Comment

R. Glenn Hubbard

It is difficult to think of more important items on the research agendas of public finance and macroeconomics than explaining personal saving behavior (especially the role of intergenerational transfers) and the impacts of social insurance programs on national saving and individual welfare. With respect to both areas, it is now well recognized that, for all its theoretical clarity, the life-cycle model has not tested out very well vis-à-vis predictions about the shape of the wealth-age profile or the impact of pensions on the level of nonpension wealth. While there is evidence that the model, in its most general context of forward-looking intertemporal optimization, is not at variance with the observed saving behavior of most households, many studies have concluded that there exists a nontrivial fraction of households for which the model does not appear to be an adequate description of saving behavior.

One element missing from most of these studies is the wealth allocation choice between assets which can be transferred to heirs upon death (e.g., stocks, bonds, or life insurance proceeds) and those which cannot (e.g., annuities). Analyses of the impact of the introduction of Social Security are typically conducted either under the assumption of a perfect private market in life annuities—in which annuity prices are actuarially fair—or complete market failure in the provision of annuities. Such polar extremes are hardly innocuous.[1]

A key advance of the paper by Benjamin Friedman and Mark Warshawsky is its attempt to quantify the extent to which annuity contracts are "unfairly" priced (in an actuarial sense). After all, the empirical finding that wealth-age profiles do not decline significantly in old age is consistent with the basic life-cycle model (when lifetime is uncertain and there is no bequest motive) only if there are no annuity markets. As Friedman and Warshawsky point out, there are well functioning life annuity markets in the United States, but very few individuals (in the present or the past) have chosen to purchase them.

Consistent with the organization of the Friedman-Warshawsky paper, my comments can be divided into three parts: (i) pricing life annuities and computing "load factors," (ii) modeling the impact of different

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1. For example, if the prices of market annuity contracts were actuarially fair and there were no restrictions on the quantities purchased, then exogenous increases in mandatory Social Security annuities would displace annuity purchases with no effect on bequeathable nonpension wealth. With no market annuities, such increases would displace marketable nonpension wealth. For discussions of implications of these assumptions for models of individual saving, see Bernheim (1984), Hubbard (1987), and Sheshinski and Weiss (1981).

assumptions about annuity pricing on individual saving, and (iii) considering the implications of the modeling approach for more general discussions of individual saving behavior and public policies toward retirement saving.

First, Friedman and Warshawsky have made a real contribution in calculating the load factors associated with the purchase of life annuity contracts in the United States. Their comparison of the present expected values of identical annuities for 65-year-old males for the "general population" and "annuity purchasers" reveals a premium most likely traceable (as they note) to the classic adverse selection problem.[2] That is, annuity prices are not actuarially fair for those individuals who choose to purchase life annuity contracts.[3]

In their table 2.3, Friedman and Warshawsky present the mean load factors under various assumptions. These implied charges are substantial, ranging up to 55 percent for individuals in the "general population." In a particularly interesting calculation, they isolate "the effect of adverse selection" by subtracting the mean load factor for individuals actually purchasing annuities from that for individuals in the general population. This calculation is not conclusive, however, as theoretical treatments of adverse selection have seldom found pure price equilibria to be optimal. That is, quantity rationing may occur. Whether such rationing is in fact important in the market for life annuities is an empirical question, and one worthy of mention in the paper.

Second, the core of the Friedman-Warshawsky paper is an extension of Fischer's (1973) model of the demand for life insurance to examine the extent to which the combination of actuarially unfair market annuities, mandatory social annuities (e.g., Social Security), and bequest motives can explain observed patterns in annuity purchases and consumption in old age. The extension of the dynamic programming model is straightforward, and the authors use the solution expressions as the basis for a simulation model.

Their modeling strategy is clever, namely, to calculate the maximum load factor an individual would be willing to pay to purchase market

2. Recent theoretical contributions to the literature on adverse selection as applied to annuities include Eckstein, Eichenbaum, and Peled (1985) and Judd (1984). The Judd paper in particular points out the potential importance of general equilibrium analysis—since the annuity market equilibrium affects incentives to save, the level of savings and the supply of capital will be affected, altering the supply of goods and the real interest rate. He shows that private insurance markets afflicted by adverse selection generally cannot internalize this spillover into the goods market, the competitive equilibrium will in general not be efficient, and that some sort of compulsory contract will be Pareto-improving.

3. In a companion paper, Friedman and Warshawsky (1985) present information on yield differentials between life annuities and marketable securities; as with the load factors, these differentials are substantial.

annuities and compare that with the actual load factors calculated earlier.[4] Because we do not observe many actual annuity purchases, such a comparison can be used to justify the appropriateness of other assumed parameter values (particularly that for the strength of the "bequest motive"). The results in table 2.4 illustrate (not surprisingly) that the no-annuities-available and market-only-annuities cases yield counterfactual results for consumption-age and wealth-age profiles in old age.

More reasonable results are obtained when Social Security annuities are introduced (based on the assumption that Social Security wealth constitutes half of total wealth). I do, however, have two reservations about the choice of parameter values. First, the values used for the annual rate of time preference and market rate of interest (1 percent for each) seem very low. We are not told how sensitive the simulation results are to this choice of parameter values (in particular with respect to the more likely case wherein the interest rate exceeds the rate of time preference), though an alternative value for the market interest rate is reported later in table 2.9. Second, while the assumption that Social Security wealth and nonpension wealth are roughly equal may be true on average, it is certainly not true for high-income and wealthy

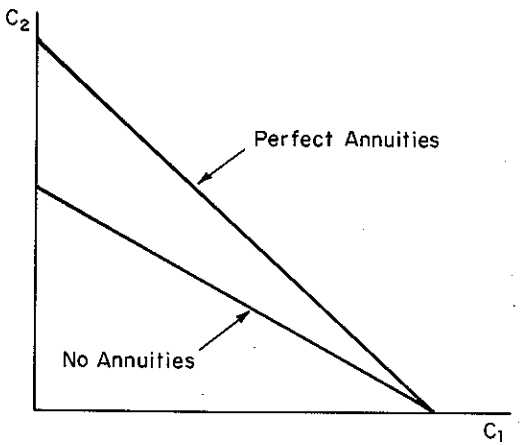

Fig. 2.2 Intertemporal budget constraints implied by no-annuity and perfect-annuity cases.

4. Friedman and Warshawsky consider the load factors on market annuities as fixed, "upfront" fees. An alternative approach would be to consider a continuous rate of return on annuities which is less than the actuarially fair return. Consider for simplicity a two-period model with consumption (C_1, C_2) in the two periods. The intertemporal budget constraints implied by the no-annuity and perfect-annuity cases are illustrated in figure 2.2. The availability of annuities expands the budget set, and compensating or equivalent variation calculations can be made. Actuarially unfair annuities could be considered by drawing an intermediate budget line between the two sketched above. Friedman and Warshawsky (1985) do focus on yield differentials.

individuals, for whom bequest motives are most frequently observed (Menchik and David 1983).[5] I will discuss this point further later.

Since across all cases prior to the introduction of bequests, the "critical load factors" calculated by the model are greater than those actually observed, there remains a puzzle as to why individuals are not more active participants in private annuity markets. The logical next step is to consider the extent to which planned bequests can rationalize the model's predictions with observed annuity purchases. Bequests are indexed by a parameter θ, which represents the ratio of a bequest to current annual consumption.

Table 2.8 is most interesting in this respect, in that the inclusion of a bequest motive, by lowering the difference between critical and observed load factors, removes the feature of earlier simulations that it is optimal to invest all non-Social-Security wealth in market annuities. While this modification does not yet explain the fact that almost no annuities are purchased by anyone in the United States, the authors' table 2.9 summarizes the model's implications very well by calculating the strength of the bequest motive (again indexed by the parameter θ) required to eliminate market annuity purchases.

For parameter values that seem sensible on average—say, an interest rate of 4 percent, a ratio of Social Security wealth to total wealth of 0.5, and a coefficient of relative risk aversion of 2—a relatively modest bequest motive ($\theta = 5$) is required. This still seems troublesome, however, for any claim that a bequest motive per se is all that is needed to explain observed behavior in private annuity markets. Plausible increases in relative risk aversion, reductions in the market interest rate, or declines in Social Security wealth relative to total wealth[6] would require implausibly high bequest motives to eliminate annuity purchases.

These results are even more pronounced in the calculations of the impact of the yield differential between annuities and government bonds. That differential on average is sufficient to eliminate annuity purchases by 65-year-old males (given a coefficient of relative risk aversion of 4 and a ratio of "social annuities" to total wealth of 0.5) irrespective of any bequest motive. For lower values of the coefficient of relative risk aversion (e.g., 2), the combination of even lower differentials and plausible bequest motives can explain the absence of market annuity purchases.

Finally, I would like to devote the remainder of my remarks to three factors that may shed further light on the stimulating findings in the

5. More subtly, the inclusion of Social Security annuities might have been better modeled by using the entire life cycle to capture the effects of Social Security on preretirement consumption and wealth accumulation. For example, these effects would not in general be invariant to the way in which the system is financed.

6. Again, such a decline in Social Security wealth relative to total wealth is perfectly plausible, given that it is wealthy individuals—with comparatively little Social Security wealth—who are most likely to leave a bequest.

Friedman-Warshawsky paper. The first relates to the definition of annuities. While the annuities described in the paper are real annuities, annuities available in the market are subject to inflation risk.[7] Moreover, when a model of the entire life cycle is considered, the lack of fungibility of annuities (e.g., because of problems in intertemporal reallocation of resources and liquidity constraints) may be important. Other "contracts" not considered in the analysis might act as proxies for market annuities, namely, private pension annuities[8] (Hubbard 1987) or implicit intrafamily contracting arrangements (Kotlikoff, Shoven, and Spivak 1987). These added considerations could account for some remaining annuity purchases in the presence of a bequest motive in table 2.8, or for a lower bequest motive required in table 2.9 to "eliminate" market annuity purchases (by augmenting "exogenous" annuities relative to total wealth).

Second, two modeling considerations might increase the robustness of the results. Solving for steady-state values of national saving and individual welfare would permit comparison of the impacts of alternative "social annuity" policies on individual welfare given different assumptions about bequest motives. In addition, it would be useful to know the size of bequests relative to life-cycle resources implied by the values in table 2.9. Such calculations could shed additional light on the importance of intergenerational transfers in accounting for the size of the capital stock.

Finally, and most important, the ultimate relevance of the simulation exercises depends on the extent to which lifetime uncertainty is the dominant form of uncertainty present in individual consumption optimization problems. I am reminded of the cry by Maggie in Tennessee Williams's *Cat on a Hot Tin Roof:* "You can be young without money, but you can't be old without money."

Uncertainty in old age is a general phenomenon. While there is no doubt that uncertain longevity is important, one can easily imagine that uncertainty over health or disability is a significant worry for the elderly.[9] That is, "uncertainty" broadly defined may account for stable wealth-age profiles in retirement. For example, Friedman and Warshawsky point out that market annuities have never been very significant in the United States, yet the past two generations of Americans have witnessed a dramatic expansion in the coverage and generosity of the Social Security and private pension systems. Extrapolating from

7. It is not clear, for example, that individuals prefer real (market) annuities given the existing structure of Social Security benefits (Feldstein 1983).

8. In addition, private pension annuities receive favorable tax treatment relative to market annuities.

9. See the discussion in Diamond and Hausman (1984).

table 2.9, an implausibly high bequest motive would have been required to eliminate life annuity purchases.[10]

Recent papers on the influence of lifetime uncertainty on national saving and this contribution by Friedman and Warshawsky suggest the importance of recognizing and modeling the effects of uncertainty on individual saving decisions and the size of the capital stock. Measuring the size of uncertainty saving may help to reconcile the life-cycle model with observed saving behavior and to reevaluate the importance of intergenerational transfers for the size of the capital stock (as in Kotlikoff and Summers 1981). Such an approach will facilitate welfare analyses of social insurance programs and complementary private programs. Finally, data permitting, cross-country comparisons of the influence of social and private annuities on the capital stock would be useful in empirically disentangling motivations for saving behavior.

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10. Problems remain, however. Empirical studies finding "oversaving" among some groups (e.g., the elderly) have also found a nontrivial fraction of the population whose saving is completely "inadequate" by usual life-cycle standards.

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3 Pension Funding and Saving

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The private saving rate in the United States in 1984 has to be considered disappointing. After the enactment of a large number of policies to make investment/saving more rewarding (such as liberalized Individual Retirement Accounts and Keogh Plans, the special tax treatment of some reinvested dividends, capital gains taxes which have been reduced twice in the past six years, and certainly increased investment incentives at the corporate level), the preliminary Bureau of Economic Analysis (BEA) estimate for the 1984 personal saving rate is 6.1 percent of disposable personal income. This is lower than the average personal saving rate in the 1970s of 7.3 percent, and only imperceptably better than the 6.0 percent of the first four years of this decade. With all of these incentives, plus a robust economy and record high real interest rates, why was the personal saving rate so low? We are not going to attempt to answer this general question here. Rather, we suggest that personal saving needs to be examined in a disaggregated manner. Some of the policies just mentioned do not really provide incentives to save at the margin, but only serve to channel the existing quantity of saving

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