

EBRI ISSUE BRIEF

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THE USE OF MODELS IN POLICY DEVELOPMENT: THE FORECASTS DEPEND UPON THE ASSUMPTIONS

Many research studies attempt to project the U.S. retirement income system's future. Concern for Social Security's solvency, the private pension system's ability to meet individuals' income security needs, and rapid demographic and economic changes have prompted policymakers to examine short- and long-range modeling forecasts.

Such forecasts are at the center of present debates over budget and tax reductions, and proposed Social Security modifications. Forecasts rely heavily upon previous economic growth patterns, labor force structure shifts, and governmental policy changes. They also must depend on assumptions of future economic, financial, and demographic movements.

Researchers use actuarial and economic models to develop forecasts of retirement income system activity. Models allow researchers to understand potential effects of policy changes on programs and people. They are mathematical representations based on theoretical formulations and assumptions about individual, firm and general economic behavior. While mathematical equations cannot completely imitate real-life events, they can aid in predicting prospective events under alternative assumptions.

In assessing retirement income policy, many types of models are utilized: macrosimulation models focus on employer or worker groups and economic trends affecting these groups; microsimulation models focus on individual employees, households, or firms, and their saving, consumption, work, and pension accrual behavior; actuarial models are used to estimate the expected costs and benefits of individual pension plans.

Models play an important role in U.S. retirement income policy development. Model utilization in analyzing the retirement income system was the keynote of a July 21, 1981 EBRI Workshop. Policy experts, modelers, economists, actuaries, and other employee benefit professionals gathered for a full-day discussion on modeling problems and potential modeling improvements.

The Need for Reasonable Assumptions: Social Security

One conclusion was: the use of reasonable assumptions concerning future demographic and economic events is a critical factor in developing realistic forecasts. Slight variations in assumptions for variables such

as population growth, interest and inflation rates, employment patterns, saving and investment rates, and real wage growth substantially affect forecast results.

Jane Ross, Deputy Director, Office of Research and Statistics, Social Security Administration, noted that even minor assumption changes in SSA's models significantly affected the 1974-1977 Social Security system's cost and revenue estimates. By 1977, "the short- and long-range cost and revenue projection models were very influential in convincing policymakers that the OASDI financing problems required speedy action." Ms. Ross stated that, "models of distributional effects were quite valuable in pointing out the cumulative and/or unintended effects of changes in the Social Security benefit structure. The Social Security system is so complex that it is unlikely that analysts can reason through all of the ramifications of a set of changes in the benefit or coverage rules. Quantitative analyses derived from benefit simulations can be extremely useful in providing such information. However, it is important to bear in mind that distributional analyses by themselves -- like other forms of analysis -- usually cannot be used by policymakers to decide whether a proposal is desirable or undesirable. It is difficult to frame a proposal that affects only an intended target group and that affects all members of that group. Value judgements and political evaluations need to be combined with various forms of analyses to decide whether, on balance, a proposal should be accepted or rejected."

The Need for Reasonable Assumptions: Private Pensions

EBRI's Research Director, Sylvester J. Schieber, reaffirmed the importance of assumptions in his discussion of the pension forecasting models used by the President's Commission on Pension Policy. He questioned the Commission's conclusion that "Commission forecasting models indicate that the proportion of the labor force covered and vested in employee pension plans is not expected to increase significantly under current policies." EBRI has carefully reviewed historical pension plan and workforce growth as well as effects of demographic trends. EBRI has developed an analysis of Pension Commission modeling assumptions and results. Dr. Schieber explained that the Commission had used models to simulate pension demand and supply. However, alternate scenarios of future pension growth based on other reasonable assumptions were not considered.

A review of the PCPP's "pension supply" model showed that arbitrary limitations were imposed on pension growth in industry-by-industry forecasts. After removing these limitations, forecasts of pension growth through 1990 substantially increased. PCPP's "pension demand" model incorporated assumptions that stipulated there would be no new pension plans created after 1979. This is contrary to the continuous historical private pension growth dating back to the 1950s. In the last three years alone the universe of private pension plans has increased by nearly 33 percent. According to the microsimulation model's construction, the only way coverage levels could increase was through the job change process. Under the Commission's current policy scenario, plan coverage trends were controlled through assumed rates of change in indexed wages for

job changers. The model's work history component assumed annual wages would grow 1 percent faster than annual prices. However, in estimating pension coverage, the Commission staff assumed that individual wage rates should be deflated by the wage index. This, in fact, cancelled the effect of future real wage growth on forecasted pension coverage and participation levels. Finally, the current policy simulation did not consider IRA growth after 1979. The only new IRAs after 1979 in the simulation resulted from workers over 40 rolling over their vested benefits at preretirement employment termination.

The Basis for Reasonable Assumptions: Empirical Research

"To improve the quality and usefulness of the assumptions used in many models, more empirical research needs to be undertaken in areas such as the labor market behavior of older workers, household asset accumulation, health and disability, and the effects of changes in regulatory policy affecting retirement income," according to Brookings Institution Senior Fellow Henry Aaron. Dr. Aaron suggested further that a better understanding of such behavioral relationships may contribute to more accurate projections. A Brookings study sponsored by the Department of Health and Human Services will investigate the possibilities of "linkage" between micro- and macrosimulation models, i.e., developing an ability to detect interactive effects of demographic, economic, and policy changes at the individual and aggregate economic level simultaneously.

The Use of Models Will Continue:

Careful Evaluation of Assumptions Will Become Increasingly Important

Modeling for policy exploration and program planning will continue to be an important tool. This technique's value, however, relies heavily upon:

- * The issue under consideration--is it normative or quantitative?
- * The assumptions employed--are they reasonable?
- * The historical data used--does it accurately reflect critical trends?
- * The results--how sensitive are they to change based on the assumptions and data used?

These crucial factors influence a simulation model's efficacy. In determining policy decisions, vital to firms and to the nation, policymakers must understand a model's viability and the significance of the model's results in influencing major decisions.

Models are essential in assessing interactive relationships among the program components of the retirement system. The system's complexity makes it virtually impossible, without the use of models, to isolate individual factors that influence the system's performance. Model selection and use must be performed carefully. Conclusions derived from simulation results must reflect an understanding of modeling problems and a knowledge of the issues involved.

Other Resources on Modeling

Through its workshops and publications, EBRI is committed to continued research and communication of modeling for employee benefit programs. Four EBRI publications discuss modeling for employee benefit programs and policy:

Modeling for Retirement Income Policy: Background and Overview (1980)

The Application of Modeling Techniques to Retirement Income Policy Issues An EBRI Workshop (1980)

Employee Benefit Programs and Policy: Modeling Research An Inventory of Research (1981)

Retirement Income Opportunities in an Aging America: Coverage and Benefit Entitlement (1981)