0.04]
Female	-0.97 ***	[-1.43 – -0.52]	-0.99 ***	[-1.45 – -0.53]
Years of education	0.15 ***	[0.09 – 0.21]	0.15 ***	[0.09 – 0.20]
Marital status (ref. married, living with spouse)				
Partnered	-0.45	[-2.19 – 1.30]	-0.09	[-1.82 – 1.63]
Separated	1.23	[-1.39 – 3.86]	1.23	[-1.40 – 3.85]
Never married	-1.16	[-3.33 – 1.01]	-1.15	[-3.33 – 1.02]
Divorced	-0.92 +	[-1.91 – 0.07]	-0.93 +	[-1.91 – 0.06]
Widowed	-1.36 ***	[-2.17 – -0.56]	-1.39 ***	[-2.20 – -0.59]
Making ends meet (ref. great difficulty)				
Some difficulty	-0.08	[-1.28 – 1.11]	-0.09	[-1.29 – 1.10]
Fairly easily	0.54	[-0.53 – 1.61]	0.53	[-0.54 – 1.60]
Easily	1.33 *	[0.21 – 2.44]	1.30 *	[0.19 – 2.41]
IHS (annual income)	0.07	[-0.14 – 0.27]	0.06	[-0.14 – 0.27]
IHS (gross financial wealth)	0.20 ***	[0.11 – 0.29]	0.20 ***	[0.11 – 0.28]
Number of children	-0.23 +	[-0.45 – 0.00]	-0.22 +	[-0.45 – 0.01]
Number of ADLs	-0.57 *	[-1.08 – -0.07]	-0.56 *	[-1.07 – -0.06]
Number of IADLs	-0.53 *	[-0.98 – -0.09]	-0.52 *	[-0.97 – -0.07]
Recent health limitation	-1.07 ***	[-1.44 – -0.69]	-1.09 ***	[-1.46 – -0.72]
Professional homecare	-1.43 **	[-2.36 – -0.49]	-1.40 **	[-2.34 – -0.45]
Child's characteristics				
Female	-0.13	[-0.53 – 0.27]	-0.11	[-0.51 – 0.28]
Marital status (ref. married or partnered)				
Separated, divorced or widowed	0.18	[-0.55 – 0.90]	0.14	[-0.59 – 0.86]
Never married	0.36	[-0.22 – -0.93]	0.30	[-0.27 – -0.87]
Working full-time	0.04	[-0.42 – 0.49]	0.08	[-0.38 – 0.53]
Any grandchildren	1.89 ***	[1.23 – 2.55]	1.87 ***	[1.22 – 2.52]

Dyad contact (ref. co-residing)

Daily or several times a week	0.84	+	[-0.18 – 1.87]	0.77		[-0.23 – 1.77]
Once a week to once a month	1.06	+	[-0.01 – 2.12]	0.96	+	[-0.09 – 2.00]
Rarely or never	2.47	***	[1.02 – 3.92]	2.36	***	[0.92 – 3.80]

Country (ref. Germany)

Austria	0.94	*	[0.10 – 1.78]
Belgium	0.84	*	[0.19 – 1.49]
Denmark	0.13		[-0.50 – 0.77]
France	1.54	***	[0.82 – 2.26]
Greece	1.62	***	[0.74 – 2.50]
Italy	2.34	***	[1.55 – 3.12]
Netherlands	1.42	***	[0.79 – 2.05]
Spain	1.88	***	[0.90 – 2.85]
Sweden	0.90	**	[0.30 – 1.50]
Switzerland	0.80	+	[-0.05 – 1.66]

Welfare regime policy

Old-age and survivor insurance	0.22	***	[0.10 – 0.34]
Healthcare	1.19	***	[0.57 – 1.81]
Family policy	-2.39	***	[-3.34 – -1.44]
Education	-0.80	***	[-1.23 – -0.37]
Gini-index difference	0.14	*	[0.03 – 0.25]
Legal obligation	-1.72	***	[-2.64 – -0.81]

F-value	44.8	47.72
N	11234	11234

*** p<0.001; ** p<0.01; * p<0.05; + p<0.1

Notes

(1) An example of children's expenditure that parents would likely consider "worthy" of their (financial) support is the cost of education, while parents' health care needs represent a typical situation where children are likely to provide financial or non-financial support. These and similar expenditures would, therefore, be part of the mutually agreed desired level of expenditures. Conversely, while children or parents may desire various luxury items, the other party may not perceive deriving any utility from supporting such spending and, consequently, for an average parent-child pair these items would not be part of the mutually agreed desired level of expenditures.

(2) An exception is the narrow band of values around the origin, where the interpretation between the two transformations differs. Although there are no established guidelines for determining the limits of this band of values, research examining wealth imputations in the Health and Retirement Study suggests it may be as little +/- \$10 (Chien et al, 2013).

(3) Supplementary analysis reveals that the spline regression is more efficient than the alternative specifications with higher order polynomials. Moreover, interpreting the results for the best-fitting alternative that includes quartic expression is cumbersome. Sensitivity analysis also favours the selection of two age-threshold points over the alternatives.

(4) The alternative modelling approach fits the spline regression using the untransformed net transfers values, but censors the sample to the middle 98 percent of observations to limit the impact of outliers. In the first model specification, country dummies show Denmark and Sweden have lower net-transfer values than the reference country, Germany, and the general finding of the North-South gradient remains valid. In the second specification, the results for public policy variables are broadly comparable to those obtained using the transformed values of net transfers: €173 increase in net transfers associated with a percentage point increase in old-age and survivor benefits, €1804 net-transfers increase related with a percentage point increase in healthcare benefits, decreases of €2842 and €931 related with a percentage point increases in family and education spending, respectively, €116 increase in net transfers for a unit change in Gini index difference pre- and post-taxes and transfers (or approximately €12 for 0.1 unit change), and €657 net-transfers decrease related to parental care legal requirement. The estimates for all other predictors of interest are also comparable between the two models in terms of direction of effects, their statistical significance and, to a somewhat lesser extent, their magnitude.