



ESSAYS ON **SAVING,**
BEQUESTS, ALTRUISM,
AND **LIFE-CYCLE PLANNING**

LAURENCE J. KOTLIKOFF

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Life-Cycle Planning**

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Laurence J. Kotlikoff

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For Alex and David and in memory of Henry—my beloved sons.

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Sources

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Chapter 3

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Chapter 4

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Chapter 5

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Chapter 6

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Chapter 7

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Chapter 9

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Chapter 11

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Chapter 13

“How Much Should Americans Be Saving for Retirement,” *The American Economic Review* 90 (2), 288–292. Reprinted by permission. Copyright © 2000, The American Economic Association.

Introduction

This book brings together fourteen articles I've coauthored in recent years. Four of these articles have never been published. Many of the rest were published in specialized books and journals. Consequently, part of my motivation in creating this book was to give this work more visibility. But the main reason stems from my belief that the value of the collection exceeds the sum of its parts.

The articles consider four interrelated topics: saving, bequests, altruism, and life-cycle financial planning. These issues were among those examined in my 1989 MIT Press volume *What Determines Savings?* But the current volume considers each of the subjects from different perspectives and applies different theoretical and empirical approaches.

The book is divided into three parts. The first part contains three chapters focused on saving, bequests, and inequality. The second part has five chapters that study altruism. And the third part offers six chapters about life-cycle financial planning. In this brief introduction I summarize the questions raised by each of the chapters, the methods used to address the questions, and the answers provided.

Saving and Bequests

Postwar America has witnessed a remarkable decline in the rate of national saving. Between 1950 and 1979 our country saved each year over 10 percent of its national income. Since then, we've been saving at about half that rate. What explains this dramatic change? Is it our fiscal policy, our demographic transition, our attitudes toward saving, or some other factors?

The first chapter of part I, coauthored with Jagadeesh Gokhale and John Sabelhaus, addresses these questions. It develops an elaborate

cohort database and uses these data to study the different factors involved in postwar changes in U.S. saving. The data construction and analysis are guided by the life-cycle theory of saving. Central to that theory is the proposition that the elderly are society's big spenders when measured in terms of their propensities to consume. Why should the elderly spend more out of each dollar of remaining lifetime resources than the young? The answer, according to the life-cycle model, is simply that they are closer to the end of their lives and have, in effect, less time to shop. The life-cycle theory thus predicts that if the government redistributes from young savers (including those not yet born, whose propensity to consume before they are born is zero) to old spenders, the private sector will, on balance, consume more and the nation will save less. Demographics also matter. Other things equal, having more old spenders relative to young savers around translates into a higher rate of aggregate consumption and a lower rate of aggregate saving. The same outcome will result from changes in behavior that lead to an increase in the propensities of either the young or the old to consume.

Chapter 1 decomposes postwar changes in national saving into those arising from government intergenerational redistribution, changes in demographics, changes in cohort-specific spending behavior, and changes in the rate of government spending. This breakdown shows that two factors explain why our nation is saving at half its former rate. Of the two, the most important is the government's massive postwar intergenerational redistribution, which it has effected primarily through the expansion of the social security, medicare, and medicaid programs.

The second factor is a significant increase in the rate at which the elderly are consuming their resources. The key reason for this appears to be the form in which they are receiving those resources. As chapter 2, written with Alan Auerbach, Jagadeesh Gokhale, John Sabelhaus, and David Weil, demonstrates, the government has not only spent the postwar period taking ever larger sums of money from young and future generations and handing them to contemporaneous older ones. It has also given the elderly these resources in the form of annuities—streams of income or in-kind benefits that continue until death. In so doing, the government has taken away much of the fear of outliving one's money and permitted the elderly to consume their resources at a much faster clip. However one

judges the morality of U.S. postwar intergenerational redistribution, the government's effective provision of insurance against lifespan uncertainty via the provision of annuities seems a major achievement. But that achievement may have come at the unintended costs of more consumption by the elderly and less national saving.

Another presumably unintended consequence of the government's implicit annuitization of the elderly is that it has increased inequality in the distributions of net wealth. Feldstein (1976) was the first to point out that social security replaces a much larger fraction of the net worth of lower than of upper income classes. It does this in two ways—by taxing away a larger share of the labor income of those with low earnings and by replacing a larger share of the preretirement earnings of such households with old-age benefits. This leaves the lower income classes with (a) less wherewithal from which to save and (b) less reason to postpone consumption. Chapter 2, which uses Survey of Consumer Finances data as well as aggregate cohort data, considers the entire gambit of government policies in generalizing Feldstein's finding.

The fact that the government has (a) facilitated the decision of the elderly to consume at a faster rate and (b) annuitized a disproportionately large share of the resources of the poor has potentially important consequences not just for the distribution of wealth, but also for the distribution of bequests and inheritances. Chapter 3, written with Jagadeesh Gokhale, James Sefton, and Martin Weale, constructs a simulation model to study the bequest transmission process as well as the government's role in altering that process. The model incorporates lifetime earnings inequality, unintended bequests, assortative mating, the inheritance of skills, social security, and a variety of other factors. Although highly stylized, the model does an excellent job of explaining the wealth distribution among American couples at retirement, including the top tail of the wealth distribution. The study delivers five messages. First, the extent of wealth inequality is highly dependent on the extent of lifetime earnings inequality. Second, intentional bequests are not needed to generate an empirically reasonable distribution of wealth. Third, intentional bequests are not needed to generate a large ratio of inherited to life-cycle wealth. Fourth, absent social security, the random nature of the receipt of unintended inheritances can actually serve to mitigate inequality in accumulated wealth. And fifth, social

security and other government annuities play an important role in raising wealth inequality as well as inequality in the receipt of inheritances.

Altruism

The articles in part I proceed from the assumption that bequests are undesired and arise because of imperfections in annuity markets. As Barro (1974) pointed out, the alternative assumption, that bequests reflect intergenerational altruism, has profound implications for the macroeconomic and microeconomic effects of fiscal policy. Strong evidence in support of intergenerational altruism would undercut not just the studies in part I, but major portions of the economics literature and virtually all conventional macroeconomic fiscal policy analysis.

Testing the Barro model carefully is, thus, a task of the first order. The first four articles of part II attempt to do just that. They take the intergenerational altruism hypothesis seriously. Indeed, they take it as the null hypothesis and directly test its predictions using cohort and micro data. The key proposition here is that the distribution of consumption within the altruistically linked extended family is independent of the distribution of resources. Two corollaries of this proposition are (a) the distribution of changes in the consumption of extended family members is independent of the distribution of changes in extended family member resources, and (b) exogenous redistribution of resources within the extended family will be offset by endogenous intrafamily transfers.

I first set about testing the Barro proposition in a paper with Michael Boskin (Kotlikoff and Boskin 1986). We assumed that one big Barro inter- and intragenerationally altruistically linked dynasty determined economy-wide consumption decisions and used dynamic programming to determine how the dynasty would consume given aggregate earnings and rate of return uncertainty. The assumption of one big dynasty is less extreme than it may seem. First, the aggregate consumption decisions of a single big dynasty would be the same as those resulting from altruistically unlinked dynasties, provided they had common homothetic intertemporal preferences. Second, as I showed in Kotlikoff (1983), and Bernheim and Bagwell independently derived in 1988, intermarriage among altruistically linked dynasties effectively links the dynasties themselves into one mega-dynasty.

After estimating our model, Boskin and I tested whether the cross-cohort distribution of economic resources mattered to aggregate consumption given the level of consumption predicted by the Barro model. The answer we found was a strong and statistically significant dependence of aggregate consumption on the intergenerational distribution of resources.

While telling, the aggregative nature of this rejection of Barro's model seemed less than fully convincing. So I next teamed up with Andy Abel to test the Barro model using cohort data derived from the Consumer Expenditure Survey. The result is chapter 4. This article was first distributed as an NBER working paper (no. 2490) in 1988 under the title "Does the Consumption of Different Age Groups Move Together?—A New Nonparametric Test of Intergenerational Altruism," and finally found a publisher in 1994.

The paper showed that altruism imbues consumption with a factor structure, one implication of which is that the Euler errors of altruistically linked individuals and, by extension, households are identical. Assuming time-separable, homothetic preferences, this implies that all altruistically linked households should experience the same percentage change in consumption from one period to the next, independent of their own resource shocks. With some weak additional assumptions, this implies that the average percentage change in household consumption within an age cohort should be the same for all age cohorts and not correlated with their income changes. As we also pointed out in the paper, the nonaltruistic life-cycle model, coupled with the assumption of risk sharing, also delivers these predictions.

Our empirical analysis is nonparametric in that it places no restrictions on preferences besides the assumption of homotheticity and time-separability. The findings indicate that the distribution of average within-cohort consumption changes depends significantly, in both economic and statistical terms, on the distribution of within-cohort average resource changes.

Our derivation of the factor structure of consumption implied by altruism and, in first difference form, by selfish risk sharing suggested yet another source of data to test both altruism and selfish risk sharing, namely the Panel Study of Income Dynamics' (PSID) data on the consumption of parents and adult children living in separate households.¹ Chapters 5 and 6 are two of three papers I wrote with Joseph Altonji and Fumio Hayashi using these data.²

Chapter 5 provides more strong evidence against interfamily altruism. It shows that extended family member resources have at most a minor effect on a household's consumption decisions; that is, the distribution of consumption among extended family members is heavily dependent on the distribution of resources across those members.

Chapter 6 plays devil's advocate to chapter 5. It grants that intergenerational altruism is not ubiquitous, but asks whether this behavior is characteristic of a subset of extended families, specifically those who are observed to be making interfamily transfers. To examine this question, we again turned to the PSID data, but this time, the data on transfers. Our objective was to test the Barro restriction on transfer-income derivatives that follows from the fact that exogenously redistributing a dollar of income from the transfer recipient to the transferor should lead the transferor to increase her transfer by a dollar. However, before we could estimate the transfer-income derivatives of parent transferors and child transferees, we needed to resolve two issues. First, we needed to clarify that the timing of transfer payments is not arbitrary, because if it were, we'd need to have data on lifetime, not annual transfers. Such data aren't available. Second, we needed to deal econometrically with the potential sample selection bias arising from focusing on the sub sample of extended families in which parents were making transfers.

We responded to the first issue by positing a model in which the future income of children is uncertain. This simple and realistic assumption has the following implication: unless children are liquidity constrained, their assumed altruistic parents will delay making transfers to them until their income uncertainty is resolved. Intuitively, if altruistic parents think their children may strike it rich and if their children aren't cash-constrained, the parents will take a wait-and-see attitude with respect to making transfers. The observation that parents are making transfers is thus an observation that the children are indeed borrowing constrained and that the amount being transferred has been chosen deliberately. This deliberate choice of the level of transfers is critical for generating the testable restriction on the parent and child transfer-income derivatives. To deal with the second issue—the sample selection problem—we used an ingenious sample selection-corrected derivative estimator developed by Altonji and Ichimura (1996).

Like the other studies in section II, this one also strongly rejects intergenerational altruism. We found that taking a dollar from a transferee child and giving it to a transferor parent would lead the parent to hand back to the child somewhere between 4 and 13 cents depending on the income measure we choose. These responses are not only small economically; they are also not statistically different from zero.

Intergenerational altruism can also be tested along other dimensions and with other kinds of evidence. For example, chapter 2 shows that the government's forced annuitization of the elderly was not undone or, indeed, even offset, by the elderly purchasing more life insurance as would be predicted in an altruistic setting. And chapter 1 shows that the dramatic postwar increase in the consumption of the elderly relative to the young coincided with a dramatic increase in their relative resources.

As a group, chapters 1, 2, 4, 5, and 6 represent a fairly definitive rejection of the specific model of intergenerational altruism posited by Barro. But does this mean that altruism is decisively ruled out as an important component of preferences? The answer, as chapters 7 and 8 indicate, is not necessarily. Chapter 7, written with Assaf Razin and Robert Rosenthal, shows that Barro's proposition (also known as Ricardian Equivalence after a seemingly off-the-cuff paragraph by David Ricardo)—that altruistically linked individuals will base their economic decisions on collective rather than individual resources—is predicated on special assumptions about the strategic interaction between donors and donees. In particular, Barro assumes that donees take their transfers from donors as given and that donors believe any transfer they make, no matter how large or small, will be accepted.

This Nash assumption seems plausible until one contemplates the behavior of two mutually altruistic individuals who each wish to transfer income to the other. If their mutual altruism is sufficiently strong, no Nash equilibrium will emerge. Instead they will pass money back and forth to each other forever. In light of this problem, chapter 7 considers an alternative game that both selfish and altruistic children can play with their altruistic parents. This game permits children to refuse the receipt of transfers if they think these transfers are too small, or, if they care about their parents, too big. If one assumes that the conflict between parents and children is

resolved via the extended Nash bargaining solution, the threat points of the parents and children will influence the game's outcome. Consequently, with this formulation of economic behavior, which seems as plausible as that entertained by Barro, Ricardian Equivalence will almost never hold. Why? Because exogenous redistribution between parent and child alters their threat points and, thus, their strategic interaction.

While chapter 7 questions the assumption that Barro makes about the strategic behavior of altruists and their loved ones, chapter 8, written with Assaf Razin, questions Barro's implicit assumption that the altruist has full information about her loved one's economic circumstances. If one introduces, as does chapter 8, asymmetric information between donors and donees, Ricardian Equivalence again loses purchase. In this case, the donor's problem becomes isomorphic to Mirrlees's (1971) optimal tax problem. In the optimal tax problem, the government tries to redistribute among agents of different, but unobserved ability. Here, parents play the role of government and children play the role of agents. Parents not only determine the absolute amount of funds to transfer to their children, but also how those transfer payments will vary with the earnings of the child. Thus inter vivos transfers will be structured just like tax and transfers programs and generate the same kind of work disincentives.

Life-Cycle Planning

Following the use of neoclassical frameworks to study saving, bequests, wealth inequality, and altruism, the final section asks whether households are actually making life-cycle economic decisions in the manner suggested by neoclassical theory. The first chapter in this part, chapter 9, was written with Ariél Pakes. The chapter points out in general terms that if households are, over time, rationally processing new information about their earnings, the changes in their consumption will imbed extractable information about the extent and time resolution of that earnings uncertainty. Stated differently, in a context of earnings uncertainty, new information about lifetime earnings and only new information about lifetime earnings should explain revisions in consumption plans. If consumption is measured accurately and is fluctuating through time to a much greater extent than can be rationalized by changes in information about future earnings (i.e., if the noise in consumption is

much greater than the news about lifetime earnings), then households are failing to intertemporally optimize. Chapter 9 uses time series data on consumption to compare the noise in consumption with the news in earnings. Its findings are not particularly supportive of optimal intertemporal consumption choice; virtually all the noise in consumption is unrelated to the news about earnings.

Chapter 9's findings are illustrative and suggestive, but hardly convincing evidence against rational consumption choice. First, the particular time series application relies on the kind of infinite horizon dynastic preferences rejected in the studies of the previous section. Second, the chapter's framework entertains one and only one form of uncertainty, namely uncertainty in labor income. Third, the high ratio of noise to news in consumption innovations may simply reflect substantial errors in measuring national per capita consumption.

Chapter 10, written with Stephen Johnson and William Samuelson, takes a more direct approach to testing the rationality of intertemporal consumption choice. It presents results from an experiment conducted at Boston University in which subjects were asked to make preferred consumption choices under hypothetical life-cycle economic conditions. The subjects' responses suggest a widespread inability to make coherent and consistent spending and saving decisions. Their errors in decision-making were not only substantial, they were, in many cases, systematic. To be more precise, subjects made substantially different choices in identical economic situations because they systematically over-discounted future earnings. They also systematically oversaved, apparently out of a failure to appreciate the power of compound interest.

Like the findings in chapter 9, those in chapter 10 are not entirely convincing. In this case, the participants in the experiment—primarily students at Boston University—while being paid to participate, had no personal stake in providing correct answers. In addition, the students were being asked to imagine themselves in a very simple economic world with no uncertainty—a situation different quite from their reality. Many of the subjects may simply have failed to set their own circumstances aside when asked to think how they would behave in a quite different environment.

In contrast to chapters 9 and 10, chapter 11, written with Alan Auerbach, looks at actual individual choice, in this case the purchase of life insurance, to assess the rationality of life-cycle decision-

making. The chapter starts with the premise that life insurance, while not perfectly actuarially fair, is sufficiently cheap to permit households to attain close to full insurance when it comes to preserving the living standards of survivors. The chapter also shows that rational choice of life insurance can be tested not simply by looking at the degree to which it is purchased, but also by considering how the amount purchased responds to the government's provision of survivor insurance through social security. The data used in the study come from the Retirement History Survey.

The chapter finds the following: first, life insurance holdings are inadequate for almost half of the sample households. Second, life insurance holdings are grossly inadequate for a significant minority of sample households. Third, empirical estimation of the demand for life insurance produces results that are, in most cases, greatly at odds with theoretical predictions. And fourth, households do not reduce their own purchase of life insurance in light of the implicit life insurance they are provided by social security.

The chapter's finding of severe under-insurance among an important minority of American households has been confirmed in my subsequent work with Auerbach (Auerbach and Kotlikoff 1991a,b), in a recent coauthored study that used the Health and Retirement Survey (Bernheim, Forni, Gokhale, and Kotlikoff 1999), and in studies by Holden, Burkhauser, and Myers (1986), and Hurd and Wise (1989).

Chapter 12, written with B. Douglas Bernheim, takes yet another approach to understanding whether households are able to plan rationally and appropriately for their economic futures. The approach is to look at their financial literacy and to examine the kind of advice households are securing from financial planners and, presumably, following when it comes to making their consumption and saving decisions. The chapter reaches the following three conclusions. First, most Americans are not making prudent financial decisions. Second, many Americans are unaware of their financial vulnerabilities and lack the knowledge and sophistication to make proper financial decisions. Third, the financial planning industry's approach to financial planning, which is based on targeted saving, produces prescriptions that are, in many cases, inappropriate and unreasonable.

Chapter 12 introduces a new financial planning tool, Economic Security Planner (ESPlanner), which I codeveloped with Jagadeesh

Gokhale, Lowell Williams, and Douglas Bernheim. Since writing chapter 12, we have developed ESPlanner into a much more sophisticated life-cycle consumption-smoothing tool.

Chapter 13, written with Bernheim, Lorenzo Forni, and Gokhale, uses the current version of ESPlanner to address the normative question of how much should the respondents in the Health and Retirement Survey, a group that is approaching retirement, be saving. The answer is a lot except for low-income Americans for whom social security replaces a very high fraction of preretirement income. A lot here means between 10 and 20 percent of income, with the recommended saving rate rising with age and income. Such high saving rates are to be expected given that these households have spent their younger years raising families, paying off mortgages, and paying for college tuition. High preretirement saving also accords with the typical cross-section profile of financial wealth by age of household head. This profile features hump savings for retirement, but the hump in savings occurs in the last 40s and 50s.

In addition to pointing out how much typical preretirees should be saving, the chapter notes the critical role of future social security benefits in making that decision. Specifically, it asks how much higher prescribed saving rates should be, under the assumption that social security benefits will be substantially cut in the medium term. The answer is that all households, particularly low-income ones, need to save at substantially higher rates than would otherwise be the case. The chapter argues that the social security system's long-run finances are in such precarious condition that major benefit cuts are almost inevitable. The fact that most Americans approaching retirement appear to be saving at lower rates than ESPlanner recommends, especially given prospects for major social security benefit cuts, represents further reason to question the quality of Americans' intertemporal economic decision-making.

In chapter 14, Gokhale, Mark Warshawsky, and I used ESPlanner to compare the recommendations of conventional financial planning software with those flowing from the economic approach imbedded in ESPlanner. The differences in recommended saving and insurance holdings are, in many instances, dramatic. The paper suggests that large segments of the American public are being persuaded to make saving decisions that leave them consuming either far too much or far too little in the present compared to what they'll be able to consume in the future.

Conclusion

This book tries to explain why our nation is saving so little, why its bequest behavior is changing, why wealth is so unequally distributed, whether altruism influences household responses to fiscal policies, how altruism might be modeled, how to formally test the rationality of intertemporal economic choice, whether people are capable of making consistent and appropriate intertemporal decisions, whether they do make such decisions, whether they have the knowledge and tools to help them in that process, and, finally, what they should be doing to prepare for the future. While the articles are not perfectly interlinked, they do, I think, feed on and nourish each other.

In trying to briefly summarize and connect the chapters of this book, I've had to restrain myself from pointing out many of the things I like about each chapter and some of the surprises they contain. For example, chapter 1 shows that the U.S. government has rearranged our net nonasset income (nonasset income after taxes and after in-kind and in-cash transfers) such that postwar cohorts can now expect to receive higher net nonasset income after retirement than prior to retirement. This depends, of course, on the government's ability to deliver on its promised transfer payments, but it provides a graphic explanation for the disappearance of personal saving in the United States. Another example is chapter 11's derivation of how Heckman's correction for sample selection bias neatly generalizes to the case in which sample selection is occurring based on two correlated processes. A third example is the subtle way one can extract new information about future earnings distributions by considering the covariance of consumption changes and ex-post realizations of lifetime earnings.

These and other discoveries as well as the opportunity to work with such a distinguished group of coauthors made these chapters great joys to write. I hope that their reading provides a small fraction of the pleasure I derived in their construction.

Notes

1. Townsend (1989) independently derived this factor structure.
2. Hayashi, Altonji, and Kotlikoff (1996) is the third. This paper provides a broader framework for analyzing the factor structure of consumption, but reaches the same negative conclusion about the existence of either widespread altruism or selfish risk sharing.

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