



## Building Better Retirement Income Models

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# BUILDING BETTER RETIREMENT INCOME MODELS

Christopher M. Bone,\* F.S.A. and Olivia S. Mitchell,† Ph.D.

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## ABSTRACT

U.S. policymakers interested in retirement issues are awakening to the fact that changes in our nation's retirement income systems are absolutely essential in the years ahead. Predicting and understanding the effect of alternative policy choices require a concerted effort to build powerful retirement models. This paper assesses the state of the art in retirement income research and data and identifies important knowledge gaps that actuaries and economists can strive to fill in the near future. The paper also describes recent collaborative efforts of actuaries, economists, pension sponsors, and government policymakers that may be of interest to pension actuaries and others concerned with retirement issues.

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## INTRODUCTION

The question of how to ensure retirement income security in old age has been answered by developed societies in a variety of ways over the years, but increasingly these answers appear to be falling short. In the U.S. and elsewhere, saving rates are dismally low, yet workers are retiring earlier and healthier than in any other period in human history. Few employers are willing to launch a new defined-benefit pension plan promising a known stream of retirement income. Lower birth rates and changes in family structure imply that family support cannot be counted on by most people reaching old age. And finally, government social security programs in the U.S. and around the world face projections of insolvency.

Taken together, these trends toward earlier retirement, longer life expectancy, changes in family structure, and inadequate public and private asset accumulation imply that many working Americans are ill-prepared to support themselves over the last quarter to one-third of their lives. However, the U.S. is awakening only slowly to the need for stronger incentives to save and work. The fact that the policy debate is beginning to take note of these emerging issues is attested to by several retirement proposals that have emerged over the last year. A sampling of these policy proposals and their intended outcomes (as expressed by those supporting the proposals) is as follows:

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|---|----|--|
| • Restructuring the income tax system   | to | Provide increased incentives for work and savings                        |
| • Simplifying pension plan laws for private- and public-sector employers                                    | to | Encourage additional sponsorship of pension plans                        |
| • Converting Social Security to a system partially based on individually managed savings accounts           | to | Fix long-term soundness of Social Security                               |
| • Adopting new rules for provision of joint and survivor benefits from employer plans (federal and private) | to | Address problems of insufficient retirement income among elderly widows. |

We contend that the next decade will see a growing number of laws and regulations proposed for revamping the nation's retirement income system. We also believe that understanding the impact of these proposals will require a new generation of retirement income models that can be used to conduct detailed analysis of key participants' reactions. The set of stakeholders is broad and includes plan sponsors, employees and their families, employee groups, providers of investment services, taxing authorities, and many others. Also, reactions do not typically occur in a single round of changes; a proposed tax reform, for instance, could lead affected parties to alter their behavior (for example, employers might redesign their plans, workers might retire later), and this change in turn must be modeled as affecting other parties, resulting in a cascading array of changes. Policymakers who are redesigning the nation's retirement income system for the

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next century are therefore in dire need of retirement models that can help assess which reforms will be feasible, successful, and cost-effective. These models must reflect key real-world interactions between affected parties, and they must also be able to provide answers about key outcomes from a given policy change.

The task of generating better retirement models for policy analysis would be well served by an analysis of the substantial body of retirement and pension research developed over the last 15 years. For the U.S. system, the time is right for a synergistic collaboration between actuaries and economic modelers seeking to answer a common set of questions about improving retirement security. This paper contributes to this discussion by offering an overview of recent advances in retirement research and data. We also identify important knowledge gaps that actuaries and economists can fruitfully strive to fill in the near future. We conclude with a report on recent collaborative efforts of actuaries, economists, pension sponsors, and government policymakers—efforts that we believe demonstrate the fruitfulness of such joint projects in the retirement field. Professional investment in enhanced data collection, retirement research, and the development of more coherent policy models will generate a high payoff in terms of informing the political debate and eventually producing a more sensible set of reforms.

## POLICY NEEDS AND POTENTIAL AUDIENCES

Experts reflecting on the 1992–94 national effort to reform the U.S. health-care system tend to agree that the debate was sorely hindered by two factors: a frustrating dearth of good data on key players in the health-care market, and the lack of good models of health insurance plans and the health-care marketplace. Many analysts now believe that a similar policy debate on U.S. retirement income policy is shaping up, and here too it will be vital to have a better understanding of the key players and their behavior in the nation's retirement income system. Developing the background to support this understanding is a tall order, requiring new models and data on the Social Security system, employer-sponsored pension plans, and private saving as well as on private and social insurance markets. Because of the complex interactions and extended time horizon over which retirement policy takes effect, these models must not only reflect first-order policy effects but also factor in responses by employees and sponsors of benefit plans as second-round effects.

In examining the types of research needed for better retirement policy models and data, we think there are three crucial, and interdependent, issues.<sup>1</sup> First, it is important to define as clearly as possible the range of retirement *policy levers* that modeling efforts should be able to incorporate. "Policy levers" refers to a wide range of benefit, tax, and employment practices that can be modified through legislation or regulation. A second, critical issue is that the set of *outcomes* of interest must be specified, given changes in the policy levers. And a third issue is the extent to which a retirement policy model utilizes up-to-date research on *behavior* of key players.

Satisfactory modeling of changes in retirement policy must take into account the many providers of retirement income. In the U.S. context, for instance, the players include employers (via pensions and retiree health programs), employees and their families (including family support arrangements), for-profit and not-for-profit groups (for example, insurers, health-care organizations, and financial institutions), the federal government (via Social Security and the Medicare program), and state governments (via public pensions, Medicaid, and welfare programs). This complex set of players can potentially be influenced by a number of different policy levers, such as tax laws, rules on benefit levels, employment law, age discrimination rules, investment and insurance regulation, and funding as well as contingent liability rules. A careful and complete model of the retirement income system would ideally take into account ways in which these many players fit together and how these policy levers influence the components as well as the whole (Gustman and Mitchell 1992).

Just as important as determining the policy levers is formulating the results of policy changes. In particular, a good model of tax and benefit programs would demonstrate how a particular policy change would affect specific agreed-on policy yardsticks. Of course, reasonable people might differ about the weights attached to particular outcomes, a fact that makes outcome assessment a difficult and sometimes contentious business. On the other hand, there are many criteria that people can agree on, outlined by the Technical Panel on Trends and Issues in Retirement Income advising the Social Security Advisory Council (Technical Panel 1995). This interdisciplinary group recommended that retirement income policies be assessed according to the following criteria:

- Welfare of those with the lowest income
- Protection against income fluctuations

<sup>1</sup>This material draws on the discussion in Hanushek and Citro (1995).

- Incentives to work and save
- Transfers across and within generations
- Administrative costs and investment performance.

Of course it is not sufficient to identify the most important policy tools and the outcomes. Policy models are most effective when they embody detail on key behavioral parameters of the various players in the policy arena, as emphasized in a recent report by the National Academy of Sciences (Hanushek and Citro 1995). For example, policy models of the effect of tax rule changes on pension plan behavior should build on information and behavioral assessments of how tax changes would influence both employer and employee interests in having a pension. Similarly, an examination of the potential effects of raising Social Security retirement ages must be integrated with models of employee behavior (including private savings and labor supply) as well as employer reactions (including retirement benefit offerings and labor demand). Some but not all of the necessary insights into employer and employee behavior are available in the existing literature; a key step in building better policy models will be to add to the literature on behavioral models (Bodie and Munnell 1992). More will be said on this point later.

Before concluding our discussion of policy needs, we think it imperative to note that those constructing policy models would do well to educate their audiences about two key issues. First, retirement modeling is inherently dynamic and intertemporal; that is, policy changes undertaken at one time will inevitably have both short- and long-term repercussions as people, employers, and other institutions respond to these changes over many years. Particularly for retirement modeling, it is essential to build in a long time horizon over which evaluations must be conducted. In some contexts this is obvious—such as when discussing the potential for Social Security privatization—but in others, a long time horizon seems, but is not, less central. For example, a proposal to alter benefit and tax treatment of existing pension programs should be evaluated both in the long and short run, simply because retirement plans and savings patterns take years to develop and change. A nontechnical or political audience sometimes overlooks the long-term nature of such changes, and modelers would do well to emphasize this point.

Second, analysts must emphasize the extent of uncertainty surrounding estimated results. Political audiences may expect a unique and simple answer to a broad policy question such as, “What would happen to pension coverage if all income were subject to a flat tax?” We believe the experts must answer explicit

questions such that policy decisions are not based solely on point estimates of uncertain value, but they also address the chances of deviation from point estimates, confidence intervals, and the consequences on the range of likely outcomes when underlying assumptions are changed.

Compare, for instance, policy proposal A, which is expected to enhance living standards for 45% of the elderly poor within five years, with a second proposal, B, which is expected to enhance living standards for 40% of the population within the same period. Now consider adding to the comparison that modeling uncertainty implies that policy A has a 90% likelihood that between 5% and 60% of the elderly poor population may be helped, while policy B has a 90% likelihood of helping 30% to 55% of the elderly poor. Understanding this range may alter the relative desirability of the two choices.

The general point is that policy models must support the provision of point estimates as well as a method for evaluating the uncertainty in these estimates. This will require models that can generate confidence intervals, sensitivity analysis using different model parameterizations, and other terms bracketing the inevitable uncertainty of policy predictions.

## **BUILDING ON THE STRENGTHS OF RETIREMENT RESEARCH**

### **Developments in the Actuarial Field**

The past decade has seen a resurgence of interest in actuarial research into retirement issues. Professional bodies have undertaken new collaborative efforts to study mortality, turnover, and retirement, with the pension plan as the unit of study. Consulting firms have built substantial databases that analyze, track, and compare plan provisions, as well as the value provided to employees through the operations of those plan provisions. Data on prevalence of retiree benefit plans as well as their liabilities and costs have also become much more widely available.

Much of this new actuarial capability can be attributed to the proliferation of cheap computing. The actuarial field—like many other areas that utilize extensive computer models—has seen a revolution in the quality and speed of computer models used to evaluate costs and liabilities of pension programs. Proprietary, fully parameterized models now exist in many actuarial consulting firms.

Despite these advances, the potential of this new technology to provide better answers to questions of interest to policymakers and plan sponsors has gone

substantially untapped. This is in part due to the ever-increasing regulatory requirements on pension plans and the associated expenses of generating actuarial liabilities and costs using assumptions and methods appropriate for the special purpose of the regulation. A decade ago, private-sector pension plan sponsors typically were required to calculate and report only two primary sets of calculations: projected benefits used in determining funding requirements, and the value of accrued benefits.

Now sponsors face a multitude of calculations requiring the use of multiple inconsistent sets of assumptions; they must prepare five to ten separate liabilities for purposes of funding; they must typically use a separate set of assumptions for determining reported expense; they may need to adopt separate assumptions to determine plan termination liabilities; and they employ yet another set of calculations to provide data to the Pension Benefit Guaranty Corporation for use in determining premiums. As a result, much of the potential for using advances in computer technology to provide better routine decision support data has been drained due to compliance with liability micromanagement. In essence, rather than focusing on quantifying the uncertainty of projections, regulatory forces have instead called for a multitude of scenario estimates using a variety of mandated alternative methods and assumptions.

On the other hand, over this period employers have begun to make much greater use of stochastic models of pension plan assets and liabilities in reviewing financial commitments. This was particularly true of large pension plan sponsors in the past, but of late, relatively inexpensive personal-computer-based stochastic models are becoming widespread among an expanding group of employers. Insurers are also beginning to make use of this technology, investigating the use of dynamic solvency testing models. What is encouraging about these models is that they offer improved understanding of not only point estimates of costs but also the range and uncertainty of cost estimates.

Also on the positive side, actuaries have devised improved models for assessing retiree medical plan costs. This follows several years of research and experience implementing the provisions of the Financial Accounting Standards Board's *Standard 106* on postretirement benefits, an exercise that has led actuaries to explore the sensitivity of these projections to age, morbidity, and longevity. In addition, better data on the prevalence and value of retiree medical benefits are now routinely reported by many private-sector plan sponsors. Data for public-sector plans should follow over the next several years, as public plan sponsors begin

to implement new accounting standards for state and local government obligations.

It may be instructive to contrast the state of knowledge on retiree medical benefits today with that in the late 1980s; at that time, estimates on retiree medical benefit costs issued by a variety of sources were not even within the same order of magnitude.<sup>2</sup> These new data have been gathered without the assistance of government agencies that regulate employer-provided retiree medical benefits. Indeed, even today, the annual filings made to the Internal Revenue Service and Department of Labor (Form 5500) often indicate the existence of retiree medical benefits only anecdotally.

There has also been a resurgence of interest of late in pension plan data collection, under the auspices of the Society of Actuaries. Interest was initially sparked by an article on turnover and retirement experience in a sample of southeastern firms in three industries (Vaughn 1992). This then led to a joint effort to collect data on turnover and retirement from a sample of pension plans across the country, under the auspices of the Society of Actuaries Retirement Systems Research Committee. The survey, currently expected to be available in early 1997, is based on information supplied by a number of national and regional consulting firms. It will generate new information on turnover patterns among employees covered by pensions in the late 1980s. Current plans call for the survey to be repeated every three to five years.<sup>3</sup>

By focusing on the pension plan as the unit of study, this Society of Actuaries pension datafile should complement existing surveys such as the Current Population Survey, a nationally representative questionnaire using individual respondents as the unit of measure. We hope that the pension file will serve as a basis for exploring the extrapolation of individual turnover results to plan-level data. Information on industry-specific turnover patterns for individuals actually covered by pension plans is clearly essential for models that evaluate certain types of proposed policies, such as policies targeted at portability of pension benefits.

<sup>2</sup>At a September 15, 1988 hearing before the Subcommittee on Oversight of the House Ways and Means Committee, witnesses provided estimates of unfunded corporate liability for retiree medical benefits ranging between \$227 and \$402 billion, excluding the provisions of the (subsequently repealed) Medicare Catastrophic Coverage Act. Witnesses could not reconcile these estimates with the \$2 trillion estimate of unfunded retiree medical liabilities made by the House Select Committee on Aging the prior year (*Daily Labor Report* 1988).

<sup>3</sup>This and other research projects funded by the Retirement Systems Practice Area of the Society of Actuaries are discussed in Anderson, Bone and Oliver (1994).

At a more preliminary stage is an ongoing Society of Actuaries-sponsored study to collect mortality data from a variety of large private-sector plans. While data collection is incomplete, commitments to contribute to this effort have been received from a number of large pension plans covering, in aggregate, several million plan participants. The designers of this study hope to generate new information on mortality trends by industry; to the extent that mortality is found to differ by industry, this will influence levels of saving required by different groups for private pensions. Questions of differences in mortality by industry were a key issue in the pension funding policy changes in the 1994 Retirement Protection Act. Good data on mortality differences would have improved the debate.

In addition to the group projects launched by actuarial organizations, privately developed databases on pension plan design have also grown in number and quality in the last decade. These privately held pension plan provision files are usually used to evaluate the desirability of alternative plans and to determine competitiveness of pensions, pension rules, and requirements. Because these databases focus primarily on medium-size and large pension plans, there is still a need to collect and analyze smaller pension plan characteristics. Efforts by the U.S. Department of Labor along these lines include recently published summary tabulations on small-employer pensions (and other benefits), but the raw data underlying these files are not currently available for confidentiality reasons. In general, the last decade has seen substantial growth in pension data collected, but as yet much of it is not available to researchers in the policy community.

### Developments in the Economics Field

Labor economists over the last 15 years have devoted a great deal of attention to modeling retirement behavior, in part responding to the development of large, nationally representative, longitudinal databases on individual workers and their retirement options. Extensive economic modeling and empirical analysis have generated several widely agreed-on conclusions (Gustman et al. 1995). First, economic factors play a crucial role in explaining why people retire when they do—not only current values of pay and benefits, but the workers' lifetime budget sets, including opportunities gained or foregone by moving up the retirement date. As a result, economic research suggests that successful behavioral models must adopt an intertemporal framework, in which people are assumed to look at the so-called opportunity cost of retiring at younger versus older ages (Fields and Mitchell 1984).

A second conclusion from the economics literature is that public and private pension plans strongly influence older workers' budget set in predictable ways. That is, some employer pension plans reward continued work at older ages (for example, many defined-contribution plans), and people in these plans are difficult to entice to retire. In contrast, many defined-benefit plans (and Social Security, in the past) have provided substantial early retirement incentives, and economic data show empirical peaks in retirement rates at early ages under such plans. Of course these responses are typically moderated by several other factors that predictably influence retirement, including marital status, family structure, and health. But most of the explained variation in retirement patterns across people appears to be due to measured differences in economic opportunities rather than other variables such as health conditions (Fields and Mitchell 1984).

While lessons from the economics literature are several, there also remain unanswered questions that require careful study and more data before researchers have all the necessary tools for high-quality retirement policy analysis (Bodie and Munnell 1992). One problem is that certain behavioral parameters appear to have changed over time, making it necessary to re-estimate old models. Thus the factors driving older women's work and retirement decisions today are suspected to be quite different from those for women reaching retirement age even one or two decades ago. Also, older peoples' reactions to health problems may have changed over time, a trend that is made more complex by the inherent difficulty of measuring health precisely. Older workers' retirement patterns appear to be driven increasingly by employee benefits in addition to cash pay, particularly retiree health-care insurance. This of course brings to the fore the central role played by government-supplied Social Security and Medicare. Both benefit programs appear to be at a point where substantial change may be anticipated; consequently the future path of benefits may be difficult to forecast. And all these behavioral parameters needed for retirement policy modeling are necessarily influenced by workers' and families' levels of private saving and consumption patterns. Specifically, why do people save so little on their own for retirement? How sensitive are their savings patterns to changes in taxes and government benefits? How might savings be expected to adapt to rising life expectancies?

Another reason questions remain unanswered after more than a decade of intensive economics retirement research is the difficulty of obtaining information on older workers' employers, along with the requisite

worker-side information (Gustman and Mitchell 1992). There is substantial promise in a new nationally representative longitudinal study of Americans age 51–61 in 1992 known as the Health and Retirement Survey (HRS), which surveyed employees and also collected data on their employers' pension and health insurance plans. Funding and data support have been provided by several U.S. government agencies, most notably by the National Institute on Aging and the Social Security Administration, to permit the matching of earnings and Medicare records to the respondent file, and by the U.S. Department of Labor, to provide employer pension data to be matched to the respondent file (Gustman et al. 1995).

The first wave of this project surveyed some 12,000 respondents between the ages of 51 and 61 in 1992 and their spouses; the data and documentation are already available to the research community over the internet ([www.umich.edu/~hrswwww](http://www.umich.edu/~hrswwww)). Plans are to continue collecting these data biannually, following the cohort as it moves out of jobs into retirement. In addition, respondents are followed if they enter nursing homes or move to retirement communities, and eventually records will be matched with mortality data when appropriate.<sup>4</sup> Refresher cohorts of baby boomers are projected to be included in the HRS as they move into the age 51–61 window, eventually ensuring that the survey will provide a steady state assessment of older Americans' well-being.

## LOOKING BACK, LOOKING AHEAD: CHALLENGES FOR POLICY ANALYSTS

During the 1970s and early 1980s, competing groups of policy analysts devoted substantial effort to devising microsimulation models to evaluate a wide range of retirement policy proposals (Hanushek and Citro 1995). Typically these modelers began with a nationally representative cross-sectional survey of households (such as the Current Population Survey collected by the U.S. Bureau of the Census). Using mainframe computers and multiple equation systems for simulating demographic and labor market outcomes, a variety of competing consulting groups developed methods of predicting the effects of a range of tax and benefit changes. The simulation scenarios for thousands of individuals and their families "aged" through time required assumptions and estimates of demographic and

economic processes, along with "laws of motion" affecting the simulated populations through time. Depending on the model, these microsimulation frameworks handled a range of policy changes on the input side and generated predictions about some of the key outcome measures deemed essential on the output side.

Over the last decade, however, these microsimulation models have fallen into disrepair. Their shortcomings include the fact that the high costs of running them prohibited extensive sensitivity analysis. Policy-makers as well as researchers also were concerned about the limited number of dynamic feedback loops that could be embedded in the systems and about the models' lack of transparency. In addition, and perhaps most crucially for our purposes, these models typically assumed that jobs and their benefits (pay, health care, pensions) could be treated as parametric to the simulations, "dropped" onto workers with few or no consequences for work effort, retirement, saving, consumption, and so on. Furthermore, pension costs (for example, contribution levels or reported pension expense) were typically allocated to pension plans without apparent regard for the incidence of such costs or possible employer responses to these cost increases.

Because existing microsimulation models are silent on employer cost motivations for offering pension plans, they would require extensive overhaul if they were to be used now to explain or anticipate likely employer reactions to changes in pension policy. Looking backward, we think the gap was inevitable in light of the lack of good data and well-researched models explaining employers':

- Decisions to offer a pension
- Determination of specific pension features
- Determination of pension funding and contribution patterns
- Comparisons of their own pension programs with those sponsored by other employers.

Looking forward, however, we think that many pension policies are currently aimed at altering employer behavior (for example, nondiscrimination rules) or influencing how companies construct plan options (for example, 401(k) or cash balance plans). To the extent that the trend is unlikely to change, existing microsimulation models cannot currently help us assess important outcomes affecting pension coverage and participation, pension accumulation and investments, and finally pension decumulation. In addition, the models must be updated and reformulated for the computer environments of the 1990s (including personal computer and supercomputer applications). A great deal of

<sup>4</sup>Other datasets currently being used by retirement researchers are discussed in Gustman and Mitchell (1994) and Hanushek and Citro (1995); see also Bodie and Munnell (1992).

work remains to be done, therefore, in the modeling of retirement policy.

### **Better Data on Employers and Their Benefit Offerings**

Some, albeit preliminary, progress has been made on modeling employer desires to offer pensions and the factors employers consider in choosing to modify or eliminate pension programs. Many actuaries have reported that changes in employer motivation for offering retirement benefits are significantly affected by two factors: cost and complexity.

Employer reaction to cost reflects both the assumption of long-term liabilities for promised benefits and the incidence of cash flows and reported cost. Cost incidence is important for all stakeholders (for example, employees, generations of management, generations of owners, and generations of regulatory overseers).

Complexity is sometimes viewed as only another element of cost. However, the differential incidence of complexity (on specialists versus benefit plan sponsors versus employees) needs to be carefully considered in analyzing how additional costs of complexity are incurred.

The importance of reported cost incidence in determining plan design appears to have been verified recently, as employers modified programs providing medical care for retirees. These cutbacks occurred at a rapid pace between 1979, when accounting standards for private-sector retiree medical plans began to be discussed, and 1994, when final implementation of the accounting changes went into effect.<sup>5</sup> Yet, at least during the latter part of the period, actual costs of providing retiree medical benefits were beginning to moderate as medical care inflation rates began to wane. This coincidental pattern indicates a significant effect of reported cost incidence on employers' desire to offer retiree health-care plans.

There are clear opportunities for actuaries to contribute to building better retirement income models. Specifically, actuaries understand the key drivers of employer behavior in their decisions to offer a benefit (and also to adopt, or to cease offering, a benefit). Their

input to policy models is required if employer responses to policy initiatives are to be incorporated.

### **Better Data on the Extent and Structure of Retirement Plans**

Data on pension plan benefits are currently collected through a number of required government filings and surveys. In addition, most private-sector pension plan sponsors are required to determine their annual costs of pension plans and report them in their financial statements. Similar accounting requirements for state and local government plans are now being implemented (GASB 25 and 27). Unfortunately, however, much of the information on benefit offerings is in the form of narrative descriptions, which cannot be readily quantified to obtain useful comparative statistics. In general, more could be done to improve the collection of private-sector plan information; a task force with input from actuaries and economists would be useful in taking stock of what currently exists and how to rationalize what could be collected at modest or no additional cost.

Data on retiree benefit plans other than pensions remain distressingly incomplete, and improvements in data collection should receive a high priority. One problem is that the information collection methods currently utilized by the Internal Revenue Service and the U.S. Department of Labor preclude separating benefits provided to retirees from those provided to active employees. In the main, the best current source of data on retiree medical plans is accounting data supplied by private-sector firms as part of the annual SEC filings; state and local government plans will begin to follow suit for some retiree medical plans in the next few years (GASB 26).

Another avenue for progress could have regulatory agencies working with private-sector groups to review the data collected by private-sector groups; then the agencies could adapt their requirements to gather similar information on a broader range of entities. This arrangement might improve the government's ability to monitor plans for compliance with regulatory requirements, while simultaneously expanding the research data available on private-sector retiree benefit offerings.

### **Retirement Research Useful for Actuarial Work**

Recent studies in the economics of pensions and retirement may be of particular interest to pension actuaries. Many collaborative efforts were undertaken

<sup>5</sup>A July 1993 GAO Study summarizes cutbacks in the provision of retiree medical benefits based on a number of surveys conducted by benefit consulting firms and providers of medical insurance. Subsequent surveys (for example, Buck Consultants 1995) continue to stress cutbacks in retiree medical benefits coincident with the implementation of new accounting rules.



over a decade ago by pension actuaries and pension economists during the work of the President's Commission on Pension Policy, including the development of concepts of replacement income sufficient to maintain a person's standard of living in retirement.<sup>6</sup> Recently this work has been revised, incorporating new tax laws and updated analyses of retirement expenses, work that has been widely used in the design of pension plans.<sup>7</sup> Of late, individual pension plan participants have also been given the opportunity to model their own retirement income needs, sometimes using computer software that includes the particular details of a sponsor's pension arrangements. Ongoing economic research has begun to examine what types of pension education appear effective in inducing pension-covered workers to participate in their firms' 401(k) plans and what types of pension information induce participants to invest in equities (Pension Research Council 1996).

Other economics research has focused on the factors motivating retirement at particular ages and under particular circumstances. Some of this analysis may be of particular interest to actuaries involved in the design of workforce management tools at the request of plan sponsors. One example is company-based "before and after" studies that analyze the effect of early retirement window offerings on retirement patterns (Lumsdaine 1995). Another is the analysis of the potential effects of privatization of Social Security retirement benefits (Mitchell and Zeldes 1996). What is needed is a cooperative process for gathering actuarial experience and evaluating consultants' and corporate experience on actual responses to tax and pension regulation changes, early retirement window programs, and changes in Social Security benefits and payroll tax rules.

## THE POTENTIAL REWARDS OF COLLABORATION

An encouraging sign to those interested in retirement policy modeling is the fact that an intellectual exchange is beginning to occur with the help of a number of key groups and players. For instance, Society of Actuaries research is actively exploring the area of modeling. Actuarial groups have recently commissioned a

joint study by an econometrician and an actuarial consulting firm to carefully evaluate existing retirement policy models, as well as to suggest ways to build actuarial expertise into the next generation of these models. This study is expected to yield a survey document and bibliography useful to actuaries and also to indicate areas that could most profitably be explored. In related work, the National Academy of Sciences (Hanushek and Citro 1995) has convened a group including actuaries and economists to review some of the key data needs for retirement models of the future.

Other alternatives beckon. It may be useful to renew past collaborative efforts in modeling retirement income consumption needs, drawing on the new Health and Retirement Survey along with other data sets. Additional research focused on efforts to educate employees about pension participation and pension asset decisions may also prove of value. Clearly, additional cooperative work on modeling retirement decisions would add significantly to our knowledge of how pension plans can be used to manage a workforce and how employees can be encouraged to provide for retirement.

## Highest Priority Issues

Actuaries who want to participate in the coming policy debate on pension and social security policy must develop a better understanding of the strengths and limitations of previous retirement simulation models. There is dissatisfaction with the old models, but recent behavioral research and newly developed data sources are promising. Clearly the next generation of modelers should be better positioned to answer a host of questions, including fundamental issues of the extent to which the private sector—rather than a universally mandated social insurance program—can or could support retirement income for coming generations. Actuaries have much to offer to the national debate in this area, particularly formal models that test current actuarial theories of behavior, including the effects of cost incidence and complexity.

Another high-priority activity is the rationalization of data gathering on key determinants of plan sponsor behavior. To the extent that pension cost and expense parameters are covered, government agencies such as the Internal Revenue Service, the U.S. Department of Labor, and the Pension Benefit Guaranty Corporation should have a strong interest in developing a more thoughtful and coherent data collection process, one that could be used for modeling. More rational data collection schemes are needed that do not add significantly to compliance costs of plan sponsors and that

<sup>6</sup>See President's Commission on Pension Policy (1981).

<sup>7</sup>Palmer (1994) has written a series of articles reviewing the change in replacement income required to replicate various after-tax income levels that reflect changes in Social Security or income tax laws; for alternative views, see Schieber (1996).

focus data collection on likely drivers of sponsor and participant behavior. It would also be extremely useful to facilitate collaborative data collection and analytic efforts between actuaries and academic economists, permitting statistical research and publication while preserving data confidentiality as necessary. Such data efforts are imperative to support the expansion of research into areas of key concern in modeling plan sponsor behavior.

## Timeliness

In closing, we emphasize that our call for better retirement income policy models is an urgent one. Changes in U.S. retirement policy are absolutely essential, and the sooner they are made, the better we will be able to protect our flexibility and range of policy options. A solid retirement system for the next century must be built on strong retirement policy models in the near term. If we wait two decades to implement the necessary changes in our Social Security and pension systems, decisions will inevitably be made with fewer degrees of freedom and in a crisis atmosphere. It is therefore imperative for informed researchers here in the U.S. to provide the tools needed for decision-making sooner rather than later.

We also believe that lessons learned by building better U.S. policy models will be useful to other nations. Most developed countries today, and many developing countries as well, face social security insolvency problems as pressing as our own, if not more urgently in need of resolution (Bodie et al. 1996). Better models of how employers and employees respond to public and private pension systems, and in turn of what contributes to a stronger retirement income system, will be invaluable the world over. Actuaries have much to gain from participation in this research and policy agenda, including the opportunity to apply new research to the practical day-to-day problems of their clients and the chance to influence retirement policy in the large.

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## DISCUSSIONS

### Robert J. Myers

The authors present a strong case for obtaining more data and constructing more models of retirement-income elements, so that policymakers can make better choices and so that actuaries can prepare better cost estimates to assist in such decisions. I would hardly oppose having more and better data available for these purposes, but I raise the question that there can be too many efforts in this direction as far as practicality is concerned (even though much "intellectual fun" may occur).

As to modeling, I assert that the actuaries at the Social Security Administration have always used models in making cost estimates. Of course, at the start, the models were quite primitive, and little data were available. Over the years and with the advent of computers, the models have become much more sophisticated. I believe that there is a point beyond which further precision and the availability of huge datasets are not really productive, and the users merely mesmerize themselves with the multitude of spreadsheets.

Furthermore, what is really gained by obtaining more precision for one small element (for example, the cost of OASDI parent's benefits) when a wide margin of variability is present for far larger elements (for example, the incidence of disability among insured workers)?

The authors introduce their advocacy by asserting that social security programs, including OASDI, "face projections of serious insolvency." In part, they say that this is so because birth rates are lower and workers are retiring earlier. As to fertility, the U.S. experience since 1975 has been the reverse (which a sophisticated model constructed in the early 1970s would never have shown!), and, then too, our high level of net immigration in recent years really has the effect of further fertility.

As to the need for retirement models obtained by studying past experience and conducting extensive

opinion polls and holding focus groups to discuss the subject, I believe that this is a relatively worthless, even though a great intellectual, exercise. As to opinion polls, people often do not know why they have taken certain actions or what they might do in the future under various scenarios. Then too, respondents are often apt to give the socially and politically "correct" answers, rather than what they really think (or believe that they think). The old story still prevails about the opinion survey with regard to desired future fertility among young mothers with children—the answer greatly depends on whether the little ones had been "angels" or "demons" that day before the interview!

Furthermore, retirement rates and patterns play only a small role in the results of the actuarial cost estimates for OASDI. Early retirement (that is, at ages below the normal retirement age—currently, age 65) have always involved benefit determination being on an actuarially reduced basis. This will continue to be so in the future and also after 2008 for retirement at and after the NRA. Since it makes little cost difference over the long run what retirement rates and patterns are, why study the subject intensively?

Raising the normal retirement age—as is currently being widely proposed—should be done solely and simply on cost grounds and the reasonableness of the proposition that, if people are living longer (and most certainly, in better health), they should work longer. So just legislate this without the need for "models of employee behavior (including private savings and labor supply) as well as employer reactions (including retirement benefit offerings and labor demand)." The latter elements will, of necessity, adjust themselves.

Finally, I am convinced that there is great need for simplicity, rather than huge tomes of research reports and modeling analyses. Policymakers in the executive and legislative branches must have simplicity in the presentations of cost estimates by actuaries. Often what is most important is the single intermediate-cost estimate, which shows both the status of the present provisions and the relative effect thereon of various proposed changes. Most certainly, in actual political practice, they do not need—or are able to use—an estimate that shows various probabilistic ranges, such as that there is only a 5% chance that a certain cost will be exceeded. After all, the average person would not be interested in a game of "Russian roulette" even if in only one time out of twenty, the bullet went off!

What is important is that the policymakers want and expect actuaries to present readily understandable cost estimates, with integrity and consistency being of the highest level. The relationship between Congress