

# The Importance of Bequests and Life-Cycle Saving in Capital Accumulation: A New Answer

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As the workhorse of consumption and saving research for the past four decades, the life-cycle model has proved flexible and useful for examining a variety of questions. In a classic paper, Albert Ando and Franco Modigliani (1963 p. 56) stated a key assumption of the basic model: “[t]he individual neither expects to receive nor desires to leave any inheritance.” Although the authors contended that the absence of a bequest motive was not critical to the heart of their results, the assumption set off a long-standing battle over the relative importance of different motives for saving. In an influential study, Laurence Kotlikoff and Laurence Summers (1981) estimated that a large fraction of the U.S. capital stock was attributable to intergenerational transfers. Modigliani and his collaborators vigorously disagreed and, based on their own empirical work, claimed that life-cycle saving was the primary source of capital accumulation (Modigliani, 1988). Subsequent work has failed to reach a consensus.<sup>1</sup>

Since this debate began, an important advance in the consumption literature has been the incorporation of uncertainty in life-cycle models (see e.g., R. Glenn Hubbard et al., 1995). We argue that allowing for uncertainty resolves the controversy over the importance of life-cycle and bequest saving by showing that these motives for saving are overlapping and cannot generally be distinguished. A dollar saved today simultaneously serves both a precautionary life-cycle function (guarding

against future contingencies such as health shocks or other emergencies) and a bequest function because, in the likely event that the dollar is not absorbed by these contingencies, it will be available to bequeath to children or other worthy causes. Under this view, households have a bequest motive, but bequests are given (i.e., the motive is “operative”) in only some states of the world.<sup>2</sup> Wealth is something like traveler’s checks: you take them along on vacation “just in case,” but odds are they will remain uncashed and available for sundry goods after the journey is complete. We first demonstrate the result using a simple model and then argue that this approach reconciles the apparent importance of bequests with households’ declared focus on life-cycle saving. Finally, we consider implications of our analysis.

## I. A Simple Model of Life-Cycle and Bequest Saving

We use a two-period life-cycle model in which households have an altruistic bequest motive and face uncertainty about future earnings, lifespan, and medical expenses. We consider period one (“young”) as ages 30–60, and period two (“old”) as ages 60–90. Households maximize expected lifetime utility:

$$U_t = E_t \left[ U(C_1^*) + (1 - D_2)V(B_1) + D_2 \left( \frac{U(C_2^*)}{1 + \delta} + V(B_2) \right) \right]$$

where  $C_s^*$  is nonmedical consumption at time  $s$ ,  $\delta$  is the rate of time preference,  $B_s$  is the bequest left in the event of death, and  $V(\cdot)$  is the utility

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<sup>1</sup> For example, see the opposing views expressed by William Gale and John Karl Scholz (1994) and Michael Hurd (2001).

<sup>2</sup> Other papers that have included or described bequest motives that are only operative in certain states of the world include Martin Feldstein (1988), Kotlikoff (1988), and John Laitner (2001).

of leaving a bequest.  $D_2$  is a state variable that is equal to 1 if the household lives through period 2, and 0 otherwise (i.e., if the household dies at the end of period 1).

We consider a household that receives no bequest and begins period 1 with no wealth. Wealth at the end of period 1 is the difference between earnings and consumption,  $A_1 = E_1 - C_1^*$ . If the household does not survive to period 2, it leaves to heirs a nonnegative bequest  $B_1 = A_1(1 + r)$  where  $r$  is the real after-tax rate of return between periods 1 and 2 (we assume that there are no annuity markets). If it survives, the household earns interest  $rA_1$ , receives after-tax earnings and pension income ( $E_2$ ), and chooses nonmedical consumption  $C_2^*$ . At the end of period 2, the family learns about and incurs medical expenses ( $M_2$ ), which we treat as necessary consumption that generates no utility but must be paid. We define total consumption as  $C_2 \equiv C_2^* + M_2$ . At the end of period 2, wealth  $A_2 = A_1(1 + r) + E_2 - C_2$ , which must be nonnegative, is left as a bequest [i.e.,  $B_2 = A_2(1 + r)$ ]. Saving rates are defined relative to period- $t$  income,  $Y_t \equiv rA_{t-1} + E_t$ , so the saving rate in period  $t$  is  $S_t \equiv (Y_t - C_t)/Y_t$ . See Dynan et al. (2000) for more details regarding the model structure and parameterization.

We parameterize the model by assuming isoelastic utility functions over consumption and bequests with a coefficient of relative risk aversion equal to 3, and (annual) rates of time preference and interest equal to 0.03. The *ex ante* probability of dying before consuming in the second period is 18 percent. First-period earnings are equal to \$48,451 (the median 1998 household income for ages 35–45 [*Statistical Abstract of the United States*, 2000 p. 467]), and we assume that in the second period Social Security and pension income replace 60 percent of this first-period income. We introduce uncertainty in income by assuming that half of the time second-period income is 25 percent above average, while half of the time it is 25 percent below average; this reflects uncertainty about the timing of retirement and adequacy of pensions. To capture medical-expense uncertainty,  $M_2$  equals 13 percent of income with a 20-percent probability (the “bad health” state) and zero otherwise. The difference in expenses across states is consistent with evidence presented in Stephen Crystal et al. (2000) on the

difference in annual out-of-pocket expenditures between those in poor health and those in excellent health. Our parameterization may overestimate true uncertainty, because we assume that the shock persists for 30 years, but it may underestimate costs because it does not reflect the upper tail of the distribution and may also miss some end-of-life expenditures. Overall, it seems a plausible representation of the sort of low-probability but high-cost event that weighs heavily on the minds of elderly households.<sup>3</sup>

Paul Menchik and Martin David (1983) find in their longest-lived group that average bequests are roughly six times average earnings. To provide an upper limit on the importance of the bequest motive, we parameterize  $V(\cdot)$  so that it generates bequests that are six times annual earnings in the absence of any other cause for bequests, such as uncertain lifespan, income, or health expenses. We view this bequest parameter as an upper bound on the true bequest motive, since it is implicitly attributing to an explicit bequest motive any observed “accidental” bequests.

The model generates saving among the young and dissaving among the elderly. Briefly, when there is just lifespan uncertainty and no bequest motive, saving rates for the young are 10 percent and saving rates for the elderly are –11.3 percent. Introducing uncertainty in medical expenses and earnings raises saving rates for the young to 14.0 percent, and for the elderly to –3.6 percent. Dissaving rates are small owing to concerns about late-in-life health-care expenditures; if households receive a good health draw, “accidental” bequests are passed along. When the bequest motive is introduced, the saving rate for the young rises to 15.2 percent. Thus, adding a bequest motive causes an incremental increase in the saving rate of only 1.2 percent. Saving rates for the old rise to 0.6 percent, a somewhat larger incremental effect than for the young, but still modest.

The intuition behind these results is as follows. In states of the world in which the marginal utility of consumption is high (combinations of low earnings, living long, and high medical expenses) the nonnegativity constraint on bequests binds, and no bequest is given. In states in which the marginal

<sup>3</sup> For simplicity, we ignore here asset-based means-tested transfers such as Medicaid, which can discourage saving for lower-income or lower-wealth households (see Hubbard et al., 1995).

utility of consumption is low (combinations of high earnings, dying early, and low medical expenses), positive bequests are given. While the latter may occur with higher probability, it is the former that is primarily driving saving decisions.<sup>4</sup>

## II. Empirical Evidence

The importance of bequests can be seen in several ways. First, bequests are common and can be sizable (Gale and Scholz, 1994). In the 1998 Survey of Consumer Finances (SCF), 30 percent of households with heads older than age 60 reported having received an inheritance. Second, at least some households are not surprised at the receipt of bequests. In the 1998 SCF, 30 percent of households under age 30 reported that they expected to receive an inheritance. Nearly 50 percent of households said “yes” or “possibly” when asked whether they expected to leave a sizable estate to others.

Third, households seem to care about their descendants and to value giving them money. Close to half of households in the 1998 SCF replied that they thought leaving an inheritance to their surviving heirs was important or very important, and the response was similar across education groups. Concern about the welfare of one’s descendants is consistent with the considerable inter vivos transfers estimated by Gale and Scholz (1994). It is also consistent with the time and money spent by tax lawyers and their clients planning how best to transfer resources to heirs. Indeed, Joel Slemrod and Wojciech Kopczuk (2001) find evidence of people delaying (or accelerating) their death a few days to take advantage of changes in estate-tax law!

Given these three observations, one might expect the bequest motive to rank high among households’ stated reasons for saving. However, nearly every survey on this topic reveals far more emphasis on life-cycle or precautionary considerations.<sup>5</sup> Figure 1 shows per-

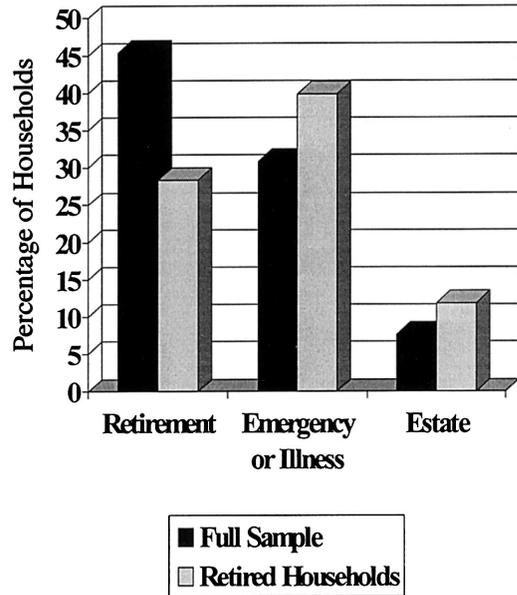


FIGURE 1. SELECTED REASONS FOR SAVING

Source: 1998 Survey of Consumer Finances.

centages of 1998 SCF households listing selected reasons as a motive for saving, for both the full sample and for households with retired heads; respondents may list up to five reasons in all. Retirement was reported by 45 percent of all households as a reason for accumulation.<sup>6</sup> Saving for emergencies or illness also figured prominently, particularly among the elderly, where 40 percent listed one or both of these reasons as a motivation.

In stark contrast, saving for one’s estate or children was rarely mentioned, with only 8 percent of all households and 12 percent of retired households in the 1998 SCF mentioning it as a reason. Weighting the calculation for retirees by net worth or limiting the retired sample to just the wealthiest 5 percent bumps the figure up by only a few percentage points. This pattern is not unique to our data. Previous waves of the SCF (going back to 1983) show even less interest in

<sup>4</sup> Consider the quote from Jason Alexander, co-star of the TV show *Seinfeld*: “Even now, when my wife, Daena, and I have a multimillion-dollar portfolio and everybody goes, ‘Oh, you’re set for life,’ I go, ‘Well, you never know—something could happen, a catastrophic illness.’” (Suze Orman, 1998 p. 60).

<sup>5</sup> This is true not only in the United States, but in Japan as well (Charles Y. Horioka, 2001).

<sup>6</sup> The 28 percent of households with retired heads listing retirement as an important reason for saving may have been anticipating a decline in the earnings of a different household member, or they may have interpreted the question as asking why they hold previously accumulated assets, rather than why they add to these assets.

this motive for saving, and Modigliani (1988) cites similar findings from 40 years ago.

Our model is consistent with this seemingly contradictory survey evidence. As shown in the previous section, our model generates considerable intergenerational transfers that will rationally be expected by households (given the low odds of the bad states). Households that behave according to this model should indicate that they value bequests, but when asked to name reasons for accumulation, they might well downplay the importance of saving for heirs, as their precautionary concerns imply that saving would be nearly as high in the absence of this motive. The model would also be consistent with the popularity of certain trusts that allow the household to tap into assets if needed but also reduce taxes in the more likely scenario that the trust passes to the beneficiary.

### III. Implications

For at least 40 years, economists have debated the relative importance of bequests and life-cycle saving in thinking about why households accumulate wealth. This paper has argued for a model where saving simultaneously serves two purposes. The first purpose (a precautionary function in a life-cycle model) is to guard against future contingencies such as low earnings, living a long time, or incurring very high health expenditures later in life. The second purpose (to bequeath wealth to future generations or other causes) becomes operative in the likely event that future developments are not as bad as they could be.

This model has implications in a variety of areas. First, it suggests that, if the bequest motive suddenly disappeared because of a confiscatory estate and gift tax, saving behavior would likely change only modestly for all but the very wealthy. Second, Ricardian equivalence may not hold in this model, despite the presence of significant bequests, because the bequest motive may not be operative when bad outcomes occur.<sup>7</sup> Third, because contingencies are a dominant feature of the optimal saving plan, our analysis underscores that when judging the adequacy of retirement saving, it is

important to take into account that households with low realizations of income will end up (*ex post*) with low retirement wealth even if they are fully optimizing.

Accounting exercises of the type performed by Kotlikoff and Summers (1981) and Modigliani (1988) measure the size of bequests but are not very useful at gauging motives for leaving bequests. While the degree of altruism will influence these measures, a variety of other factors will as well. For example, J. Bradford De Long (2001) performed a similar accounting exercise for pre-industrial Eurasia and found that inherited wealth comprised roughly 91 percent of aggregate wealth, compared to his estimate of 43 percent for a modern developed economy. The differences are likely the consequence of high mortality rates, and low population and productivity growth rates in the pre-industrial era, rather than the degree of altruism. Therefore one should not conclude from these calculations that our ancestors cared more about their children than we do today (Skinner, 2001).

The fundamental message of this paper is that, in models of uncertainty, it is not useful or even possible to parse net worth into life-cycle and bequest components on an *ex ante* basis, because each dollar can effectively serve both purposes. An implication of this view is that, while households may care about leaving money to their descendants, adding such a bequest motive on top of an existing motive for precautionary saving would have relatively little impact on capital accumulation for nearly all households.

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<sup>7</sup> See Feldstein (1988) for a related argument.

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