Probability of Receiving an Inheritance and Leaving a Bequest: Evidence from the 1989 Survey of Consumer Finances

The results of logistic regression analysis using the 1989 Survey of Consumer Finances, suggested that a respondent's socio-demographic characteristics have significant effects on the probability of receiving an inheritance. The likelihood of a household's leaving a bequest was found to be positively and significantly related to its value of liquid and non-liquid asset holdings, education, and its attitude toward bequests, but inversely associated with the total number of children of the household. Household heads who were middle-aged, married, and not disabled were more likely to leave bequests.

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Introduction

About 80 percent of the wealth held by all American households comes from intergenerational transfers while the other 20 percent is accumulated from life cycle income (Kotlikoff & Summers, 1981). Economists estimate that more than eight trillion dollars of net wealth will transfer from one generation to the next over the coming twenty years. This is the largest movement of assets in the U. S. history (Zabner, 1993). The large percentage of wealth accumulated by intergenerational transfers and the magnitude of bequests transferred in the U. S. economy suggests a strong need for research on households' bequest behaviors.

Intergenerational transfers not only play an important role in wealth accumulation, they are also the primary cause of increased concentration of wealth in the United States (Carroll, 1991; Koretz, 1992). One study by Kennickell and Woodbum (cited in Koretz, 1992), estimated that the top one percent of all U. S. households held 31.3% of total household wealth in 1983. This percentage increased to 36.1% in 1989. The average net worth held by the top one percent of all households amounted to $5.9 and $10.3 million respectively in 1983 and 1989. This severe inequality of wealth distribution is deemed to have a great impact on the nation's economy (Carroll, 1991). Therefore, research on the characteristics of inheritance recipients and of bequest givers should provide some implications for policy makers on how to efficiently utilize national wealth.

Inheritance is recognized as a major factor in the persistence of economic inequality, an encumbrance in creating equal opportunities to families and individuals, and a barrier to socio-economic mobility. Low socio-economic mobility results in feelings of relative deprivation by people in the lower classes. These socio-economic phenomena and issues associated with inheritance have caught the attention of researchers and policy makers.

A number of theoretical and empirical studies on bequest motives, which challenge the long believed life cycle hypothesis of consumption, have been generating interest for researchers and economic implications for the government. There are three major bequest theories: 1) the altruistic bequest motive theory, which suggests that altruistic parents save financial wealth to leave to their children or invest in their children's human capital (Becker & Tomes, 1986), and in so doing, obtain utility in addition to that from their own consumption; 2) the strategic bequest motive theory, which indicates that parents hold bequeathable wealth to exchange for services they need from their children (Bernheim, 1991); and 3) the accidental bequest theory, which posits that people save due to uncertainty about the date of death or because of risk aversion, and thus, leave unexpected bequests after their death (Hurd, 1989).

Empirical studies have tested these three bequest theories, but there is no consensus about which theory is more appropriate and accurate in interpreting households' bequest behaviors. Little research has been done with identifying the determinants of bequest behaviors. Those studies that do exist usually employ regional or longitudinal data to predict the relationships between bequests and household's characteristics in their empirical models. However, national and cross-sectional data have been subject to little investigation. The present study, based on altruistic bequest theory, examines the effects of households' characteristics on their probabilities of receiving and leaving bequests, using data from a national and cross-sectional survey, which provides not

only detailed information about households, but also direct responses to inheritance questions.

Literature Review

According to human capital theory and altruistic bequest theory as posited by Becker and Tomes (1986), richer parents are more likely to give material wealth to their children to lower the pace of "regression to the mean". That is, wealthier parents not only derive satisfactions from their own consumption, but also from their children's well-being, and were more likely to leave bequests to maintain the children's economic standing or to preserve family wealth across generations (Menchik, 1989).

Several studies on intergenerational supports and caregiving among generations provide valuable empirical references to this analysis on the determinants of households' bequest behaviors. Cooney and Uhlenberg (1992) found that the age effect on the receipt of parental support was not linear, and that middle-aged householders were more likely to receive financial support from their parents than younger or older ones. Married couples were more likely to receive financial assistance from their parents, and also more likely to bequeath wealth to their spouses to assure the economic well-being of the survivors or to preserve family wealth through inheritance after they die (Kotlikoff & Summers, 1981; Hogan, Eggebeen & Clogg, 1993).

Previous research suggested that the differences in family structure, needs, and available resources, as well as migration which creates geographic distances between generations and might reduce the involvement of intergenerational interactions, in spite of the stronger family relationships recognized in black or Mexican-American families when comparing them to whites (Cox, 1987; Hogan, Eggebeen & Clogg, 1993). Hence, fewer intergenerational interactions among non-white households could lower the likelihood of receiving supports. Investigations by Cooney & Uhlenberg (1992) indicated that an individual who had more siblings would expect competition when inheriting wealth from parents. The parents of an individual who came from a larger family were less likely to have available resources for bequeathing as they might have already depleted their wealth in supporting a large family or have invested more in children's human capital (Tomes, 1981).

A household with more children would deplete family resources either by financing daily consumption or by investing in children's human capital (Becker & Tomes, 1986). As is well-documented by many studies (Cox, 1987; Eggebeen, 1992; Cooney & Uhlenberg, 1992), an individual's education was a significant determinant of providing financial assistance to children because the better educated were more likely to appreciate intergenerational interactions and to be altruistic toward improving their children's economic well-being than the less educated.

Methods

Conceptual Framework

Based on the altruistic bequest motive theory, which asserts that individuals derive lifetime utility not only from their own consumption, but also from the economic well-being of their offspring. Parents maximize utility by deriving additional satisfaction from bequest behavior which depends on children's needs, without reducing their own consumption.

This captures the spirit of the Becker's and Tomes' theoretical models (1986) in which parents gain satisfaction from children's well-being by augmenting children's earning capacities through investment in human capital and non-human capital accumulations. The probability of children's receiving a bequest is defined as a function of children's well-being measured by a linear combination of children's socio-demographic characteristics. On the other hand, parent's leaving a bequest to children to maximize utility is subject to their budget constraints. Parents expect to leave bequests based on their own financial and socio-demographic characteristics, assuming their consumption levels are known.

Data and Sample

Data used for this study are from the 1989 Survey of Consumer Finances, which was sponsored by the Federal Reserve Board in cooperation with other government agencies. This survey containing detailed and comprehensive financial and demographic as well as attitudinal information about 3,143 households offers two specific advantages to the present study. First, it over-sampled high income households which were considered more likely to involve bequest behaviors. A number of studies suggest that intergenerational transfers are one of the reasons for inequality of income and wealth distribution in the U. S. (Carroll, 1991). Therefore, it is important to include a high-income group to examine their bequest behaviors. Second, the survey contains inheritance and bequest data which are not available from other sources, such as the attitudinal variables toward leaving a bequest, expectations to receive and to leave bequests, and the amount of bequests ever received.

These allowed the present study to investigate the potential bequest behaviors of households.

Variables

The dependent variables in the two models are dichotomous. They were coded one if respondents expected to receive an inheritance or leave a bequest, zero otherwise. The probability of receiving an inheritance is a function of three groups of independent variables: economic factors including household income, liquid and non-liquid asset holdings; socio-demographic factors consisting of age, education, marital status, race, number of children under 18, and number of siblings; and health-related factors containing self-reported health and disability status. The likelihood of leaving a bequest is affected by four groups of factors. They are: household income, liquid and non-liquid asset holdings, amount of inheritance ever received, and self-employment status as economics factors; age, education, marital status, race, and number of children as socio-demographic factors; attitude toward leaving a bequest, ever made a charitable contribution, and extent of risk aversion as attitudinal factors; self-reported health and disability status as health -related factors.

The hypothesized effects of household economic and demographic factors on households' bequest behaviors were developed based on altruistic bequest theory and pervious research. Health-related and attitudinal factors have not been investigated inn existing literature. This study employed self-reported health and disability status of a household head and three attitudinal variables to explore their effects on households' bequest behaviors. As Census data indicates, individuals who were disabled had lower earning capacities (Bureau of the Census, 1994), and were less likely to accumulate available resources or wealth for bequeathing. Also, disabled individuals are more likely to incur more expenditures because of their special needs for health care and equipment or facilities, and thus have a lower probability of bequeathing in addition to the fulfilling of their own needs.

Individuals themselves who had more favorable attitudes toward bequest behaviors were expected to be more likely to have strong intentions of leaving bequests, as research on attitude-behavior relationship suggests that attitudes toward a specific behavior accounted for significant variances in behavioral intentions (Konkoly & Perloff, 1990). Individuals themselves who had more favorable attitudes toward bequest behaviors were more likely to have strong intentions of leaving bequests. Personal altruism was indicated by philanthropic behavior: whether a charitable contribution had ever made. This variable had a significantly positive effect on the probability of bequeathing. It is known that people leave bequests to spouse, children, and kin relatives, but may also bequeath their possessions to churches, foundations, or public welfare organizations (Zaleski & Zech, 1992). Respondents who were highly risk averse were less likely to leave bequests because they were conservative and would preserve their resources for future consumption after retirement or for their own financial emergency (Hurd, 1989).

Compared to the middle-aged householders, household heads at the earlier stage of life cycle might be more optimistic about their future economic standings or be less knowledgeable about the potential heavy burden of children's education and of health care expenditures in their retirement years, and thus, were more likely to expect to leave bequests. Elderly householders might expect that the wealth they owned would not be depleted during the rest of their lives (Cooney & Uhlenberg, 1992), so they were more likely to leave bequests.

Analysis

The two theoretical models, the model of the probability of receiving an inheritance and the model of the likelihood of leaving a bequest are empirically estimated by data from the 1989 Survey of Consumer Finances using the statistical procedure of logistic regression (N=3140)[2]. Since there are five multiple imputed data sets in the survey, logistic regression was performed for each set, and five sets of estimated coefficients and five variance-covariance matrices were obtained for each model. Combining analysis based on the Bayesian theory (Rubin, 1987) and SAS-IML procedure was used to obtain the final results.

Results

Sample Characteristics

About 19% of all households expected to receive inheritances in the future, while almost half of the sample expected to leave bequests to their children. For continuous variables, actual values were obtained. For instance, the mean household income before taxes and deductions was about $33,000, and the average number of children including those either co-residing or living outside, adopted, fostered and with in-laws was 2.36. For dummy and categorical variables, percentage of each specific category is calculated from the observed frequency, such that about 10% of household heads had higher education beyond college, 31% had a college degree or some college, and 59% attended school for

twelve years or less, almost 12% of the household heads in this sample were self-employed.

The Probability of Receiving an Inheritance Model

As shown in Table 1, the estimated coefficients were combined from the five individual logistic regression analyses. Education of a household head was found to be positively related to the probability of receiving an inheritance. As expected, a curvilinear relationship was found between the age of a household head and the probability of receiving an inheritance. Middle-aged householders were more likely to receive inheritances than those younger or older. Married householders were more likely to receive an inheritance than those who were single, widowed, divorced, separated, or never married. Whites were found to be more likely to receive inheritances than non-whites. As hypothesized, the number of siblings exerted a significantly negative effect on the likelihood of receiving an inheritance. A respondent perceiving him/herself in better health conditions was more likely to receive an inheritance than those having poorer health.

Table 1
Logit Results of the Probability of Receiving an Inheritance Model

VARIABLES	Coefficients
Intercept	-3.6092***
Economic Factors:	
Household income ($100,000)	.0219
Liquid assets ($100,000)	-.0195
Non-liquid assets ($100,000)	.0002
Socio-demographic Factors:	
Education	.5255***
Age	.0587*
Age squared	-.0010***
Married	.4122***
Race	.9466***
Number of children under 18	-.0589
Number of siblings	-.1558***
Health-related Factors:	
Self-reported health	.1627*
Disabled	-.2146
Model Fit: F - value	27.479***

*p < .05. **p < .01. ***p < .001.

Table 2
Changes in the Probability of Receiving an Inheritance

Changes in Variables	Changes in Probabilities
Education	
2 = college	+ .0673
3 = more than college	+ .1582
Age (by 10)	+ .0902
Age squared	- .0724
Married (0 vs. 1)	+ .0517
Race (0 vs. 1)	+ .1025
Number of siblings(by 1)	- .0186
Self-reported health	
fair	+ .0172
good	+ .0364
excellent	+ .0581

Table 2 presents the changes in the probabilities of receiving an inheritance as the magnitudes of the independent variables change. By calculating changes in the probabilities which indicated the strengths of the effects of independent variables on the predicted probabilities, this further step of model testing confirmed the results of the logistic regression analyses.

An individual who had a post-baccalaureate education had a greater probability of receiving an inheritance than a high school graduate by almost .16, other things being equal. As mentioned earlier, a curvilinear relationship existed between age and the likelihood of receiving an inheritance. Mathematically speaking, the probability increased by .0902 as a respondent's age increased by 10 years, but it decreased by .0724 when age squared was inflated by 1061.6. In other words, the probability of receiving an inheritance would increase as a respondent ages until he or she reached the age of 29.35. At that age, the probability of receiving an inheritance maximized at .2514, and then the likelihood started decreasing. Whites had greater likelihood of receiving an inheritance than non-whites by about .10, holding other variables constant. Having one more sibling lowered the probability of receiving an inheritance by .0186.

The Probability of Leaving a Bequest Model

As expected, the liquid and non-liquid asset holdings of a household were found to be significantly and positively related to the probability of leaving a bequest (see Table 3). This reflects the fact that households owning more financial resources were more likely to invest in accumulations of either children's human or non-human capital, in addition to financing their own consumption or needs (Becker, 1988; Becker & Tomes, 1979 & 1986; Bernheim, 1991; Hurd & Mundaca, 1989; Menchik & David, 1983; Tomes, 1981). Surprisingly, household income and the amount of inheritance ever received were insignificant factors affecting the possibility of leaving bequests after combining the results of the five data sets, but they were significant in the estimated model using individual data sets. Due to the multiple-imputation technique employed in the 1989 Survey of Consumer Finances, substantial variations in the estimated coefficients of these two variables were detected among the five data sets, and thus, altered the combined results.

Table 3
Logit Results of Probability of Leaving a Bequest Model

VARIABLES	Coefficients
Intercept	-.3075
Economic Factors:	
Income ($100,000)	.5028
Liquid assets ($100,000)	.6883***
Non-liquid assets ($100,000)	.0574**
Inheritance ever received ($100,000)	.4991
Self-employed	.0258
Socio-demographic Factors:	
Education	.2051**
Age	-.0715***
Age squared	.0005**
Married	.2225*
Race	-.0364
Number of children	-.0588*
Number of siblings	-.1558***
Health-related Factors:	
Self-reported health	.0390
Disabled	-.8440***
Attitudinal Factors:	
Attitude toward leaving bequests	.6377***
Ever made a charitable contribution	.2387*
Extent of risk aversion	-.1480*
Model Fit: F - value	32.019***

*p < .05. **p < .01. ***p < .001.

Married household heads were found, as hypothesized, to be more likely to leave bequests than the non-married, and the total number of children was found to have a significantly negative effect on the likelihood of leaving bequests. Controlling all other variables, better-educated householders had a greater likelihood to leave bequests. Disabled householders were less likely to leave bequests than the non-disabled. The likelihood of leaving bequests varied significantly and positively according to the level of perceived importance toward bequeathing by a respondent. Respondents who had ever made a charitable contribution were more likely to be altruistic and to bequeath to either their descendants. The extent of risk aversion was negatively associated with the likelihood of leaving a bequest. This finding suggested that people maximize satisfactions by first enhancing their own consumption, which varies relatively according to personal psychological expectations, and then by increasing any heir's economic well-being through leaving bequests.

The strength of the explanatory variables can be seen in Table 4, where the impacts of changes in the magnitudes of independent variables on the probabilities of leaving bequests are presented. The probability of leaving a bequest is .5158, if the respondent had all the average characteristics among the 3,140 respondents.

Table 4
Changes in the Probability of Leaving a Bequest

Changes in Variables	Changes in Probabilities
Liquid assets (by $100,000)	+ .1637
Non-liquid assets (by $100,000)	+ .0143
Age (by 10)	- .1733
Age squared	+ .0924
Married (0 vs. 1)	+ .0555
Race (0 vs. 1)	+ .1025
Number of children (by 1)	- .0147
Education	
2 = college	+ .0512
3 = more than college	+ .1015
Disabled (0 vs. 1)	- .2034
Attitude toward leaving bequests	
2 = somewhat important	+ .1297
3 = no different	+ .2848
4 = important	+ .4380
5 = very important	+ .5632
Ever made a charitable contribution (0 vs. 1)	+ .0594
The extent of risk aversion -- the level of risk respondents were willing to take	
2 = above average	- .0360
3 = average	- .0726
4 = no	- .1096

Liquid asset and non-liquid asset holdings increased by $100,000 advanced the probability of leaving bequests by .1637 and .0143 respectively. The U-shaped relationship between age and the probability of leaving a bequest suggested that the likelihood declined as age increased, but heightened while age square mounted. Hence, an increase of 10 years in age resulted in a decrease in the probability by .1733. Inflating age squared by 1061.6 boosted the probability by .0924. That is, the likelihood of leaving a bequest descended until age reached 71.5 years with the minimum probability of .41, and then ascended. The difference in the probability of bequeathing between the married and non-married household heads was .055. An increase in the number of children by one lowered the likelihood of leaving bequests by .147, assuming other characteristics were held at sample means. The possibility of leaving a bequest rose as a respondent's years of schooling increased. Disabled householders were found to have less probability than the non-disabled of leaving bequests by more than 0.2. The attitude toward leaving bequests indicated strong differences affecting the likelihood of bequeathing. The probability escalated exponentially as the extent of a respondent's perceived importance increased. Individuals who were unwilling to take any

financial risk had a lower probability of bequeathing by 0.11, in comparison to those who were willing to take substantial risk.

Conclusions and Implications

Based on altruistic bequest theory and the findings of previous research, this study examined the probability of receiving an inheritance and leaving a bequest using the 1989 Survey of Consumer Finances. The results of logistic regression analysis suggest that a respondent's socio-demographic characteristics such as education, age, race, and number of siblings have significant effects on the probability of receiving an inheritance. More educated and white household heads had a greater likelihood of receiving an inheritance than the less educated or non-white ones. Household heads who were in the middle stage of the life cycle or had fewer siblings were more likely to expect an inheritance than those younger or older or who have more siblings. The probability of leaving a bequest by a household head was found to be positively and significantly related to the value of his or her liquid and non-liquid asset holdings, education, and attitude toward bequests, but inversely associated with the total number of children. Household heads who were middle-aged, married, and not disabled were more likely to leave bequests. The findings of this study suggest that individuals do have bequest motives: almost 50% of household heads expected to leave bequests. The average amount of an inheritance ever received amounted to $15,000 for this sample. The probability of leaving a bequest was .5158, which means a householder's likelihood of leaving a bequest was slightly higher than 50% in lay terms when his or her economic, socio-demographic, and attitudinal characteristics were all set at sample means.

By identifying and defining the factors affecting the probability of receiving inheritances and leaving bequests, and then examining the strengths of effects that a projected change might have, implications for making rational public polices related to inheritance can be drawn from this study.

Although the association between inheritance and unequal wealth distribution was not explicitly investigated, it can be seen from the findings of this study that household bequest behaviors or intergenerational wealth transfers are prevalent especially for high-income, affluent, and better educated households. A significant relationship between inheritance and income or wealth inequality has been suggested in a number of previous studies that showed redistribution would help reduce economic inequalities (Koretz, 1992; Kosters, 1992).

An effective inheritance tax policy may contribute to achieving the twin goals of wealth redistribution and socio-economic equality. However, one may argue that the ideology or "American Dream" suggests that people with talent, ambition, and efforts deserve the successes they achieve, the wealth they accumulate, and the social status they hold (Brinkerhoff & White, 1985).

Also, efficient and effective welfare and educational programs are essential to assist children from poorly-endowed families to have an equal opportunity of obtaining education and employment. However, these will not completely equalize employment opportunities that remain skewed by racial or gender discrimination. Findings from the study indicate that less educated and non-white householders are less likely to receive inheritances than the better educated and whites. This implies that the economic well-being of individuals with low human capital and non-whites would be even worse, and upward movement toward high economic status would be difficult for them. Therefore, more investments by the government in education and professional skills training as well as laws against discriminations in hiring and promoting would be fundamental to creating equal starting places and improving an individual's or household's socio-economic mobility.

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Endnotes

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2. For both models, the sample included the 3,140 households in the 1989 survey after dropping three extreme cases: two of them had total household income over $90 million, and the third received inheritances over $35 million.