

UPSTREAM TRANSFERS AND THE DONOR'S LABOUR SUPPLY: EVIDENCE FROM MIGRANTS LIVING IN FRANCE*

by

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With the use of data on migrants living in France, we study the pattern of transfers of time and money made to parents. Monetary transfers allocate predominantly towards the large number of elderly parents in the country of origin, while the smaller number of migrant parents in France are more likely to receive time transfers. Our econometric results suggest that monetary transfers are more consistent with the altruistic hypothesis. Furthermore, while the donor's labour participation increases the propensity to give money, there is no negative relationship between time transfers and the labour participation of the donor.

1 INTRODUCTION

The increasing importance of upward private transfers of resources has long been one of the most topical issues associated with ageing economies around the world. In the USA, for example, 11 per cent of the adult respondents to the Health and Retirement Study were found to provide an upward financial transfer of at least \$500 during the preceding two years, while 10 per cent of them provided more than 100 hours of personal care to a parent and as many as 30 per cent provided occasional help with chores (Sloan *et al.*, 2002).

In Britain, 16 per cent of the adult respondents to a representative survey defined themselves as elderly care providers. One-fourth of them reported a devotion of at least 20 hours per week to caring for an elderly person, while 1/10 of them devoted more than 50 hours per week to elderly care (Eurofamcare, 2005). In France, a country characterized by one of the most generous social security systems, the incidence of upward monetary transfers was found to occur among 8 per cent, and the incidence of upward service transfers was found to occur among as many as 31 per cent of the respondents to a representative survey (Wolff, 2000).

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The rising concern with elderly care costs in terms of forgone labour supply is hardly surprising. Some earlier research revealed a high negative correlation between caregiving and the labour supply of the care provider, but failed to resolve the associated endogeneity problem (McLanahan and Monson, 1990; Spitze and Logan, 1991). While addressing the endogeneity issue, others found a stronger negative impact of employment on caregiving than of informal care on employment, but restriction of the sample to include only caregivers brought into question the unbiasedness of the findings (Boaz and Muller, 1992). At the same time, research addressing both endogeneity and selection bias problems failed to reach unambiguous conclusions. Stern (1995) and Ettner (1996) found a significant and negative impact of care on the labour supply of the care provider, while Wolf and Soldo (1994), Ettner (1995) and Pavalko and Artis (1997) found this impact to be insignificant.

One of the shortcomings of these studies is their failure to consider the possibility of substitution of informal care with monetary transfers. However, a case could be made whereby efficient allocation of resources ensures informal upward care donation by less productive individuals, while substitution of money for time ensures the continued and indeed increased labour force participation of middle-aged donors. This possibility is supported by evidence of not only partial substitutability among time and monetary transfers in developed countries, but also a positive correlation between financial gifts and the wage of the donor (Sloan *et al.*, 2002; Wolff and Dimova, 2006).

To the best of our knowledge, no attempt has been made to explore rigorously the interplay between both time and monetary transfers and the labour supply of the donor. We address this issue using a rich data set on immigrants living in France, collected in 2003. Our main contribution is to account for the possibility of substitution between money and time in upward transfer provision, which may lead to an overstatement of the negative impact of informal care on labour supply found in previous studies. In doing so, we explore a peculiar aspect of migration and thus suggest a novel way of assessing its costs and benefits in ageing economies.

The rest of the paper is organized as follows. In Section 2, we briefly review the literature on the motives for upstream transfers and present our econometric strategy which is valid under both altruism and exchange. The survey on migrants living in France is described in Section 3. The determinants of the transfers and labour decisions are discussed in Section 4. The relationships between transfers and work decisions of the care-providing migrants are investigated in Section 5. Finally, Section 6 concludes.

2 THEORETICAL BACKGROUND

Economists have explored two theoretical motives for the provision of intergenerational transfers across generations, mainly with reference to the

transfer flows from parents to children (Laferrère and Wolff, 2006). To begin with, they have emphasized the tendency of parents to care for the well-being of their children.

According to this altruistic framework (Becker, 1991), parents give money to their children in order to reduce inequalities in the distribution of intra-family resources. The transfer amount made to the child is increasing in the parents' level of income, but decreasing in the child's level of income and less well-off children are more likely to receive transfers. As shown in Altonji *et al.* (1997), the transfer to the child is reduced by one euro when the child's income is increased by one euro and the parent's income is decreased by one euro. Several empirical studies have found that parental transfers are not very sensitive to variations in either their income or the income of their children, thus casting doubt on the relevance of the altruistic motive (Cox, 1987; Altonji *et al.*, 1997; Wolff, 2000).

A competing model involves exchanges across generations. Cox (1987) and Cox and Rank (1992) suggest that parents give money to their children only when the latter provide time-related support in the form of contact or services. In that case, the transfer is more likely to be an increasing function of the child's level of resources. Another form of exchange occurs when transfers are family loans (Cox, 1990; Cigno, 1993). In this setting, parents give to their children money that is paid back later at an interest rate which may be above that of the financial market. The family thus acts as a substitute to the credit market and family transfers become a means of improving the inter-temporal allocation of resources. Cigno *et al.* (1998) find that the self-interested motive better fits the data, but exchange models offer less clear-cut predictions than the altruistic model.

Transfers from adult children to their parents, i.e. transfers in the upward direction, may be explained with the use of the same analytical frameworks. On the one hand, a child may behave altruistically and care for the elderly parents when the latter are either poor or unhealthy. Under altruism, the provision of family transfers should depend strongly on the needs of the parents and richer children are more likely to give money to their parents. On the other hand, a child may repay for earlier parental help. If transfers to children are in the form of investment in human capital, one should observe that more educated adults provide more care to the parents. In the same vein, the provision of upstream transfer should be less dependent on the parental situation (either financial or health) when the children have to honour their debt.

Upstream transfers add two dimensions to the stylized framework of downstream transfers. First, while the literature on downward transfers explores primarily the monetary flows from parents to children, models of upstream transfers should take into account the possibility of substitution of time and monetary transfers from adult children to their parents. If for instance parents live far away, it may be difficult for the child to provide

services and other caregiving activities as this entails transaction costs associated with either transportation or co-residence. In that case, it may be less costly to send money to the parents who could pay for formal old-age support. Once the transaction cost is taken as part of the transfer decision, the real choice becomes one between the two forms of transfers, money and time, which is expected to depend on their marginal effectiveness (Sloan *et al.*, 2002).

Second, one should take into account the trade-off for middle-aged adults between having a paid job and caring for the elderly parents. Indeed, providing care is time-consuming, meaning that the labour supply decision of the caregiver is now endogenous. If the parents are in very poor health and need attention, their children may have to withdraw from the labour market. However, a reverse pattern may occur if the children prefer to send money to their parents. By spending more time at work, they will receive a higher income and thus may devote more financial resources to their elderly parents.

In the Appendix, we present a model of transfers driven by altruism which accounts for both time and money transfers in endogenous labour supply. It extends the framework of Sloan *et al.* (2002) to the case of endogenous labour supply of the donor. Alternative models of upstream transfers, based on exchange and bargaining between generations, may be found in Pezzin and Schone (1999) and Sloan *et al.* (1996). This model is used to guide our specification and define our null hypothesis, namely the allocation of transfers from better-off children to worse-off parents. Whatever the underlying child motivation for old-age support, it is important to account for the joint determination of labour supply and transfers and for the potential interaction between the two types of transfers when understanding the donor's behaviour.

Let H^* , S^* and T^* be three latent variables which indicate the propensity to work, the propensity to provide time-related resources, and the propensity to make a cash gift, respectively. Due to data limitations, namely the absence of information on work hours, we only focus on the discrete decisions of working and giving denoted by H , S and T . In other words, we have $H = 1$ if $H^* > 0$ and $H = 0$ if $H^* \leq 0$, $S = 1$ if $S^* > 0$ and $S^* \leq 0$ otherwise, and $T = 1$ if $T^* > 0$ ($T^* \leq 0$ otherwise). The reduced-form econometric specification corresponding to a model of transfers with time, money and endogenous labour supply is therefore given by

$$\begin{cases} H^* = X_H \beta_H + \varepsilon_H \\ S^* = X_S \beta_S + \varepsilon_S \\ T^* = X_T \beta_T + \varepsilon_T \end{cases} \quad (1)$$

where X_H , X_S and X_T are three sets of exogenous variables which respectively influence labour participation, time and financial transfers, β_H , β_S and β_T are the corresponding parameter vectors, and ε_H , ε_S and ε_T are random errors.

In a setting where transfers and labour supply are jointly decided, the residuals of each equation are likely to be correlated. Omitted variables that influence the probability to make a monetary transfer, for instance, the unobserved helper's degree of altruism, are also likely to influence the probability of informal care. Similarly, the characteristics of people who dislike idleness should have similar influence on the propensity to work and to undertake time-related services. To account for the correlation between these random errors, we assume that $(\varepsilon_H, \varepsilon_S, \varepsilon_T)$ follow a normal trivariate distribution:

$$\begin{pmatrix} \varepsilon_H \\ \varepsilon_S \\ \varepsilon_T \end{pmatrix} \sim \begin{pmatrix} 0 & 1 & \rho_{HS} & \rho_{HT} \\ 0, & \rho_{HS} & 1 & \rho_{ST} \\ 0 & \rho_{HT} & \rho_{ST} & 1 \end{pmatrix} \quad (2)$$

where ρ_{HS} , ρ_{HT} and ρ_{ST} are three additional parameters to estimate. Under the normality assumption, the model is a trivariate probit model. We estimate it with the use of a simulated likelihood method (Cappellari and Jenkins, 2003).¹ The key feature here is that the trivariate probit model allows us to control for the influence of individual characteristics on the three different choices made by the donor.

3 DESCRIPTION OF THE DATA

Our empirical analysis is based on the 'Passage à la Retraite des Immigrés' (PRI) data set collected by the Caisse Nationale d'Assurance Vieillesse and Institute National de la Statistique et des Etudes Economiques in Paris between December 2002 and March 2003.

This is a representative sample of the diverse nationalities of first-generation immigrants living in France at retirement age and age close to retirement. It includes rich information on these middle-aged or elderly first-generation immigrants, their parents, spouses and children, such as age, educational and professional attainment, transfers of money and time, migration history, health status and wealth. While the lower age bound for similar types of surveys is typically set at 50 and there is usually no requirement for an upper bound, the PRI sample was restricted between age groups 45 and 70. This restriction was based on the requirement for assuring sufficient representativeness of all nationalities in the sample, which is rather low in the case of younger cohorts such as those coming from sub-Saharan Africa.²

¹The Geweke–Hajivassiliou–Keane simulator is used to evaluate the trivariate normal integrals. For each observation, a likelihood contribution is calculated for each replication, and the simulated likelihood contribution is the average of the values derived from all the replications. We choose 50 replications in the estimation, which is approximately the square root of the size of our selected sample.

²Specifically, these are cohorts facing high representation in the lower parts of the age distribution and virtually no representation in the age groups above 70.

The interviews were based on a computer-assisted personal interviewing questionnaire and were administered in the residence of the respondent. The sample was constructed by way of random selection on the basis of the population census and included around 10,000 residences of immigrants in age groups 45–70 from 12 regions in the country, accounting altogether for 90 per cent of the population of immigrants in these age groups in France (Attias-Donfut *et al.*, 2006). About 51 per cent of the respondents to the final sample come from Europe, 38 per cent from Africa and 11 per cent from all other continents. Six highly represented countries, Portugal, Italy and Spain for Southern Europe, Algeria, Morocco and Tunisia for Northern Africa, account for 70 per cent of the respondents. Given the low retirement age in France, with the majority of workers with regular employment retiring at age 60, we restrict our sample by imposing the age of 60 as the upper age limit.

There are two location possibilities for the parents of the respondents. They can reside either in France or in the country of origin. In what follows, we treat the location of the parents as exogenous. As we focus on the labour-related decision making of the adult child residing in the host country, the potential retirement location of the child is of no interest to our study. In addition, given the typically low age of migration and hence high probability that a parent residing in the host country has migrated there during youth, and was not directly influenced by the caregiving ability of the child, we believe it reasonable to assume that the parental location choice is exogenous.³

It is crucial for the purposes of this study to account for the geographical distribution of the migrants' families and to link this distribution to the portfolio of transfers of time and money. We report these cross-tabulations in Table 1 for each of the two parental locations.⁴ We observe that about 28 per cent of the migrants' parents reside in France, while the majority of parents (72 per cent) reside in the country of origin. The former group attracts the bulk of the upward transfers of time, while the second of these groups attracts the bulk of the upward financial transfers. Specifically, about one-fourth of the parents residing in France receive a time transfer (24.8 per cent), while about one-fourth of the parents residing in the country of origin receive a monetary transfer (26.5 per cent).

When the parents live in France, respondents mainly provide time-related resources, while the rate of financial transfers remains low (5.1 per cent). The reverse pattern is found when parents live in the origin country, the

³Indeed, our results indicate that 69.3 per cent of the first-generation migrants' fathers have arrived in France during their youth for work, 11.1 per cent of them have migrated due to absence of security in their country of origin, while 9.4 per cent have not specified any reasons for migrating. The number of fathers who have arrived for family reasons and in particular to join their children is insignificant.

⁴Questions concerning financial transfers are as follows. For financial transfers, 'did you give money to your parents during the last five years?' For time, 'do you actually spend time helping your parents in old age?'

TABLE 1
THE PATTERN OF UPSTREAM TRANSFERS

<i>Variables</i>	<i>Parents living in France</i>			<i>Parents living in the origin country</i>		
	<i>Men</i>	<i>Women</i>	<i>All</i>	<i>Men</i>	<i>Women</i>	<i>All</i>
Rate of transfer (in %)						
Time	19.2	30.6	24.8	5.6	3.9	4.7
Money	4.3	5.9	5.1	32.8	20.4	26.5
Portfolio (in %)						
No transfer	77.1	66.5	71.8	64.9	76.7	70.9
Money only	3.7	2.9	3.3	29.6	19.4	24.4
Time only	18.6	27.7	23.1	2.3	2.9	2.6
Money and time	0.6	2.9	1.7	3.3	1.0	2.1
Labour supply (in %)						
Participation	84.0	70.0	77.1	79.8	53.6	66.4
Number of observations	349	340	689	880	918	1798

Source: Survey PRI 2003.

proportion of time transfers being more than five times lower than that of financial gifts. Finally, there is evidence of gender differences in the pattern of upstream transfers. Women are much more likely to give time to their elderly parents when the latter live in France (30.6 per cent against 19.2 per cent of men). When parents are in the origin country, male respondents are more likely to send money to the elderly (32.8 per cent against 20.4 per cent).

As location is an important determinant of the portfolio of transfers, we take a further look at the transfer allocation, accounting not only for the two extreme locations (France and the origin country), but also for intermediate locations, including different geographical distances within France and outside of France. The results are reported by gender in Fig. 1. For both men and women, we find that informal care to parents living in France is a decreasing function of the geographical distance, while the relationship is less clear for financial transfers. The incidence of upward monetary transfers increases dramatically when moving from near foreign countries towards distant foreign countries.

Irrespective of the transfer motive, the income levels of both the donor and the recipient and the wage rate faced by the donor should strongly influence transfers. Our data set contains a continuous variable of the total household income of the donor and we use this variable as a proxy for the child's income. Given the high number of nationalities among parents residing outside of France, it is more difficult to construct a comparable continuous proxy for the income of the parent. We therefore use a qualitative variable, reported by the respondent and indicating a different level of lifestyle of the parent.⁵

⁵The question is about the standard of living of the parent when the child was a teenager. It indicates whether the parents were 'very poor', 'poor', 'fair' or 'rich'.

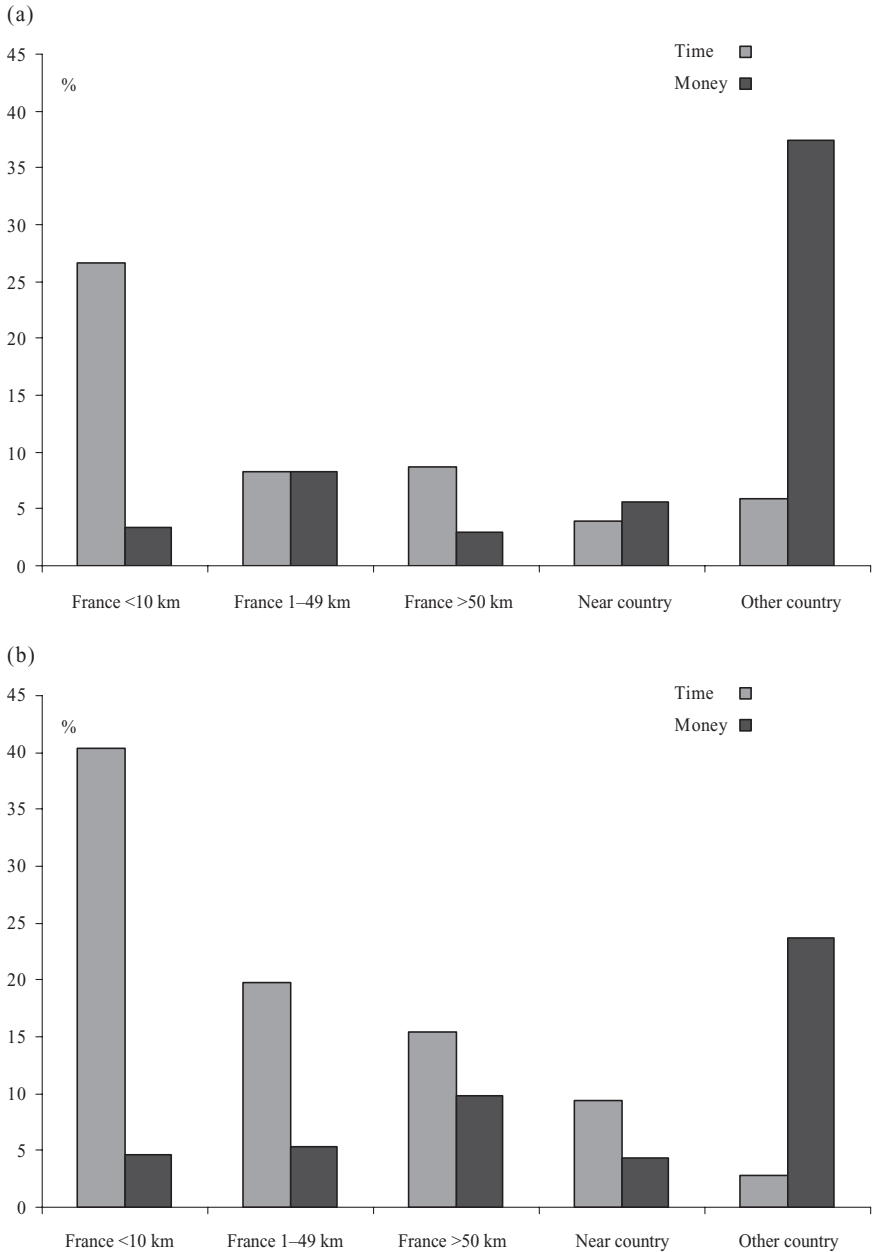


FIG. 1 The Provision of Upstream Transfers, by Distance to Parents: (a) Male Respondents, (b) Female Respondents
 Source: Survey PRI 2003.

Unfortunately, we do not have information on wages. However, the empirical construction of wage rates for non-workers involves problematic identification issues (Ettner, 1996). We therefore follow the stylized empirical literature in including factors influencing the wage (such as gender, age or education) directly in the various outcomes equations. In addition to these factors, we include controls for the geographical distance between donors and recipients, duration of migration, health, marital status and children of both the donor and the recipient. The means of these variables are reported in Table 2.

These statistics indicate that while the age distribution of migrants does not vary on the basis of whether they participate in the labour force or provide any upward transfers, higher levels of labour force participation and provision of monetary transfers occur among better-educated respondents. Interestingly, it is also the higher-educated respondents who have a higher probability of providing time transfers. This observation could be consistent with a theory of return of favours to parents who have invested in their offspring's education (Bhaumik and Nugent, 2000).

A finding that is more consistent with the altruistic hypothesis is that upward transfers of both time and money allocate predominantly towards parents of either very poor or poor financial status, and to a much lesser extent towards parents with fair or high incomes. At the same time, the means of current and permanent wealth of children providing any type of transfers are slightly higher than those of children not providing transfers.⁶

We also find that higher duration of migration is associated with higher level of labour force participation and time transfers and lower level of financial transfers. Larger distance of the parents from France is associated with higher incidence of monetary and lower incidence of time transfers. Resources allocate more intensively towards parents of poorer health and are less important if both parents are alive and hence able to help each other. Finally, married or cohabiting respondents are more likely to provide monetary as opposed to time transfers.

While giving a good idea of the characteristics of respondents on the basis of labour force participation and provision of financial or time transfers, the descriptive statistics provide insufficient information on the complex relationships between transfers and work. We explore these relationships more rigorously in the next two sections.

⁶However, the proportion of respondents who own their house is on average higher for those who give time to their parents, but lower for those who give money with respect to those who do not help their parents.

TABLE 2
DESCRIPTIVE STATISTICS OF THE SAMPLE

Variables	Labour participation		Financial transfer		Time transfer		All
	No	Yes	No	Yes	No	Yes	
<i>Respondent's characteristics</i>							
Female	0.693	0.423	0.532	0.405	0.501	0.547	0.506
Age	50.871	50.362	50.548	50.401	50.479	50.855	50.518
Lives with a partner	0.848	0.856	0.846	0.883	0.858	0.809	0.853
Number of children at home	2.252	1.728	1.760	2.384	1.937	1.461	1.888
Number of children outside	1.366	0.903	1.087	0.885	1.049	1.012	1.045
Years of education	7.301	9.618	8.869	9.057	8.771	10.105	8.908
Health problem	0.322	0.165	0.214	0.207	0.210	0.238	0.213
Duration of migration	28.028	30.289	30.406	26.464	29.013	34.672	29.596
Problems in reading or writing	0.665	0.591	0.589	0.708	0.618	0.578	0.614
Problems in reading or writing French	9.535	9.978	9.817	9.941	9.833	9.922	9.842
Household's income (log)	0.429	0.547	0.540	0.397	0.501	0.602	0.511
<i>Parents' characteristics</i>							
Number of siblings	4.798	4.318	4.276	5.198	4.536	3.848	4.465
Both parents alive	0.298	0.328	0.326	0.288	0.320	0.309	0.318
Health problems	0.588	0.557	0.566	0.568	0.534	0.848	0.566
Financial status							
Very poor	0.177	0.160	0.157	0.196	0.165	0.164	0.165
Poor	0.252	0.268	0.265	0.256	0.255	0.336	0.263
Fair	0.382	0.414	0.411	0.378	0.410	0.355	0.404
Rich	0.189	0.158	0.167	0.170	0.170	0.145	0.168
Location							
In France: less than 10 km	0.121	0.179	0.194	0.031	0.120	0.520	0.161
In France: 10–50 km	0.037	0.070	0.070	0.020	0.057	0.082	0.060
In France: more than 50 km	0.050	0.059	0.066	0.018	0.055	0.066	0.056
Foreign country: near	0.109	0.117	0.137	0.027	0.119	0.078	0.115
Other foreign country	0.684	0.575	0.532	0.904	0.649	0.254	0.608
Unemployment rate (departmental)	9.671	9.254	9.411	9.270	9.362	9.557	9.382
Number of observations	762	1725	1976	511	2231	256	2487

Source: Survey PRI 2003.

4 RESULTS FROM THE JOINT ESTIMATION OF LABOUR SUPPLY AND TRANSFERS

The results from our trivariate probit analysis are reported in Table 3. Following previous works (Ettner, 1996), we assume that the parents' characteristics do not have a direct influence on the child's work decision.

In the transfer equation, we therefore introduce the characteristics of the parents, i.e. number of children, marital, health and financial status, as well as geographical distance of the parents from their donor children, as excluding conditions. At the same time, we exclude the household's level of income and the home ownership dummy from the labour force participation equation. Finally, we keep the variable indicating problems in reading or writing French along with the local rate of unemployment out of the transfer equations.⁷ The labour supply estimates are reported in columns 2 and 3 of Table 3, while the estimates for the transfers of money and time are in columns 4, 5 and 6, 7, respectively.

As expected, more educated children are more likely to work. Age has a negative impact on the probability of labour participation, which is easy to explain given the age restrictions of our sample and the related higher probability of people belonging to this age group dropping out from the labour force. Duration of migration has a positive effect on the labour participation of the migrant and higher rate of unemployment has a negative impact on the probability of work. Finally, both a larger number of children and the existence of health problems negatively affect labour supply.

In columns 4 and 5, we observe that the financial transfer estimates are more consistent with an altruistic hypothesis of transfers than with an exchange explanation. Specifically, we note a positive influence of the donor's income on the probability of making a monetary transfer, while richer parents are less likely to receive a financial transfer. The coefficients of 'fair' and 'rich' parental level of resources are negative and significant at the 1 per cent level. At the same time, we find evidence of a positive impact of the expected wage on monetary transfers. In particular, the coefficient of years of education of the donor in the monetary transfer equation is positive.

Parents in poor health face a higher probability of receiving some money from their children (at the 10 per cent level). This suggests that the respondents care for the well-being of their parents, which is consistent with altruism. Under an exchange motivation, in particular if children have to repay their parents from investments in education received earlier, the characteristics of the parents should not matter in the transfer decision. Our findings thus cast doubt on the relevance of such self-interest models for migrants.

The provision of upstream services is more difficult to explain. The only significant respondent characteristics are age and education. The only paren-

⁷The level of unemployment is measured at the departmental level using aggregate data provided by INSEE. There are 95 departments in France.

TABLE 3
REDUCED-FORM ESTIMATES OF LABOUR SUPPLY, FINANCIAL AND TIME TRANSFERS

<i>Variables</i>	<i>Labour participation</i>	<i>Financial transfer</i>	<i>Time transfer</i>
Constant	2.389*** (5.18)	-3.854*** (5.91)	-2.357*** (3.09)
<i>Characteristics of the respondent</i>			
Female	-0.763*** (12.56)	-0.187*** (2.79)	0.134* (1.64)
Age	-0.021*** (2.58)	0.002 (0.18)	0.025** (2.14)
Lives with a partner	-0.093 (1.12)	0.087 (0.87)	0.007 (0.06)
Number of children at home	-0.086*** (4.18)	-0.005 (2.03)	-0.036 (1.19)
Number of children outside	-0.114*** (4.60)	-0.056** (3.72)	-0.050 (1.34)
Years of education	0.025*** (3.72)	0.017** (2.08)	0.030*** (2.88)
Health problem	-0.567*** (8.37)	0.075 (0.95)	-0.000 (0.00)
Duration of migration	0.009*** (2.65)	0.002 (0.56)	0.002 (0.37)
Problems in reading or writing French	-0.059 (0.96)		
Household's income (log)		0.192*** (4.51)	-0.007 (0.14)
Home ownership		-0.093 (1.31)	-0.041 (0.46)
Rate of departmental unemployment	-0.050*** (3.85)		
<i>Characteristics of the parents</i>			
Number of siblings		0.016 (1.46)	-0.028* (1.94)
Both parents alive		-0.027 (0.39)	-0.090 (1.05)
Health problems		0.114* (1.77)	0.827*** (8.98)
Financial status		-0.083 (0.85)	0.003 (0.02)
(reference: Very poor)		-0.251*** (2.71)	-0.192 (1.64)
Rich		-0.363*** (3.05)	-0.155 (1.03)
In France: 10–50 km		0.220 (1.09)	-0.640*** (4.26)
In France: >50 km		0.214 (1.02)	-0.799*** (4.96)
Foreign country: near		0.286 (1.54)	-1.110*** (7.02)
Other foreign country		1.189*** (8.93)	-1.275*** (11.36)
Labour participation		0.193*** (4.23)	0.096* (1.71)
Financial transfer			0.268*** (4.12)
Number of observations		-2940.6	
Log likelihood		2487	

Source: Survey PRI 2003.

Notes: Trivariate probit model estimated by a simulated maximum likelihood technique, with 50 draws. Absolute values of *t* values are in parentheses, significance levels being respectively 1 per cent (***), 5 per cent (***) and 10 per cent (*). Each single regression also controls for the origin country of the respondent (six dummies).

tal characteristic that influences positively the time-related transfers is the health status of the parent. On the one hand, the result is consistent with the assumption that children care for the well-being of their parents (altruism). On the other hand, children would not have been able to repay their parents through the use of time transfers if the latter were not in poor health. That economic resources (either income or expected wage of the donor and financial situation of the recipient) do not influence the provision of upward time transfers seems to be more consistent with an exchange motive.⁸

Table 3 provides evidence on the impact of geographical distance on both time and monetary transfers that is consistent with both Table 1 and Fig. 1. We observe a significant and positive impact of foreign location on the provision of financial transfers, but negative and increasingly strong impact of distance on the provision of time transfers. It is much more costly for migrants whose parents live far away to give time due to transaction costs. Finally, we observe positive coefficients of correlation between the various outcomes. The positive correlation between financial and time transfers does not mean that the two forms of assistance are complements, but rather that there exist unobserved factors (such as altruism or respondent generosity) influencing at the same time the decisions to give money and time to parents.

There are also gender differences in the provision of upstream transfers. As shown in Table 3, women are less likely than men to give money to their parents. The opposite is true for time transfers, although the gender dummy is only significant at the 10 per cent level. As there are large differences between men and women in their labour market, we also estimated the trivariate models by gender. These regressions, not shown here, indicate that very similar covariates influence the transfer decisions of men and women. Financial gifts increase with the level of income of the donor, but are a decreasing function of the parent's resources, while time transfers are mainly devoted to parents in poor health and living nearby.

To understand any location-based behavioural differences, we also estimated two bivariate probit models for time and monetary transfers separately for the cases of parents living in France and parents living in the country of origin. These estimates, shown in Table 4, indicate that the behaviour of these two different groups of people is indeed different. In the case of parents living abroad, more educated respondents are more likely to provide the two types of transfers. The probability to make a cash gift is higher for richer respondents, while it decreases with the resources of the recipient. Both forms of transfers are more frequently received by parents in poor health, and parents with a fair socio-economic status are less likely to receive services.

⁸We also find a negative effect of the number of siblings on the probability to give time to the parents. Parents are like a public good and each child may have an incentive to free ride on the transfers made by the other siblings.

TABLE 4
BIVARIATE PROBIT ESTIMATES OF FINANCIAL AND TIME TRANSFERS

Variables	Parents living abroad		Parents living in France	
	Financial transfer	Time transfer	Financial transfer	Time transfer
Constant	-3.797***	-2.071*	-3.973*	-3.340***
<i>Characteristics of the respondent</i>				
Female	-0.238***	-0.079	0.165	0.405***
Age	-0.002	-0.003	-0.014	0.046**
Lives with a partner	0.076	0.209	0.042	-0.136
Number of children at home	0.004	-0.007	-0.100	-0.087*
Number of children outside	-0.045	-0.041	-0.154	-0.068
Years of education	0.019**	0.038***	0.023	0.023
Health problem	0.102	-0.170	-0.232	0.142
Duration of migration	0.011**	0.010	-0.031**	0.142
Household's income (log)	0.219***	-0.019	0.284*	-0.008
Home ownership	-0.148*	0.046	0.198	-0.169
<i>Characteristics of the parents</i>				
Number of siblings	0.021*	-0.017	0.013	-0.045**
Both parents alive	-0.030	-0.109	-0.039	-0.066
Health problems	0.119*	0.657***	-0.025	1.021***
Financial status	-0.148	-0.055	0.755*	0.037
(reference: Very poor)	-0.356***	-0.313*	0.569	-0.139
Rich	-0.393***	-0.263	-0.193	-0.141
Location			0.176	-0.659***
(reference: In France: <10 km)			0.271	-0.811***
(reference: In France: >50 km)				
(reference: Foreign country: near)	0.967***	-0.153		
Coefficients of correlation	0.281 (3.56)		0.214 (1.45)	
Number of observations	1798		689	
Log likelihood	-1217.4		-415.3	

Source: Survey PRI 2003.

Note: Bivariate probit models estimated by a maximum likelihood technique. Absolute values of t values are in parentheses, significance levels being respectively 1 per cent (***) 5 per cent (**) and 10 per cent (*). Each single regression also controls for the origin country of the respondent.

The sensitivity of transfers to the economic situation of both generations makes these results more consistent with altruism.

While the trade-off between time and monetary transfers is clearly driven by the socio-economic achievement of the respondent in the case of parents living in the origin country, the decisions of migrants whose parents live in France are less easy to interpret. The economic variables are hardly significant in either equation, although the donor's income has a positive effect at the 10 per cent level on the cash gift decision. Services are more frequently given by women to their parents, and respondents facing health problems and living near their children face a higher probability to benefit from such assistance. The opportunity cost of caregiving seems to be what matters most in this case.

5 THE INTERPLAY BETWEEN FAMILY TRANSFERS AND LABOUR PARTICIPATION

The trivariate analysis is performed under the implicit assumption that the outcomes are jointly determined, without any interactions between them. However, several authors have suggested that time transfers are endogenous in the labour participation equation of the donor (Wolf and Soldo, 1994; Ettner, 1995, 1996; Johnson and Lo Sasso, 2000; Carmichael and Charles, 2003). One can put forward several arguments in favour of the endogeneity of transfers in the labour participation equation.

For instance, it is possible that parents expect children who are more familiar with domestic tasks (these are most often daughters) to provide more informal care. The existence of formal care substitutes for some time-related services can make it possible for a child whose opportunity cost of time is high to pay for formal care provision to parents instead of giving time. At the same time, having a paid job may increase the propensity of the respondents to provide assistance to the parents. This sets up a problem of reverse causality for financial transfers through an income effect, whereby professionally more successful individuals have a larger ability to provide financial transfers. To disentangle the complex relationship between labour and transfer decisions, we proceed in the following way.

Since most transfers to parents outside of France are in the form of money and most transfers to parents in France are in the form of time, we split our sample by parental location. First, we explore the impact of labour supply on financial gifts, working respondents being expected to provide more money to their parents. When the latter live abroad (money being the primary transfer), the model to estimate is⁹

⁹As pointed out by an anonymous referee, it seems more difficult to interpret the role of financial transfers on the labour participation decision. We therefore focus on the reverse case of labour participation influencing the financial transfers.

$$\begin{cases} H^* = X_H \beta_H + \varepsilon_H \\ T^* = X_T \beta_T + \gamma_T H + \varepsilon_T \end{cases} \quad (3)$$

Conversely, when the parent lives in the origin country, time is the primary transfer and we are interested in the effect of the labour participation on the time provision. We then estimate the following model:¹⁰

$$\begin{cases} H^* = X_H \beta_H + \varepsilon_H \\ S^* = X_S \beta_S + \gamma_S H + \varepsilon_S \end{cases} \quad (4)$$

The above specifications define a recursive, simultaneous equations model with two probit equations. Under the assumption that both residuals follow a bivariate normal distribution, we estimate bivariate probit models (Greene, 1998). Wilde (2000) has shown that exclusion restrictions were not necessary for identification in these models. However, in that case, the model is only weakly identified. To secure identification, we exclude the parental characteristics, the household's level of income and home ownership from the labour participation equation. We also exclude from the transfer equations both the variable indicating problems in reading or writing French and the local rate of unemployment.

The results from the bivariate probit models are in Table 5. Since the coefficients of our key exogenous covariates are consistent with those of the trivariate probit regression, we concentrate in what follows on the interpretation of the endogenous variables.

We first focus on the sample of immigrants whose parents live in the origin country, i.e. the recipients of financial gifts. We observe that when the decision to work is treated as endogenous, we obtain a significant value for the labour participation variable in the gift equation. This means that working will increase the respondent's propensity to redistribute part of the earned income to parents.¹¹

Let us now consider the relationship between time transfers and labour participation. We find that working has a positive effect on the decision to give time, but this relationship is only significant at the 10 per cent level. In the reverse direction, when estimating a bivariate model with the endogenous transfer in the labour participation equation, we also get a positive coefficient for the time provision. However, the coefficient is very small and absolutely not significant at any conventional level.

For the USA, several studies have found a significant negative relation between time transfers and the labour supply of the donor (Ettner, 1996;

¹⁰Nevertheless, it could also be that the decision to help parents through services is itself endogenous in the labour participation equation, as stated in the previous literature. We have performed additional regressions to account for this reverse causality.

¹¹When considering separately the subsamples of men and women (not reported), we note that the estimate of the endogenous labour participation is about twice as high for men than for women.

TABLE 5
SIMULTANEOUS ESTIMATES OF LABOUR PARTICIPATION AND FAMILY TRANSFERS

Variables	Parents living abroad		Parents living in France	
	Labour participation	Financial transfer	Labour participation	Time transfer
Constant	2.453***	-4.426***	3.276***	-4.282***
<i>Characteristics of the respondent</i>				
Female	-0.852***	0.033	-0.495***	0.503***
Age	-0.024**	0.005	-0.024	0.052***
Lives with a partner	-0.191*	0.145	0.151	-0.139
Number of children at home	-0.096***	0.035	-0.088*	-0.052
Number of children outside	-0.109***	-0.007	-0.163***	-0.013
Years of education	0.026***	0.009	0.025	0.015
Health problem	-0.568***	0.283**	-0.597***	0.309*
Duration of migration	0.019***	0.004	-0.018**	-0.004
Problems in reading or writing French	-0.048		-0.010	
Home ownership		0.181***		0.009
Household's income (log)		-0.137*		-0.151
Rate of departmental unemployment	-0.048***		-0.058**	
<i>Characteristics of the parents</i>				
Number of siblings		0.019*		-0.039*
Both parents alive		-0.037		-0.060
Health problems		0.118*		0.963***
Financial status		-0.132		0.028
(reference: Very poor)		-0.334***		-0.121
		-0.347***		-0.139
		0.895***		
Location				
(reference: Foreign country; near)				
(reference: In France: <10 km)				
<i>Endogenous variables</i>				
Labour participation		1.001**		0.971*
Coefficient of correlation				
Number of observations		-0.429 (1.50)		-0.505 (1.43)
Log likelihood		1798		689
		-1848.0		-620.1

Source: Survey PRI 2003.

Note: Simultaneous probit equations estimated by a two-stage method, with corrected standard errors. Absolute values of t values are in parentheses, significance levels being respectively 1 per cent (***), 5 per cent (**) and 10 per cent (*). Each single regression also controls for the origin country of the respondent.

Johnson and Lo Sasso, 2000; Carmichael and Charles, 2003). One possible explanation of the difference in findings could be the difference in labour market institutions and social security systems between the USA and France, since the more generous provision of health care in France is likely to reduce the opportunity costs of private informal care within the household.

6 CONCLUSION

As migrants grow older, especially in European countries characterized by expensive social security systems, caring for elderly parents becomes an important concern. Empirical studies, using primarily data from the USA, have suggested that the upward provision of informal care may reduce the labour force participation of the donor, typically the child of the elderly disabled individual.

We add to the literature on upstream transfers by considering the case of migrants in a continental European context and taking into consideration the possibility of a substitution of time for money and the relationship between these transfers and the labour supply of the middle-aged donor. Our empirical results indicate that parental location has an important impact on the portfolio of upward transfers. While altruism explains to a large extent the transfer choice to parents living in the country of origin, the opportunity costs of the financial and time types of transfer seem to be the primary determinant of the portfolio of transfers to parents living in France.

We find that monetary transfers allocate predominantly towards the large number of elderly parents in the country of origin and the probability of giving money is an increasing function of the donor's labour participation. Conversely, the smaller number of migrant parents in France are more likely to receive time transfers than monetary transfers. There is no clear relationship between these time transfers and the donor's labour supply. Our results thus provide some challenges to the apprehensions related to the fiscal burden of ageing migrants in developed countries and highlight the advantages of continued inflows of first-generation immigrants. They also emphasize the necessity of taking the substitutability of time and money seriously into account when studying the link between family transfers and the donor's labour supply.

APPENDIX: AN ALTRUISTIC MODEL OF TRANSFER WITH ENDOGENOUS LABOUR SUPPLY

For the presentation, we focus on a model of transfers from one middle-aged child k to a parent p , meaning that we neglect the potential interactions between siblings. In the sequel, we take the location of the donor and recipient as given.

The child's utility function $U(C_k, l_k)$ depends on his or her level of private consumption C_k and on the hours of leisure l_k . Caring for parents is costly and it

entails a loss of income ($u_1 > 0$, $u_{11} < 0$, $u_2 > 0$ and $u_{22} < 0$). The parent's utility function $v(C_p, s_k)$ depends on his or her private consumption C_p and on the amount of informal care s_k . The parent enjoys receiving time-related transfers from the child, so that s_k enters the utility function as a separate parameter. We have $v_1 > 0$, $v_{11} < 0$, $v_2 > 0$ and $v_{22} < 0$. Finally, we denote by β_k the caring parameter which indicates the weight of the parental satisfaction in the child's extended utility function $u(C_k, l_k) + \beta_k v(C_p, s_k)$.

The labour force participation is endogenous for the child. He or she allocates his or her total time L_k between paid work H_k , leisure l_k and upstream services s_k , so that $H_k + l_k + s_k = L_k$. The child's income is given by the sum of exogenous income Y_k and paid work hours wH_k , where w is the hourly wage rate. The gross revenue is devoted to consumption and to a financial transfer T_k made to the parent and $C_k = wH_k + Y_k - T_k$. The parent's resources are assumed to be exogenous as they stem from decisions made in the past. They include personal income Y_p and the gift T_k , so that the budget constraint is $C_p = Y_p + T_k$. We further assume that $T_k \geq 0$ and $s_k \geq 0$. This implies that both transfers flow upwards.

By combining the first two constraints, we get the child's full budget constraint $C_k + wl_k + ws_k + T_k = wL_k + Y_k$. The problem for the child is to maximize his or her augmented utility function subject to the resource and non-negativity constraints:

$$\max_{l_k, s_k, T_k} u(wL_k + Y_k - wl_k - ws_k - T_k, l_k) + \beta_k v(Y_p + T_k, s_k) \quad (\text{A1})$$

The first-order conditions with respect to l_k , s_k and T_k give

$$-wu_1 + u_2 = 0 \quad (\text{A2})$$

$$-wu_1 + \beta_k v_2 = 0 \quad (\text{A3})$$

$$-u_1 + \beta_k v_1 = 0 \quad (\text{A4})$$

The interpretation of these conditions is straightforward. The marginal utility of leisure u_2 is equal to the marginal disutility wu_1 of forgone income (equation (A2)). The marginal cost of lower income is equal to the marginal benefit from helping the parent, weighted by the caring parameter (equation (A3)). Finally, equation (A4) indicates that the financial transfer is such that the marginal cost for the child of transferring resources (due to a lower private consumption) is equal to the marginal benefit resulting from the increase in the parental level of well-being. By combining (A3) and (A4), we obtain $wv_1 = v_2$. When this condition is not satisfied, it is preferable for the child to modify his or her allocation between time and money transfers in order to reach a higher level of satisfaction.

By differentiating the system of the first-order conditions (A2)–(A4), one can determine the effects of w , Y_k , Y_p and β_k on the choice variables l_k , s_k and T_k . It is straightforward to show that the financial gift is an increasing function of the child's income $L_k w + Y_k$ and that the time transfer is positively related to the exogenous income of both the child and the parent, while an increase in the wage rate reduces the child's provision of informal care. This model clearly shows the need to take into account the joint determination of labour supply and transfers and the potential substitutability of the two types of transfers conditional on the marginal product of labour of the donor. ■

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