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Why do children transfer to their parents? Evidence from South Korea

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Abstract I examine motives behind interhousehold upstream transfers using a sample of child-parent pairs in South Korea. The estimation results indicate that upstream transfers in Korea cannot be explained by just one motive. I find evidence that altruism is the dominant motive at the margin if parental income is low, but not so if parental income is high. I also find that upstream transfers are given, at least in part, in exchange for child care service and in lieu of personal visits. There is little evidence that upstream transfers are used by children to win parental favor for future gains such as an inheritance or to repay implicit parental loans used for education. Additional evidence is provided from the analysis of the frequency of personal visits and semiparametric regressions. Determinants of downstream transfer amounts are also examined.

Keywords Upstream transfer · Intergenerational transfer · Interhousehold transfer · Altruism

JEL Classification D10 · J14 · J18

1 Introduction

Monetary transfers from adult children to their parents ('upstream transfers') are common, especially in countries lacking well-developed public old-age insurance. In this study, I examine motives behind interhousehold upstream transfers using longitudinal data from South Korea called the Korean Labor and Income Panel Study (KLIPS). The main reason for using the data is that the KLIPS tracks split-offs, mostly adult children who have moved out of their parents' home. By matching

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the split-offs to their parents and constructing the sample of child-parent pairs, I can use the same set of detailed information on socioeconomic characteristics of both sides engaging in intergenerational transfer for empirical analysis. Missing information on either children or parents is a potentially confounding yet a common problem with many previous studies on intergenerational transfer. Matching split-offs to their original households has been used to overcome the data problem by, for example, Rosenzweig and Wolpin (1993, 1994) and Altonji et al. (1992, 1997) studying downstream transfer. Few studies on upstream transfer, however, have used the strategy mainly because of data limitation.

The literature on intergenerational transfer suggests that upstream transfers may occur due to altruism or for non-altruistic reasons (see Laferrère and Wolff 2006) for a comprehensive survey of the literature). An altruistic upstream transfer may occur if children's utility depends on parental consumption or parental utility derived from it (Becker 1981). A non-altruistic upstream transfer, on the other hand, may occur for three reasons. One is an exchange (Cox and Rank 1992). For example, children whose own children are cared for by their parents (the child's grandparents) may pay their parents for the child care service. Another reason is repayment of implicit parental loans (Lillard and Willis 1997; Park 2003; Raut and Tran 2005). A child whose education is paid for by the parents may be obligated to repay the costs to the parents once he or she finishes schooling. Analyzing data from Malaysia, Park (2003) finds that individuals with post-secondary education in Malaysia transfer to their parents partly to repay implicit parental loans. The third reason is to win parental favor to secure an inheritance in the future (Bernheim et al. 1985; Lucas and Stark 1985), which results in that the wealthier the parents are, the more transfer they get. Lucas and Stark (1985) show that in Botswana parental wealth is positively correlated with the amount of transfers from children, and Bernheim et al. (1985) show that the frequency of contacts by children increases with the parents' bequeathable wealth in the United States.

Whether upstream transfers are motivated by altruism or not has an important policy implication. If they are motivated purely by altruism, increasing public transfers to the elderly population will reduce the amount of private upstream transfers, and thus it may have little impact on the overall economic well-being of the elderly population; if transfers are not purely motivated by altruism, increasing public transfers may change little or even increase the private transfer amount, and thus it is likely to have a significant impact on the economic well-being of the elderly population. A knowledge of the transfer motive, therefore, will help us predict behavioral changes brought by the public old-age security system and devise a more effective system.

A number of studies have been done on upstream transfers. Raut and Tran (2005), using data from Indonesia, test if upstream transfers are the results of pure loan contracts, and reject the hypothesis. Cai et al. (2006) find evidence that upstream transfers to the parents living under the poverty line in urban China are motivated by altruism. Kazianga (2006), on the other hand, finds that upstream transfers in Burkina Faso are motivated by altruism for the middle income class, but not for the lower income households. As the somewhat conflicting findings of the previous research indicate, we have yet to understand fully the nature of upstream transfer.

In this study, examining the relationship between the upstream transfer amount and parental income in Korea, I find evidence that transfers to the parents with lower income are motivated by altruism at the margin, but transfers to the parents with higher income are not. Examining the effects of personal characteristics of children and parents on the transfer amount, I also find evidence that some upstream transfers are given in exchange for child care service or in lieu of personal visits. I find, on the other hand, little evidence that upstream transfers are used by children to repay parental loans or to win parental favor for an inheritance in the future. I also examine the determinants of the frequency of personal visits by children to their parents and get the similar results. Analyzing downstream transfers, I find some evidence that they are motivated partly by altruism.

The balance of the paper is organized as follows. In Sect. 2 a simple model of upstream transfer with multiple motives is presented, and its empirical implications are discussed. In Sect. 3 the data used for this study are described, and in Sect. 4 the main estimation results, the findings from the semiparametric regressions, and the analysis of the frequency of visits and downstream transfers are discussed. In Sect. 5 the paper is summarized and concluded.

2 A model of upstream transfer

In this section I describe a simple model of upstream transfer arising from altruism (Becker 1981), exchange (Cox and Rank 1992), repayment of implicit parental loans used for acquiring human capital (Lillard and Willis 1997), and desire to win parental favor by children seeking an inheritance (Bernheim et al. 1985; Lucas and Stark 1985). Using the model, I discuss how to infer existence of a transfer motive from the relationship of the transfer amount with the child's income and education, and parental income, wealth, and education. The empirical implications are used later to interpret the estimation results and to answer why children transfer to their parents.

The starting point of the model is pure altruism. If upstream transfers are motivated only by altruism, the child tries to balance his or her marginal utility of consumption and the parent's. It implies that the transfer amount is negatively correlated with parental income and wealth and, if parental income or wealth is sufficiently high, there is no transfer. Furthermore, since altruistic transfer has the effect of pooling the parental and the child's income, it satisfies the condition $\frac{\partial T}{\partial y_k} - \frac{\partial T}{\partial y_p} = 1$, where T is the upstream transfer amount, y_k is the child's income and y_p is parental income. On the other hand, if the transfer motive is non-altruistic, such as exchange for parental service (e.g., child care), repayment of parental loan, and strategy to win parental favor, the transfer amount may be positively correlated with parental income, wealth, or education, since those variables are likely to be positively correlated with the price of parental service, loan amount, and the size of inheritance. If altruistic and non-altruistic motives co-exist, the relationship between the upstream transfer amount and parental income is likely to be nonlinear. If parental income is sufficiently low, the transfer amount is negatively correlated with parental income since altruistic transfer is operational and dominant over non-altruistic transfer; if parental income is sufficiently high, the

transfer amount is positively correlated with parental income since altruistic transfer ceases to be operational or is dominated by non-altruistic transfer.

To show more formally the relationships summarized above, we consider a child-parent pair. The child lives for two periods, period 1 and 2, whereas the parent is alive only in period 1. The child solves the following problem:

$$\max_{A,S} f(A,S) \equiv U(y_{k1} - A - l - pS, S) + \alpha V\big(y_{p1} + rW + A + l + pS, S\big) + \rho U[y_{k2} + B(A,W)], \quad (1)$$

where $U(\cdot)$ is the child's own instant utility function, $V(\cdot)$ is the parental utility function, y_{kt} is the child's exogenous income in period t, y_{p1} is parental income in period 1, $\alpha \geq 0$ is the degree of the child's altruism toward the parent, ρ is the discount rate, A is the amount of altruistic transfer, l is the amount of parental loan to be repaid, W is parental wealth, rW is the amount of wealth the parent spends for himself, S is parental service the child gets, p is the price of parental service, and $B(A, W)$ is the function that determines how much the child inherits.[1] A and S must be non-negative. In the data we do not observe A, l, and pS separately but observe only the total transfer $T \equiv A + l + pS$.

In the case of pure altruism where $\alpha > 0, l = 0,\ U_2 = 0$ and $B_1 = 0$, the altruistic transfer is operational and satisfies the condition $-U_1 + \alpha V_1 = 0$ if $y_{p1} + rW$ is small. It is easy to show that if $T > 0$, $\frac{\partial T}{\partial y_{p1}} < 0$ and the so-called 'derivative condition,' that is, $\frac{\partial T}{\partial y_{k1}} - \frac{\partial T}{\partial y_{p1}} = 1$ is satisfied (Cox 1987; Altonji et al. 1997).

In the case where $U_2 > 0$, the child draws utility from parental service and may ask for it. If both A and S are positive, it should be that $\frac{\partial S}{\partial p} < 0$ and $\frac{\partial A}{\partial p} < 0$. Since $\frac{\partial T}{\partial p} = \frac{\partial A}{\partial p} + p\frac{\partial S}{\partial p} + S$, the effect of the price of parental service on the transfer amount has an ambiguous sign. It will be positive, if S is large. There is no direct information on p, but parental education or income is likely to be positively correlated with the opportunity cost of providing the service. Thus a positive relationship between parental income or education and the transfer amount can occur if the upstream transfer is (partly) given in exchange for parental service provided to the child. Further evidence of the exchange motive can be found by examining whether the greater need for parental service increases the transfer amount. For example, later in the empirical section I will examine whether the number of children's own young children has a positive effect on the transfer amount.

If the child has to repay the parental loan or $l > 0$, $\frac{\partial T}{\partial l} = \frac{\partial A}{\partial l} + p\frac{\partial S}{\partial l} + 1$. Since $\frac{\partial A}{\partial l} < 0$ and $\frac{\partial S}{\partial l} < 0$, an increase of the parental loan may increase or decrease the total transfer amount depending on how responsive the altruistic transfer and demand for parental service are to the loan amount. While we cannot directly observe the loan amount, if the loan is used to pay for an investment in human capital, the loan amount is likely to be positively correlated with the child's schooling controlling for the other factors. Therefore I later examine the relationship between the child's education and the upstream transfer amount. Furthermore, if the upstream transfer is (partly) a

[1] It is assumed that $U_1 > 0$, $U_2 > 0$, $V_1 > 0$, $V_2 < 0$, $B_1 > 0$, $B_2 > 0$, $U_{11} < 0$, $U_{22} < 0$, $V_{11} < 0$, $V_{22} < 0$, $U_{12} = V_{12} = 0$, $B_{11} < 0$, $B_{22} < 0$ and that parental service is a normal good.

repayment of the parental loan, the total transfer amount may be positively correlated with parental income, since parental income is likely to be positively correlated with the size of the loan.

The effect of parental wealth (W) on the transfer amount depends on the size and the sign of B_{12}.[2] If transfer has no effect on the bequest ($B_1 = 0$ and $B_{12} = 0$), $\frac{\partial A}{\partial W} < 0$ and $\frac{\partial S}{\partial W} < 0$. If the wealthier the parent is, the less responsive to the transfer the bequest is ($B_{12} < 0$), $\frac{\partial A}{\partial W} < 0$ and $\frac{\partial S}{\partial W} \gtreqless 0$; if $B_{12} > 0$ and is large in magnitude, $\frac{\partial A}{\partial W}$ and $\frac{\partial S}{\partial W}$ may be positive. Thus a positive sign of $\frac{\partial T}{\partial W}$ is likely to indicate that $B_{12} > 0$—the transfer amount is an important determinant of the size of inheritance—and that the child transfers (partly) in order to win parental favor for future bequest (Bernheim et al. 1985). The relationship between parental wealth and upstream transfer amount will be examined later empirically.

In sum, the model suggests that while the amount of upstream transfer motivated only by altruism has necessarily a negative relationship with parental income and satisfies the derivative condition, the amount of transfer motivated by non-altruism does not. A non-negative or positive relationship between parental income and the upstream transfer amount suggests existence of a non-altruistic motive, but from it alone we cannot know which non-altruistic motive is behind the upstream transfer. For that purpose, we need to further examine the relationship between upstream transfer amount and the personal and household characteristics of the children and parents, such as education and composition of household members.

If altruism and non-altruistic motives co-exist, the effect of parental income on upstream transfer amount may be nonlinear. If parental income is low and the size of the non-altruistic transfer is not large enough, an altruistic upstream transfer is operational. In this case we may find that parental income is negatively correlated at the margin with the total transfer amount. If parental income is high enough or the non-altruistic transfer is large enough so that $\alpha V_1 + \rho\, U_1 B_1 < U_1$, the altruistic transfer ceases to operate and the relationship between parental income and the upstream transfer amount may be non-negative. That is, if the loan amount or the price of parental service is positively correlated with parental income, and parental income is high enough, the total upstream transfer amount may be positively correlated with parental income. Thus a nonlinear relationship between the upstream transfer amount and parental income would strongly imply that altruism and non-altruistic motives co-exist behind the upstream transfer.

3 Data

The sample for this study is drawn from the KLIPS. The KLIPS is a longitudinal study of a nationally representative Korean household sample conducted annually

[2] Note that

$$\frac{\partial A}{\partial W} = -|\mathbf{D}|^{-1}(\alpha r V_{11} U_{22} + \alpha r V_{11} V_{22} + \rho U_{11} B_1 B_2 f_{22} + \rho U_1 B_{12} f_{22}),$$

$$\frac{\partial S}{\partial W} = -|\mathbf{D}|^{-1}\left(\alpha\rho p r U_{11} V_{11} [B_1]^2 + \alpha\rho p r V_{11} U_1 B_{11} - \rho U_{11} B_1 B_2 f_{12} - \rho U_1 B_{12} f_{12}\right),$$

where $|\mathbf{D}|$ is the Hessian of the objective function $f(A, S)$ which is by the second order condition positive.

since 1998. It collects socioeconomic information of households and individuals including income, consumption, wealth, labor market status, and so forth. Split-offs are tracked and interviewed along with the original households.

Data from waves 4–9 of the KLIPS are used for this study. Waves 1–3 are excluded because they do not have information on intergenerational transfer. By matching split-offs to their original households, I construct a sample of pairs of non-coresident children and their parents. Because the KLIPS collects information only on transfers to and from the head's parents and on assets at the household level, I only use the pairs of household heads.[3] Excluding the pairs with missing information and pooling the remaining ones over the six waves, I use 1,504 observations of 596 child-parent pairs for the analysis. Since the number of split-offs has increased over time, the majority of the observations are from the more recent waves. Observations from waves 7–9 constitute about 62 % of the sample.

This study limits the analysis to interhousehold transfers between non-coresident children and parents due to lack of information on intrahousehold transfer. Excluding coresident child-parent pairs from the analysis may bias the estimation results if coresidence status and the monetary transfer amount are correlated. For example, if non-coresident children are less altruistic than coresident children, excluding coresident pairs may lead to underestimating the role of altruism in determining the upstream transfer amount. Existing literature suggests, however, that such selection bias is not likely to be serious. For example, Park (2003) finds that correcting potential selection bias by coresidence status has little effect on the estimation results for interhousehold intergenerational monetary transfer in Malaysia.

In this paper I left-censor the transfer amount at a half million Korean Won (KW) ($\approx$US$500) a year, since the decision making process for small transfers is most likely to be dictated by the social custom economic models are, in general, considered agnostic about. Furthermore, reports of small transfers are prone to errors. For such reasons, some socioeconomic surveys collect information only on transfers over a certain amount. For example, the Health and Retirement Study (HRS) of the United States directs the respondents to report only transfers larger than $500 a year. In this paper, I follow the convention of the HRS, although the KLIPS asks the respondents to report any amount. About 40 % of all the positive gross upstream transfers reported are smaller than a half million KW a year.

The information on the transfer amount used in this paper is collected from the children's side. There is a measurement error issue since children may under-report downstream transfer amounts and over-report upstream transfer amounts. However, since the transfer amount is used as the dependent variable in this paper, the measurement error should affect estimation of only the intercept term, as long as the measurement error is not systematically correlated with the explanatory variables. In this paper, the gross upstream transfer amount refers to the total amount given by the child to the parents, and the gross downstream transfer amount refers to the total amount given by the parents to the child. The net upstream transfer amount is the gross upstream transfer amount minus the gross downstream transfer amount. Thirty 7 % of the observations in the sample report gross upstream transfer exceeding a half million KW a year, and one third report net upstream transfer exceeding the

[3] One of the parents should be the household head.

threshold. Only 12 % report downstream transfer exceeding a half million KW a year. The summary statistics of the sample are shown in Table 1.

4 Estimation results

4.1 Main results

4.1.1 Estimation methods

The data on transfers are left-censored. I use two estimation methods that can deal with censoring. One, which I call the 'A−I estimator' henceforth, is the method developed by Altonji et al. (1997, 2012) that does not assume separability between the observed explanatory variables and the unobserved heterogeneity such as the degree of intergenerational altruism. The Monte Carlo simulation results of Altonji et al. (2012) indicate that the method works well for both non-separable and separable cases. In obtaining the A–I estimates, I pool the data across the six waves, treating each observation of transfer as an independent observation.

The estimation method can be described briefly as follows (Altonji et al. 2012). Suppose that the transfer amount T is determined by function $M(X, u)$, where X is the vector of observed determinants of the transfer amount and u is a scalar random variable. We observe $T = M(X, u)$ if $M(X, u) > \overline{T}$. Let $I_M(X) = I[M(X, u) > \overline{T}]$ where $I[\cdot]$ is the indicator function. The parameter of interest is $\beta(x)$, the average derivative of T with respect to X, given that $X = x$ and T is not censored. Assuming that $M(X, u)$ is continuous and monotonic with respect to u for each X,

$$\beta(x) = E[\nabla M(X,u)|X = x, I_M(X) = 1] = \int_{u_L(x)}^{\infty} \nabla M(x,u) f(u) du / P_M(x), \qquad (2)$$

where $M[x, u_L(x)] = \overline{T}, \nabla M(X, u)$ is the partial derivative of function $M(X, u)$ with respect to X, $f(u)$ is the density function of u and $P_M(x) = Pr\{I_M(X) = 1|X = x\}$. It is shown that

$$\beta(x) = \nabla[\Psi(x)P_M(x)]/P_M(x) = \nabla\Psi(x) + \Psi(x)\nabla P_M(x)/P_M(x), \qquad (3)$$

where $\Psi(x) = E[M(X,u)|X = x, I_M(X) = 1] = \int_{u_L(x)}^{\infty} M(x,u) f(u) du / P_M(x)$. To estimate $\beta(x)$, we have to estimate $\Psi(x), P_M(x)$, and their derivatives and apply the formula (3). To obtain the A–I estimators, $\Psi(x)$ and $\nabla\Psi(x)$ are estimated by linear regressions with the uncensored sample only. $P_M(x)$ and $\nabla P_M(x)$ are estimated with the whole sample using the probit model of the uncensored transfer dummy on the same set of explanatory variables.

The strength of the A–I estimator over the popular Tobit model estimator is that it is consistent even when the separability assumption fails. Its weakness, on the other hand, is that it does not utilize the panel data structure of the KLIPS sample and thus the inference based on it may be biased. For that reason, I also use the random effect Tobit model (Wooldridge 2002, pp. 540–542) for the analysis. The random effect

Table 1 Summary statistics

	Child	Parents
Gross upstream transfer amount >0.5 million KW	0.37	
Gross upstream transfer amount	1.14 (2.76)	
Gross upstream transfer amount|amount >0.5 million	2.38 (5.12)	
Gross downstream transfer amount > 0.5 million KW	0.12	
Gross downstream transfer amount	1.01 (8.23)	
Gross downstream transfer amount|amount >0.5 million	8.07 (22.60)	
Net upstream transfer amount >0.5 million KW	0.33	
Net upstream transfer amount	0.13 (8.73)	
Net upstream transfer amount|amount >0.5 million	3.01 (4.12)	
Total non-asset income of the household	26.59 (20.50)	20.41 (33.41)
Household net worth	67.92 (110.19)	164.02 (312.02)
Number of years of education	14.0 (2.2)	8.8 (4.3)
Age	32.1 (5.2)	62.5 (6.9)
Number of the other household members aged 0–6	0.72 (0.78)	–
Number of the other household members aged 7–18	0.17 (0.51)	–
Number of the other household members aged 0–18	–	0.08 (0.39)
Number of the other household members aged 19–25	0.08 (0.28)	0.20 (0.47)
Number of the other household members aged 26–60	0.71 (0.47)	0.37 (0.61)
Number of the other household members older than 60	0.005 (0.07)	0.09 (0.29)
Number of sons born to the mother	1.93 (0.98)	–
Number of daughters born to the mother	1.50 (1.28)	–
Gender: female	0.21	–
Marital status: married	0.74	–
Both of the child and the child's spouse work	0.26	–
Region: Seoul	0.22	0.18
Region: Busan	0.07	0.10
Region: Incheon/Gyeonggi/Gangwon	0.34	0.29
Region: Choongchung	0.12	0.12
Region: Jolla	0.10	0.14
Region: Gyeongsang/Jeju	0.15	0.16
Distance between regions in kilometers	45.0 (94.0)	
Parental type: both	0.82	
Parental type: father only	0.01	
Parental type: mother only	0.17	
Wave: 4	0.08	
Wave: 5	0.10	
Wave: 6	0.19	
Wave: 7	0.19	
Wave: 8	0.21	
Wave: 9	0.23	
Number of observations	1,504	1,504

Monetary unit is one million KW at the nominal value. Standard deviations are in the parentheses

Tobit model assumes that the unobserved heterogeneity of each child is invariant across time, and linearly separable from and uncorrelated with the observed explanatory variables. The weakness of the random effect Tobit model is that if the unobserved heterogeneity is correlated with an explanatory variable, it may produce inconsistent estimates. The A–I estimation results and the random effect Tobit model results will be compared to check robustness of the estimation results.

The estimations are done under two slightly different specifications, the baseline and the extended specifications. Under the baseline specification I use a parametric linear functional form for $M(X, u)$ similar to that used by Altonji et al. (1997)—a general high-order polynomials of income and wealth variables, interaction terms, and demographic variables. The dependent variable is the gross or net upstream transfer amount, left-censored at a half million KW a year. The explanatory variables are children's and parent's household non-asset income, household net worth, age, years of schooling, and the distance in kilometers between the children's and parent's residential regions.[4] The squares and the cubes of those variables are also included. Each of the variables, including the squares and the cubes, is interacted with parental age. The children's household non-asset income and net worth are also interacted with parental household non-asset income and net worth. The children's and parent's years of education are interacted with each other.

Included also are parental type dummy variables (mother only and father only, with both parents excluded), children's gender dummy variable, children's marital status dummy variable (married or not), the interaction between the children's gender and marital status, dummy variable indicating whether both the children and children's spouses work, children's and parent's residential region dummy variables, numbers of children's and parent's household members by age group, and numbers of male and female children born to the mother. The number of the children's household members aged 0–6 is interacted with the dummy variable indicating whether both children and children's spouses work. The wave dummies are also included.

The extended specification augments the baseline specification by adding a set of dummy variables indicating the difference between children's and parent's household non-asset incomes and net worth per capita (=children's household non-asset income/wealth per capita - parental household non-asset income/wealth per capita).[5] The differences in non-asset income per capita dummy variables are [observed share in the sample]: (1) less than −7.5 million KW [10.4 %], (2) more than or equal to −7.5 million and less than −2.5 million KW [14.1 %], (3) more than or equal to −2.5 million and less than 2.5 million KW [20.8 %], (4) more than or equal to 2.5 million and less than 7.5 million KW [23.0 %], (5) more than or equal to 7.5 million and less than 12.5 million KW [13.8 %], and (6) more than or equal to 12.5 million KW [17.9 %]. The differences in household net worth per capita dummy variables are [observed share]: (1) less than −300 million KW [10.2 %], (2) more than or equal

[4] The greater of the mother's and the father's years of schooling and ages is used as the parental years of schooling and parental age respectively, if both parents are alive and together.

[5] The household non-asset income and net worth per capita are the total household non-asset income and net worth divided by the total number of household members.

to −300 million and less than −125 million KW [15.0 %], (3) more than or equal to −125 million and less than −75 million KW [12.0 %], (4) more than or equal to −75 million and less than −25 million KW [18.8 %], (5) more than or equal to −25 million and less than 25 million KW [24.7 %], (6) more than or equal to 25 million and less than 75 million KW [9.6 %], and (7) more than or equal to 75 million KW [9.6 %]. These dummy variables provide us with an informal way to test for existence of altruism, since the amount of the altruistic transfer depends not only on the absolute levels of income and wealth of the donor and the recipient but also the differences in their incomes and wealth.

4.1.2 Estimation results

Table 2 shows the estimated marginal effects of income, wealth, years of schooling, age, and distance variables at the means of the explanatory variables on the gross upstream transfer amount, and Table 3 shows those on the net amount. Panels I and II show the results under the baseline specification and under the extended specification respectively. Each panel shows the A–I estimates under the heading 'A–I' and the estimates using the random effect Tobit model under the heading 'Panel Tobit.' The standard errors of the A–I estimates are obtained from bootstrap procedures with 200 replications. The notable estimation results follow.

First, the children's non-asset income is estimated to have a positive effect on the gross and net upstream transfer amounts. The point estimates, which differ somewhat across specifications and estimation methods, indicate that an increase of the children's income by 1,000 KW a year increases the gross upstream transfer amount by 100–150 KW a year and the net amount by 100–160 KW a year at the means of the variables. In all of the estimation results, the effects are statistically significant at the 1 % or smaller levels. The estimates under the extended specification are smaller in magnitude than those under the baseline specification by 20–35 %, probably because the differences in income and net worth are controlled for. The panel Tobit estimates are larger in magnitude than the A–I estimates by 10–30 %, but the estimates are not significantly different from each other as the confidence intervals of the two estimates largely overlap.

Second, parental non-asset income is estimated to have negative effects on the gross and net upstream transfer amounts. An increase of parental income by 1,000 KW a year is estimated to decrease the gross upstream transfer amount by 10–100 KW a year and the net amount by 9–155 KW a year at the means of the variables. The estimated effects of parental income are smaller in magnitude under the extended specification than under the baseline specification. Furthermore, the effect of parental income on the upstream transfer amount is statistically significant at the 5 % level under the baseline specification, but not significant even at the 10 % level under the extended specification. Besides the panel Tobit estimates are much smaller than the A–I estimates in the magnitudes. For example, in panel I of Table 3, the A–I estimate is −.155 (SE = 0.041) but its panel Tobit counterpart is only −.039 (SE = .016). It suggests that using the pooled data and ignoring the panel structure may lead to an overestimation of the negative effect of parental income on the upstream transfer amount, but the difference is not large enough to alter the qualitative implications of the estimation results.

Table 2 Estimated marginal effects on the gross upstream transfer amount (in ten thousand KW) at the means of the variables

Marginal effect of	(I) Baseline specification				(II) Extended specification			
	A–I		Panel Tobit		A–I		Panel Tobit	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Child's income	.137	(.020)	.154	(.014)	.102	(.022)	.123	(.022)
Child's net worth	−.010	(.007)	−.003	(.003)	−.013	(.009)	−.003	(.004)
Child's education	9.557	(8.316)	-5.618	(11.309)	7.827	(7.942)	−8.194	(11.163)
Parental income	−.100	(.034)	−.034	(.014)	−.060	(.041)	−.010	(.021)
Parental net worth	.00002	(.002)	−.0008	(.001)	.004	(.006)	.0004	(.002)
Parental education	−9.024	(7.318)	−6.773	(8.384)	−5.977	(7.080)	−5.720	(8.282)
Parental age	1.445	(23.563)	−2.905	(7.235)	−1.388	(29.426)	−3.423	(7.128)
Distance	1.078	(1.173)	1.130	(0.529)	1.469	(1.181)	1.181	(0.523)
Child's income—parental income per capita								
Smaller than −7.5 million		–		–	54.018	(105.957)	25.075	(84.295)
−7.5 to −2.5 million		–		–	8.656	(70.137)	−93.158	(59.797)
−2.5 to 2.5 million		–		–	Omitted case			
2.5 to 7.5 million		–		–	16.161	(57.262)	13.015	(47.965)
7.5 to 12.5 million		–		–	177.550	(81.899)	135.058	(62.910)
Greater than or equal to 12.5 million		–		–	234.698	(118.283)	171.529	(80.883)
Child's networth—parental networth per capita								
Smaller than −300 million		–		–	−353.994	(240.409)	−130.835	(104.577)
−300 to −125 million		–		–	13.067	(119.712)	33.146	(61.793)
−125 to −75 million		–		–	−48.973	(84.907)	−27.811	(55.259)
−75 to −25 million		–		–	31.847	(50.036)	48.483	(41.743)
−25 to 25 million		–		–	Omitted case			

Table 2 continued

Marginal effect of	(I) Baseline specification				(II) Extended specification			
	A–I		Panel Tobit		A–I		Panel Tobit	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
25 to 75 million		–		–	20.080	(74.550)	2.874	(49.589)
Greater than or equal to 75 million		–		–	100.595	(9650.138)	−23.523	(70.672)

Standard errors of the A–I estimates are obtained from a bootstrap procedure with 200 replications. Transfer is left-censored at half million KW

Table 3 Estimated marginal effects on the net upstream transfer amount (in ten thousand KW) at the means of the variables

Marginal effect of	(I) Baseline specification				(II) Extended specification			
	A–I		Panel Tobit		A–I		Panel Tobit	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Child's income	.149	(.021)	.163	(.015)	.097	(.023)	.126	(.023)
Child's net worth	−.014	(.007)	−.006	(.003)	−.018	(.011)	−.008	(.004)
Child's education	14.805	(9.735)	−5.201	(12.118)	11.443	(8.941)	−7.243	(11.945)
Parental income	−.155	(.041)	−.039	(.016)	−.083	(.051)	−.009	(.024)
Parental net worth	.001	(.003)	−.0001	(.001)	.005	(.009)	.003	(.003)
Parental education	−9.412	(8.396)	−10.479	(9.057)	−6.515	(8.264)	−9.366	(8.922)
Parental age	16.375	(76.373)	−2.171	(7.709)	7.685	(87.737)	−2.553	(7.602)
Distance	1.334	(1.182)	1.085	(0.565)	1.566	(1.198)	1.099	(0.558)
Child's income—parental income per capita								
Smaller than −7.5 million		–		–	5.924	(109.119)	−8.260	(92.573)
−7.5 to −2.5 million		–		–	7.876	(81.498)	−73.763	(64.895)
−2.5 to 2.5 million		–		–	Omitted case			
2.5 to 7.5 million		–		–	39.199	(64.488)	21.340	(51.564)
7.5 to 12.5 million		–		–	219.344	(87.983)	142.345	(67.642)
Greater than or equal to 12.5 million		–		–	327.279	(132.138)	200.014	(86.878)
Child's networth—parental networth per capita								
Smaller than −300 million		–		–	−348.398	(288.359)	−239.150	(126.866)
−300 to −125 million		–		–	3.350	(149.259)	−35.596	(73.111)
−125 to −75 million		–		–	−80.933	(110.635)	−72.033	(61.688)
−75 to −25 million		–		–	23.227	(60.127)	31.161	(45.012)
−25 to 25 million		–		–	Omitted case			

Table 3 continued

Marginal effect of	(I) Baseline specification				(II) Extended specification			
	A–I		Panel Tobit		A–I		Panel Tobit	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
25 to 75 million		–		–	29.086	(78.460)	5.002	(53.358)
Greater than or equal to 75 million		–		–	99.097	(9032.799)	−15.806	(78.328)

Standard errors of the A–I estimates are obtained from a bootstrap procedure with 200 replications. Transfer is left-censored at half million KW

The negative marginal effect of parental income on upstream transfer amount suggests that upstream transfers are altruistic at the margin at the means of the variables. However, the derivative condition, which should be satisfied under the null hypothesis of pure altruism, is rejected. The test statistic obtained under the baseline specification, which should be close to one under the null hypothesis, ranges between 0.2 and 0.3, far smaller than one. This implies that upstream transfers are not likely to be purely altruistic.

Third, it is estimated that the higher the children's income relative to parental income, the bigger the upstream transfer. The results in panel II of Table 2 suggest that the children whose non-asset income exceeds parental non-asset income by 7.5–12.5 million KW per capita a year transfer about 1.3–1.8 million KW more in gross to the parents than the children with income roughly equal to the parent's. They also suggest that the children whose non-asset income exceeds parental non-asset income by no less than 12.5 million KW per capita a year transfer 1.7–2.3 million KW more in gross than the children with income roughly equal to the parent's. The effects of income differences on the net upstream transfer amount are similar. These findings are consistent with altruistic transfer motive. It should be noted, however, that the estimation results are not entirely consistent with the altruistic motive—children do not transfer less to the parents whose income is higher than theirs. Also notable is that the estimated effects of income differences are smaller in the panel Tobit results than in the A–I results, although the differences in the estimates are not very large.

Fourth, the estimated marginal effect of parental net worth on the upstream transfer amount is very small and never statistically significant. Under the extended specification, the relative positions in household net worth do not have any significant effect on the upstream transfer amount. Furthermore, children's education does not have any statistically significant effect on the upstream transfer amount at any level. The results suggest that, at least at the mean, trying to win or keep parental favor for a future inheritance or repaying implicit parental loans used for education is unlikely to be an important upstream transfer motive.

Fifth, it is estimated that the farther away the children and the parents are, the greater the upstream transfer amount is. An additional one kilometer in the distance is estimated to increase the transfer amount by about 10,000 KW a year. The effect of distance is statistically significant at the 5 % level in the random effect Tobit model. This result suggests that monetary transfers and personal visits are likely to be substitutes for each other.

Sixth, children's net worth seems to have a negative effect on the upstream transfer amount, although the coefficient size is small. The counter-intuitive effect of children's net worth on the net upstream transfer amount is even statistically significant at the 5 % level. One possible explanation for it is that children who hold large wealth may be recipients of under-reported wealth transfer from the parents.

All in all, the results in Tables 2 and 3 suggest that altruism motivates upstream transfers at least partly at the means of the variables. There is no evidence that children try to repay parental implicit loans or to win parental favor for a future inheritance through monetary transfers. There is some evidence that monetary transfers are given in lieu of personal visits. The estimation results differ quantitatively by estimation methods and specifications, but the qualitative implications are essentially the same.

If altruism and non-altruistic motives coexist, the effect of parental income on upstream transfer amounts may differ by parental income. As discussed in Sect. 2, if parental income is low, transfer may be motivated by altruism at the margin; if parental income is high, it may not be. To examine whether altruism and non-altruistic motives coexist, the effects of parental income on the upstream transfer amount are evaluated under the baseline specification at different levels of annual parental income—0.5, 1, 5, 10, 15, 20, 25, 30, 35, 40, 45, and 50 million KW. The results are shown in Fig. 1. Both the OLS estimates and the A–I estimates are shown.

Figure 1 shows that the effect of parental income on the upstream transfer amount is negative at low levels of parental income, and that it is non-negative, even positive at some points, at high levels. The change appears to occur around 25 to 30 million KW in parental income. The hypothesis that the marginal effects are identical across the parental income levels is rejected at the 5 % level in the net transfer case. The results shown in Fig. 1 are consistent with the case where altruistic and non-altruistic motives coexist behind upstream transfers. This finding is similar to that of Cai et al. (2006) for China.

Table 4 shows the estimated marginal effects of personal and household characteristics on the gross upstream transfer amount under the baseline and the extended specifications at the means of the variables.[6] The estimation results are similar across the specifications and the estimation methods. The following three results are notable.

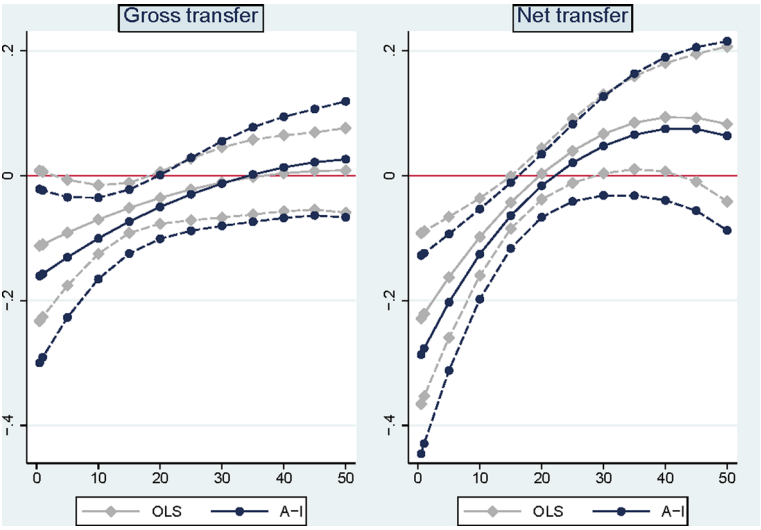

Fig. 1 Estimated marginal effects of parental income and 95 % confidence intervals evaluated at various levels of parental income (in million KW) under the baseline specification

[6] The results for the net upstream transfer amount are similar and thus omitted. They are available upon request.

First, fathers without a spouse receive significantly and substantially smaller transfer, by about 3–4 million KW a year, from children than married couples do, while mothers without a spouse receive roughly an equal amount as married couples do. Second, if both the children and the children's spouses work, the upstream transfer amount increases by 0.7–1.5 million KW a year for every additional member aged 0–6 in the child's household; if both the children and the children's spouses do not work, the upstream transfer amount is little affected by the number of household members. In three of the four results reported in Table 4, the interaction between the number of the children's household members aged 0–6 and the dummy variable indicating that both the children and the children's spouses work is statistically significant at the 5 % level. This result, along with the first result, suggests that upstream transfers are given, at least partly, in exchange for child care service provided by the parents.

Third, the children's gender or marital status has no significant effect on the upstream transfer amount, and siblings, regardless of their gender, transfer to their parents more or less equally, everything else being equal. This is somewhat surprising for South Korean parents are known for their traditional son preference (Edlund 1999), which is often explained by the expectation that a son, especially the eldest son, should provide for parental old-age security in Korea. In our sample, it is observed that 39 % of the sons transfer more than a half million KW a year but only 28 % of the daughters do so to the parents. However, the results in Table 4 suggest that the apparent difference between upstream transfer amounts by gender is likely to stem not from difference in the children's role by gender but from difference in economic conditions associated with gender.

4.2 Additional results

In this section three additional estimation results that complement the main results of the previous section are provided: the determinants of the frequency of the children's personal visits to the parents, semiparametric estimation results, and the determinants of the gross downstream transfer amount.

4.2.1 Visits to the parents

The KLIPS collects information on the frequency of personal visits by household heads to their non-coresident parents. By examining what determine the frequency of visits, I investigate whether the children's motives inferred from the analysis of visits are consistent with those inferred from the analysis of monetary upstream transfers.

For the analysis of visits, the frequency of visits per month in the past year is regressed on the same set of explanatory variables used for the analysis of upstream transfer under the baseline specification. To simplify the interpretation, the squares, the cubes and the interaction terms are dropped.[7] Excluding a few observations with

[7] Including the high order terms and interaction terms or using Poisson regression or negative binomial regression instead of OLS does not change the results.

missing information on visits, 1,499 pooled observations are used. The mean number of visits is 5 per month and the standard deviation is 7.2. 172 observations or 11.5 % of the total observations report no visit.

Table 5 shows the estimation results. The results show that children's income or wealth has no significant effect on the frequency of visits. Since those variables are likely to be positively correlated with the opportunity cost of a visit, one may expect negative coefficients. On the other hand, if the time spent with the parents is a normal good, one may expect positive coefficients. Theoretically, therefore, the signs of the coefficients are ambiguous. The children's education has no significant effect on visits, which is similar to the finding on the effect of children's education on the upstream transfer amount.

Parental non-asset income has no significant effect, but parental net worth has a significantly negative effect on the frequency of visits. This result is opposite to the finding by Bernheim et al. (1985) in the US, and it suggests that Korean children do not visit parents to win or keep parental favor for a future inheritance. The children's non-strategic behavior implied by this finding is consistent with the finding from monetary transfer.

Another notable result in Table 5 is that fathers without a spouse are visited significantly less frequently (1.6 times less per month) by their children than married couples are, while mothers without a spouse are visited almost as often as married couples are. Furthermore, the number of the children's own household members younger than seven has a positive effect on the frequency of visits, while the numbers of the children's own household members of the other age groups have negative effects on the frequency. The positive effect of the number of young household members on the frequency of visits is significantly greater—by about two visits per month—if both the children and the children's spouses work. An obvious explanation for these findings on visits and the similar findings on monetary transfer in Table 4 is that the children's visits are, at least in part, to seek child care service provided by the parents, and that the children pay for the service through monetary transfer.

Some other interesting findings from Table 5 are as follows. First, parental education has a positive effect on the frequency of visits. This may be explained by the quality of time with the parents or the quality of child care service provided by the parents. Second, the children's gender or marital status has no significant effect on the frequency of visits. This finding is comparable to that of monetary transfer. Third, unsurprisingly, distance has a strong negative effect on the frequency of visits. This result and the previous one that monetary transfer amount increases as the distance increases offer strong evidence that personal visits and monetary transfer are likely to be substitutes for each other.

4.2.2 Semiparametric estimation result

The estimation results shown in Fig. 1 indicate that the marginal effect of parental income is negative at low levels of parental income, but zero or even positive at high levels of parental income. This result is obtained under the flexible parametric assumption on the 'upstream transfer function' involving high order polynomials and interaction terms. One may question, however, whether the parametric

Table 4 Estimated marginal effects of personal and household characteristics on the gross upstream transfer amount (in ten thousand KW)

Marginal effect of	(I) Baseline specification				(II) Extended specification			
	A–I		Panel Tobit		A–I		Panel Tobit	
Parental type: father only	−401.3	(198.2)	−328.4	(162.1)	−389.0	(194.6)	−308.9	(161.3)
Parental type: mother only	7.0	(53.5)	17.2	(49.5)	9.5	(51.3)	31.7	(49.1)
Child: female	47.4	(102.3)	5.4	(68.2)	79.0	(106.8)	37.6	(68.2)
Child: married	−51.8	(137.6)	−51.9	(78.4)	−18.8	(128.8)	−21.9	(79.4)
Child: female & married	−33.9	(119.6)	−100.3	(87.3)	−44.6	(122.7)	−129.0	(86.7)
Both child and child's spouse working	−131.3	(58.6)	−77.1	(53.3)	−109.7	(61.8)	−80.6	(53.3)
Child's household members								
0–6 years old	−31.5	(30.7)	−29.7	(29.1)	8.3	(39.0)	2.3	(31.5)
× Both child and child's spouse working	144.9	(9535.0)	96.2	(44.2)	146.5	(58.0)	98.7	(44.0)
7–18 years old	32.2	(57.8)	−9.4	(38.9)	63.3	(60.7)	20.9	(39.6)
19–25 years old	−22.4	(163.6)	−74.7	(69.0)	39.0	(175.3)	−32.1	(70.0)
26–60 years old	−74.4	(119.2)	−69.0	(66.0)	−37.4	(123.3)	−30.0	(67.8)
61 and older	−202.3	(495.2)	−153.2	(303.6)	−201.9	(522.9)	−146.4	(302.0)
Parental household members								
0–18 years old	17.8	(43.0)	12.7	(39.4)	9.7	(42.2)	8.3	(39.0)
19–25 years old	−36.3	(59.2)	−71.3	(42.2)	−51.5	(63.1)	−86.5	(43.5)
26–60 years old	36.1	(32.1)	36.4	(29.3)	20.9	(35.8)	23.4	(31.6)
61 and older	−88.8	(68.8)	−58.6	(56.7)	−104.0	(68.0)	−74.0	(56.3)
Number of sons born to the mother	−47.7	(23.4)	−40.8	(21.6)	−51.2	(24.1)	−37.7	(21.1)
Number of daughters born to the mother	−33.9	(19.1)	−40.5	(15.9)	−31.3	(18.3)	−38.1	(15.5)

In the parentheses are standard errors. Standard errors of the A–I estimates are obtained from a bootstrap procedure with 200 replications

Transfer is left-censored at half million KW

Table 5 Determinants of the frequency of visits by children to the parents (dependent variable: the number of visits a month in the past year, N = 1,499)

Variable	Estimated coef.	
Child's non-asset income	−6.60e−5	(1.16e−4)
Child's net worth	1.52e−5	(2.11e−5)
Child's education	−.146	(.094)
Child's age	.094	(.055)
Parental non-asset income	−1.93e−5	(3.97e−5)
Parental net worth	−9.80e−6	(4.53e−6)
Parental education	.133	(.053)
Parental age	−.040	(.041)
Distance	−.018	(.002)
Parental type: father only	−1.638	(.839)
Parental type: mother only	−.502	(.581)
Child is female	.894	(.735)
Child is married	.279	(.857)
Child is female & married	−1.473	(.942)
Both child and child's spouse working	.496	(.627)
Child's household members		
0–6 years old	.637	(.332)
× Both child and child's spouse working	1.827	(.665)
7–18 years old	−.394	(.385)
19–25 years old	−.030	(.690)
26–60 years old	−.966	(.694)
61 and older	−4.562	(1.809)
Parental household members		
0–18 years old	.213	(.537)
19–25 years old	−.883	(.360)
26–60 years old	.579	(.320)
61 and older	.203	(.608)
Number of sons born to the mother	−.081	(.244)
Number of daughters born to the mother	−.079	(.180)

Robust standard errors are in the parentheses. Estimated coefficients of wave and region dummies are not shown

assumption is still too restrictive. In this section, I estimate a semiparametric partial linear model (Yatchew 1998, 2003) that does not impose any parametric assumption on the relationship between parental income and the upstream transfer amount, while maintaining the linearity assumption of the other parameters. Only the uncensored observations are pooled and used. Therefore the semiparametric estimation in this section cannot substitute for the estimations done in Sect. 4.1 that correct for censoring. However, if the two results diverge substantially, it will cast serious doubt on the validity of the estimation results obtained in Sect. 4.1.

The partial linear model used for the analysis in this section is

$$T_i = g(y_i^p) + \mathbf{Z}_i\beta + \varepsilon_i, \text{ for } \quad i = 1, \ldots, N, \tag{4}$$

where T_i is the gross or net upstream transfer amount of uncensored observation i, y_i^p is i's parental non-asset income, $g(\cdot)$ is the unknown smooth function, $\mathbf{Z}_i$ is the vector of i's regressors other than any function of y_i^p, β is the parameter vector of the linear part, ε_i is the homoskedastic random error, and N is the pooled sample size of uncensored observations. Function $g(\cdot)$ is estimated by locally weighted smoothing. The bandwidth is set at 0.8. The data are pooled across the waves.

Figure 2 depicts the estimated function $g(\cdot)$ and the implied derivative of the estimated upstream transfer amount function with respect to parental non-asset income.[8] The two charts in the left show the results for gross upstream transfer and those in the right for net upstream transfer. It appears that the estimated net transfer amount is slightly larger than the estimated gross transfer amount, but the difference is very small and the estimated functions differ only slightly.

The upper part in both sides of Fig. 2 shows an overall negative relationship between the transfer amount and parental income, but the lower two charts show clear differences in the derivatives by parental income. The derivative is clearly negative in the range of low parental income and practically zero in the range of high parental income. The overall pattern of the derivatives is very similar to that

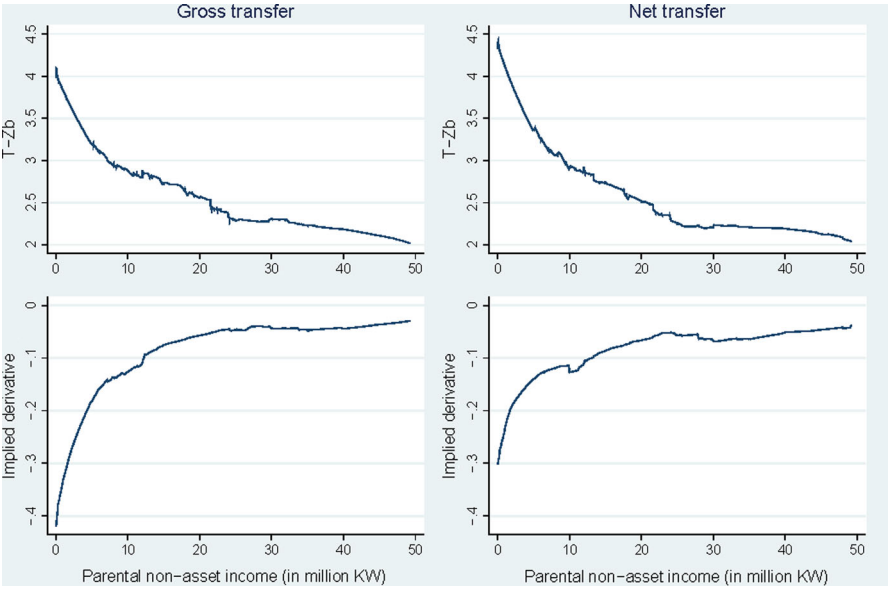

Fig. 2 Estimated relationship between the transfer amount and parental income from the partial linear model and the implied derivatives

[8] The implied derivatives are obtained by locally weighted smoothing (bandwidth = 0.8) of $\frac{\hat{T}_i - \hat{T}_{i-1}}{y_i^p - y_{i-1}^p}$ where $\hat{T}_i = \hat{g}(y_i^p)$.

shown in Fig. 1, which suggests that the parametric assumption is not a cause for any serious concern. The major difference is that while in Fig. 1 the derivatives are estimated to be positive—not statistically significant—for income levels higher than 25–30 million KW, in Fig. 2 the derivatives are still negative, albeit close to zero.

4.2.3 Gross downstream transfer

While downstream transfer is not the focus of this study, a study of how downstream transfer is determined is likely to shed additional light to the nature of intergenerational transfer. To study downstream transfer, I estimate how the gross downstream transfer amount is determined under the same specifications using the same estimation methods used in Sect. 4.1, except that downstream transfers are left-censored not at half million KW but at zero, since incidences of downstream transfers above half million KW are relatively rare as shown in Table 1.

Table 6 shows the results. Most of the marginal effects are estimated with low precision, but there is some evidence that altruism is a motive behind downstream transfers at the means of the variables. The results show that the amount of downstream transfer decreases as the children's income increases. Under the baseline specification the marginal effect of children's income on the downstream transfer amount is significant at the 10 % level in the first column and at the 1 % level in the second column, implying that an increase of 1,000 KW of child's income decreases the downstream transfer amount by about 210–240 KW. Under the extended specification, it is statistically significant at the 8 % level in the panel Tobit model. However, unlike the case of upstream transfer, differences in income between the child and the parents are not statistically significant determinants of the downstream transfer amount.

It is notable that children's net worth is positively correlated with the downstream transfer amount and it is statistically significant at the 10 % or smaller level. This is comparable to the finding in Tables 2 and 3 that the gross and net upstream transfer amount is negatively correlated with children's net worth. As discussed before, this result may be due to unreported downstream wealth transfer, or it may indicate that children invest downstream transfer and increase wealth.

5 Summary and Conclusion

In this paper I investigate what motivates adult children to transfer money to their parents, using a sample of child-parent pairs from South Korea. The findings suggest that both altruism and non-altruistic exchange motivate children to transfer. The amount of upstream transfer to the parents of little income is strongly negatively correlated with parental income, but that to the parents of higher income is uncorrelated or positively correlated with parental income. This implies that altruism is the dominant upstream transfer motive at the margin if the parents have little income of their own, whereas it is not so if the parents have enough income.

I also find strong evidence that upstream transfers are given, at least in part, in exchange for child care. The amount of transfer has a positive relationship with the

Table 6 Estimated marginal effects on the gross downstream transfer amount (in ten thousand KW) at the means of the variables

Marginal effect of	(I) Baseline specification				(II) Extended specification			
	A–I		Panel Tobit		A–I		Panel Tobit	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Child's income	−.240	(.141)	−.211	(.042)	−.320	(.235)	−.126	(.070)
Child's net worth	.043	(.020)	.037	(.011)	.054	(.029)	.034	(.013)
Child's education	90.612	(62.289)	66.496	(38.375)	90.852	(62.157)	65.464	(38.636)
Parental income	.015	(.074)	.061	(.044)	.103	(.115)	−.044	(.076)
Parental net worth	.002	(.006)	.0001	(.003)	−.005	(.015)	.003	(.006)
Parental education	−9.644	(27.893)	−32.481	(26.264)	−23.867	(34.383)	−38.037	(26.724)
Child's income—parental income per capita								
Smaller than −7.5 million		–		–	−271.378	(388.648)	330.461	(259.090)
−7.5 to −2.5 million		–		–	278.043	(204.110)	450.775	(179.634)
−2.5 to 2.5 million		–		–	Omitted case			
2.5 to 7.5 million		–		–	116.295	(204.202)	−60.840	(170.994)
7.5 to 12.5 million		–		–	384.451	(363.522)	−221.049	(237.723)
Greater than or equal to 12.5 million		–		–	762.364	(626.296)	−199.943	(304.685)
Child's networth—parental networth per capita								
Smaller than −300 million		–		–	46.514	(620.614)	−411.006	(369.626)
−300 to −125 million		–		–	347.273	(412.053)	33.773	(212.980)
−125 to −75 million		–		–	462.557	(282.865)	212.343	(185.390)
−75 to −25 million		–		–	−140.767	(161.285)	−147.032	(157.715)
−25 to 25 million		–		–	Omitted case			
25 to 75 million		–		–	−.360	(224.729)	43.098	(191.478)
greater than or equal to 75 million		–		–	−319.813	(14267.9)	−69.810	(266.932)

Standard errors of the A–I estimates are obtained from a bootstrap procedure with 200 replications. Transfer is left-censored at zero

number of children younger than seven in the child's household only if both the children and the children's spouses work. Fathers without a spouse receive significantly smaller transfer than married couples or mothers without a spouse do. The frequency of visits by children to their parents has the similar relationships with the number of young children and gender and marital status of the parent.

Although some studies suggest that upstream transfers are given strategically to secure a future inheritance from wealthy parents, I do not find any evidence for it. Parental wealth has a very small and statistically insignificant effect on the amount of upstream transfer in South Korea. Furthermore, contrary to the finding by Bernheim et al. (1985), the number of visits by the children to their parents is negatively correlated with parental net worth.

The findings of this paper imply that a public old-age pension, especially under the pay-as-you-go pension system, is likely to crowd out private upstream transfers received by elderly parents with little income in Korea. The pension is, therefore, likely to have only a small impact on the overall economic well-being of the elderly population with little means. On the other hand, a public pension is not likely to have any significant effect on private upstream transfers received by elderly parents with higher income.

The analysis of this paper is limited to interhousehold intergenerational transfer due to data limitation. Few, if any, data sets provide information on intrahousehold transfers. Even if such data exist, however, it would be a difficult task to empirically examine the motives behind intrahousehold intergenerational transfers. Theoretically one should extend the model to include monetary and non-monetary types of transfer that are much more complex and varied than those of interhousehold transfer. Empirically, one should overcome problems of measuring many unobserved forms of non-monetary transfer, such as sharing responsibilities for household care, and monetary transfer, such as shared consumption of food and utilities. There are a few studies on intrahousehold spousal care, for example Mentzakis et al. (2009) and Pezzin et al. (2009), which explore what factors affect informal caregiving for the spouse among the older and elderly population, but few studies are done on intrahousehold intergenerational transfers comprehensively.

At this point any conjecture about the nature of intrahousehold intergenerational transfers has little to base on. Still, the limited evidence from the existing literature on intrahousehold resource allocation, few of which directly deal with intergenerational resource allocation, indicates that intrahousehold transfers are not purely altruistic (e.g., Lundberg et al. 1997; Park 2007). Considering it together with the strong evidence in this paper that interhousehold upstream transfers are motivated by both altruism and non-altruistic exchange, I conjecture that intrahousehold intergenerational transfers are also motivated partly by altruism and partly by exchange or other non-altruistic motives. Although it cannot be done in this study due to data limitation, rigorous research of intrahousehold intergenerational transfer in the future is necessary.

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