# ARE PRIVATE TRANSFERS ALTRUISTICALLY MOTIVATED? THE CASE OF THE REPUBLIC OF KOREA BEFORE AND DURING THE FINANCIAL CRISIS

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Using household panel data from Korea for 1995–98, this paper shows that private transfers of Korean households were altruistically motivated. Although the altruistic motive of households seemed to be reinforced during the financial crisis, the amount of private transfers was still not sufficient to support households living in urban areas. Also, there had been a strong crowding-out relation between private and public transfers. This suggests that the Korean government should have designed its public transfer scheme carefully in order to improve the effectiveness and efficiency of its social safety net programs.

## I. INTRODUCTION

THE Asian financial crisis was truly a watershed in the Republic of Korea's economic history. With the onset of the crisis, the country's real GDP and real wage contracted by 5.8 and 10 per cent, respectively, between 1997 and 1998. Unemployment rate jumped from 2.6 per cent to 6.8 per cent and inflation rose to 7.5 per cent (Bank of Korea 2001; National Statistical Office 2001). As a result of the economic downturn, poverty increased substantially in the country—the 7.5 per cent share of poor urban households in the first quarter of 1997 jumped to 23 per cent by the third quarter of 1998. Also, the Gini coefficient in terms of per capita income of urban households increased from 0.27 in 1997 to 0.30 in 1998 (Kakwani 2000; World Bank 2000).

In the face of crisis-induced shocks, Korean households were forced to adopt drastic measures to protect their living standards. In fact, the World Bank (2000) reported that Korea was able to weather the crisis through effective coping policies. Furthermore, Goh, Kang, and Sawada (2002) indicated that private transfers played a significant role in protecting households in the face of crisis, suggesting that private income transfers are important for reallocating resources.

Using the Korean Household Panel Survey (KHPS) data, in this paper the motives of private income transfers and the crowding-out effect of public transfers on private transfers were investigated. In particular, the two competing hypotheses of transfer provision motives were evaluated as follows: the altruism and the self-interested exchange. These two motives imply different outcomes of public transfers, namely, redistributing income (Cox 1987). Altruistically motivated private transfers can lead to ineffective public transfers (Becker 1974). On the other hand, for households that are motivated by exchange, this finding does not hold (Cox 1987).

In contrast to the somewhat mixed existing empirical findings for other countries, the empirical results obtained in this paper clearly showed that Korean households were altruistically motivated. Accordingly, there had been a strong substitutability between private and public transfers. While Korea was able to weather the crisis through the expansion of public transfers, the empirical results suggest that the government should have designed targeting schemes carefully in order to prevent such crowding-out effect of its social safety net programs.

The paper is organized as follows. In Section II, some theoretical background from existing work on public and private transfers is provided. In Section III, descriptive evidences are provided and in Section IV, the estimation model and results are discussed. In the final section, a conclusion is presented.

## II.   LITERATURE

Traditional studies on transfers have focused on the motives of private transfer behavior and crowding-out effect of public transfers on private transfers. Public transfers may take the form of cash or in-kind transfers such as pensions, child allowances, food subsidies, housing subsidies, energy subsidies, feeding programs, social funds, etc.; or they may be in the form of income support to the vulnerable members of the society by providing jobs in an emergency situation, through public work and other employment programs.

In addition to public safety nets, most societies make informal community-based arrangements that help mitigate deprivation and temporary income shortfalls. Among other things, these remittances provide support for the elderly in retirement, help during illness, loans for education, and funds for domestic and overseas migration. In some low-income countries, the most prevalent forms of exchange are between migrants and their home household, or from an adult to elderly parents in the form of old age support. Typically, a household member is sent to the urban sector for wage employment and then sends cash home to support the family. Private transfers between family members living apart are common in developed countries as well. For example, parents frequently provide financial support to their children when they leave home or perhaps if they become single parents, and children sometimes help support their parents in old age.

In the studies on private transfers, two motives of private transfers have been identified (Cox 1987, 1990): altruism (Becker 1974) and self-interested exchange (Bernheim, Shleifer, and Summers 1985). Households may transfer resources out of feelings of altruism that implicitly determines the receiving household's consumption. Alternatively, donors may provide private transfers in order to receive something in exchange for their transfers in times of need.

The distinction between the altruism and exchange models has an important policy implication (Cox 1987; Cox and Jimenez 1990). Becker (1974), in his altruistic model, argues that public transfer programs will not affect appreciably the distribution of economic welfare. Under altruism, public transfers reduce the pre-transfer marginal utility of the recipient's consumption. Hence, if the government were to tax the donor and give the proceeds to the recipient, the donor's intention to provide transfer may fade and she/he may decide to provide a smaller amount of private transfers. This cutting back of private transfers in response to public redistribution is referred to as the "crowding-out" effect of public transfers. Thus, the Becker's altruism model predicts that public transfers tend to displace private transfers.

On the other hand, exchange-motivated transfers interact with public transfers in a different way. If transfers are motivated by exchange where the recipient compensates the donor by providing him some kind of services, public transfers will exert a negligible effect on private transfers (Cox 1987). In contrast to the assumption of the Becker (1974) altruism model, in the exchange model, it is argued that crowding-out between private and public transfers does not necessarily occur. Exchange-motivated transfers represent payments made in exchange for services provided by family members. Nonaltruistic family behavior has been investigated in a variety of contexts, including private annuity insurance (Kotlikoff and Spivak 1981) and labor supply decisions (McElroy 1985). Bernheim, Shleifer, and Summers (1985) applied an exchange model to bequest behavior. They found empirical support for the bequests-as-exchange model. Services provided by children, measured by the frequency of visits and telephone calls, were found to be positively related to the size of the parental estate.

Moreover, under exchange motive, public transfers may even increase the probability of receipts by providing donors additional sources of income. In this case, an expansion of social insurance by the government will increase the size of the risk-sharing pool and may act as an effective social safety net device for households. That is, exchange-motivated transfers can actually amplify, rather than offset, the effect of redistributive policies on the well-being of the recipients of private transfers.

Existing evidences on the extent and magnitude of the crowding-out effect of public transfers are mixed. In some studies, it was suggested that public transfers exerted a negligible effect on private ones (e.g., Cox and Jakubson 1995; Cox and Rank 1992; Altonji, Hayashi, and Kotlikoff 1992, 1997; Rosenzweig and Wolpin 1994), while in others (e.g., Cox and Jimenez 1992, 1995; Cox, Eser, and Jimenez

1998; Jensen 2002), it was indicated that the probability for crowding-out to occur could be quite high. For example, Cox and Jimenez (1995) estimated that if an unemployment insurance system were to be introduced in the Philippines, private transfers would fall so much that the intended beneficiaries of the program would scarcely be any better off. In contrast, they observed that the degree of crowding-out associated with pensions was much less significant.

Due to the crowding-out effect, responses of private transfers to public transfer programs pose much more difficult targeting problems. The reason is that private transfers are likely to originate from high-income groups. Suppose a public income transfer is targeted to a low-income household that depends in part on support coming from a high-income household. Suppose further that, in response to the public transfer program, the high-income household cuts back some of its private support. Then the high-income household indirectly benefits from a program ostensibly targeted to the poor.

In East Asia, many households are likely to be altruistically linked through a widespread and operative informal transfer network. From the assumption that as the amount of public transfers increases, donors of altruistically linked private transfers may cutback their private transfer provisions, a government subsidy intended only for those people in need may indirectly benefit donors who are often from the upper-income brackets and protected from exogenous shocks (Morduch 1999). Hence, a quantitative assessment of the altruistic model is very important. If the assumption of the altruism model is verified, that is the crowding-out effect is proved to exist, the government then should have developed careful targeting schemes to ensure the effectiveness of its social safety net programs.[1]

## III.   DESCRIPTIVE EVIDENCE

### A.   *Data*

The main data source is the Korean Household Panel Survey (KHPS) conducted by the Daewoo Research Institute that covers all prefectures except Jeju-do. Based on a stratified random sampling by street block, the data are collected through household- and individual-level multipurpose surveys.[2] In this paper, the survey data for 1995–98 were used. Each round covers the period from August to July of the

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[1] The referees pointed out the difficulties in specifically differentiating the practices of altruistic transfers from those of exchange-motivated transfers, particularly in East Asian societies where the influence of Confucianism is still strongly felt. In this type of environment, people would like to maximize the utility of the whole household. In other words, an individual is not considered as an object for the maximization of utility. This argument may lead to the assumption that it may be more appropriate to reconstruct the analytical framework by adopting an expanded, longer-term model that may not be restricted by the dichotomy between altruistic and exchange-motivated models.

[2] The data structure follows the Panel Survey of Income Dynamics (PSID) data of the United States.

next year. The 1998 round is considered to reflect the period of the financial crisis since it covered the period from August 1997 to July 1998. Income and expenditure variables were converted into real value by using provincial consumer price indices.

### B.    *Impact of the Financial Crisis on Household Income and Consumption*

Table I shows that the total income increased by 10 per cent between 1995 and 1997. Labor income increased by 6.8 per cent while asset income increased by 18 per cent—accounting for 71 and 19 per cent of the total income in 1997, respectively. The number of public and private transfers also increased but accounted for only a small percentage of the total income, i.e., 3.7 per cent in 1997.

However, with the onset of the financial crisis, per capita total income fell by 24.1

TABLE I

DESCRIPTIVE STATISTICS FOR THE ENTIRE SAMPLE

|  | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|
| Age of head | 47.1 | 48 | 48.8 | 50.2 |
| Household size | 3.8 | 3.8 | 3.7 | 3.7 |
| Total income | 7,085 | 7,843 | 7,795 | 5,920 |
| Pre-transfer income | 6,885 | 7,579 | 7,494 | 5,610 |
| Labor income | 5,184 | 5,531 | 5,535 | 4,056 |
| Asset income | 1,220 | 1,523 | 1,443 | 854 |
| Transfer income | 196 | 262 | 290 | 314 |
| Private transfers | 133 | 205 | 228 | 228 |
| Public transfers | 63 | 57 | 62 | 86 |
| Other income | 516 | 585 | 555 | 737 |
| Outstanding debt (formal bank loans, informal and personal loans) | 2,038 | 2,385 | 2,171 | 3,006 |
| Financial assets (saving accounts, shares, bonds, insurances, and loans) | 2,368 | 2,788 | 2,740 | 2,857 |
| Total expenditure | 6,284 | 5,397 | 5,437 | 4,300 |
| Non-durable | 1,450 | 1,376 | 1,420 | 1,087 |
| Food | 979 | 991 | 1011 | 842 |
| Housing | 3 | 3 | 3 | 3 |
| Clothing | 263 | 236 | 232 | 148 |
| Education | 540 | 569 | 615 | 469 |
| Medical and child care | 322 | 172 | 180 | 172 |
| Luxury (durables and dining out) | 673 | 590 | 526 | 189 |
| Car | 1,280 | 681 | 617 | 367 |
| Public utilities | 1,863 | 1,831 | 1,892 | 1,820 |
| Others | 149 | 164 | 175 | 197 |
| Number of households | 2,985 | 2,676 | 2,536 | 2,215 |

Note: Income and expenditure values are indicated in 1,000 Korean won per capita household at constant 1995 prices.

TABLE II

PERCENTAGE OF TRANSFER RECIPIENTS BY YEAR

| | | | | (%) |
|---|---|---|---|---|
| | Private | Public | Total | Number of Households |
| 1995 | 13.1 | 6.2 | 17.9 | 2,985 |
| 1996 | 16.7 | 6.5 | 20.9 | 2,676 |
| 1997 | 18.3 | 9.3 | 22.8 | 2,536 |
| 1998 | 21.7 | 16.3 | 30.6 | 2,215 |
| Total | 15.3 | 7.8 | 20.1 | 13,977 |

per cent between 1997 and 1998. The two major income categories—labor and asset income—dropped by 26.7 and 40.8 per cent, respectively. Private transfers remained identical. Public transfers, on the other hand, rose by 38.7 per cent. Although transfer income accounted for only a small share of the total income, its share increased from 3.7 per cent to 5.3 per cent in contrast to the decrease of the share of the labor income from 71.0 per cent to 68.5 per cent.

With the contraction of the economy, rising unemployment, and falling income, household expenditure also dropped by 20.9 per cent during the same period. The largest drop of 64.1 per cent was recorded in the consumption on luxurious items (durables and dining out), 16.7 per cent in food consumption, and 23.7 per cent in consumption on education (which includes expenses for extracurricular activities and additional after-school classes). Although the consumption on food and education fell in absolute terms during the crisis, it accounted for a higher proportion of household budgets—30.5 per cent of total expenditure. The share of expenditure on nondurables remained almost the same, 26.1 and 25.3 per cent, respectively, while that of luxury expenditure fell from 9.7 per cent to 4.4 per cent. This suggests that average households were cutting back consumption on non-essential items to weather the crisis and protect consumption on food and education.

Table II shows that the percentage of households that received private and public transfers had increased since 1995. Throughout the period, there was an increasing trend in the number of households who received private and public transfers. The percentage of households that received private and public transfers rose from 18.3 and 9.3 per cent in 1997 to 21.7 and 16.3 per cent in 1998, respectively. This evidence suggests that private and public transfers were important risk-coping devices during the financial crisis.

Furthermore, Table III indicates the percentage of recipients of private and public transfers by characteristic of household head. By gender, there was no remarkable change over time. Throughout the period, the percentage of male-headed households was higher than that of female-headed households. However, considering that the percentage of female-headed households was just about 10 per cent of the total

TABLE III

PERCENTAGE OF TRANSFER RECIPIENTS BY CHARACTERISTIC OF HOUSEHOLD HEAD

|  |  | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|
| Private transfers |  |  |  |  |  |
| Gender: | Female | 24.9 | 27.3 | 26.3 | 26.3 |
|  | Male | 75.1 | 72.7 | 73.7 | 73.7 |
| Region: | Urban | 40.8 | 37.7 | 34.8 | 34.6 |
|  | Rural | 59.2 | 62.3 | 65.2 | 65.4 |
| Occupation: | Salaried | 19.7 | 13.5 | 13.6 | 12.3 |
|  | Self-employed | 11.8 | 11.0 | 9.7 | 9.2 |
|  | Farmers and fishers | 27.4 | 31.6 | 33.9 | 32.6 |
|  | Unemployed and |  |  |  |  |
|  |   non-paid | 41.2 | 44.0 | 42.8 | 46.0 |
| Education: | Primary or less | 46.7 | 53.8 | 51.0 | 49.2 |
|  | Secondary | 37.5 | 31.6 | 37.2 | 36.0 |
|  | Tertiary | 15.8 | 14.6 | 11.9 | 14.8 |
| Public transfers |  |  |  |  |  |
| Gender: | Female | 22.1 | 21.8 | 23.2 | 22.9 |
|  | Male | 77.9 | 78.2 | 76.8 | 77.1 |
| Region: | Urban | 39.3 | 31.6 | 30.9 | 24.9 |
|  | Rural | 60.8 | 68.4 | 69.1 | 72.1 |
| Occupation: | Salaried | 18.9 | 13.8 | 14.0 | 10.0 |
|  | Self-employed | 8.7 | 9.8 | 5.5 | 11.9 |
|  | Farmers and fishers | 26.5 | 29.9 | 30.1 | 33.2 |
|  | Unemployed and |  |  |  |  |
|  |   non-paid | 46.0 | 46.6 | 50.4 | 44.9 |
| Education: | Primary or less | 44.6 | 44.8 | 53.0 | 48.9 |
|  | Secondary | 40.3 | 43.1 | 37.3 | 40.3 |
|  | Tertiary | 15.1 | 12.1 | 9.8 | 10.8 |

sample, it can be said that female-headed households received more private and public transfers than male-headed households. By area, the percentage of rural households was higher than that of urban households and there was no significant change in the distribution of private transfers among these households. With respect to public transfers, the percentage of rural households increased by 3.0 per cent, while the percentage of urban households dropped by 6.0 per cent.

By occupation, households with unemployed or non-paid head accounted, not surprisingly, for the highest share. In addition, it seems that they received more private transfers than public transfers during the crisis since the percentage of those who received private transfers increased by 3.2 per cent, in contrast to the 5.5 per cent fall in the percentage of those who received public transfers. By educational level, household head with primary or less education accounted for the largest share. Overall, almost no change was observed depending on the educational level even during the crisis.

One of the key premises for private transfer is that it responds to capital-market

imperfection. If this is true, transfer receipts should be more frequent in the phase of the life-cycle when desired consumption exceeds current earnings. If households prefer to smooth consumption over the life-cycle and transfers help to achieve this objective, then the young and the old persons receive more transfers than the middle-aged ones. Thus the timing of transfers is very important.

Table IV depicts the pattern of private and public transfers by age of household head. In 1998, households with a head above sixty years old received about 480,000 won per capita of private transfers and those with a head below thirty-five years old received 230,000 won. On the other hand, households with head age of thirty-six to sixty years old received only 70,000 won as private transfers, indicating that households with a head above sixty years old tended to receive more public transfers than other households. This is not surprising since public transfers consist mainly of pensions. The amount of public and private transfers received by households with head age of twenty to twenty-five years old in 1996 and 1998 was large due to a change of head and change in occupation status. For example, the gender of the head of two households among three households which received private transfers changed to fe-

TABLE IV

AVERAGE PER CAPITA PRIVATE AND PUBLIC TRANSFERS BY AGE OF HOUSEHOLD HEAD

|  | 1995 | 1996 | 1997 | 1998 | Total |
|---|---|---|---|---|---|
| Private transfers |  |  |  |  |  |
| 20–25 | 71 | 0 | 0 | 147 | 43 |
| 26–30 | 235 | 272 | 489 | 243 | 192 |
| 31–35 | 67 | 63 | 182 | 302 | 93 |
| 36–40 | 46 | 58 | 34 | 77 | 43 |
| 41–45 | 30 | 34 | 98 | 77 | 48 |
| 46–50 | 42 | 14 | 19 | 19 | 21 |
| 51–55 | 49 | 54 | 77 | 73 | 52 |
| 56–60 | 84 | 170 | 241 | 105 | 135 |
| 61–65 | 179 | 326 | 366 | 386 | 285 |
| 66–70 | 514 | 816 | 491 | 574 | 584 |
| Above 70 | 590 | 900 | 896 | 789 | 755 |
| Public transfers |  |  |  |  |  |
| 20–25 | 0 | 190 | 0 | 20 | 40 |
| 26–30 | 0 | 46 | 117 | 208 | 39 |
| 31–35 | 24 | 18 | 33 | 67 | 21 |
| 36–40 | 36 | 20 | 31 | 10 | 21 |
| 41–45 | 13 | 10 | 6 | 21 | 10 |
| 46–50 | 25 | 4 | 7 | 19 | 14 |
| 51–55 | 37 | 59 | 49 | 53 | 42 |
| 56–60 | 59 | 51 | 46 | 79 | 50 |
| 61–65 | 231 | 174 | 136 | 54 | 140 |
| 66–70 | 186 | 197 | 224 | 263 | 189 |
| Above 70 | 129 | 133 | 146 | 296 | 157 |

Note: Values are indicated in 1,000 Korean won at constant 1995 prices.

male and the head of another household became unemployed where more transfers were received as shown in Table III.

## C.  *Private and Public Transfers as Social Safety Nets*

One of the main concerns of this paper was to analyze the role of private and public transfers as social safety net during the financial crisis. Table V shows the trend of private and public transfers based on per capita pre-transfer income decile.

In terms of per capita pre-transfer income decile, the poorest 10 per cent group received the largest amount of private transfers, e.g., 1,016,000 won in 1998. Interestingly, during the crisis, the private transfer network was expanded to the next lowest three deciles—transfers increased by 98 per cent in 1998 for households in the lowest 30 per cent decile.

The poorest 10 per cent group also received the largest amount of public transfers, composed mainly of financial support received by the poor from the government or social organizations rather than pensions, during the crisis. During the same period, middle-percentile groups tended also to receive more public transfers. On the other

TABLE  V

AVERAGE PER CAPITA PRIVATE AND PUBLIC TRANSFERS BY DECILE

| Percentile | 1995 | 1996 | 1997 | 1998 | Change '96–'97(%) | Change '97–'98(%) |
|---|---|---|---|---|---|---|
| Private transfers | | | | | | |
| 10 | 665 | 1,187 | 1,121 | 1,016 | −5.6 | −9.4 |
| 20 | 86 | 210 | 244 | 321 | 16.2 | 31.6 |
| 30 | 88 | 89 | 122 | 229 | 37.1 | 97.7 |
| 40 | 43 | 84 | 72 | 128 | −14.3 | 77.8 |
| 50 | 24 | 87 | 90 | 72 | 3.5 | −20.0 |
| 60 | 26 | 36 | 71 | 47 | 97.2 | −33.8 |
| 70 | 86 | 80 | 80 | 43 | 0 | −46.3 |
| 80 | 69 | 47 | 209 | 133 | 344.7 | −36.4 |
| 90 | 85 | 123 | 98 | 70 | −20.3 | −28.6 |
| 100 | 120 | 128 | 227 | 116 | 77.3 | −48.9 |
| Public transfers | | | | | | |
| 10 | 242 | 286 | 276 | 300 | −3.5 | 8.7 |
| 20 | 77 | 10 | 77 | 68 | 670.0 | −11.7 |
| 30 | 41 | 39 | 57 | 132 | 46.2 | 131.6 |
| 40 | 22 | 25 | 23 | 82 | −8.0 | 256.5 |
| 50 | 29 | 13 | 15 | 88 | 15.4 | 486.7 |
| 60 | 43 | 23 | 18 | 29 | −21.7 | 61.1 |
| 70 | 37 | 34 | 34 | 54 | 0 | 58.8 |
| 80 | 14 | 36 | 20 | 33 | −44.4 | 65.0 |
| 90 | 47 | 27 | 40 | 34 | 48.2 | −15.0 |
| 100 | 75 | 65 | 60 | 45 | −7.7 | −25.0 |

Note:  Values are indicated in 1,000 Korean won at constant 1995 prices.

hand, the amount of public transfers in the richest 10 per cent and 20 per cent groups dropped by 25 per cent and 15 per cent, respectively.[3]

Table VI summarizes the distribution of public transfers in 1998. The average amount of per capita public transfers included national pensions, financial support from the government or social organizations, and unemployment insurance. The poorest half of total households received more than the average amount of total public transfers (85,800 won). Compared to the 20 percentile, the 30 percentile received more pensions, because it included a larger number of households receiving pensions: eight households against two households in the 20 percentile.

Financial support from the government or social organizations, as expected, played a major role in helping the poor. However, the larger average amount of pension relative to that of support from the government and social organizations suggests that most of the public transfers may have acted more as permanent sources of extra income than as temporal safety net devices. The role of unemployment insurance was negligible since the coverage of an official unemployment insurance program was expanded substantially only after October 1998.[4]

TABLE VI

AVERAGE PER CAPITA PUBLIC TRANSFERS IN 1998 BY CATEGORY AND DECILE

| Percentile | Pension | Financial Support from the Government and Social Organizations | Unemployment Insurance | Total |
|---|---|---|---|---|
| 10 | 177 | 121 | 1 | 300 |
| 20 | 17 | 51 | 0 | 68 |
| 30 | 120 | 10 | 2 | 132 |
| 40 | 74 | 3 | 5 | 83 |
| 50 | 83 | 6 | 0 | 88 |
| 60 | 27 | 1 | 1 | 29 |
| 70 | 49 | 4 | 0 | 54 |
| 80 | 29 | 1 | 2 | 33 |
| 90 | 26 | 8 | 0 | 34 |
| 100 | 44 | 1 | 0 | 45 |
| Mean | 64 | 21 | 1 | 86 |

Note: Values are indicated in 1,000 Korean won at constant 1995 prices.

[3] In 1995 and 1996, Table V shows that households belonging to the 80 percentile received a smaller amount of private and public transfers than those in the 90 and 100 percentiles. This is due to the difference in household size, i.e., in 1996, the household sizes of 80 and 90 percentiles were 4.0 and 3.8, respectively and the estimation later showed that the household size was negatively correlated with the amount of transfers.

[4] The new formal unemployment insurance scheme expanded its coverage from firms with more than thirty employees to all firms as well as to temporary and daily workers.

## IV.   ESTIMATION

### A.   *Empirical Model Specification*

Under the altruistic motive, the variable determining whether a transfer occurs depends on the difference between the donor's marginal utility of consumption and the recipient's marginal utility of consumption (Cox 1987). A rise in the recipient's pre-transfer income reduces transfers because it lowers the donor's marginal utility from transferring income to her/him. Therefore, the richer the recipient is, the less likely for him to receive a transfer.

On the other hand, the exchange motive predicts that the latent variable determining the transfer decision is inversely related to the pre-transfer income of the recipient because increases in pre-transfer income reduce the chances that transfers are mutually beneficial.

In order to identify the motives of private transfers quantitatively, we employed the empirical model of Cox (1987) and Cox, Eser, and Jimenez (1998). To determine whether a transfer occurs, the following stochastic model of the latent variable that indicates private transfer receipts of household $i$ at time $t$ can be used:

$$PRT_{it} = \alpha_1 y_{it} + \alpha_2 PUT_{it} + X_{it}\beta + u_i + u_t + \varepsilon_{it}, \tag{1}$$

where $PRT$ is a latent variable of private transfers. Per capita pre-transfer income and public transfers are represented by $y$ and $PUT_{it}$, respectively. The matrix, $X$, includes various household characteristics. The last term, $\varepsilon$, represents the well-behaved stochastic error term. In order to compensate for unobserved heterogeneity, we also included household and time fixed effect, $u_i$ and $u_t$, respectively, where the latter was expected to capture the aggregate effects of the financial crisis.

The dependent variable of equation (1) is a latent variable which can be observed only when positive. Therefore, we estimated the binary transfer functions by defining the following binary variables:

$$\begin{aligned} \delta^{PRT}_{it} &= 1 \quad \text{if } PRT_{it} > 0, \\ &= 0 \quad \text{otherwise.} \end{aligned} \tag{2}$$

Since equation (1) includes household fixed effects, we employed Chamberlain's (1981) conditional likelihood function and estimated the Logit model with fixed effects. We estimated private and public transfers separately by assuming that the error term, $\varepsilon$, in equation (1) is independent and uncorrelated with $PUT$ and $X$. This assumption is plausible, since most of the unobserved factors that affect private and public transfers can be captured by household and time fixed effects.

Note that, per capita pre-transfer income is included as an independent variable. The key to identify transfer motives is the sign for the pre-transfer income coeffi-

cient in the decision versus the amount equation. Cox (1987) observed that the comparative statistics results for the transfer decision were the same for both transfers motivated by altruism and exchange. This finding implies that information on transfer decisions alone is insufficient for making inferences about transfer motives. Thus the estimated coefficient for pre-transfer income in equation (1) is not sufficient to identify transfer motives.

Nevertheless, through the estimation of the transfer amount equation, we can identify the transfer motives since the exchange motive predicts a positive coefficient on the recipient pre-transfer income while the altruistic motive predicts a negative sign (Cox 1987; Cox and Rank 1992). Hence, we also estimated the transfer amount equation as follows:

$$PRT_{it} = \beta_1 y_{it} + \beta_2 PUT_{it} + X_{it}\gamma + u_t + u_i + \varepsilon_{it} \qquad \text{if } PRT_{it} > 0. \qquad (3)$$

For the estimation, instead of adopting a Tobit model with household fixed effect which uses, for example, the trimmed least absolute deviation estimator developed by Honoré (1992), we employed a random effect Tobit model since the estimation method for fixed effect Tobit model has not yet been developed and no practically reliable computation methodology is appropriate for our data (Lee 2002). In the random effect Tobit model, the household specific term, $u_i$, is a stochastic variable. The likelihood function to estimate the random effect Tobit model involves integration over the household random effects, $u_i$. We utilized an approximation of the likelihood with Gauss-Hermite quadrature. According to Cox (1987), the sign hypothesis for $\beta_1$ is positive under exchange and negative under altruism. If the estimated coefficient of public transfers, $\beta_2$, is negative, it indicates the presence and magnitude of the crowding-out effect of public transfers

In equations (1) and (3), the matrix of other control variables, $X$, includes the household head's characteristics such as age, education level, and occupation and the household's demographic characteristics. We have two specific comments on the selection of independent variables.

First, we included age variables of household head because, as Cox (1990) emphasized, the timing of transfers over the life cycle is important, especially for households facing liquidity constraints. If households are subject to binding borrowing constraints, the transfer receipts will be concentrated at an early age when current resources are low. Although developing countries provide public pensions, most of them apply only to urban workers in the formal sector (World Bank 1989). Thus, old family members are likely to depend on informal support from young family members.

Second, in order to capture the effect of the transfer network of an extended family, we entered variables representing the residential area, gender of household head, family size, and the number of children and elderly as household's characteristics. Particularly, the number of children will be an important determinant of public

transfers in light of the old-age insurance motives of having many children. In addition, larger households are likely to obtain a large amount of public transfers since they have more members to support.

### B.    *Estimation Results*

In order to examine the impact of the financial crisis on private transfers, we conducted separate estimations for the entire period, 1995–98, before the crisis period, 1995–97, and during the crisis period, 1998. The correlation matrix of the variables used in the estimation is reported in the Appendix Table. Table VII reports the Logit and Tobit estimation results of fixed effects and random effects. In the first two columns with the entire sample, since year dummies were significantly positive and increasing over time, it appears that the overall amount of private transfers had increased.

Before the crisis, since the coefficient of per capita pre-transfer income was not statistically significant, it was difficult to identify the motives of private transfers in terms of decision while the coefficient of the amount was negative and significant.[5] These results together suggest that the altruistic motive of private transfers existed before the crisis. In addition, a significant crowding-out effect between private and public transfers was observed, since the coefficient of public transfers was highly negative and significant, a finding which is consistent with previous findings for other countries (e.g., Cox and Jimenez 1990, 1995; Cox, Eser and Jimenez 1998; Jensen 2002).

As for the effects of occupational characteristics, households whose head was unemployed, a non-paid worker or engaged in agriculture and fisheries activities were clearly targeted by private transfers. On the other hand, households with a self-employed head appeared to receive a significantly lower amount of private transfers. With respect to the age variables, the coefficient of age of the household head was significantly negative whereas that of age squared was significantly positive. These results suggest that the amount of private transfers tended to decrease initially as the household head became older and then started to increase again at a certain age level, possibly reflecting the liquidity constraints of the old age group (Cox 1990).

On the other hand, during the financial crisis, pre-transfer income had a negative and significant coefficient in both the decision and amount equations, indicating

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[5] In order to remove the influence of macro-shock due to the financial crisis, the 1998 income was replaced by the average income over 1996–97. The estimation results were highly consistent with those in Table VII. First, the coefficient for Logit estimation of equation (1) was –1.000 (*z*-value = –6.08), compared with –0.822 (*z*-value = –4.37) in Table VII. In addition, the coefficient for Tobit estimation of equation (3) was –84.107 (*z*-value = –5.63), also compared with –55.476 (*z*-value = –3.99). Since absolute values of the coefficients were larger than those in Table VII, it can be inferred that the degree of altruistic motive became stronger if the effect of the financial crisis on the 1998 income was ignored. In other words, the altruistic motive became weaker due to the financial crisis.

TABLE VII

PANEL ESTIMATION RESULTS

| | Entire Period | | Before the Crisis | | During the Crisis | |
|---|---|---|---|---|---|---|
| | Fixed Effects Logit | Random Effects Tobit | Fixed Effects Logit | Random Effects Tobit | Fixed Effects Logit | Random Effects Tobit |
| Pre-transfer income / $10^3$ | −0.058 (0.79) | −22.159 (3.99)** | −0.07 (0.78) | −21.729 (3.49)** | −0.822 (4.37)** | −55.476 (3.99)** |
| Public transfers | −0.009 (3.52)** | −0.481 (6.5)** | −0.008 (2.94)** | −0.781 (5.99)** | −0.003 (2.88)** | −0.316 (3.99)** |
| = 1 if the head is self-employed | 0.246 (0.91) | 4.387 (0.39) | 0.414 (1.24) | 9.292 (0.71) | −0.168 (0.77) | −17.994 (0.94) |
| = 1 if the head is engaged in agriculture/fisheries/part-time | 0.746 (2.91)** | 88.839 (7.60)** | 0.673 (2.01)* | 93.469 (6.80)** | 0.861 (4.21)** | 70.953 (3.67)** |
| = 1 if the head is unemployed/ non-paid | 1.317 (5.04)** | 167.428 (13.49)** | 1.363 (3.93)** | 180.664 (12.00)** | 1.271 (6.09)** | 140.177 (7.13)** |
| Household size | −0.203 (2.28)* | −20.082 (5.30)** | −0.261 (2.12)* | −18.545 (4.16)** | −0.22 (3.38)** | −27.485 (4.50)** |
| Number of children below fifteen | 0.169 (1.07) | −5.95 (1.09) | 0.42 (1.97)* | −11.003 (1.71) | 0.08 (0.89) | 8.752 (1.01) |
| Number of elderly members above sixty | 0.226 (2.54)* | 37.715 (8.00)** | 0.242 (2.03)* | 37.153 (6.56)** | 0.366 (4.77)** | 37.708 (5.21)** |
| Age of the head | −0.145 (2.55)* | −9.085 (4.30)** | −0.183 (2.41)* | −10.309 (4.13)** | −0.054 (3.84)** | −2.026 (0.62) |
| Age squared / 103 | 1.109 (2.02)* | 93.958 (4.74)** | 1.406 (1.98)* | 106.864 (4.55)** | 0.634 (3.82)** | 27.282 (0.92) |
| = 1 if the head is a junior high school graduate | 0.307 (0.58) | 8.365 (0.66) | −0.334 (0.44) | 0.939 (0.06) | 0.129 (0.66) | 28.222 (1.54) |
| = 1 if the head is a senior high school graduate | −1.049 (1.88) | −8.703 (0.67) | −1.936 (2.50)* | −11.05 (0.72) | −0.082 (0.41) | 10.06 (0.52) |
| = 1 if the head is a college graduate or above | −0.613 (0.82) | 52.581 (3.52)** | −2.258 (2.16)* | 45.612 (2.62)** | 0.696 (2.96)** | 89.907 (3.94)** |
| = 1 if the head is a female | −0.143 (0.39) | 81.925 (6.82)** | −0.86 (1.59) | 83.523 (5.90)** | 0.531 (2.75)** | 64.768 (3.63)** |
| = 1 if the head resides in an urban area | 2.191 (1.81) | −15.695 (1.93) | 35.782 (0.00) | −9.745 (1.03) | −0.371 (2.81)** | −27.128 (2.24)* |
| = 1 for 1996 | 0.435 (4.08)** | 33.262 (4.00)** | 0.464 (4.25)** | 35.017 (4.07)** | | |
| = 1 for 1997 | 0.627 (5.65)** | 39.121 (4.67)** | 0.665 (5.69)** | 40.458 (4.66)** | | |
| = 1 for 1998 | 0.791 (6.81)** | 36.533 (4.27)** | | | | |
| Constant | | −33.079 (0.59) | | −22.709 (0.34) | | −100.1 (1.08) |
| Observations | 2,867 | 9,915 | 1,755 | 7,798 | 2,117 | 2,117 |
| Number of households | | 3,076 | | 2,979 | | |

Note: Absolute value of *z*-statistics in parentheses.
 * significant at 5 per cent, ** significant at 1 per cent.

clearly that private transfers were altruistically motivated. This result suggests that the altruistic motive of households was reinforced during the crisis, which consequently allowed poor Korean households to depend on informal transfers. However, we should note that there was still a strong crowding-out effect between private and public transfers, implying that the effectiveness and efficiency of the government's interventions was diluted significantly.

Through comparisons of the results before and after the financial crisis, we can infer that urban households suffered from the lack of private transfers since the coefficient of urban residence dummy became significantly negative during the crisis. These results suggest that although the financial crisis promoted altruistically motivated private transfer networks, urban households still required informal financial support.

Other findings during the crisis were similar to those before the crisis, which can be summarized as follows. First, households whose head was unemployed, a nonpaid worker or engaged in agriculture and fisheries activities and in part-time jobs were targeted by private transfers. Second, larger households tended to receive a smaller amount of private transfers. On the other hand, households with more elderly members were well targeted by private transfers.

Third, the significant positive coefficients for female-headed households indicate that female-headed households were more likely to receive transfers, and in larger amounts than male-headed households—a consistent pattern across countries (Lucas and Stark 1985; Kaufman and Lindauer 1986; Cox 1987; Cox and Jimenez 1989). We should note that this result was not related to the poverty of female-headed households, since even after holding current income constant—comparing transfer amounts across households with similar income levels—the same pattern persisted. One possible reason for this finding is simply that females tend to live longer than males and may receive a larger amount of old-age transfers through an altruistically linked informal network and formal channel. Another reason may be that private transfers compensate females for wage discrimination in the formal labor market.

Finally, an interesting finding over the periods was the change in the sign of the coefficient of college graduate dummy. This can be interpreted by a change of occupation before and during the crisis. For example, the percentage of unemployed persons among college graduates increased from 5 to 11 per cent between 1997 and 1998 while that in 1996 was 6 per cent. Furthermore the percentage of unemployed persons among junior high school graduates changed from 16, 20, and 22 per cent in 1996, 1997, and 1998, respectively. Thus it can be inferred that more college graduates tended to be unemployed than junior high school graduates so that they tended to receive a larger amount of private transfers during the crisis.

## V.  CONCLUSION

Through the estimation of an econometric model with household-level panel data before and during the financial crisis in Korea, this paper investigated the motives and crowding-out effects of private transfers. The estimation results showed that the transfer behavior of Korean households was altruistically motivated, especially during the crisis. Yet, the amount of altruistically motivated private transfers was still insufficient for households living in urban areas. In addition, the estimation results suggest that the altruistic motive of Korean households was quite widespread independently of the crisis period. Furthermore, this motive became stronger during the crisis. Also, there had been a strong crowding-out effect of public transfers on private transfers.

In general, we may conclude that Korean households were well protected by inter- and/or intra-household transfers and public transfers during the crisis. However, the evidence of a strong crowding-out effect between private and public transfers suggests that the government should have designed its targeting schemes carefully in order to improve the effectiveness and efficiency of its social safety net programs.

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