Estimating the Determinants of Bargaining Power Within the Family using Semiprivate Consumption: Transfers to Parents from Their Adult Children and Vice-versa in South Korea

John C. Ham
University of Maryland,
IFAU, IRP (Madison) and IZA

Heonjae Song
Korea Institute of Public Finance

First Draft: August 2008
This Draft: July 2011

* Corresponding author: John Ham, john.ham.econ@gmail.com. We thank Maurizio Mazzocco, John Strauss and Naomi Utgoff for many important conversations and comments, as well as Tarun Jain and seminar participants at the Korea Development Institute, Korea Institute for International Economic Policy, Korea Institute of Public Finance, Korea Labor Institute, Maryland, NEUDC (2009), the Seoul Summer Economics Conference at Seoul National University (2010), Econometric Society World Congress (2010) and USC for helpful comments. Two anonymous referees and a Co-Editor made numerous comments that substantially improved the paper. We would also like to thank Professor H. Kazianga for providing us with his computer program. Ham’s research was partially supported by the NSF. We are responsible for all errors, and this paper reflects the views of the authors and in no way represents the views of the NSF or the Korea Institute of Public Finance.
Abstract

We consider a model of family bargaining that involves transfers between an adult couple and both sets of their parents. We then estimate it using panel data from South Korea while allowing the bargaining power between the husband and wife to depend on their observable characteristics. This issue is important since in South Korea (and other S.E. Asian countries) such transfers make up a significant portion of the elderly’s income; further we shed important light on how families in Korea make their decisions. Moreover, our paper contributes to the literature on intergenerational transfers in several ways. First, we focus on estimating structural parameters. Second, we use a bargaining model to analyze these transfers. Third, we consider transfers between an adult couple and both sets of parents where the couple can give to, or receive from, each set of parents. We contribute to the family bargaining literature since we apply it to transfers between adult children and their parents. This is an especially fruitful problem to apply a bargaining model to since it involves semi-private consumption, i.e. it is plausible that wife cares about transfers to her parents but not to her husband’s parents, and vice-versa for the husband. Much previous work in assessing household bargaining is based on the assumption that one party cares more about a specific type of consumption than the other party.

We find that we can precisely estimate the determinants of the husband’s bargaining power, and that at mean values, husbands have slightly (but statistically significantly) less bargaining power than their wives. Moreover the husband’s bargaining power is (statistically significantly) increasing in his education and his wife’s age, and (also significantly) decreasing in her education and his age.
1. Introduction

In this paper we estimate a model of transfers to parents from adult children and vice-versa for South Korea. Private intergenerational transfers have been extensively studied by economists. The altruism model made famous by Barro (1974) and Becker (1974, 1991), and the exchange model introduced by Cox (1987), are examples of theoretical models that explain intergenerational transfer behavior. In more recent work this behavior has been analyzed further in a substantial body of literature including a series of papers by Altonji, Hayashi, and Kotlikoff (1997), Lundberg, Pollak and Wales (1996), Duflo (2003) and Thomas (1994). In the U.S., Canada and other developed European countries, market institutions and government pensions supplement, or entirely substitute for, the support that younger family members would provide to older ones. As a result, most work on transfers in those countries has focused on transfers from parents to adult children, but for developing countries transfers from adult children to parents tend to be more important.

We then estimate our bargaining model of two-way transfers using panel data from South Korea, where the bargaining power between the husband and wife depends on their observable characteristics which affect their marketability in the marriage market. Transfers from adult children to parents are important in South Korea (and other S.E. Asian countries) because such transfers make up a very significant portion of the elderly’s income; further we shed important light on how families in Korea make their decisions.

Our paper contributes to the literature on intergenerational transfers in several ways. First, we focus on estimating structural parameters. Second, we use a bargaining model to analyze these transfers. Third, we consider transfers between an adult couple and both sets of parents where the couple can give to, or receive from, each set of adult parents.

We do not consider the effect of labor income on bargaining power since it is likely, at least in part, to be an outcome of family bargaining.)
We also contribute to the significant and rapidly growing literature on bargaining within the family by taking seriously the argument of Behrman and Rosenzweig (2006) that observable semi-private consumption is essential for investigating bargaining power within the family. In other words, rather than arguing that one spouse cares more about a certain type of consumption, (e.g. children’s consumption) and that expenditure on this type of consumption will increase if she gains more bargaining power, it is better to observe expenditure on consumption that benefits only one spouse directly. We believe that it is plausible that wife cares about transfers to her parents but not to her husband’s parents, and vice-versa for the husband, and thus we have an example of semiprivate consumption that constitutes a significant portion of the couple’s joint income, making our estimation of family bargaining parameters especially credible. Previously Lee (2007) investigated how each spouse’s ‘pocket money’ was affect by their bargaining power, but as we discuss below, our estimation is based on assumptions that are generally weaker than he employs within the context of his linear model, even though he uses fixed effect estimation.\footnote{In fairness to Lee, his assumptions are stronger than ours in part because he wants to relate bargaining power to a wider set of variables, some of which are hard to justify as being exogenous.}

Finally our work may also help policy makers design better policies toward low income elderly citizens, since our results indicate how such transfers are affected by not only the elderly citizens’ income, but the income of the adult couple, the income of the other set of parents, and the bargaining power between the husband and wife.

Below we first discuss the importance of two-way transfers in South Korea, and briefly review the literature on intergenerational transfers and the literature on intrahousehold bargaining. We then develop a model of transfers that involves the adult couple and both sets of parents. The model is quite simple and used for the express purpose of producing structural equations describing transfers amenable to econometric estimation. Next we develop our econometric approach for estimating our model and dealing with the statistical issues we face. We then compare our model explicitly to the
important paper by Kazianga (2006), which is perhaps closest to our approach in terms of intergenerational transfers. We also compare our approach to the less closely related papers on intergenerational transfers by Lee, Parish, and Willis (1994), Lillard and Willis (1997) and Khemai (1999). Finally we compare our approach to that of Lee (2007) who also investigates semi-private consumption. Then, we present our estimates of the determinants of transfers and the husband’s bargaining power. We find that at mean values, husbands have slightly (but statistically significantly) less bargaining power than their wives. Moreover the husband’s bargaining power is (statistically significantly) increasing in his education and his wife’s age, and (also significantly) decreasing in her education and his age. These result are in keeping with the work of Lee and Ham (2011), who find that for both men and women in the age group we consider, one’s marketability in the South Korean marriage market is a positive (negative) function of his or her education (age). Finally we find that if the couple experiences and increase in their income, they keep about 50% of it and about 25% of the increase goes to each set of parents.

We believe our work illustrates the value of including both parents and in-laws when studying intergenerational transfers. It also demonstrates the value of having semiprivate consumption when estimating the determinants of bargaining power. Third, the paper suggests if one is interested in estimating how a couple will provide support to their parents it is important to know not only the potential overall earning power of the couple, but also the distribution of human capital within the couple.

2. Within-Family Transfers, Tradition and Institutional Features in South Korea

2.1 Basic Facts on Within-Family Transfers in South Korea

To see the importance of transfers from children to parents in the rapidly developing economies in S.E. Asia including Korea, relative to that in many Western economies, consider Figure 1. For each
country, the first (blue) line shows the percentages of the Elderly (Age ≥ 50) who receive net positive transfers from their children, while the second (brown) line shows the fraction of the Elderly (Age ≥ 50) who make net positive transfers to their adult children. For example, in Austria about 7% of parents receive a net transfer from their adult children, while about 26% make a net transfer. (Approximately 67% of elderly couples who have children do not make or receive a net transfer.) In all of the Western countries the percentage of elderly making net transfers is at least twice as big as the percentage receiving a net transfer, and on average the percentage making a net transfer is about five times as big as the percentage receiving a transfer. On the other hand, Korean parents are 50% more likely to receive a net transfer from their children than to make one.3

[Figure 1 here.]

Table 1 shows the contribution of net transfers from children to the total income of elderly parents in Korea relative to Taiwan, Japan, the US, and Germany; thus it focuses on both the frequency and magnitude of transfers from adult children to their elderly parents. Korea and Taiwan show similar patterns. However, the difference between Korea and the Western countries is dramatic: transfers from children make up over half the total income of elderly Koreans, while these transfers constitute less than ten percent of the income of the elderly in the Western countries.

[Table 1 here.]

Table 2 shows the percentage distribution of adult children across different net transfer behaviors towards the parents for the years 2001-2005 in the Korea Labor and Income Panel Study (KLIPS). For example column 1 indicates that on average 40% of Korean couples make net transfers to their elderly parents from their adult children.

3 Transfers from adult children to their parents are an important component of the elderly’s income in other S.E. Asian countries, and tend to be considerably larger than transfers from parents to children in these countries - see Kagitcibasi (1982, 2007), Lee, Parish and Willis (1994) and Lillard and Willis (1997), Mason et al. (2006), and the National Transfer Accounts (NTA) website (http://www.ntaccounts.org) for the general pattern of the intergeneration transfers in various countries such as China, India, Indonesia, Japan, Philippines, South Korea, Taiwan, Thailand and Vietnam.
transfers to both sets of parents, while columns 2 indicates that 14% only make a net transfer to the husband’s parents and do not receive a net transfer from the wife’s parents. Further column 3 indicates that on average 3% of couples make a net transfer only to the wife’s parents and do not receive a net transfer from the husband’s parents, while columns 4 indicates that on average 22% of couples neither make or receive a net transfer from either set of parents. Finally column 5 indicates that on average 21% of couples receive a net transfer from at least one set of parents. Four things may be noted from the table. First, since first sons and sons over 40 are omitted, the disparity between only making a transfer to the husband’s parents and to the wife’s parents is not due to first sons, or sons over 40, facing social pressure to take care of the husband’s parents. However, it is worth noting that husbands are generally older than their wives, and thus the husband’s parents are generally older (and poorer) than the wife’s parents. Second, almost 60% of the couples make a transfer to at least one set of parents. Third, there is a substantial fraction of couples who have zero net transfers to or from parents, and a substantial fraction who receive a positive net transfer from the parents. The econometric model we use below allows for all of these features of the data.

[Table 2 here.]

Columns 1 and 2 of Table 3 indicate that conditional on a couple making a transfer to both sets of parents, the transfer to the husband’s parents is, on average, about 50% more than the transfer to the wife’s parents. Further, column 4 indicates that among these couples approximately 6% of a couple’s before-tax household income is allocated to transfers to the parents. This is a substantial amount and indicates that if, as we argue below, transfers to parents represent semiprivate consumption, the level of this consumption is important relative to household income.

[Table 3 here.]

---

4 As we discuss below, social norms in Korea dictate that men in these groups have special responsibilities to their parents.
2.2 Tradition and Support for Parents

Greenhalgh (1985, p.265) states that “Traditional Confucian China and its cultural offshoots, Japan and Korea, evolved some of the most patriarchal family systems that ever existed.” It is fair to say that elderly persons depend on their adult sons (especially the first son) for old-age support in the East Asian traditional family system affected by Confucianism. On the other hand, it is also fair to say that the Confucian patriarchal family system is no longer valid to all families in modern East Asian society – see Xie and Zhu (2006). Many changes have occurred to the Korean family structure partly as a result of the increasing employment of women and decreasing gender inequality in socioeconomic status.

For example, gender difference has been substantially reduced in years of schooling over time. However, it is probably safe to say that i) patriarchal family systems still work in older generations and ii) the first son usually has greater responsibility to support the parents. We will deal with this by only including households whose head’s age is less than or equal to 40 years and whose head is not a first son.

2.3 Institutional Background: Public Support for the Elderly in Korea

Public pension plans are very recent phenomena in South Korea. For example, the compulsory coverage of the social security system had not been extended to all residents until 1999. In addition to the National Pension Program, various types of assistance under the National Basic Livelihood Security System are currently provided to low-income citizens who meet the criteria in South Korea. To be eligible for government support citizens should show that their imputed total income is lower than the minimum cost of living as defined by government guidelines. A certain level of financial

---

5 The National Pension Act came into effect in January 1988 in Korea. It covered only those who were working in firms with more than 10 full-time employees. The National Pension has extended coverage to workplaces with more than 5 full-time employees (January 1992), and farmers and fishermen (July 1995). In April 1999, the National Pension Program extended compulsory coverage to all residents aged 18 to 60 in Korea. As a result, the number of insured persons increased from about 6.5 million in 1998 to about 16 million in 1999.
support from children is assumed to exist and is included in the government’s imputed value of total income. That is, under Korean law, there is a legal family responsibility for adult children to support their parents, and the government assumes that children provide a certain level of such support regardless of the amount actually transferred by the children. Hence, even if the children do not provide any transfers, low income elderly citizens can be excluded from public assistance if their children are presumed to be capable of support. Those responsible for financial support include the married daughter and her husband. Daughters have the same degree of responsibility towards their parents as their male siblings under Korean law. Note that if men were to have greater bargaining power and the result was that the couple’s contribution to the wife’s parents was small, the public safety net would be inadequate for her parents.

3. Literature Review

3.1 Intergenerational Transfers

Cox and Fafchamps (2008) present a thorough review of the literature on intergenerational transfers. Intergenerational transfers in developing countries are likely to focus on old age support because social security is often inadequate and parents rely on private support from adult children. Ravallion and Deardon (1988) estimated transfer equations with Indonesian data and found significant targeting towards elderly people. More recently Cox, Galasso, and Jimenez (2006) studied private inter-household transfers in a diverse cross section of developing countries based on nationally representative surveys for Albania, Bulgaria, Jamaica, Kazakhstan, the Kyrgyz Republic, Nepal, Nicaragua, Panama, Peru, Russia and Vietnam. They find that transfers from young to old are greater than those going from old to young in the Latin American countries in their sample as well as in Vietnam and Nepal, whereas the opposite is true for Russia and Bulgaria.
However, Cox’s (1987) exchange model raised the issue of whether these transfers are altruistically motivated or whether the elderly receive reward for the service they provided to the children. For example, Raut and Tran (2005) proposed two alternative models of intergenerational transfers. The first model links parental investment (as a pure loan contract) in their children’s human capital to old-age support in later period, while the second model views old age support as based on self-enforcing two-sided altruism. They conclude that parents and children are altruistic in a manner consistent with two-sided altruism.

Another empirical issue is the “crowd out” effect of upstream intergenerational transfers. The altruism model predicts that government income redistribution programs can be ineffective due to adjustments in private intergenerational transfers. On the other hand, the exchange model can prevent crowd out. According to Cox and Fafchamps (2008), numerous studies do suggest partial crowd out, usually on the order of a 20 to 30 cent reduction in private transfers per dollar increase in public transfers. However, the range of estimated effects is exceedingly wide, with many studies suggesting little private transfer response at all. Kazianga (2006) thoroughly investigates possible explanations for this weak transfer response to public support for the elderly in Burkina Faso. He uses a careful econometric approach that addresses a variety of estimation issues, such as potential endogeneity of income, non-linearities in income effects, and selection bias, that may bias the results of previous research. Finally, Altonji et al (1997) test the altruism hypothesis using PSID data on the extended family. In their methodology they incorporate unobserved heterogeneity across families in the degree of altruism. Their results strongly reject the altruism hypothesis, and they show that test results are robust to changes in functional form, outliers and measurement error in income and wealth.

As noted above, we make several important contributions to the important approaches of the important research of Kazianga and Altonji et al (1997). First, they focus on testing the implications
of altruism by estimating equations which are based on theory but do not directly allow for recovering structural parameters. Second, these studies also do not allow for bargaining within the family, although Altonji, Hayashi, and Kotlikoff (1993) suggest that a bargaining model could be useful in analyzing these transfers. Third, neither of these studies considers transfers between an adult couple and both sets of parents separately. Our approach addresses all of these issues below.

3.2 Intrahousehold Bargaining

Here we give a very brief overview of some of the papers in this literature but certainly do not claim to do justice to this literature. Manser and Brown (1980) and McElroy and Horney (1981) characterize the household as a group of agents making joint decisions. In these papers the household decision process is modeled as a Nash bargaining problem. Chiappori (1988, 1992) extends this analysis to allow for any type of efficient decision process by developing the static collective model. This model has been extensively studied, tested, and estimated in the literature, and numerous empirical papers have shown that the distribution of bargaining power between parents is important for their investment decisions in children’s human capital. (See, e.g., Thomas, Contreras, and Frankenberg (2002) and Rubalcava and Thomas (2000).) Further, Blundell, Chiappori and Meghir (2005) extend this collective model to allow for the existence of public consumption (which is interpreted as children’s consumption). Mazzocco (2006) then extends the Blundell et al (2005) approach to allow for dynamic decision making by developing a dynamic collective model. Using this dynamic collective model, he is able to recover parents’ preferences for expenditure on children when at least one parent works. However, there have been relatively few studies (discussed below in section 5.3) that consider bargaining over upstream intergenerational transfers.

---

6 Two other papers in this literature are Brown (2009), who studied the positive relationship between dowries and women's welfare, and Schoeni (2000), who examined the case where altruistic parents and parents-in-law make transfers to their adult children.
4. A Simple Economic Model of Transfers from Adult Children to Their Parents and Vice-versa

4.1 Basic Setup: Preferences and Bargaining Power

Our goal in specifying our economic model of transfers from adult children to parents and vice-versa is to obtain estimating equations that we can take to the data. We allow for both bargaining between the adult children, and between each of them and their own parents. However, we do not allow for bargaining between the adult children and their in-laws, or between the in-laws. We assume that the husband only cares about his consumption and that of his parents, while the wife only cares about her consumption and her parents’ consumption. The parents care only about their consumption and their own child’s consumption. In our setup bargaining will take place simultaneously between all of the parties, so that the husband and wife will take into account transfers to or from each set of the parents when bargaining with each other, and also will take into account the split between the husband and wife when they bargain with their respective parents. We find that to obtain tractable estimating equations we must keep our specification of preferences and bargaining power relatively simple.

Let $C^h, C^{hp}, C^w$ and $C^{wp}$ represent the consumption of the husband, his parents, the wife and her parents respectively, and let $Y, Y^{hp}$ and $Y^{wp}$ represent the income of the couple, the husband’s parents, and the wife’s parents respectively. Transfers between the adult couple and the husband’s parents are given by

$$T^{hp} = C^{hp} - Y^{hp},$$

while transfers between the couple and the wife’s parents are given by

$$T^{wp} = C^{wp} - Y^{wp}.$$
As noted above, we assume simple functional forms for preferences that will allow us to obtain closed form solutions for these transfers and identify the parameters of interest. Specifically the husband’s preferences are given by

\[ U^h \left( C^h, C^{hp} \right) = \ln C^h + \alpha \ln C^{hp}. \]  

(3)

His parents have the preferences

\[ U^{hp} \left( C^h, C^{hp} \right) = \ln C^{hp} + \alpha \ln C^h. \]  

(4)

Similarly, the wife’s preferences are

\[ U^w \left( C^w, C^{wp} \right) = \ln C^w + \alpha \ln C^{wp}. \]  

(5)

Finally her parents’ preferences are

\[ U^{wp} \left( C^{hw}, C^{wp} \right) = \ln C^{wp} + \alpha \ln C^w. \]  

(6)

When the wife and the husband bargain, the husband has bargaining power given by \( 0 \leq \mu^h(X) \leq 1 \), where \( X \) consists of a set of demographic variables for the husband and wife that are likely to affect their bargaining power with each other. Further, when the husband (wife) bargains with his (her) parents, each set of parents have bargaining power \( 0 \leq \mu^p \leq 1 \). We focus on the bargaining power between the husband and wife and do not let \( \mu^p \) depend on observable variables for two reasons. First, we do not have a measure of semiprivate consumption between the adult child and her parents. Second, even if \( \mu^p \) is constant, it is clear from the derivations below that it cannot be identified from estimation of our transfer functions.

4.2 Derivation of the Transfer Functions

Our problem is to model how a couple and both sets of parents reach the optimal consumption levels, since these also determine the optimal transfer functions given (1) and (2). Following the
literature, e.g. Chiappori’s (1992) pathbreaking work on family labor supply, we solve the two stage collective model recursively. Specifically, we first solve the bargaining between children and parents for an arbitrary split of the couple’s income to obtain the value function for each adult child. Given these value functions, we can solve for the optimal split by the couple, and thus the optimal transfers by substituting the respective shares of the couple’s income into the first stage decision rules.\(^8\)

Thus assume that there is an arbitrary sharing rule for the couple’s income \(\rho^h + \rho^w = Y\). Given this sharing rule, the value function for each adult child is determined by

\[
V^j(\rho^j, Y, Y^{hp}, Y^{wp}) = \text{Max}_{\tilde{C}^j, \tilde{C}^{jp}} \mu^p (\ln C^{jp} + \alpha \ln C^j) + (1 - \mu^p)(\ln C^j + \alpha \ln C^{jp}),
\]

s.t. \(C^j + C^{jp} = \rho^j + Y^{jp}, \quad j = h, w.\)

The first order condition for each adult child is

\[
\frac{\mu^p}{C^{jp}} - \frac{\beta}{\rho^j + Y^{jp} - C^{jp}} - \frac{1 - \mu^p}{\rho^j + Y^{jp} - C^{jp}} + \frac{(1 - \mu^p)\alpha}{C^{jp}} = 0, \quad j = h, w.
\]

The first order conditions imply that \(C^j\) and \(C^{jp}\) \((j = h, w)\) can be expressed as function of the adult child’s share of the couples’ income \(\rho^j\) and their parents’ income

\[
C^j = \frac{1 + \mu^p (1 + \alpha)}{1 + \alpha} (\rho^j + Y^{jp}),
\]

\[
C^{jp} = \frac{\alpha + \mu^p (1 - \alpha)}{1 + \alpha} (\rho^j + Y^{jp}).
\]

We now use (9) to determine how the adult children split their joint income by considering the optimization problem

\(^8\) In other words, in the second stage one concentrates out the optimal transfers as a function of the split between husband and wife and focuses on the latter decision only.
Some tedious algebra indicates that the sharing rule is given by

\[
\begin{align*}
\rho^h &= \mu^h(X)(Y + Y^{wp}) - (1 - \mu^h(X))Y^{hp}, \\
\rho^w &= (1 - \mu^h(X))(Y + Y^{hp}) - \mu^h(X)Y^{wp}.
\end{align*}
\]

(11)

As one would expect, the husband’s share of the couple’s income is a function of his bargaining power, the couple’s income, the husband’s parents’ income and the wife’s parents’ income. As one’s intuition would suggest, as the husband’s bargaining power increases, he ‘takes’ more of the couple’s income and his wife’s parents’ income, and ‘gives up’ less of his parent’s income.

Substituting (11) into (9) yields the optimal consumption levels of the husband’s parents and wife’s parents

\[
\begin{align*}
C^{hp} &= \left(\frac{\alpha + \mu^p(1 - \alpha)}{1 + \alpha}\right)\mu^h(X)(Y + Y^{hp} + Y^{wp}), \\
C^{wp} &= \left(\frac{\alpha + \mu^p(1 - \alpha)}{1 + \alpha}\right)(1 - \mu^h(X))(Y + Y^{hp} + Y^{wp}), \quad j = h, w.
\end{align*}
\]

(12)

Using (1) and (2) we have
\[ T^{hp} = \theta \mu^h(X)(Y + Y^{hp} + Y^{wp}) - Y^{hp}, \]
\[ T^{wp} = \theta(1 - \mu^h(X))(Y + Y^{hp} + Y^{wp}) - Y^{hp}, \]  
\[ \text{where } \theta = \left( \frac{\alpha + \mu^p(1 - \alpha)}{1 + \alpha} \right). \]  

Finally we assume that

\[ \mu^h(X) = [1 + \exp(- (\beta_0 + X \beta_1))]^{-1}. \]  

Note that only \( \theta, \beta_0 \) and \( \beta_1 \) are identified, and it is not possible to separately identify \( \mu^p \) and \( \alpha \). 

We acknowledge that we have made strong assumptions on preferences and bargaining power to obtain our transfer equations. Unfortunately if we allow the \( \alpha \) terms to vary across parties, or allow for different bargaining power for the two sets of parents, we lose identification. Alternatively, if we describe the respective preferences with a Stone-Geary Utility function that has different committed quantities across the parties, we do not even get a closed-form solution. This raises the question if it would be better to proceed by not specifying the utility function (except that the husband (wife) only cares about his (her) consumption and that of his (her) parents) and take a flexible approximation to the resulting, more general, transfer functions. However proceeding in this seemed to make it harder to convincingly estimate the determinants of the husband’s bargaining power. To see this, note that if we do not specify the utility function, our optimization problem becomes

\[ \max_{C^h, C^{wp}, C^w, C^{wp}} \mu^h(X) \left[ \mu^p U^{hp}(C^h, C^{hp}) + (1 - \mu^p) U^h(C^h, C^{hp}) \right] \]
\[ + (1 - \mu^h(X)) \left[ \mu^p U^{wp}(C^w, C^{wp}) + (1 - \mu^p) U^w(C^w, C^{wp}) \right], \]
\[ \text{s.t. } C^h + C^w + C^{hp} + C^{wp} = Y + Y^{hp} + Y^{wp}. \]  

This optimization function would produce consumption functions for the parents of the form

\[ C^k = C^k(Y, Y^{hp}, Y^{wp}, \mu^p, \mu^h), k = hp, wp, \]  

and transfer functions of the form
\[ T^k = T^k (Y, Y^{hp}, Y^{wp}, \mu^h, \mu^t) = C^k (Y, Y^{hp}, Y^{wp}, \mu^h, \mu^t) - Y^k, \quad k = hp, wp. \]  

At this point our only option would seem to be to take a first order (or second order) Taylor approximation along the lines of

\[ T^k = \frac{\partial T^k}{\partial Y} Y + \frac{\partial T^k}{\partial Y^{hp}} Y^{hp} + \frac{\partial T^k}{\partial Y^{wp}} Y^{wp} + \frac{\partial T^k}{\partial \mu^h} \mu^h + \frac{\partial T^k}{\partial \mu^t} \mu^t, \quad k = hp, wp. \]

treating the derivatives as constants in estimation. Since in this case the effect on transfers to a set of parents of an increase in \( Y, Y^{hp} \) or \( Y^{wp} \) would be independent of bargaining power (because the derivatives are treated as constants), this approach appears to us to be an unattractive alternative to the approach we describe above, and thus we do not pursue it further.

5. Estimation Strategy and Comparison to Previous Work on Transfers and Semiprivate Consumption

5.1 Econometric Model

Since we have panel data, a natural starting point is to add \('i'\) and \('t'\) subscripts and error terms to the model given by (13) and (14)

\[ T_{it}^{hp} = \theta \mu_i^h (Y_{it} + Y_{it}^{hp} + Y_{it}^{wp}) - Y_{it}^{hp} + e_{it}^{hp}, \]
\[ T_{it}^{wp} = \theta (1 - \mu_i^h) (Y_{it} + Y_{it}^{hp} + Y_{it}^{wp}) - Y_{it}^{wp} + e_{it}^{wp}, \]
\[ \mu_i^h (X_i) = [1 + \exp(-(\beta_0 + X_i \beta_1))]^{-1}, \quad i = 1, ..., I \text{ and } t = 1, ..., T. \]  

Since \( T_{it}^{hp} \) and \( T_{it}^{hp} \) can take on both positive and negative values, and the model predicts that \( T_{it}^{hp} \) and \( T_{it}^{hp} \) are determined by continuous functions, it would be natural to estimate (19) by nonlinear least squares (NLS) while imposing the cross-equation restrictions.\(^9\) However, we face two problems in estimating (19) that preclude a simple application of NLS. First, in the data set we use, the Korean Labor and Income Panel Study (KLIPS), we see transfers and the couple’s income, but

\(^9\)To obtain standard errors, we would cluster the residuals by family; alternatively we could use a random effects (GLS) version of NLS where the random effect refers to the family.
not the parents’ incomes. To avoid this missing data problem we impute parents’ income from a data set on the elderly, the Korean Longitudinal Study of Ageing (KLoSA), using a procedure suggested by Skinner (1987). Specifically we run the following regressions using data from KLoSA, using explanatory variables $Z_{it}^{hp}$ and $Z_{it}^{wp}$ that we observe in both data sets.\(^{10}\)

\[
Y_{it}^{hp} = \delta_{wp} Z_{it}^{hp} + u_{hpi},
\]

\[
Y_{it}^{wp} = \delta_{wp} Z_{it}^{wp} + u_{wpii}.
\]

(20)

In (20) $Z_{it}^{hp}$ is a vector of exogenous variables containing the husband’s age, age-squared, education, parents’ education, husband’s (wife’s) birth order and a dummy for only one parent still living, while $Z_{it}^{wp}$ is defined analogously. $X_i$ consists of the husband’s (wife’s) age and education. We made a conscious choice not to let $\mu_i^h(X_i)$ depend on spousal earnings since we believe they are just as likely to be determined by bargaining power as being a determinant of bargaining power. Once we have estimated (20) using KLoSA, we take the estimated coefficients and impute parents’ income for our KLIPS data

\[
\hat{Y}_{it}^{hp} = \hat{\delta}_{hp} Z_{it}^{hp},
\]

\[
\hat{Y}_{it}^{wp} = \hat{\delta}_{wp} Z_{it}^{wp}.
\]

(21)

We made a conscious choice not to let $\mu_i^h(X_i)$ depend on spousal earnings since we believe that such earnings are just as likely to be determined by bargaining power as being a determinant of bargaining power. However, this also implies that it is likely that the couple’s total income, which is the sum of spousal earnings, is endogenous. To address this issue we use the variables $Z_{it}^c$ to predict the couple’s income

\[
\hat{Y}_{it}^c = \hat{\pi} Z_{it}^c,
\]

(22)

\(^{10}\) Detailed descriptions of the data sets are presented in the next section.
where $\hat{\pi}$ comes from the usual first stage equation. In our empirical work below, $Z_{it}^c$ consists of both the husband and wife's age, age-squared, education, parents' education, birth order and a dummy for only one parent still living.\(^{11}\) We then substitute $\hat{Y}_{it}^{hp}$, $\hat{Y}_{it}^{wp}$ and $\hat{Y}_{it}^h$ into (19) to obtain

$$T_{it}^{hp} = \theta \mu_h^h \left( \hat{Y}_{it} + \hat{Y}_{it}^{hp} + \hat{Y}_{it}^{wp} \right) - \hat{Y}_{it}^{hp} + \nu_{it}^{hp},$$

$$T_{it}^{wp} = \theta (1 - \mu_h^h) \left( \hat{Y}_{it} + \hat{Y}_{it}^{hp} + \hat{Y}_{it}^{wp} \right) - \hat{Y}_{it}^{wp} + \nu_{it}^{wp},$$

$$\mu_h^h = [1 + \exp(-(\beta_0 + X_i \beta_i))]^{-1}.\tag{23}$$

Parameters estimates obtained from NLS estimation of (23) will be consistent, but in calculating standard errors one needs to allow both for correlation over time in observations from the same family and randomness due to predicting $\hat{Y}_{it}^{hp}$, $\hat{Y}_{it}^{wp}$ and $\hat{Y}_{it}$. Note that since $Z_{it}^c$, $Z_{it}^{hp}$ and $Z_{it}^{wp}$ contain more than three variables not included in $X_i$, this model will satisfy the order condition for identification, i.e. the model is not simply identified off the nonlinear functional forms used.

The second problem we face is that over 35% of couples have a zero transfer with at least one set of parents,\(^{12}\) and a regression model cannot adequately deal with this large spike at zero. This problem was also encountered by Udry (1994) and Kazianga (2006), and we follow their solution to this problem. Specifically, we assume that when the absolute value of a desired transfer to a parent in (13) is less than some limit $K$, transactions costs make it optimal to set the transfer to the parent to zero instead. In this case $T_{it}^{hp}$ and $T_{it}^{wp}$ become latent net desired transfers. Denoting actual transfers by $T_{it}^{hp}$ and $T_{it}^{wp}$, we have a bivariate version of Rossett’s (1959) friction model

\(^{11}\) We also included $\hat{Y}_{it}^{hp}$ and $\hat{Y}_{it}^{wp}$ when predicting $Y_{it}$ to make them orthogonal to the residual for $Y_{it}$. Unfortunately there is no way to make $\hat{Y}_{it}$ orthogonal to the forecast errors in $\hat{Y}_{it}^{hp}$ and $\hat{Y}_{it}^{bp}$, since KLoSA does not contain information on, e.g., an elderly couple’s daughter-in-law; thus there may be a small sample problem here but of course this will disappear asymptotically. We did not follow Kazianga in using the couple’s assets as an excluded instrument for their income, since one could argue that assets may also affect transfers, i.e. the exclusion restriction necessary for using it as an instrumental variable is likely to fail.

\(^{12}\) Add columns 2, 3 and 4 in Table 2.
\[
T_{ij}^A = \begin{cases} 
T_{ij}^j + K & \text{if } T_{ij}^j < -K < 0, \\
0 & \text{if } -K < T_{ij}^j < K, \quad (j = hp, wp) \\
T_{ij}^j - K & \text{if } T_{ij}^j > K > 0,
\end{cases}
\]

(24)

where \( K \) denotes the unobserved (symmetric) transaction cost.\(^{13}\)

Assuming that the errors in (23) \((v_{1it}, v_{2it}) \sim iid \ N(0, \Sigma)\) over \(i\) for a given \(t\), we can derive the contribution to the likelihood function for family \(i\) in year \(t\); denote the logarithm of this contribution as \(L^*_it\). Since each contribution will take one of nine functional forms, for ease of exposition, all of the possible contributions are given in the Appendix. We then estimate the parameters of the model by maximizing the quasi-likelihood

\[
L^* = \sum_{i=1}^{I} \sum_{t=1}^{T} L^*_it.
\]

(25)

These estimates can be shown to be consistent using arguments from Amemiya (1979). However, obtaining analytical standard errors will be quite difficult given the prediction of the income terms. Instead we use the bootstrap with 500 replications to obtain the standard errors. Each bootstrap replication involves:

1. Choose a new bootstrap cross-section sample in KLoSA;
2. Estimate both parents’ income equations from the KLoSA replication sample;
3. Choose a new bootstrap sample of family histories from KLIPS, i.e. resample by families, not by family-year observations;
4. Impute parent’s income for the KLIPS families.
5. Predict the couple’s income and substitute all predicted values into the transfer functions.
6. Remaximize the quasi-likelihood for the bootstrap sample.

\(^{13}\) Net transfers to the parents are positive and net transfers received from parents are negative.
5.2 Comparison to Kazianga’s (2006) Approach

Kazianga (2006) is a very careful empirical study on income transfers to and from a couple which addresses a number of estimation issues that arise in this context. First, as noted above, he uses Rossett’s friction model and we adopt his approach. Second, he allows family income to be endogenous, using family assets as an excluded (from the second stage equation) instrument for permanent income and rainfall as an excluded instrument for transitory income. We also allow family income to be endogenous but do not use family asset as an excluded instrument; moreover we also correct the standard errors using the bootstrap.\(^{14}\) Kazianga also allows for a very flexible response of transfers to income by considering a spline function in income in the transfer equation. Using a spline function, or a polynomial, in income is straightforward if income can be considered exogenous. If one treats income as endogenous, it is better to use the actual values of income in the polynomial and then exploit normality to deal with the endogeneity, analogous to the procedure in Blundell and Smith (1986). We will consider this in future work.

Finally, Kazianga allows transfers to be non-separable functions of income and the unobservables, using the approach in Altonji, Ichimura and Otsu (2008) when he only allows for positive (and not negative) transfers. The Altonji et al (2008) procedure cannot be used allowing both for positive and negative transfers. Thus Kazianga covers a number of areas that we do not, but we would note that the reverse is also true. First, we deal with missing parents’ income, while Kazianga simply considers the biases that arise from omitting it. Second we would argue that our approach has a closer link to theory than his. Third, and perhaps most importantly, we also allow for a separate role of both sets of parents while he only considers total transfers to and from the adult couple. Fourth, as noted above, we use the bootstrap to obtain consistent standard errors. In

\(^{14}\) Kazianga appears to have substituted a predicted value of income in, which will produce consistent parameter estimates but inconsistent standard errors.
summary, our paper deals with different issues and thus is a complement, rather than a substitute, for his important paper.

5.3 Comparison to Other Work on Transfers from Adult Children to their Parents

There have been three important papers on transfers from children to parents with bargaining approach in developing countries. Lee, Parish, and Willis (1994, hereafter LPW) were the first to address bargaining power in the adult children’s families when analyzing upstream transfers. Using data from the 1989 Taiwan Family and Women Survey, they found that wives who earned more income provided more support to their own parents. Lillard and Willis (1997, hereafter LW) replicate LPW for Malaysia, and also find that the amount being transferred to the wife’s parents depends more strongly on the wife’s income than on the husband’s income, and vice-versa for the size of transfers to the husband’s parents.

Khemai (1999) focuses on a bargaining model and found that the distribution of assets between husbands and wives affects the likelihood of transfers to their respective families using Indonesia Data. From the bargaining model she derives latent variables that determine whether transfers are made to the parents of the husband and the wife, respectively, and reports reduced-form probit estimates. However, she does not consider the actual amounts to be transferred to each set of parents in the estimation and thus she cannot identify the effect of assets (or income) on transfers.15

We extend these papers in several directions. First, we use a formal bargaining model to derive our estimating equations. Second, we use the parents’ characteristics and a second data set to impute the parents’ income, while LPW, LW and Khemani only use parents’ characteristics as control variables. Third, in LPW, LW and Khemani, positive (net) transfers from parents to children are treated as zero transfers, while our model can deal with two-way transfers. Finally, LPW, LW and Khemani ignore the role of tradition in upstream transfers, while we allow for first-born sons to

15 Formally she can identify the coefficient of assets up to a factor of proportionality, e.g. divided by the standard deviation of the error term in the transfer equation.
differ in their transfer behavior, since they have traditional duties to take care of the parents. As noted above, we focus on families where the head is 40 years or younger, and thus implicitly allow older adult couples to have different structural parameters, since they may be more affected by tradition than their younger counterparts.\footnote{In a paper that appears to have been written concurrently with ours, Pan (2009) considers a regression where the dependent variable is the ratio of the transfers to husband's and wife's parents and the independent variables consist of the husband’s and wife’s income. Pan uses a sample that has positive transfers to at least one set of parents, and treats husband's and wife's labor market participation as endogenous using regional unemployment rates as excluded instruments. Three possible concerns are the sample selection, whether bargaining power is determined by current income (or permanent income proxied by education), and whether transitory fluctuations in income driven by the business cycle affect bargaining power.}

5.4 Comparison to Lee (2007)

In an interesting and original paper, Lee (2007) considers a static model of bargaining between husband and wife for South Korea where private assignable/semiprivate consumption is represented by “pocket money”. As to the composition of pocket money, Lee states that “according to informal surveys, people usually spend pocket money on private items, such as recreation, a hobby, alcoholic beverages”.\footnote{Li and Wu (2011) argue that a pregnant woman’s prenatal nutrition level represents semiprivate consumption and they find that having a first born son improves the mother’s nutrition intake. While individual food consumption is exclusive, the husband is likely to care about the gender of the children; indeed this seems to be the only explanation why the gender of the first born child would affect nutrition.} One’s initial reaction is that pocket money may be too small a fraction of family resources and to justify substantial bargaining on the part of the couple, but Lee finds in his data that taken together, the husband and wife’s pocket money constitutes about 12%-15% of the family’s before-tax earnings. To us this percentage seems implausibly high for covering recreation, hobbies and alcohol that the husband and wife consume separately, suggesting there may be a joint aspect to this consumption based on pocket money.

In any case, to compare his approach to ours, we need to linearize (23), since in his framework $\mu^h$ is a fixed effect (FE) that cannot be treated as random since it is potentially correlated with the couple’s income.
Thus to use this approach one must assume that $v_i$ is uncorrelated with $Y_{it}$, $Y_{it}^{hp}$, and $Y_{it}^{wp}$. This is not an innocuous assumption since $v_i$ may reflect temporary taste shocks or measurement error in $Y_{it}$, $Y_{it}^{hp}$, and $Y_{it}^{wp}$; indeed it is well known that a FE model will accentuate biases due to measurement error. Next, in the context of our model, he runs the regression

$$
\hat{\mu}_{it}^h = \tau Z_{it}^L + \varepsilon_i
$$

(27)

where $\hat{\mu}_{it}^h$ are the estimated FEs, and $Z_{it}^L$ consists of the individual mean of two local variables (sex ratio, divorce rate), demographic variables (based on the husband and wife’s age and education) and three potentially endogenous variables (dummy variables for a child under age 7, living with husband’s parents, living with wife’s parents) that he must assume are independent of $v_i$ and $\varepsilon_i$.\textsuperscript{18}

In contrast, in the context of (26) our approach takes the form

$$
T_{it}^{jp} = \tilde{\alpha}_0 + \tilde{\alpha}_1 Y_{it} + \tilde{\alpha}_2 Y_{it}^{hp} + \tilde{\alpha}_3 Y_{it}^{wp} + \tilde{\beta}_1 X_i + \tilde{\nu}_i,
$$

(28)

where $\tilde{\nu}_i$ can contain an idiosyncratic shock that is correlated with $Y_{it}$; further $\tilde{\beta}_1$ is the coefficient vector of interest. To obtain a consistent estimate of it we need to assume the husband’s and wife’s age and education are uncorrelated with $\tilde{\nu}_i$; this is not as weak as one might imagine, since we have to assume that these variables affect transfers only through bargaining power conditional on income. (Note that Lee has to make the same assumption to identify the determinants of bargaining power using equation 27.) However, we do not assume that dummy variables for a child under age 7, living with husband’s parents, and living with wife’s parents, are uncorrelated with $\tilde{\nu}_i$. Secondly we

\textsuperscript{18} See Hausman and Taylor (1981) for a general discussion of identification and consistent estimation in this context.
address the problem that $Y_{it}^{c}$, $Y_{it}^{hp}$, and $Y_{it}^{wp}$ may be correlated with $\tilde{v}_{it}$ by running the first stage equations

$$Y_{it} = \pi Z_{it}^{c} + \varphi_{1it},$$
$$Y_{it}^{hp} = \delta_{hp} Z_{it}^{hp} + \varphi_{2it}$$
on KLoSA and

$$Y_{it}^{wp} = \delta_{wp} Z_{it}^{wp} + \varphi_{3it}$$
on KLIPS. Our IV-type estimates of (26) will be consistent as long as $Z_{it}^{c}$, $Z_{it}^{hp}$, and $Z_{it}^{wp}$, which consist of predetermined demographic variables, are orthogonal to measurement and taste shocks captured by $\tilde{v}_{it}$; these assumptions are weaker than what Lee needs. On the other hand, we should note that Lee can consistently estimate the $\alpha$ parameters in (26) under commonly made assumptions without an exclusion restriction, while our approach cannot.

Of course, our IV procedure becomes substantially more complicated in a nonlinear model if $\mu^{b}$ contains an unobserved idiosyncratic term. Here we would simply note that using a FE in a nonlinear model is generally quite problematic since it raises the incidental parameter problem; thus Lee’s approach does not seem directly applicable to our estimating equations. Further, our model seems much too complicated to apply Altonji and Matzkin’s (2005) approach for using FE$s$ in nonlinear models. On the other hand, we may be able to use the approach of Chamberlain (1984) if one treats the equation relating the independent variables to the correlated random as a structural one, rather than simply as a projection, and we hope to investigate this in future work.

6. Data

We use data from the “Korean Labor and Income Panel Study” (KLIPS), which is administrated by the Korea Labor Institute (KLI). We briefly discuss the data and emphasize the unique features of
KLIPS that we exploit in this paper. KLIPS is a longitudinal study of a representative sample of Korean households and individuals living in urban areas. Starting in 1998, it is conducted annually to track the characteristics of households as well as the economic activities, labor movements, incomes, expenditures, education, job training, and social activities of individuals and families. Especially important for us is the fact that this panel dataset contains information on financial exchanges with parents from 4th wave (2001) on. Specifically, a household is asked whether the household head has surviving parents who do not co-reside with the couple, who they are, and how much financial support to and from the household head’s parents was made last year; the same questions are asked about the spouse’s parents. This financial exchange with parents is, of course, our focus of interest. (We do not use data on couples who co-reside with parents since it is not possible to determine the level and direction of the transfers.) Summary statistics are presented in Table 4.

[Table 4 here.]

Parents’ income is crucial information in our models. Unfortunately, as noted above, KLIPS does not have data on parents’ income and we must impute them. We run regressions in KLoSA for the parents’ income using explanatory variables common to both data sets. We then use the coefficients from KLoSA to impute parents’ income in our KLIPS data.\(^\text{19}\) All monetary units are in real (2004) ₩ values. Note that KLoSA cannot be used to analyze two way transfers since it does not have information on the income of the adult couple or on the characteristics or income of the in-laws.

### 7. Estimation Results

When we estimated our model we found that the data were not rich enough to support precise estimates of the fixed costs \( K \). Instead, we set \( K = ₩100,000 \), but also investigate estimation based

\(^{19}\) We use those in KLoSA who have at least one married child who does not live with them.
on the assumption that $K = \text{₩}50,000$ as a robustness check.\footnote{$\text{₩}100,000$ equaled approximately U$100$ in 2004.} As noted above, we use the bootstrap (by couple) to obtain consistent standard errors. Table 5 reports the parameter estimates of the function of the husband’s bargaining power from (14).

[Table 5 here.]

We consider three different specifications of $\mu^h(X_i)$. First we let $\mu^h(X_i)$ be a function only of the husband’s and wife’s education. Second, we let it depend only on the husband’s and wife’s age. In our third specification we let $\mu^h(X_i)$ depend on both education and age for the husband and wife. Interestingly, all three specifications imply that the husband’s bargaining power is significantly increasing in his education and his wife’s age, and decreasing in her education and his age. Our results for education are consistent with the intrahousehold bargaining literature which argues that education is an important proxy for an individual’s earning ability and thus their bargaining power. The age results are consistent with the research by Lee and Ham (2011) that suggests that one’s marketability in the marriage market is declining in age for the sample that we consider, since it is plausible that bargaining power is an increasing function of such marketability. As a robustness check, we also estimated the model for $K = \text{₩}50,000$. The results are presented in Table 6 and are very similar to those in Table 5.

[Table 6 here.]

To get an idea of the magnitude of the effect of changing education on the husband’s bargaining power, we predict the husband’s bargaining power for the nine cases where the husband and wife’s bargaining power each take on 3 possible values: 16 years of schooling (high education); 14 years of schooling (middle education) and 12 years of schooling (low education). (We assume that husband’s
and wife’s ages are always equal to the sample mean values of 34.56 and 32.32 years respectively.)

The results for $K = \¥100,000$ are reported in Table 7.

(Table 7 here.)

The results show that husbands have slightly (and statistically significantly) less bargaining power than their wives for all of the nine combinations of education levels. Further, the husband’s bargaining power estimate increases by about 0.014 both when his education increases from low to middle and by about 0.010 when it increase from middle to high education. On the contrary the husband’s bargaining power falls by about 0.014 both when his wife’s education increases from low to middle and when it increases from middle to high schooling. The analogous results for $K = \¥50,000$ are presented in Table 8 and again are very similar to those in Table 7.

(Table 8 here.)

We next consider the husband’s bargaining power when the husband’s and wife’s age can take on three values. For the husband we use: 38 years - husband’s high age; 35 years -husband’s middle age and 32 years - husband’s low age, while for the wife’s we use: 35 years -wife’s high age, 32 years -wife’s middle age and 29 years - wife’s low age. (Now we assume that the husband’s and wife’s schooling take on the mean levels of 13.68 years and 13.12 years respectively.) The results for $K = \¥100,000$ are reported in Table 9.

(Table 9 here.)

The husband’s bargaining power estimates falls by about 0.03 both when his age increases from low to middle and when it increases from middle to high. The husband’s bargaining power estimates rises by about 0.03 both when his wife’s age increases from low to middle and when it increases from middle to high. The results for $K = \¥50,000$ are presented in Table 10 and again are very similar to those in for $K = \¥100,000$.

(Table 10 here.)
Finally, we consider the estimated effect of a ₩100,000 increase (separately) in $Y, Y^{hp}$ and $Y^{wp}$ on $T^{hp}$ and $T^{wp}$ respectively; note that for simplicity we consider the derivatives corresponding to the index functions in (23) and not to the actual transfers after fixed costs are considered in (24). These effects are given by ($₩100,000$ times):

$$
\frac{\partial T^{hp}}{\partial Y} = [\theta \mu^h], \quad \frac{\partial T^{hp}}{\partial Y^{hp}} = [\theta \mu^h - 1], \quad \frac{\partial T^{hp}}{\partial Y^{wp}} = [\theta \mu^h],
$$

(29)

$$
\frac{\partial T^{wp}}{\partial Y} = [\theta(1 - \mu^h)], \quad \frac{\partial T^{wp}}{\partial Y^{hp}} = [\theta(1 - \mu^h) - 1], \quad \text{and} \quad \frac{\partial T^{wp}}{\partial Y^{hp}} = [\theta(1 - \mu^h)].
$$

We see from (26) hat using our preferences and solving the bargaining model puts a lot of structure on these derivatives.\textsuperscript{21} The results for $K = ₩100,000$ are reported in Table 11. First, we see that a ₩100,000 increase in any income terms increases the couple’s consumption by about ₩50,000 and each set of parents by about ₩25,000. Second, we see that as we increase the bargaining power of the husband, the transfer to his parents’ increases by a relatively small amount. For example, from the first three sub-tables in Table 11 we see that as the wife’s education goes from high to low (when the husband has high education), the transfer to the husband’s parents (from a ₩100,000 increase in the couple’s income) goes from ₩21,973 to ₩23,374, or increases by 7.5%.

[Table 11 here.]

The results for $K = ₩50,000$ are very similar and thus are omitted to save space.

8. Conclusions and Future Research

We derive a model of family bargaining that determines transfers to and from an adult couple and both sets of their parents. We then estimate the model using panel data from South Korea, while

\textsuperscript{21} Unfortunately, when we attempted to estimate the derivatives in unrestricted form, we obtained quite noisy estimates.
allowing the bargaining power between the husband and wife to depend on their observable characteristics. We find that we can precisely estimate the determinants of the husband’s bargaining power, and that at mean values, husbands have slightly (but statistically significantly) less bargaining power than their wives. Moreover the husband’s bargaining power is (statistically significantly) increasing in his education and his wife’s age, and (also significantly) decreasing in her education and his age; these results are compatible with how changes in these variables affect the current (potential) marketability of the husband and wife in the Korean marriage market.

In future research it would be very useful to consider two extensions. First, it would be useful to add uncertainty to the static model. Secondly, it would be very interesting to investigate dynamic models, such as the one in Mazzocco (2007). He found that household members cannot commit to future plans and the individual participation constraints bind frequently, which implies that households must renegotiate their decisions over time. Thus it would be desirable to include this feature in any dynamic model used for estimation. While the current version of KLIPS is probably too short for us to apply and estimate such a model for our problem and obtain precise estimates, it will be interesting to investigate this possibility as future waves of KLIPS become available.
References


________________ (2006). “Parents’ Preferences for Expenditure on Children When At Least One Parent Works and Preferences Are Non-separable.” Mimeo, Department of Economics, UCLA.


Appendix: The Overall Likelihood Function

Since we assume that error terms in (23) are bivariate normally distributed, we can construct likelihood function by combining the contribution of the likelihood function of each transfer pattern. $T_{it}^{hp}$ and $T_{it}^{wp}$ in (24) can be positive or negative or zero. Hence, we have total 9 cases. For the case where $T_{it}^{hp} > 0$ and $T_{it}^{wp} > 0$, the probability of this event is

$$f(T_{it}^{hp}, T_{it}^{wp}) = n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma),$$

where $n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma)$ is bivariate normal density with zero means and covariance matrix $\Sigma$, and the error terms $\mathbf{v}_{it} = (v_{it}^{hp}, v_{it}^{wp})$ are defined in (23). In the same way, the contribution of the likelihood function of the other eight cases can be constructed and are shown below

$$L(T_{it}^{hp}, T_{it}^{wp}) = \prod_{i=1}^{N} \prod_{t=1}^{T} \left[ n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) \right]^{\gamma(T_{it}^{hp} > 0, T_{it}^{wp} > 0)} \left[ \int n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) dv_{it}^{hp} \right]^{\gamma(T_{it}^{hp} = 0, T_{it}^{wp} > 0)} \left[ \int n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) dv_{it}^{wp} \right]^{\gamma(T_{it}^{hp} > 0, T_{it}^{wp} = 0)}$$

$$\cdot \left[ n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) \right]^{\gamma(T_{it}^{hp} > 0, T_{it}^{wp} < 0)} \left[ \int n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) dv_{it}^{hp} \right]^{\gamma(T_{it}^{hp} = 0, T_{it}^{wp} < 0)} \left[ \int n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) dv_{it}^{wp} \right]^{\gamma(T_{it}^{hp} < 0, T_{it}^{wp} > 0)}$$

$$\cdot \left[ n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) \right]^{\gamma(T_{it}^{hp} < 0, T_{it}^{wp} = 0)} \left[ \int n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) dv_{it}^{hp} \right]^{\gamma(T_{it}^{hp} = 0, T_{it}^{wp} < 0)} \left[ \int n_2(\mathbf{v}_{it}; \mathbf{0}, \Sigma) dv_{it}^{wp} \right]^{\gamma(T_{it}^{hp} < 0, T_{it}^{wp} < 0)}.$$
Table 1
Income Source for the Elderly in 1995 (Age ≥ 60) in Percentages

<table>
<thead>
<tr>
<th>Income source</th>
<th>Korea</th>
<th>Taiwan</th>
<th>Japan</th>
<th>U.S.</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor income</td>
<td>26.6</td>
<td>15.2</td>
<td>21.6</td>
<td>15.5</td>
<td>4.6</td>
</tr>
<tr>
<td>Financial income</td>
<td>9.9</td>
<td>18.6</td>
<td>6.6</td>
<td>23.3</td>
<td>13.7</td>
</tr>
<tr>
<td>Private transfer</td>
<td>56.6</td>
<td>40.3</td>
<td>6.6</td>
<td>1.6</td>
<td>1.9</td>
</tr>
<tr>
<td>Public pension</td>
<td>6.6</td>
<td>26.1</td>
<td>57.4</td>
<td>55.8</td>
<td>77.6</td>
</tr>
</tbody>
</table>

Note: The data of Taiwan is the percentage of consumption source of the elderly over 65 in 1998.
Table 2
The Percentage Distribution of Household by Type of Net Transfers

<table>
<thead>
<tr>
<th>Year</th>
<th>To Both sets of parents</th>
<th>Only to Husband's parents</th>
<th>Only to Wife's Parents</th>
<th>To Neither parents</th>
<th>Receive Net Transfer from parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>37</td>
<td>16</td>
<td>3</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>(2.57)</td>
<td>(1.96)</td>
<td>(.96)</td>
<td>(2.26)</td>
<td>(2.13)</td>
</tr>
<tr>
<td>2002</td>
<td>38</td>
<td>18</td>
<td>4</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>(2.57)</td>
<td>(2.03)</td>
<td>(1.03)</td>
<td>(2.14)</td>
<td>(2.09)</td>
</tr>
<tr>
<td>2003</td>
<td>37</td>
<td>11</td>
<td>3</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>(2.41)</td>
<td>(1.59)</td>
<td>(.78)</td>
<td>(2.14)</td>
<td>(2.15)</td>
</tr>
<tr>
<td>2004</td>
<td>44</td>
<td>14</td>
<td>2</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>(2.56)</td>
<td>(1.79)</td>
<td>(.74)</td>
<td>(2.00)</td>
<td>(2.09)</td>
</tr>
<tr>
<td>2005</td>
<td>44</td>
<td>11</td>
<td>4</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>(2.61)</td>
<td>(1.67)</td>
<td>(.98)</td>
<td>(2.17)</td>
<td>(2.08)</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>14</td>
<td>3</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>(1.49)</td>
<td>(.97)</td>
<td>(.44)</td>
<td>(1.21)</td>
<td>(1.23)</td>
</tr>
</tbody>
</table>

Source: Calculated by the authors using KLIPS (2001-2005).
Notes:
(1) First-born sons and heads older than 40 are excluded.
(2) Standard errors are in parentheses.
Table 3  
Real (2004) Transfer Amounts for Households with Transfers to Both Parents

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>Transfer to Husband's parents</th>
<th>Transfer to Wife's parents</th>
<th>Couple's Household income</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>130</td>
<td>102.76</td>
<td>61.40</td>
<td>3024.52</td>
<td>6.47%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10.64)</td>
<td>(5.57)</td>
<td>(129.09)</td>
<td>(.73)</td>
</tr>
<tr>
<td>2002</td>
<td>137</td>
<td>132.82</td>
<td>86.03</td>
<td>3542.07</td>
<td>6.46%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(14.32)</td>
<td>(12.31)</td>
<td>(173.89)</td>
<td>(.53)</td>
</tr>
<tr>
<td>2003</td>
<td>149</td>
<td>116.68</td>
<td>71.36</td>
<td>3501.00</td>
<td>6.13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(9.44)</td>
<td>(6.02)</td>
<td>(151.60)</td>
<td>(.48)</td>
</tr>
<tr>
<td>2004</td>
<td>168</td>
<td>118.59</td>
<td>69.30</td>
<td>3844.25</td>
<td>5.18%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(11.28)</td>
<td>(5.90)</td>
<td>(166.67)</td>
<td>(.35)</td>
</tr>
<tr>
<td>2005</td>
<td>159</td>
<td>123.98</td>
<td>87.23</td>
<td>3674.20</td>
<td>5.64%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12.95)</td>
<td>(13.50)</td>
<td>(145.72)</td>
<td>(.41)</td>
</tr>
<tr>
<td>Total</td>
<td>729</td>
<td>119.21</td>
<td>75.25</td>
<td>3539.88</td>
<td>5.93%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.00)</td>
<td>(5.02)</td>
<td>(104.14)</td>
<td>(.25)</td>
</tr>
</tbody>
</table>

Source: Calculated by the authors using KLIPS (2001-2005).

See notes to Table 2.
(3) Transfer amount is measured in tens of thousands of Korean Won (₩). ₩10,000 is approximately US$10 in 2004.  
* Ratio = (Column 1 + Column 2) / Column 3.
Table 4  
Summary Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer to husband's parents</td>
<td>72.80</td>
</tr>
<tr>
<td></td>
<td>(4.12)</td>
</tr>
<tr>
<td>Transfer to wife's parents</td>
<td>40.25</td>
</tr>
<tr>
<td></td>
<td>(4.17)</td>
</tr>
<tr>
<td>Transfer from husband's parents</td>
<td>16.50</td>
</tr>
<tr>
<td></td>
<td>(2.01)</td>
</tr>
<tr>
<td>Transfer from wife's parents</td>
<td>15.80</td>
</tr>
<tr>
<td></td>
<td>(2.06)</td>
</tr>
<tr>
<td>Couple's household income</td>
<td>3114</td>
</tr>
<tr>
<td></td>
<td>(67.60)</td>
</tr>
<tr>
<td>Husband's parents' imputed income</td>
<td>1319</td>
</tr>
<tr>
<td></td>
<td>(36.26)</td>
</tr>
<tr>
<td>Wife's parents' imputed income</td>
<td>1646</td>
</tr>
<tr>
<td></td>
<td>(42.08)</td>
</tr>
<tr>
<td>Husband’s years of education</td>
<td>13.68</td>
</tr>
<tr>
<td></td>
<td>(.0980)</td>
</tr>
<tr>
<td>Wife’s years of education</td>
<td>13.12</td>
</tr>
<tr>
<td></td>
<td>(.0851)</td>
</tr>
<tr>
<td>Husband’s age</td>
<td>34.57</td>
</tr>
<tr>
<td></td>
<td>(.0862)</td>
</tr>
<tr>
<td>Wife’s age</td>
<td>32.33</td>
</tr>
<tr>
<td></td>
<td>(.0885)</td>
</tr>
<tr>
<td>Observation</td>
<td>1854</td>
</tr>
</tbody>
</table>

Notes:
1) First-born sons and heads older than 40 excluded.
2) Zero transfers are included; transfers are in real (2004) KRW.
Table 5
The Determinants of the Husband’s Bargaining Power $\mu^h$

<table>
<thead>
<tr>
<th></th>
<th>Specification 1$^3$</th>
<th>Specification 2$^6$</th>
<th>Specification 3$^5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.1228</td>
<td>-.3735</td>
<td>-.3889</td>
</tr>
<tr>
<td></td>
<td>(.1836)</td>
<td>(.6068)</td>
<td>(.7354)</td>
</tr>
<tr>
<td>Husband’s Education</td>
<td>.0237*</td>
<td>.0279**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0128)</td>
<td>(.0129)</td>
<td></td>
</tr>
<tr>
<td>Wife’s Education</td>
<td>-.0294***</td>
<td>-.0287***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0112)</td>
<td>(.0109)</td>
<td></td>
</tr>
<tr>
<td>Husband’s age</td>
<td></td>
<td>-.0390***</td>
<td>-.0397***</td>
</tr>
<tr>
<td></td>
<td>(.0100)</td>
<td>(.0100)</td>
<td></td>
</tr>
<tr>
<td>Wife’s age</td>
<td></td>
<td>.0475***</td>
<td>.0484***</td>
</tr>
<tr>
<td></td>
<td>(.0135)</td>
<td>(.0145)</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

(1) Bootstrapped standard errors are in parentheses. Resampling is by household and 500 replications are used.
(2) *** p<0.01, ** p<0.05, * p<0.1
(3) Specification 1:
$$\mu^h = [1 + \exp(-\beta_0 - \beta_1 (\text{husband's educ}) - \beta_2 (\text{wife's educ}))]^{-1},$$
e.g., $\frac{\partial \mu^h}{\partial (\text{husband's educ})} = (\beta_1 / \mu^h) > 0$ if $\beta_1 > 0$.
(4) Specification 2:
$$\mu^h = [1 + \exp(-\beta_0 - \beta_1 (\text{husband's age}) - \beta_2 (\text{wife's age}))]^{-1},$$
e.g., $\frac{\partial \mu^h}{\partial (\text{husband's age})} = (\beta_1 / \mu^h) > 0$ if $\beta_1 > 0$.
(5) Specification 3:
$$\mu^h = [1 + \exp(-\beta_0 - \beta_1 (\text{husband's educ}) - \beta_2 (\text{wife's educ})$$
$$- \beta_3 (\text{husband's age}) - \beta_4 (\text{wife's age}))]^{-1}.$$
Table 6  
The Determinants of the Husband’s Bargaining Power $\mu^h$  
$K=\text{₩50,000}$

<table>
<thead>
<tr>
<th></th>
<th>Specification 1</th>
<th>Specification 2</th>
<th>Specification 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.1242</td>
<td>-.3636</td>
<td>-.3796</td>
</tr>
<tr>
<td></td>
<td>(.1880)</td>
<td>(.6109)</td>
<td>(.7396)</td>
</tr>
<tr>
<td>Husband’s Education</td>
<td>.0238*</td>
<td>.0279**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0131)</td>
<td>(.0130)</td>
<td></td>
</tr>
<tr>
<td>Wife’s Education</td>
<td>-.0294***</td>
<td>-.0288***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0117)</td>
<td>(.0109)</td>
<td></td>
</tr>
<tr>
<td>Husband’s age</td>
<td>-.0392***</td>
<td>-.0399***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0101)</td>
<td>(.0101)</td>
<td></td>
</tr>
<tr>
<td>Wife’s age</td>
<td>.0474***</td>
<td>.0483***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0136)</td>
<td>(.0146)</td>
<td></td>
</tr>
</tbody>
</table>

See notes to Table 5.
Table 7
The Husband's Bargaining Power for Various Levels of Education for the Husband and Wife

\[ K = \text{₩100,000} \]

<table>
<thead>
<tr>
<th>Wife's Education Level</th>
<th>Husband's Education Level</th>
<th>( K ) = \text{₩100,000}</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Education</td>
<td>Husband's High Education</td>
<td>.4476 (0.0102)</td>
</tr>
<tr>
<td></td>
<td>Husband's Middle Education</td>
<td>.4339 (0.0118)</td>
</tr>
<tr>
<td></td>
<td>Husband's Low Education</td>
<td>.4202 (0.0159)</td>
</tr>
<tr>
<td>Middle Education</td>
<td>Husband's High Education</td>
<td>.4617 (0.0096)</td>
</tr>
<tr>
<td></td>
<td>Husband's Middle Education</td>
<td>.4480 (0.0100)</td>
</tr>
<tr>
<td></td>
<td>Husband's Low Education</td>
<td>.4343 (0.0137)</td>
</tr>
<tr>
<td>Low Education</td>
<td>Husband's High Education</td>
<td>.4762 (0.0117)</td>
</tr>
<tr>
<td></td>
<td>Husband's Middle Education</td>
<td>.4623 (0.0108)</td>
</tr>
<tr>
<td></td>
<td>Husband's Low Education</td>
<td>.4484 (0.0133)</td>
</tr>
</tbody>
</table>

Notes:
1. Parameters from Column 3, Table 5 are used to predict the husband's bargaining power. The husband's age and wife's age are evaluated at their mean values (husband's age=34.56, wife's age=32.32).
2. High Education: 16 years of schooling (College graduate), Middle Education: 14 years of schooling, Low Education: 12 years of schooling (High School graduate).
3. Standard errors are in parentheses. The delta method is used to compute standard errors.
Table 8
The Husband’s Bargaining Power for Various Levels of Education for the Husband and Wife

$K = \text{₩}50,000.$

<table>
<thead>
<tr>
<th>Wife’s Education</th>
<th>Husband’s High Education</th>
<th>Husband’s Middle Education</th>
<th>Husband’s Low Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Education</td>
<td>.4474 (.0103)</td>
<td>.4337 (.0119)</td>
<td>.4200 (.0160)</td>
</tr>
<tr>
<td>Middle Education</td>
<td>.4617 (.0096)</td>
<td>.4479 (.0100)</td>
<td>.4341 (.0137)</td>
</tr>
<tr>
<td>Low Education</td>
<td>.4760 (.0117)</td>
<td>.4612 (.0108)</td>
<td>.4483 (.0134)</td>
</tr>
</tbody>
</table>

Notes: Parameters from Column 3, Table 6 are used to predict the husband’s bargaining power. See notes to Table 7.
Table 9
The Husband’s Bargaining Power for Various Ages of the Husband and Wife
\( K=₩100,000 \)

<table>
<thead>
<tr>
<th>Wife’s Age</th>
<th>Husband’s High Age</th>
<th>Husband’s Middle Age</th>
<th>Husband’s Low Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wife’s High Age</td>
<td>.4504 (0.0122)</td>
<td>.4800 (0.0103)</td>
<td>.5098 (0.0132)</td>
</tr>
<tr>
<td>Wife’s Middle Age</td>
<td>.4147 (0.0114)</td>
<td>.4439 (0.0106)</td>
<td>.4735 (0.0143)</td>
</tr>
<tr>
<td>Wife’s Low Age</td>
<td>.3800 (0.0179)</td>
<td>.4084 (0.0184)</td>
<td>.4375 (0.0214)</td>
</tr>
</tbody>
</table>

Notes:
1. Parameters from Column 3, Table 5 are used to predict the husband’s bargaining power. The husband’s education and wife’s education are evaluated at their mean values (husband’s education=13.68, wife’s education=13.12).
2. Husband’s High Age: 38, Husband’s Middle Age: 35, Husband’s Low Age: 32.
4. Standard errors are in parentheses. The delta method is used to compute standard errors.
Table 10
The Husband's Bargaining Power for Various Ages of the Husband and Wife

\[ K = W 50,000. \]

<table>
<thead>
<tr>
<th></th>
<th>Husband's High Age</th>
<th>Husband's Middle Age</th>
<th>Husband's Low Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wife's High Age</td>
<td>.4500 (0.0123)</td>
<td>.4798 (0.0104)</td>
<td>.5097 (0.0133)</td>
</tr>
<tr>
<td>Wife's Middle Age</td>
<td>.4144 (0.0114)</td>
<td>.4438 (0.0106)</td>
<td>.4735 (0.0144)</td>
</tr>
<tr>
<td>Wife's Low Age</td>
<td>.3797 (0.0179)</td>
<td>.4083 (0.0184)</td>
<td>.4375 (0.0215)</td>
</tr>
</tbody>
</table>

Notes: Parameters from Column 3, Table 6 are used to predict the husband's bargaining power. See notes to Table 9.
Table 11
The Effect of a ₩100,000 Increase (Separately) in the Couple’s Income, Husband’s Parents’ Income and Wife’s Parents’ Income on Transfers to the Husband’s and Wife’s Parents.
K=₩100,000.

(a) The Husband has High Education and the Wife has High Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>21,973 (563.48)</td>
<td>27,115 (635.01)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-78,026 (563.48)</td>
<td>27,115 (635.01)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>21,973 (563.48)</td>
<td>-72,885 (635.01)</td>
</tr>
</tbody>
</table>

(b) The Husband has High Education and the Wife has Middle Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>22,673 (544.17)</td>
<td>26,416 (612.56)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-77,327 (544.17)</td>
<td>26,416 (612.56)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>22,673 (544.17)</td>
<td>-73,584 (612.56)</td>
</tr>
</tbody>
</table>

(c) The Husband has High Education and the Wife has Low Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>23,374 (644.53)</td>
<td>25,714 (698.02)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-76,626 (644.53)</td>
<td>25,714 (698.02)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>23,374 (644.53)</td>
<td>-74,286 (698.02)</td>
</tr>
</tbody>
</table>
Table 11 (Continued)

(d) The Husband has Middle Education and the Wife has High Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>21,299 (613.85)</td>
<td>27,790 (707.78)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-78,701 (613.85)</td>
<td>27,790 (707.78)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>21,299 (613.85)</td>
<td>-72,210 (707.78)</td>
</tr>
</tbody>
</table>

(e) The Husband has Middle Education and the Wife has Middle Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>21,993 (537.07)</td>
<td>27,095 (638.71)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-78,707 (537.07)</td>
<td>27,095 (638.71)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>21,993 (537.07)</td>
<td>-72,905 (638.71)</td>
</tr>
</tbody>
</table>

(f) The Husband has Middle Education and the Wife has Low Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>22,692 (581.56)</td>
<td>26,396 (672.56)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-77,308 (581.56)</td>
<td>26,396 (672.56)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>22,692 (581.56)</td>
<td>-73,604 (672.56)</td>
</tr>
</tbody>
</table>
Table 11 (Continued)

(g) The Husband has Low Education and the Wife has High Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>20,629 (791.62)</td>
<td>29,460 (886.66)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-79,371 (791.62)</td>
<td>29,460 (886.66)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>20,629 (791.62)</td>
<td>-70,540 (886.66)</td>
</tr>
</tbody>
</table>

(h) The Husband has Low Education and the Wife has Middle Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>21,318 (690.37)</td>
<td>27,770 (795.94)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-78,682 (690.37)</td>
<td>27,770 (795.94)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>21,318 (690.37)</td>
<td>-72,230 (795.94)</td>
</tr>
</tbody>
</table>

(i) The Husband has Low Education and the Wife has Low Education

<table>
<thead>
<tr>
<th>Effect of a ₩100,000 Increase in</th>
<th>On Transfer to Husband’s Parents</th>
<th>On Transfer to Wife’s Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s Income</td>
<td>22,013 (678.39)</td>
<td>27,076 (783.40)</td>
</tr>
<tr>
<td>Husband’s Parents’ Income</td>
<td>-77,987 (678.39)</td>
<td>27,076 (783.40)</td>
</tr>
<tr>
<td>Wife’s Parents’ Income</td>
<td>22,013 (678.39)</td>
<td>-72,924 (783.40)</td>
</tr>
</tbody>
</table>

Notes: The resulting amounts are measured in real (2004) Korean Won (₩). See notes to Table 7.
Figure 1: Inter-Vivos Transfers to and from the Elderly (Age ≥50)