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EXPECTED BEQUESTS AND THEIR DISTRIBUTION

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INTRODUCTION

Despite the central theoretical role bequests have played in economic models of inter-generational exchange (Yaari (1965)), there remains considerable controversy about their current and future importance. Some argue that bequests have had little direct role as a motivation for private savings, do not facilitate interactions across generations, and consequently have had little impact on the well-being of future generations. Others see bequests as a primary savings motive (Kotlikoff and Summers, 1981), as an important mechanism supplying incentives for appropriate care-giving behavior between the elderly and their adult children (Cox, 1987; Bernheim, Shleifer and Summers, 1985), and as a central part of the solution to financial problems associated with population aging. For example, in this view the baby-boom generations may eventually receive significant estates from their parents who have benefitted from the stock market boom, potentially alleviating the tax burden necessary to support the older generation.

Our understanding of bequest motives has been limited by the inherent problems in measuring the bequests that individuals anticipate making, and the bequests that they actually make. One often used approach has inferred bequest intentions from changes in wealth accumulation with age, especially among older households (Hurd (1989)). But, because wealth is observed with error, wealth change (the first difference in wealth) is observed with substantial error, making it difficult to base estimation on observed individual-level data. In addition to any contamination due to large measurement error in household wealth, unanticipated capital gains at the macro level can cause observed wealth change to differ from anticipated wealth change for many households. A second approach has examined patterns of actual bequests, typically relying on available estate records (David and Menchik (1985). But estate records represent bequeathing behavior of the very well-to-do, and often contain very limited information about donors and recipients alike.

In this paper we study bequest behavior by using new methods of measuring both anticipated and actual bequests from data representative of all survivors of cohorts born before 1948. By asking people to reveal their anticipated bequests, the first method informs us about the bequests current generations anticipate making in the future. Studying anticipated bequests has many advantages as it relates directly to the motives for current savings decisions of

households. Anticipated bequests are also measured in panel surveys, so that we can track how intentions to bequeath evolve over time, especially in reaction to the largely unanticipated wealth increases associated with the recent stock market boom. The second method involves actual bequests which will be obtained for a large representative sample of decedents. Because these decedents had previously been surveyed, their actual bequests can be compared to their previously stated bequest intentions as well as their prior levels of household wealth.

This paper is divided into four sections. The next section outlines the main features of the data we will use and the variables that will be constructed from that data. Our research will be based on unique data from several waves of the Health and Retirement Study (HRS). These data measure the bequests that households anticipate bequeathing, and the actual bequests that they leave. Section 3 describes our methods for estimating the expected amount of bequests of individuals and households, and the distribution of those estates across potential heirs. The fourth section contains our principal empirical findings concerning the level and distribution of expected bequest across birth cohorts, the expected inheritances to be received by children of these birth cohorts, and the amount of dissaving anticipated by these birth cohorts.

Section 1. Theory

Much of the existing economic literature on bequests has focused on distinguishing among three prominent motives for bequests: altruistic, strategic and accidental. As the label implies, "altruistic" bequests exist because individuals care about future generations, particularly their children and grandchildren (Becker, 1981; Mulligan, 1997). There are two main implications of inter-generational altruism for bequests. First, bequests should rise with the income of the donors and fall with the income of recipients so that increasing income equality across generations should lead to a fall in inheritances. Altruism also implies that the largest bequests should go to the least well-off children as parents use their financial transfers to help those children most in need.

The strategic motive specifies that bequests are the outcome of an implicit or explicit contract made between the generations. Transfers between the generations represent payments that will be made conditioned on the observed behavior of the other generation (Cox, 1987;

Bernheim, Shleifer and Summers, 1985). For example, parents may use the prospect of future bequests to induce their children to provide assistance to them when they are old. The final motive, accidental bequests, views bequests as flowing principally not from any form of inter-generational exchange, but rather as a necessary precaution against the inherent uncertainties associated with the end of life (Yaari, 1965). Individuals would like to have consumed all their assets by their death, but because the date of death is uncertain, they will die with assets and hence leave bequests.

Our goal here is not to posit tests that distinguish among these motives, but rather to develop new methods of measuring the magnitude of total bequests and their distribution for cohorts of households whose bequest leaving behavior is not yet fully realized. Whatever the motive for bequests, expected bequests of households represent a combination of their assessment of the wealth they may have at each future age, and the probability they will die at each age and bequeath that wealth. Thus, the starting point for expected future bequests involves the shape of the optimal path of household wealth at older ages.

A useful framework to derive the optimal path of household wealth is the life-cycle model of consumption (LCH) as explicated in Yaari (1965) and Hurd (1989). A typical solution is an equation of motion in marginal utility of consumption

$$(1) \qquad \frac{du_t}{dt} = u_t(h_t + \rho - r) - h_t V_t \qquad for \qquad w_t > 0$$
$$c_t = A_t \qquad for \qquad w_t = 0$$

where u_t = marginal utility of consumption at time t

h_t = mortality risk (mortality hazard)

V_t = marginal utility of bequests at time t.

ρ the subjective time rate of discount and r the real interest rate (constant and known)

A_t = flow of annuities and w_t bequeathable wealth at time t.

Suppose for the moment that there is no bequest motive, ($V_t = 0$ in (1)). If $\rho > r$,

$\frac{du_t}{dt} > 0$ so that $\frac{dc_t}{dt} < 0$ provided $u(\cdot)$ is concave,

and consumption will always decline with age. If $r > \rho$ and h_t is small as would be the case at young ages $\frac{du_t}{dt} < 0$

and consumption will increase with age. At older ages, however, h_t is approximately exponential so that at some age τ

$$h_t + \rho - r = 0, \text{ and } \frac{du_t}{dt} = 0 \text{ at } t = \tau$$

For $t \geq \tau$ $\frac{du_t}{dt} > 0$ and $\frac{dc_t}{dt} < 0$

Thus, a typical solution predicts that at some age following retirement both consumption $\{c_t\}$ and wealth $\{w_t\}$ paths will decline. Based on prior estimation, single men should begin to dissave in their late 60s and single women at about age 75 (Hurd, 1990). Should a household live to advanced old age, bequeathable wealth will be completely consumed and consumption will equal annuity income after that age. However, because the probability of dying before wealth is completely consumed is positive, expected bequests will be positive. The expected present value of bequests will be

$$\int_0^N w_t^* e^{-rt} m_t dt$$

where w_t^* is the optimal wealth path, r the interest rate and m_t equals the probability of dying at t.

Without a bequest motive, these bequests will be accidental (Yaari (1965)), but if individuals are sufficiently risk averse, bequests could still be a large fraction of bequeathable wealth.

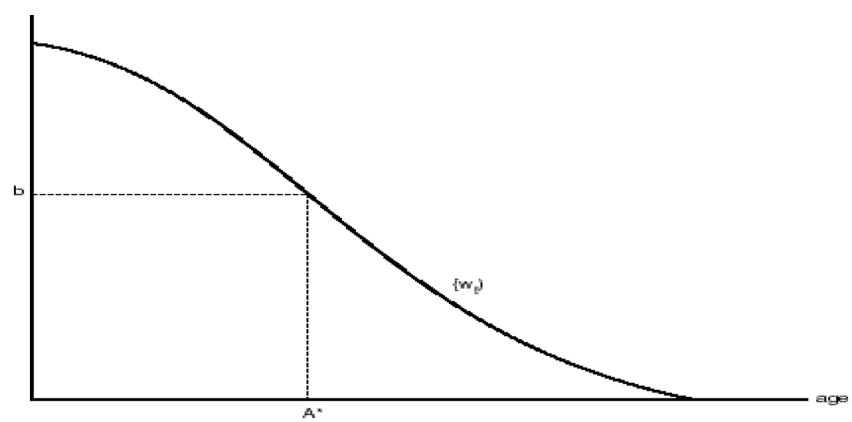

Figure 1

At sufficiently advanced ages such that individuals plan to dissave, the population will dissave provided on average the anticipations of individuals are realized. In this situation the pure effect of age (or equivalently surviving to another year) on population bequest probabilities is unambiguous in a stationary environment. As illustrated in Figure 1, with increasing age, wealth will decline and thus expected bequests must decline.[1]

In cross-sections, greater wealth should be associated with higher anticipated bequests even where there is no bequest motive: the wealth path $\{w_t\}$ in Figure 1 is shifted out. In panel data, there should be no direct relationship between wealth change and anticipated bequests as long as the observed wealth change is due to anticipated dissaving. For example, in Figure 1 panel wealth change will be small at the youngest ages shown, yet the change in anticipated bequests would be large if they are concentrated at age A. Panel wealth change will be large at ages near A, yet the change in anticipated bequests would be small if they are concentrated at very advanced ages. An unanticipated wealth change, however, should change anticipated bequests. For example, an increase in wealth through a stock market expansion should lead to an increase in anticipated bequests.

An explicit bequest motive means that individuals place value on holding wealth, which reduces consumption, and so wealth should decline less rapidly with age. An increase in the bequest motive, say through the birth of a first grandchild, would flatten the consumption path, and reduce initial consumption further, causing more wealth to be held and expected bequests to increase.

Section 2. Sources of Data

Our research relies on a set of companion surveys representative of all living members of all birth cohorts born in 1947 or earlier. These surveys include the Health and Retirement Study (HRS), the Assets and Health Dynamics of the Oldest Old (AHEAD), the Children of the

[1]An increase in life expectancy via an unexpected decrease in mortality risk at all ages will reduce bequests were there no behavioral response to the change in mortality risk: individuals would consume more of their bequeathable wealth before they die. If there is a behavioral response, however, bequests could increase: a decline in mortality risk will flatten the consumption path and reduce initial consumption, causing more wealth to be held against the increased risk of outliving resources. The total effect is ambiguous.

Depression Age (CODA), and the War-Babies Cohort. HRS is a national sample of about 7,600 households with at least one person in the birth cohorts of 1931 through 1941. Thus, HRS age-eligible persons were approximately 51-61 years old at the baseline interview in 1992. The first companion survey, AHEAD, includes 6,052 households with at least one person born in 1923 or earlier so that AHEAD subjects were aged 70 or over at the initial interview in 1993. Two year follow-ups have been conducted for both surveys and in1998 four waves of HRS and three waves of AHEAD had been completed. In 1998, these surveys were augmented with baseline interviews from the cohorts of 1924-1930 (the CODA cohort with 2,320 households) and 1942-1947 (the War Babies with 2,528 households). We will refer to the collection of all the cohorts in 1998 as HRS98. We organize the research in this paper around the birth cohorts of individuals or of households. That is, a person born between 1924 and 1930 is assigned to that birth cohort no matter which of the HRS98 samples in which he originally appeared. In married households, birth cohort is assigned by randomly selecting the birth cohort of a spouse. All data are appropriately weighted.

While HRS98 is extremely rich in survey content, there are three measures in particular that are central to our research: household wealth, anticipated bequests, and actual inheritances received. In all components of HRS98, a very comprehensive and detailed set of questions were asked to measure household wealth. In addition to housing equity, assets were separated into the following eleven categories; other real estate; vehicles; business equity; IRA or Keogh; stocks or mutual funds; checking savings or money market funds; CD's, government savings bonds or treasury bills; other bonds; other assets; and other debt. HRS98 has adopted several innovative techniques to improve the quality of wealth data and is widely regarded as providing one of the better measures of wealth in those household surveys that lack a high-income over-sample (Juster and Smith, 1997).

A second measure in the HRS involves a promising new way of obtaining insight into the existence and strength of bequest motives. This measure relies on respondents' reports about the subjective probability of leaving a bequest at or above some selected threshold amounts. These subjective probabilities tell us not only about the individual's bequest intentions and how they are changing over time, but also, when appropriately averaged, about the expectations of cohorts.

The basic form of the subjective probability of bequest questions (SPB) can be illustrated with the initial question asked about a $10,000 threshold. "Using a number between 0 and 100 what are the chances that you will leave an inheritance of at least $10,000?" Respondents had previously been instructed to interpret 0 as absolutely no chance and 100 as absolutely certain. If the answer was 31 or more, the question was repeated but with a target of $100,000. If the answer was 0, respondents were then asked the probability of leaving any positive bequest. In the case of a couple, each spouse was asked these questions independently so that within family comparisons can be made. These subjective probabilities were ascertained for all cohorts included in HRS98 and in all preceding waves of HRS and AHEAD with the exception of the HRS baseline in 1992.

The third measure concerns the amount of actual bequests and how such bequests are distributed among potential heirs. Bequests are inherently difficult to measure in the population and most applied research on inheritances has relied on estate records (David and Menchik, 1985). While valuable, estate data can provide only a limited picture as the great majority of inheritances are below the estate tax thresholds and so do not appear in official estate records. The strategy pursued here relies instead on 771 "exit" interviews reported by proxy respondents, often relatives of the deceased, for those who died between the first and second wave of the AHEAD survey. These proxy respondents were asked about the total value of the estates, to whom the estate was bequeathed and the specific amounts that were received by each heir. This approach not only has the advantage of describing the complete distribution of inheritances, not just those in wills or probate, it also has the advantage of containing detailed information about the deceased during the years they participated in the household surveys.

Table 1 shows the distribution of estates obtained for the 771 respondents who died between the first and second wave of AHEAD. Mirroring the wealth distribution among these households, the distribution of estate values is quite dispersed and highly skewed. One in five of the deceased AHEAD respondents had estates of no value. The mean estate value is $94.5 thousand but the median is half as much, $50.0 thousand. Some respondents leave relatively large estates: 30% are $100,000 or more and 7% are in excess of $200,000. Only 3% of the estates were valued at $600,000 or more, which is the lower limit for estates to be subject to the estate tax. Consequently, estate tax records are extremely incomplete and they give a very distorted

picture of bequests and the attributes of households who bequeath. For example, AHEAD deceased respondents left bequests worth more than 73 million dollars, but only one quarter of that value would appear in estate tax files.

One way of testing the quality of exit interview reports is to compare the value of estates with the previous report of wealth by the deceased in the prior wave of the survey. Absent any significant death related costs, the value of assets reported in the prior wave and the value of estates should be similar. The last three rows of Table 1 provides that comparison by listing both exit interview reports of estate values and household wealth as reported in wave 1 by the AHEAD respondents. On average wave 1 wealth was $130.2 thousand, and the estates averaged $94.5 thousand. However in married households, the estate is quite close to non-housing wealth suggesting that when there is a surviving spouse, the house (presumably jointly owned) is often not included in the estate. When there is no surviving spouse, mean estates values are virtually identical to prior wave total household wealth.

Many of the qualitative conclusions of this paper are based only on a comparison of subjective bequest probabilities and household wealth, both averaged over members of birth cohorts. The relevant comparisons for birth cohorts represented in our data are presented in Table 2. For each birth cohort, this table shows the fraction of persons with wealth at least as large as the $10,000 and $100,000 bequest targets and the average of the subjective probabilities of leaving bequests at or above those two targets. For example, about 89% of people born prior to 1924 had wealth at least as large as $10,000; yet, if the subjective bequest probabilities are accurate predictors of actual bequests, just 66% of them will die with bequests that large. Similarly, about 62% of that birth cohorts had wealth of $100,000 or more, but only 38% of them will leave a bequest of $100,000 or more. While the precise numbers vary, all cohorts listed in Table 2 reported wealth holdings that exceeded the average bequest probabilities at both bequest thresholds. In that they anticipate leaving bequests less than their current wealth, the implication from these data is that individuals on average anticipate significant dissaving before they die. As long as average SPBs are less than the fraction with wealth exceeding a threshold, current wealth holdings of cohorts are an upper bound on their likely bequests to their heirs.

Table 2 also tells us that the size of bequests is likely to grow over time. For example, the

proportion of those who anticipate leaving a bequest above $100,000 is 46% among those born between 1942-1947 compared to 38% among those born before 1924. Secular increases in the fraction leaving an estate and the size of estates that are bequeathed are not surprising in light of the corresponding increases in wealth.

Section 3. Methods for Estimating Household Bequest

In this section, we outline our methods for estimating the expected future bequest of each individual and household in our data and how those bequests are likely be distributed among potential heirs. The data used for these calculations are based on the amounts of total household wealth and non-housing wealth, the set of individual responses to the sequence of subjective probability of bequest (SPB) questions, and the estate distributions as revealed in the AHEAD exit interviews.

By answering the complete set of SPB questions, each individual has revealed his expected probability of leaving a bequest in the following bequest intervals: $0, $1-9,999, $10,000-99,999, $100,000 or more. These expected probabilities of leaving a bequest $(P(B \in I_j))$ in any interval I_j are found from the subjective bequest probabilities and an interval could be one of a number of types such as closed or half closed.[2]

The expect bequests for each individual i can be expressed as

$$E(B_i) = \quad E(B_i \mid B \in I_j)\, P_i(B \in I_j)$$

where $E(B_i \mid B \in I_j)$ is the expected bequest given that the bequest is in I_j (interval j) and $P_i(B \in I_j)$ is the probability that the bequest is in I_j. The $P_i(B \in I_j)$ are known from the individual responses to the SPB questions so that we need to know only the expected bequest for each bequest interval for which the individual has a positive probability of leaving a bequest.

We estimate these individual expected bequests in each bequest interval in two steps. The first step involves deriving the likely distribution of expected bequests in the population without

[2]Some individuals gave partial answers to this sequence. For example, they answer the $10,000 or more question, but say that they do not know when asked the $100,000 threshold question. In this case, all we know is the probability of a bequest of $10,000 or more. In our computation of expected bequests, we allow for all possible bequest intervals consistent with the manner in which respondents answered the subjective bequest questions.

assigning any bequest value to any specific individual. The second step involves the assignment of a specific bequest value from this bequest distribution to individual respondents.

Consider the first step of obtaining the distribution of expected bequests in the population. In the population we observe from the answers to the SPB questions the average of three probability points of the bequest distribution: $P(B > 0)$, $P(B \geq 10\text{k})$ and $P(B \geq 100\text{k})$. Our basic strategy in obtaining a bequest distribution is to shift to the left the actual wealth distribution of the population until it matches these three probability points of the bequest distribution, while preserving the shape of the wealth distribution. For example, let w_{100} be the point on the wealth distribution such that $P(W \geq w_{100}) = P(B \geq 100\text{k})$. Because the bequest distribution is shifted to the left of the actual wealth distribution, $w_{100} > 100\text{k}$, and the implication is that a person who holds w_{100} in wealth at baseline plans to dissave the fraction $(w_{100} - 100\text{k}) \div w_{100}$ of his wealth before he dies. We then apply the same fractional amount of dissaving to all persons with wealth greater than w_{100} and call the resulting distribution the distribution of anticipated bequests for those bequests $\geq$ 100k. To illustrate, assume that 30% of the population assert that they will leave a bequest greater than 100K while exactly 30% of the population have actual wealth greater than 150K. In this case, 150K wealth households plan on average to dissave one-third of their wealth, a fraction we apply to all wealth values above 150K to obtain a bequest distribution above 100K. In a similar way, we find w_{10} which satisfies $P(W \geq w_{10}) = P(B \geq 10\text{k})$. Someone with initial wealth of w_{10} plans to dissave a fraction of their initial wealth $(w_{10} - 10\text{k}) \div w_{10}$ before dying.[3]

We now have two population-wide distributions: actual wealth and bequests (adjusted from wealth) and need to assign a specific bequest value to each individual. For each of the bequest intervals for which an individual has a positive probability of leaving a bequest, we assigned a bequest to each person that depends on his bequest probabilities and on his actual wealth. In general each person may have positive probabilities of bequests in several intervals so the expected bequest will be the assigned bequest from each interval weighted by the probability that the bequest lies in that interval. We assign bequests so that the bequest value assigned in an

[3]Because $(w_{100} - 100\text{k}) \div w_{100}$ is unlikely to be the same as $(w_{10} - 10\text{k}) \div w_{10}$, neither $(w_{100} - 100\text{k}) \div w_{100}$ nor $(w_{10} - 10\text{k}) \div w_{10}$ can be applied to all of the wealth observations between w_{10} and w_{100}. Rather we apply a linear interpolation to the amount of the shift that will be applied to the points between w_{10} and w_{100}.

interval will be at the same percentile in the bequest distribution for that interval as that person's actual wealth percentile compared to the wealth of those with a positive bequest for that interval. Thus, among those with positive probabilities of bequests in any interval, the ranking of bequests will be exactly the same as the ranking of actual wealth.

Consider, for example, the bequest interval, $10,000-$99,999. We selected a sample of people with positive probabilities of bequests lying in that interval and then ordered them by their actual wealth. We also have a distribution of bequests (adjusted wealth) that lie between $10,000 and $99,999 that are also ordered from lowest to highest value. We make the bequest assignment so that the top wealth percentile persons are assigned are assigned the highest bequest values, the next highest wealth percentile persons the next highest bequest values and so on until all assignments are completed. The identical procedure is done for all possible bequest intervals defined by the subjective probability questions. Then the expected bequest for each person can be calculated from equation (1) as the sum of $b_i\, p_i$ where b_i is the within-interval bequest assigned to the individual and p_i is the probability the bequest lies in that interval.

There are two additional issues that arise in married families: how to treat the house when there is a surviving spouse and what to do with the two distinct spousal responses to the subjective bequest questions. The evidence from the data is that housing equity (which tends to be jointly owned) is not counted as part of the bequest when the first spouse dies. For example, using the AHEAD exit interviews, Table 1 demonstrated that the actual bequests left when there was a surviving spouse were virtually identical to the household's non-housing wealth while actual bequest were approximately equal to total household wealth when the last surviving spouse died. Consequently, for married individuals, the procedures described above in deriving a population-wide bequest distribution from a wealth distribution and assigning specific values to individuals were computed twice, once using total household wealth and once using total non-housing wealth. The bequest values obtained from the non-housing wealth distribution were used when the individual left a surviving spouse while the bequest values from the total wealth distribution were used when the individual was the last spouse to die.

Second, in married families, both spouses were asked about their bequest expectations and they typically gave quite different answers. We interpret the answer to the expected bequest of

each spouse to be the expected value of the estate at the time of that spouse's death. Assume for the moment that the probability that the husband dies before the wife is approximately 1.0 (say in the case of a very old husband and a very young wife). Then, his answer to the subjective bequest questions reflects his expected bequest of total non-housing assets at the time of his death while his wife's answer reflects her expected bequests of total household wealth upon her subsequent death. This interpretation automatically takes into account any dissaving between the time the husband dies and the time the wife dies; the wife 'tells' us about that dissaving.

In the more usual case, the husband will die before the wife with a probability that we can calculate from standard life-tables. Using gender specific life-tables, we computed for all HRS98 households the probability that the husband dies first.

Let $P_a(h)$ be the probability that the husband dies while the wife is still alive, and consider the calculation for a husband of age τ and a wife of age θ. Let t index years beginning from the present date, $t = 0$. The event that the husband dies before the wife can happen by the husband dying in the coming year and the wife surviving that year, or the husband dying in the following year and the wife surviving that year and so forth to the greatest age possible. A life table for men shows the number of males, M_t, that are expected to survive from birth to any given age t, and similarly for the number of females F_t. Then among men who have reached age τ, the probability of dying while age $\tau + t$ is

$$\frac{(M_{\tau+t} - M_{\tau+t+1})}{M_\tau}$$

For the husband to die at age $\tau + t$ while the wife is still alive, the wife must survive to age $\theta + t + 1$, and the probability of that is

$$\frac{F_{\theta+t+1}}{F_\theta},$$

Under the assumption that the deaths of the husband and wife are independent, the probability of the joint event is the product of the probabilities. Then,

$$P_a(h) = \sum_{t=0}^{\infty} \frac{(M_{\tau+t} - M_{\tau+t+1})}{M_\tau} \frac{F_{\theta+t+1}}{F_\theta},$$

which is the sum of the joint probabilities over all possible ages at which the husband could die. There is a similar calculation for $P_a(w)$, the probability that the wife dies while the husband is still alive.[4] Except for approximations intrinsic in life-table analysis, $P_a(w) = 1 - P_a(h)$.

The expected bequest for each spouse can be expressed as an average of the death-weighted probabilities of leaving a bequest if that spouse dies first and if that spouse dies last. For example, the husband's expected bequest is $P_a(h)$* E(B_h | husband dies first) + (1 - $P_a(h)$)* E(B_h| dies second).

We distinguish between bequests made by an individual, to which the preceding discussion pertains, and bequests made by the household. Household bequests are those made to persons or institutions outside of the household, and exclude bequests made from one spouse to the other. Let f(s_h) be the fraction of the estate bequeathed to the wife by the husband and f(s_w) the share of the estate bequeathed to the husband by the wife. Then, the expected bequest by a married household to persons or institutions outside
of the household is

(1- f(s_h)) $P_a(h)$* E(B_h | husband dies first) + (1 - $P_a(h)$)* E(B_h | husband dies second)
+ (1-f(s_w)) (1 - $P_a(h)$)* E(B_w | wife dies first) + $P_a(h)$* E(B_w | wife dies second).

To allocate an expected bequest by a household among its heirs we need to estimate how estates are divided. To obtain these rules, we used exit interviews available from the 771 AHEAD decedents who died between the first and second wave of the survey. We computed shares of estates given to the following categories of heirs: surviving spouses, children and grandchildren, siblings, other relatives, friends, and charity. These shares were computed separately by whether

[4]When men and women were equally likely to die in the same year, we allocated these 'ties' in proportion to expected mortality. That is, if the odds that a male dies first within a year was two-to-one, two-thirds of the ties in a year were assigned to the male dying first.

there was a surviving spouse, whether there were surviving children, and by sex of the decedent.

For example, let f (c) be the fraction of estate that is bequeathed to children. We allow this fraction to vary by the sex of the donor and by whether there is a surviving spouse and by whether there are any surviving children. Then in married families, the expected value of estates that goes to children can be expressed as

$$f(c_1)\, P_a(h)^* \, E(B_h \mid \text{husband dies first}) + f(c_2)\,(1 - P_a(h))^* \, E(B_h \mid \text{husband dies second})$$
$$+ f(c_3)\,(1 - P_a(h))^* \, E(B_w \mid \text{wife dies first}) + f(c_4)\, P_a(h)^* \, E(B_w \mid \text{wife dies second}).$$

The index c_1 through c_4 indicates the fraction of total estate going to children when (1) by the husband when he died first, (2) by the husband when he died second, (3) by the wife when she died first (3), and by the wife when she died last.

In this formulation, children receive bequests from their parents in two stages. The first stage involves the bequest received upon the death of the first parent and the second the additional bequests received when the last parent dies. Our computation of expected bequests includes both stages and allows bequests to vary by whether the mother or father dies first.

Section 4- Expected Bequests and Their Distribution

In this section, we summarize our principal findings organized around the following topics; cohort levels of expected bequests, the distribution of expected estates among heirs, the response of bequest intentions to unanticipated wealth increases, and the extent of dissaving that will take place at older ages.

4.1 Expected Bequests by Cohort

With the assumptions outlined in section 3, we can assign exact values of expected bequests to the individuals in the HRS98 cohorts. From these we calculate mean and median values of total expected bequests. They are given in Table 3 along with the mean and median values of household wealth. Not surprisingly for all birth cohorts, median expected bequests are considerably lower than their mean values. To illustrate, in the birth cohorts of 1931-1941 median bequests are only 30% of the mean. While such inequality is not surprising given the

dispersion and skew in household wealth, bequest inequality is greater than wealth inequality particularly in the older cohorts. This ordering results from a very non-linear relation between the SPBs and wealth: below median wealth, increases in wealth exhibit a much smaller relation with the subjective probability of a bequest than they do above median wealth.

Both mean and median expected bequests increase steadily across birth cohorts until median bequests among the youngest cohort listed (those born between 1942-1947) is $100,000, more than twice the median bequest of those born before 1924. While the median expected bequest increases across birth cohort, median household wealth reaches its cross-sectional peak among those born between 1931-1941. Even though the cohort of 1942-1947 has less wealth than the older cohort, they believe that will leave larger bequests. The implication is that younger cohorts anticipate that their wealth will continue to grow, so that by the time they are the same age as the 1931-1941 cohort they will have higher wealth. This finding indicates that in answering questions about expected bequests individuals are quite forward looking in that they do not base their responses on current wealth levels alone.

Our estimated expected mean bequest for the pre-1924 cohorts listed in Table 3 (about $180.5) is more than twice as large as that obtained in the AHEAD exit interview for decedents as shown in Table 1 ($94.5). There are several reasons for this difference. First, even at the baseline interview, survivors had higher household wealth than the AHEAD exit interview decedents and for this reason alone they should bequeath larger amounts. Second and more important, due to the sharp run up in the stock market, AHEAD survivors experienced a very large wealth increment between the first and third wave of the survey. Apparently, a fraction of this new wealth will be bequeathed to their heirs, a subject to which we turn below.

4.2 Distribution of Estates

In this section, we summarize our results concerning the likely future distribution of bequests to spouses and children.

We used AHEAD exit interviews to derive estate division rules among potential heirs. As shown in Table 4, the exit interviews reveal that most financial inheritances are bequeathed to the immediate family. A surviving spouse received three quarters of the estate while about one-

fourth went to children. At the death of the surviving spouse more than 90% went to children. Consequently, all other beneficiaries were left relatively small amounts of money. Aggregating across all decedents, those outside of the immediate family received 10% of the total bequests.

The division patterns shown in Table 4 were applied to the individual expected bequests discussed in the previous section to find bequests by the household. Table 5 shows those bequests to all those outside of the household including children. Table 5 differs from Table 3 in two ways. The unit of observation is the household rather than the individual so that household weights are used. Table 5 includes only final bequests whereas Table 3 includes bequests to a surviving spouse.

Household wealth reaches a maximum with the cohort of 1931-1941 and then drops by about 25% for the cohort of 1942-1947 ; yet total expected bequests are about the same for both cohorts. The explanation is that the younger cohort which was 51-56 in the HRS98 interview anticipates additional saving.

Expected bequests to children are composed of bequests at the death of one spouse and bequests at the eventual death of the surviving spouse. As shown in the table the median value of bequests to children of the oldest cohort was about 23 thousand dollars and increased to 63 thousand dollars to children of the youngest cohort.

The money an individual child receives depends not only on the total amount given to all children, but on how an estate is divided among children in the same family, and the number of children in the family. Consistent with other findings, the AHEAD exit interview is unambiguous: parents give equal financial inheritances to their children.[5] In multiple child families, each child was bequeathed precisely the same amount of money in 81% of cases (not shown). Therefore in our simulations of future inheritances by each child, we assume equal distribution of the total estimated amount that was bequeathed to children.

Children with more siblings will receive a smaller bequest for two reasons. First, total estate values tend to decline with family size because wealthier families have fewer children;

[5]The within-family distribution of estates has been used as a way to discriminate among alternative theories about bequests. For example, an altruistic model predicts that more bequests should go to the least well-off children in the family while the model of accidental bequests is silent on this issue.

second, the smaller estates of larger families are then divided roughly equally among more children.[6] This pattern of lower bequests per child in large families implies that distribution of bequests among children is more unequally distributed than bequests are themselves.

Table 6 shows the distribution of inheritances received by the children of the AHEAD decedents as reported in the exit interviews. Most children received nothing from their parents estates. Even when the death involved the last surviving parent, more than 40% of children received nothing. Many other children were left just a few thousand dollars. Still, a reasonable fraction of adult children were bequeathed a significant amount of money. One in every ten children collected $45,000 or more from an estate of their parent and one in every hundred got at least $250,000.

The data in Table 6 understate the total amount of inheritances received by children from their parents because in all cases one part of the inheritances is missing. The column labeled no surviving spouse includes only the inheritances children received from the last surviving parent ignoring any estate children received from the first parent who died. Similarly, the column labeled surviving spouse ignores the future inheritances children will receive when their last parent dies. But, by studying anticipated bequests by younger cohorts we can obstqin a substantially cojplet distribution

Table 7 lists by birth cohort the distribution of expected financial inheritances per child. In the youngest cohorts these figures will be very close to lifetime inheritances from the parents of the children because very few parents will have died before age 50. Across all birth cohorts about one in five children will receive no financial inheritance and many more will receive very modest amounts. While the mean bequest per child is almost fifty thousand dollars, we estimate that the median or average child born to a member of the pre-1924 birth cohort will ultimately receive only about nine thousand dollars. However, one in every five children of members of these birth cohorts will eventually receive more than $112 ,000 in financial bequests while one in

[6]To illustrate, consider two types of families in our data- those with two children and those with five. When there were two children in the family, the mean estate value was $121,000 of which all children combined were bequeathed $60,000. Each of the two children received half of that amount or $30,000. However, while when there were five children, the total estate was only worth about $65,000 of which $27,500 went to children so that each of the five children received only $6,700

twenty will get at least $185,000.

The inheritance per child depends on total bequests to the children of the household and on the number of children of the household. As shown in Table 5, bequests to children increased in each cohort until the cohort of 1931-1941. Yet, the number of children per household also increased, causing inheritances per child to increase at a more moderate rate than would be suggested by wealth change alone.

The children of those born between 1942 and 1947 came from smaller families which means that they will eventually receive larger inheritances for that reason alone. Comparison of Tables 5 and 7 show that the higher mean inheritances in Table 7 are the results of having fewer siblings to share the bequest. We estimate that the median child born of those born between 1942 and 1947 will receive a bequest of about 21 thousand dollars, more than double that received by children of those born between 1924 and 1930.

Twenty thousands dollars is still a modest sum, the flow from which can only finance modest additional consumption flows over a lifetime. Thus, it remains true that most adult children now in their fifties can not expect to receive much additional financial help from their parents in the form of bequests. Yet, the top five percent of children of those born between 1942-1947 will get almost $350,000.

4.3 The Elasticity of Expected Bequests to Unanticipated Wealth Increases

There has been considerable speculation that financial inheritances will play a central role in providing income security when the baby-boom generations retire. The reasoning is that such inheritances will be large because their parents have been the beneficiaries of a substantial stock market boom over the last two decades. To gauge how likely this prospect is, it is necessary to know the magnitude of the wealth increase as well as how bequests respond to plausibly exogenous unanticipated changes in household wealth.[7] In our view, the best available strategy for doing so involves the response of expected bequests to capital gains achieved in the stock

[7]To measure the impact of wealth on expected bequests, one must isolate exogenous changes in household wealth. For example, It would not be surprising to find that increases in household wealth are associated with increases in the probability of bequests, but such an association would not inform us about this response function. For example, households who for some reason revise upward their desire to leave bequests may begin to accumulate more wealth so that changes in subjective probabilities would lead to changes in wealth.

market. Due to the large stock market boom during the 1990s, the size of equity-based capital gains has been quite large for many households. Because the original AHEAD respondents (those born before 1924) are reasonably representative of the parents of the baby-boom generation, we use across-wave changes in wealth and bequest expectations to investigate this question.

Table 8 shows the levels of household wealth, expected bequests, and expected bequests to children in these waves of the data. Between the first and third wave of AHEAD, household wealth rose by $128.6 thousand while expected bequests increased by about $74.4 thousand. Thus about 58% of the change in wealth is expected to be bequeathed. The elasticity of total bequests is 1.08, which is not inconsistent with a life cycle model in which bequests are accidental.

4.4 Do Households Dissave during Old Age?

Whether the elderly dissave during later life has become one of the most contested and controversial issues regarding household savings behavior. In part, this controversy is about establishing which economic theory is most consistent with the data because the prediction that they do in fact dissave is a central implication of the pure life cycle model. But there are other important reasons for wanting to establish whether the elderly dissave. If they do dissave, their control of economic resources will decline with age and, should they survive to advanced old age, they may be poor. In addition, because the elderly own substantial amounts of assets, dissaving by them could reduce the national household saving rate.

Because subjective bequest probabilities can be used to estimate future saving intentions of cohorts, we can ascertain who plans to save or dissave. Our index of saving intentions is

$$S(t) = E(B) \div W(t)$$

where W(t) is current household wealth and E(B) expected bequests. If we compare expected bequests to the actual wealth holdings of a cohort, we have an excellent indicator of whether the cohort intends to build up their wealth in the future or to draw down their wealth. If S(t) is greater than one, cohorts anticipate saving before they die and if S(t)equals zero, cohorts will eventually dissave all their current wealth. An implication of the life-cycle model is that households should dissave if they live to a sufficient old age.

The actual data for singles from selected birth cohorts are presented in Table 9. This table shows the anticipated annual rates of dissaving by birth cohorts that are required in order to reach their bequest targets. Dissaving at a significant rate does not commence with retirement, but instead begins during the early 70s at about 3% per year. This rate subsequently grows until households in their 80s are dissaving out of wealth at rates of 8% per year. The acceleration in the rate of dissaving is consistent with the life-cycle model.

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Table 1

Distribution of estates (thousands), AHEAD decedents

Percentile	Single	Married	All
10	0.0	0.0	0.0
30	2.0	20.0	10.0
50	33.3	50.0	50.0
70	77.0	150.0	100.0
90	180.0	200.0	188.5
95	250.0	400.0	322.7
98	600.0	600.0	600.0
Mean estate	*80.6*	*109.8*	*94.5*
Wave 1 wealth	*80.7*	*184.7*	*130.2*
Wave 1 non- housing wealth	*42.4*	*104.8*	*72.1*

Table 2

Percent of respondents with wealth above target and average bequest probability

	target			
	$10,000		$100,000	
cohort	wealth	bequest probability	wealth	bequest probability
1923 or earlier	88.9	65.8	62.1	38.3
1924-1930	89.2	67.7	62.7	41.0
1931-1941	88.3	70.6	63.4	43.5
1942-1947	86.5	74.4	58.0	46.4

Table 3

Wealth and expected bequests (thousands, weighted)

Cohort	mean wealth	median wealth	mean bequest	median bequest
1923 or earlier	335.4	150.0	180.5	46.7
1924-1930	342.7	162.5	183.8	58.3
1931-1941	420.4	160.0	290.2	79.8
1942-1947	304.3	134.6	267.6	100.0

Table 4

Division of bequests (percent), AHEAD wave 2 exit interview

	characteristics of decedent				
	spouse		no spouse		
bequest targets	children	no children	children	no children	all
spouse	76.1	82.7	0.0	0.0	52.1
children	22.4	0.0	91.6	0.0	37.9
charity	0.3	14.6	0.6	6.0	1.2
siblings	0.3	0.7	0.7	34.7	2.6
other relatives	0.8	1.8	5.4	45.9	4.8
friends	0.0	0.2	1.6	11.8	1.2
other	0.1	0.0	0.1	1.6	0.2
total	100.0	100.0	100.0	100.0	100.0
number of observations	*302*	*17*	*284*	*58*	*661*
wave 1 wealth (1000')	*200.8*	*175.9*	*83.8*	*100.7*	*141.1*

Table 5

Wealth and expected bequests outside of household (thousands, weighted)

	wealth		total expected bequests		expected bequests to children	
Cohort	mean	median	mean	median	mean	median
1923 or earlier	303.6	127.1	166.4	41.8	131.0	23.4
1924-1930	305.5	131.0	180.9	52.1	148.4	32.0
1931-1941	362.9	132.0	255.8	76.6	215.2	52.1
1942-1947	274.0	113.1	253.8	98.6	213.6	64.2

Note: Weighted by household weights

Table 6

Distribution of inheritances (thousands) to the children of the AHEAD wave 2 decedents

Percentile	All	No surviving spouse	Surviving spouse
60.0	0.5	7.8	0.0
80.0	15.6	30.0	5.8
90.0	45.0	65.0	25.0
95.0	90.0	100.0	50.2
99.0	260.0	300.0	250.0
Mean inheritance	*18.6*	*27.7*	*10.4*

Table 7

Distribution of expected inheritances (thousands per child, weighted)

	Cohort of parents			
Percentile	1923 or earlier	1924-1930	1931-1941	1942-1947
5.0	0.0	0.0	0.0	0.0
10.0	0.0	0.0	0.0	0.0
25.0	0.7	0.5	1.6	3.0
50.0	9.0	9.3	12.8	21.0
75.0	39.1	44.9	52.8	67.1
90.0	112.8	113.2	129.5	183.9
95.0	185.8	194.6	223.3	346.7
Mean inheritance	*47.6*	*46.6*	*65.1*	*81.9*
# of children in family	*2.75*	*3.18*	*3.30*	*2.61*

Table 8

Average household wealth and expected bequests (thousands, weighted)

	wealth	expected bequests	expected bequests to children
AHEAD wave 1	200.0	107.0	80.8
AHEAD wave 3	328.6	181.3	142.5
Percent change	*64.3*	*69.5*	*76.4*

Table 9

Estimated annual rates of dissaving (percent)

Age	Singles
50-59	0.1
60-69	0.8
70-74	3.0
75-709	5.8
80-84	5.9
85 or over	8.0