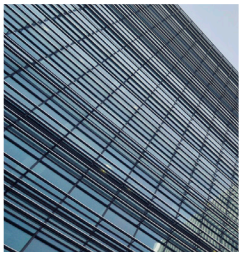
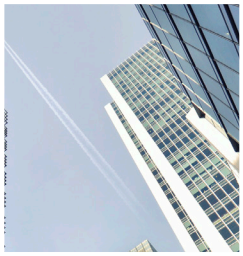
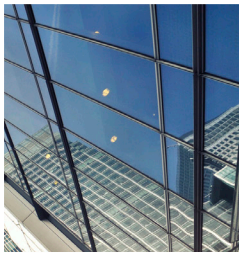
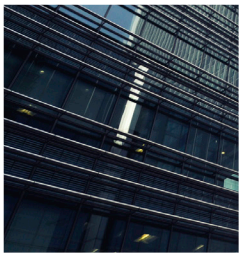

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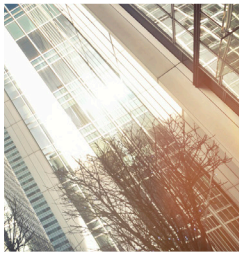

MORTALITY IMPROVEMENT MODELING IN THE UNITED STATES

By Bruce Rosner and Francisco Orduña

In the United States, longevity across all ages has improved almost continuously over the past century. In 1900, according to the Social Security Administration, a 45-year-old was likely to live another 22 years, to age 67. Today, a 45-year-old is likely to live another 38 years, to age 83—a 72 percent increase in life expectancy.

In this same time period, the Social Security Administration reported that mortality improved at an average rate of 1.10 percent per year. That mortality will continue to improve into the next century is considered a given. But will the improvement continue at this rate or an even faster rate? Or will mortality improvement eventually flatten out or perhaps drop? Making the right assumptions regarding mortality and its rate of improvement is critical to the effective pricing and financial management of many forms of insurance and annuity contracts, in addition to determining the ongoing funding of pension plans and other retirement provisions. In the second half of the 1900s, actual improvement rates have outpaced the projections used to value pensions and other retirement products, contributing to pension plan funding deficits as people lived longer than anticipated post-retirement.

Consequently, North American actuaries are in the midst of examining different techniques and models used to forecast short-term and long-term mortality improvement rates. The Society of Actuaries has undertaken a review of the literature to assess techniques, models and assumptions used for these forecasts. The report "Literature Review and Assessment of Mortality Improvement Rates in the U.S. Population: Past Experience and Future Long-Term Trends" is

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PENSION SECTION NEWS

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2013 SECTION LEADERSHIP

This newsletter is free to section members. Current issues are available on the SOA website (www.soa.org).

To join the section, SOA members and non-members can locate a membership form on the *Pension Section Council* Web page at *http://www.soa.org/pension/*

CHAIRPERSON'S CORNER

By Azita Bassiji

It is a beautiful fall day in Toronto and I am writing the Pension Section Council (PSC) chair remarks for the first Pension Section News of the new calendar year. I joined the PSC in 2011/2012 as the secretary and then vice chair in 2012/2013. Thank you for all your support to become an elected member of the PSC.

As I reflect on my experience as an SOA member and a PSC member since 2011, I have come to realize that a tremendous amount of work is accomplished by the PSC volunteers and the SOA staff who labor tirelessly to help the volunteers in the quest to advance the profession.

IDENTIFYING THE PROVERBIAL *"ELEPHANT IN THE ROOM"*

The PSC is painfully aware of the difficult times in pension consulting. The continued extreme volatility in pension obligations combined with longevity risk is forcing more and more defined benefit plan sponsors to rethink the design of their defined benefit pension plans. With this threat to the continued existence of defined benefit pension plans, we have fewer young actuaries entering the pension consulting profession. But we still need the expertise to help our clients solve their pension plan issues.

Over the last several years, the PSC has gone through a soul searching exercise to identify the areas help is required from the membership and the employers. Please consider this article a call to action. Change / improvement can only be accomplished effectively if we are all involved.

1. Become a Pension Section member and encourage your colleagues to join;
2. Get involved—bring us your ideas;
3. Use the SOA/PSC webcasts as a key source for supporting your continuing education;
4. Help us help you

CALL TO ACTION
PENSION SECTION & PSC MEMBERSHIP

It really is simple. In order for your voice to be heard (employers, pension actuaries, plan sponsors hiring actuaries, regulators and law makers), you need to be members of the Pension Section. It is the Pension Section member dues that generate the funds required to perform specific pension related research, recruit speakers for SOA webcasts and the SOA annual meetings, as well as pay for some of the cost of technology in support of webcasts and podcasts, etc. in short - to be more relevant. You can take it a step further by running for election to the PSC, which allows you to help shape the future of the pension consulting profession.

Azita Bassiji, FSA, FCIA, is partner at Aon Hewitt in Toronto, ON. She can be reached at *Azita.Bassiji@aonhewitt.com.*

The PSC is comprised of nine elected members who each serve a three-year term. We desire that the council be representative of our section membership, including representation from large and small employers spanning North America (including independent actuaries) with Canadian SOA members included. In addition we look for actuaries employed by plan sponsors, regulators, governments, and actuaries from the non-traditional side of pension consulting. In order to become an elected member of the PSC, you are required to be a pension section member with the desire and willingness to volunteer time for the good of the profession.

CHANGING FACE OF THE PENSION PROFESSION

My experience for the last 20 years has been that there is more demand on pension actuaries from our clients, our employers and our regulators than ever before. The pension actuaries' role is no longer a narrow, technical role but an ever changing, all encompassing role, including business partnership through pension risk management with our clients, educating the public on sufficiency of retirement income and facilitating an efficient delivery method with proper governance.

Under the leadership of Faisal Siddiqi and involvement from a former Pension Section leader, Evan Inglis, the PSC—through a Project Oversight Group (POG) —is working to educate and market pension actuaries as pension risk consultants. Actuaries' knowledge on the liability side of the balance sheet coupled with their knowledge of the pattern of movement of liabilities with assets can position the pension actuary to be uniquely equipped in the pension plan risk area. To accomplish this, the PSC, with help from the Investment Section, developed a curriculum and conducted a first ever "Investment Boot Camp for Pension Actuaries" as part of the 2013 SOA Annual Meeting in San Diego. The seminar has received great interest in participation and good reviews from the participants. The PSC is evaluating running this seminar in a few major cities across North America with local speakers in 2014.

The POG has also developed a reference guide for pension actuaries who would like to gain more academic knowledge in the area of pension risk management. This reference guide will be published over the next several months and will be available to all Pension Section members.

This is an example of an idea brought forward by a Pension Section member who reached out, got involved and helped the PSC deliver on its objective of expanding the role of the pension actuary and, thereby, help pique the interest of young actuaries entering the profession.

PENSION SECTION RESEARCH

The Research Committee of the PSC arranges for great research to be performed with the oversight of the PSC. Over the last several years, the Research Committee has improved the accessibility of research through providing a one page

summary of research, delivery of such summaries at the CIA and SOA annual meetings, presentations by researchers and practicing actuaries in webcasts and podcasts. There is also a Project Oversight Group (POG) working on further socializing the Pension Section research within the profession and other interested parties including the public. The roster and the relevance of research topics can only be enhanced by your participation in the Pension Section and sharing your ideas. The list of research performed is available on the SOA website.

ATTENDANCE AT SOA PENSION SECTION WEBCASTS

Living in a more technologically advanced world and having listened to the employers of pension actuaries, a great amount of continuing education is provided by SOA/PSC through webcasts. Over the last few years, the number of webcasts per year has increased. The topics have become more relevant, also addressing some of the needs of the Canadian membership by either offering Canadian specific webcasts or adding Canadian commentary to the webcasts. The PSC started offering a subscription arrangement to large employers for the webcasts and a short outline of topics and timing of the webcasts are available at the beginning of every calendar year.

Our request to pension actuaries and their employers is to consider the SOA webcasts series as part of the continuing education plan for the upcoming year. It is with your support and participation that PSC can assist us in doing our jobs.

ATTENDANCE AT SOA ANNUAL MEETING

Every year a larger number of pension specific and co-sponsored sessions are offered. The continuing education committee of the PSC, with help from the SOA Pension Staff Fellow, Andy Peterson, work from February to October to brainstorm on topics, prepare short summaries, recruit speakers and ensure a positive experience for attendees and speakers. They also work closely with the communication committee of the PSC on short summaries of selected sessions for podcasts or potential future webcasts if the session is overwhelmingly popular.

Our request of you is to get involved by participating in the SOA Annual Meeting as an attendee, a presenter or an organizer through our continuing education committee.

It is by participation/membership in the Pension Section that we can have our voices heard and help our profession improve—through innovative ideas, implementing the ideas and gaining the interest of young actuaries entering the profession.

Please support the Pension Section by becoming (or maintaining) your membership, encouraging your colleagues to join, bringing us your ideas, using the SOA/PSC webcasts as a key source for supporting your continuing education and helping us help you. ■

NOTES FROM THE EDITOR

By Martin McCaulay

Martin McCaulay, FSA, FCA, EA, MAAA, is an actuary with the U.S. Department of Energy in Washington, D.C. He can be reached at *martin.mccaulay@hq.doe.gov.*

Welcome to the January 2014 issue of *Pension Section News*. Topics in this issue include perspectives on lifetime income, decisions to retire and decisions in retirement, mortality improvement modeling, and defined contribution plans. The issue also includes six essays on defined contribution plans that relate to an aspect of DC plans that could be turned into a larger research project. Thanks to the authors for their contributions to this issue.

The Pension Section currently has twelve podcasts on the SOA website. Topics include the equity risk premium, retirement savings, research, smoothing, the PBGC, and Social Security. Check out the podcasts at *http://www.soa.org/Professional-Development/Event-Calendar/Podcasts/Pension-Section.aspx*.

Pension actuaries might be interested in attending some of these upcoming SOA sponsored meetings:

- The Investment Symposium on March 13th–14th in New York City
- The ALM Investment Symposium on April 7th in Hong Kong
- The Retirement Industry Conference on April 9th–11th in Chicago, jointly sponsored with LIMRA and LOMA.
- Lastly, the 2014 SOA Annual Meeting will be on October 26th–29th in Orlando.

For more information on these meetings, please see the SOA.org Professional Development calendar.

Have an article you think will be of interest to others in the Pension Section?
You can email them to the newsletter editor at *martin.mccaulay@hq.doe.gov.*

available on the SOA's website.[1] This article discusses those findings, describing techniques and models used to forecast mortality improvement and the considerations that underlie long-term mortality improvement projections.

TECHNIQUES FOR FORECASTING MORTALITY IMPROVEMENT

Demographers and actuaries use a variety of techniques to forecast mortality improvement rates and reflect the embedded uncertainty of such forecasts. The primary techniques can be classified into the following broad categories:

- ***Extrapolative:*** projects historical trends in mortality into the future—includes parametric methods and targeting methods
- ***Process-based:*** focuses on the underlying causes of death and attempts to model mortality rates from a bio-medical perspective

The following section indicates some of the most common techniques available to practitioners.

Extrapolative

- **Lee-Carter.** Developed by Ronald Lee and Lawrence Carter in 1992, this is a basic time-series technique that uses historical mortality data to predict future trends by age and period. Because the technique is purely extrapolative, its accuracy depends on patterns from the past continuing into the future, which they rarely do. Surprisingly, however, back-testing data from 1900–1989 showed a highly linear improvement in mortality, even with the period's significant medical, behavioral and societal changes. This result gives some researchers confidence that the technique will continue to produce accurate forecasts.
- **Lee-Carter APC.** The Lee-Carter Age-Period-Cohort (APC) technique adds cohort effects to the original Lee-Carter technique. Rather than by period, it is possible to specify mortality improvement by year of birth. The implication of a factor based on year of birth is that, in future years, the associated mortality improvements affect only the people born during a particular period, rather than everyone passing through a certain age.
- **P-spline.** The penalized spline (P-spline) technique uses interpolation to create a smooth curve from noisy historical mortality data. This curve can then be extrapolated to project future mortality rates by age and period. Back-testing data for the years 1984–2003 has shown this technique to produce accurate short-term forecasts.

Process-based

- **Cause-of-death.** Future mortality improvements may be developed from a composite of anticipated changes in mortality attributable to various causes of death. These models may reveal patterns around causes of death that can better inform and educate the user on the trends underlying the aggregate mortality rates. The disadvantages of this technique are the lack of credible and sufficient data, and an assumption that each cause of death to be independent of the others when, in reality, the causes are often interrelated.

The SOA report provides more detail on each of these techniques, including advantages and disadvantages, back-testing results, practitioner insights, and a comparison of modeling approaches.

INTEGRATED MODELS TO PROJECT MORTALITY IMPROVEMENT

In addition to each of the techniques described above, in practice, researchers may combine those techniques and expert opin-

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ions to project mortality improvement rates. The two integrated models considered in our study are the Social Security Administration's model and the Continuous Mortality Investigation (CMI) model currently used in the United Kingdom.

The Social Security Administration uses a model based on a cause-of-death forecasting technique. The primary input is an historical analysis of trends by five causes of death: cardiovascular disease, cancer, violence, respiratory disease and "other" causes. The secondary input is a sampling of expert opinions about anticipated changes in each cause of death, including risk factors, medical breakthroughs and environmental factors—changes that might affect long-term mortality improvement. The cause-of-death forecast and expert opinions are then mapped together to develop long-term mortality improvement estimates, which are then used to determine mortality improvement rates.

The CMI model is a sophisticated yet easy-to-use model for forecasting mortality improvements by gender, age, cohort and projection year. It uses two components:

- Short-term rates of mortality improvement, determined using P-spline smoothing
- A long-term rate of mortality improvement, as determined by the user

The model then generates mortality improvement rates through the convergence of the short-term rate to the user-selected long-term rate. The long-term mortality improvement rate is the heart of the model and makes it an easy-to-use tool for comparing outcomes across a range of long-term mortality improvement scenarios. It also helps to overcome some of the weaknesses of a purely extrapolative model, since socioeconomic and lifestyle factors that affect life expectancy can be reflected in the long-term rate selected, as well as the basic assumption on whether or not humans are approaching a fundamental limit to lifespan. This model may be useful to actuaries in the United States as well.

HOW WILL MORTALITY IMPROVEMENT CHANGE IN THE FUTURE?

Is it reasonable to assume that mortality improvement will continue into the future indefinitely? Or will it slow, eventually stop improving and perhaps even reverse as negative external factors come more and more into play?

In projecting mortality improvement researchers tend to fall into two extremes, with little middle ground. At one extreme, many see a practically unlimited human lifespan, arguing that every component of mortality has the potential to be reduced by human intervention. At the other extreme, some researchers believe the human life span is limited. Although they predict that life expectancy will continue to lengthen for some time into the future through medical advances and other factors, these researchers believe the inevitable processes of aging and damage accumulation will create a limit to the average life span.

The two camps have not attempted to arrive at a consensus. In reviewing available literature, we found that the implied annual mortality improvement rate of 1.26 percent, as reported to the Social Security Administration in the 2011 Technical Panel on Assumptions and Methods, represents an approximate middle ground for the range of long-term rate assumptions found in our review (Figure 1). The literature review provides a detailed review of the range of opinions on human longevity.

Socioeconomic status—driven by wealth, education and occupation, as well as other lifestyle factors—also has a significant impact on mortality improvement and creates

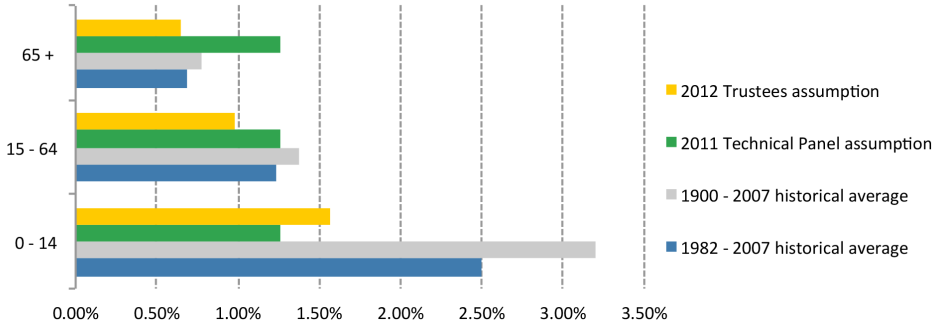
subgroups within a population. The literature review provides some context for actuaries to understand how certain subpopulation mortality improvement rates may compare to the general population.

CONCLUSION

Understanding mortality improvement is critical to the ongoing financial health of pension plans and retirement benefit programs, as well as insurance and annuity coverage. As professionals in life contingencies, we encourage actuaries to become more aware of the various considerations in developing mortality improvement assumptions and the modeling techniques that are available for this purpose.

The opinions expressed in this article reflect the opinions of the authors and are not necessarily those of Ernst & Young LLP. ■

Figure 1. Historical and assumed annual rates of reduction in aggregate mortality Source: Social Security Administration, Office of the Chief Actuary 2012



* Ultimate intermediate assumption for period 2036–86 in Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds 2012

** Derived from the 2011 Technical Panel on Assumptions and Methods unisex period life expectancy at birth in 2085 in Office of the Chief Actuary 2012

*** Historical average annual percent reductions in age-adjusted death rates are based on 2000 Census resident population and are "ultimate" rates of reduction after year 2036

ENDNOTES

[1] http://www.soa.org/Research/Experience-Study/Pension/research-2013-lit-review.aspx

A VIEW FROM THE SOA'S STAFF FELLOW FOR RETIREMENT

By Andrew Peterson

Andrew Peterson, FSA, EA, MAAA is Staff Fellow – Retirement Systems at the Society of Actuaries headquarters in Schaumburg, Ill. He can be reached at *apeterson@soa.org*.

As we start a new calendar year, I want to highlight a key SOA project of particular relevance to pension actuaries. The SOA's Retirement Plans Experience Committee (RPEC) will be publishing exposure draft reports for new pension-based mortality tables and projection scales. The new tables, RP-2014 (base mortality tables) and MP-2014 (mortality projection scale) are intended to replace the RP-2000 tables and associated Scale AA projection scale. These are the first new tables for U.S.-based pension mortality in over a decade, other than the interim Scale BB release issued by RPEC in 2012, so this is a significant development. I encourage every actuary working in the pension arena to read the exposure reports and learn about the new tables and projection scale techniques. In addition, the exposure reports provide directions on how to provide feedback to the SOA during the comment period.

While the topics of mortality improvement and appropriate projection methodologies are subject to debate, I hope that the core tenet of projecting mortality improvement is not. Certainly for U.S.-practicing actuaries, the Actuarial Standards Board has recognized the importance of mortality improvement by requiring disclosure of mortality improvement assumptions in ASOP #35. As foreshadowed by the RPEC's release of interim Scale BB in 2012, the new MP-2014 scale is being released as a "two-dimensional" scale based on both age and year-of-birth. (In fact some suggest that the new scale is actually three-dimensional since we are already used to projection scales based on age and sex—and the sex-distinction continues in this new version.)

We expect there may be questions about whether this new two-dimensional approach is necessary. Some may argue it is too much "fine-tuning" for limited additional benefit (particularly for smaller pension plans) or that software systems will not be able to handle this approach. However, a key aspect of the SOA's role as an educational and research association is to encourage the evolution of best practice, not merely maintain the status quo. We know that currently used projection scales based purely on age, have not done a particularly good job of reflecting recent historical mortality improvements. Two dimensional approaches provide users with the opportunity to model anticipated mortality improvement trends simultaneously over broad ranges of ages and year-of-birth cohorts, something that has not been possible with one dimensional approaches. In addition, two dimensional approaches are already in use or being encouraged in other countries such as the United Kingdom and Canada.

In conjunction with the release of these new mortality tables, the SOA is working on several projects in the education area. To help actuaries understand the new tables and projection scale and the methodology used in creating them, the SOA will be hosting a webcast covering this topic on April 16, and there will be sessions on this topic at the 2014 Enrolled Actuaries meeting. In addition, we are working on an educational presentation deck that will include "client-ready" slides that actuaries can insert into their own presentation decks for use in client situations when discussing mortality improvement, in general, and these new tables. In the meantime, if you have questions or comments, feel free to contact me or Bill Roberts (bill.roberts@towerswatson.com) who chairs the RPEC. ■

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MORE THAN 15 YEARS OF RESEARCH ON POST-RETIREMENT RISK

By Anna Rappaport, Carol Bogosian and Cindy Levering

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Carol Bogosian, ASA, is president of CAB Consulting in Chicago, Ill. She can be reached at *cbogosian@aol.com.*

The Society of Actuaries Committee on Post-Retirement Needs and Risks (CPRNR) has conducted a variety of research projects for more than 15 years. The CPRNR is a multi-disciplinary group, bringing together actuaries, economists, attorneys, survey researchers, plan sponsors and other types of professionals. The group engages in a variety of research projects and partners with other groups including WISER, INFRE, LIMRA, the Urban Institute, the Stanford Longevity Institute and others. All of the completed work can be found on our website.

Activities of the committee in 2013 included:

- Conducting focus groups on the decision to retire and the process of management in retirement.
- Completing a major report on lifetime income options, focused on providing employers what they need to put such options in their DC programs. This project includes quantitative modeling of a range of options (see below).
- Starting a project to develop best practices for financial management of the post-retirement period. The project focuses on middle class issues.
- Publishing a paper on the range of planning approaches with an approach to categorizing them.
- Issuing a call for papers on the link between long term care and retirement planning.
- Developing a concept for a paper on the range of approaches to providing advice, focused on employer options to participation in offering advice. This will be a continuing project of the Committee.

New projects for 2014 will be selected in January when the committee holds its annual planning meeting in Washington, D.C.

The major continuing project of the committee is the biennial survey of post-retirement risks. The first six surveys were conducted by telephone. In 2013, the CPRNR moved to an on-line survey for the seventh survey. The growth of technology and the move to cell phones are two of the changes that encouraged us to move to an on-line survey. Also in 2013, the CPRNR conducted focus groups on the decision to retire and personal management during retirement. The purpose of the focus groups was to explore why people did what they did. The focus groups are the topic of another story in this issue of *Pension Section News*. They served to provide valuable qualitative information used in structuring the 2013 risk survey. That survey explores a number of new issues and is designed to build on and add to what we learned previously.

The Lifetime Income paper, which was a major accomplishment in 2013, is designed to offer guidance to employers who are considering adding lifetime income options to their defined contribution plans. It includes a checklist and action steps for employers as well as a discussion of fiduciary issues. It also includes stochastic modeling of a range of income approaches and provides a clear demonstration of which approaches may be more appropriate in various situations. We will be working on a follow-up to this project dealing with optimal retirement income solutions in 2014.

The following broad themes have emerged repeatedly from our research over the years:

- There are major gaps in public understanding of post-retirement risks and the available solutions to manage those risks.

- The average American family nearing retirement age does not have enough money to retire and maintain their pre-retirement level of spending.
- It is extremely common for people to retire at an age significantly earlier than they planned to.
- Many people do not plan, and among those that do, many plan for a period shorter than the rest of their life.
- Planning is often focused on cash flow management in the next year or two, rather than on longer-term risk management.
- It is common to underestimate the impact of working longer, life expectancies, and the impact of widowhood.
- Women are not as well off in retirement as men.
- The shift to defined contribution plans has aggravated all of the above challenges. People are increasingly called on to plan on their own.
- Pre-retirees' expectations are different from the actions ultimately taken by retirees. Many people retire a lot earlier than they expect to. In the 2013 risk survey, there was a seven year difference (65 versus 58) in the expected age of retirement by pre-retirees and the actual retirement age for retirees.
- Pre-retirees are more concerned about risks than retirees. Top risk concerns are repeatedly inflation, paying for health care, and paying for long-term care. ■

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THE DECISION TO RETIRE AND POST-RETIREMENT FINANCIAL STRATEGIES

By Cindy Levering

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The Society of Actuaries Committee on Post-Retirement Needs and Risks recently conducted focus groups of people who have retired voluntarily in the last ten years. The report is titled "The Decision to Retire and Post-Retirement Financial Strategies" and it is available at *http://www.soa.org/Research/Research-Projects/Pension/The-Decision-to-Retire.aspx*. The purpose of this study was to gain understanding of how people make decisions about when to retire and about managing financial risks in retirement. This is an important topic because whether people have sufficient assets and income for retirement is very dependent on when they decide to retire and how they expect to live during retirement. In addition, certain financial shocks will continue to occur in retirement, much like they did during a person's working lifetime. There are also many non-financial decisions involved in the process.

Focus group research is not based on random sampling and provides no quantitative results. Rather, it collects qualitative data that in this study offers insights into the thinking and the rationale that goes into the decisions about when and under what circumstances to retire and decisions on how to manage during retirement. It supplements quantitative research, and can also help inform the issues for such research. Eight focus groups of financially resource constrained retirees who had retired voluntarily were interviewed. Groups were separated by asset level ($50,000 - $150,000 and $200,000 - $400,000), sex and geographical locations. A comparison of the experiences of recent (0-5 years) retirees versus more long-term (5-10 years) retirees was also examined.

The report offers many quotes from retirees and a chance to "give a face" to much of what we say about retirement. I had the opportunity to observe the two focus groups that were held in Baltimore and found them to be very interesting.

While many of the issues around retirement do not seem to change much, we observed two main findings that we felt offered new insights:

- Many voluntary retirement decisions were the result of a push.
- There were very big differences in experiences and perceptions by gender.

Exiting the labor force: While most of the participants said they had retired voluntarily when they were recruited for the focus group, it became apparent as they shared their experiences that a lot of them had been pushed into retirement. Few retired to meet their dreams, pursue a hobby or start a business. However, most had adjusted to retirement and were enjoying frequent travel. Reasons mentioned for retiring were that the work became too difficult, the workplace became less pleasant, health challenges, or the need to provide care-giving. They described workplace difficulties such as jobs that were

physically difficult, messages from their employer that they perceived as "encouraging" them to retire, and challenges in working with younger supervisors, among others. For example, participants said:

- *"When the company reorganized and showed that they weren't interested in people my age and opportunities came and went. Opportunities came to younger people and to me it was a sign that you'd better start thinking about it." Female, Chicago*
- *"But the last four years, I used to run big presses, and it was getting too much for my knees physically. If you have an office job, you can probably work until you're 70-75. But you can't do manual work like that." Male, Phoenix*

Typically, the retirement decision is assumed to consist of a clear distinction between voluntary and involuntary retirement. The stories in these focus groups indicate that much so-called voluntary retirement is actually the result of a "push," and that the distinction between voluntary and involuntary retirement is not necessarily clear-cut for middle-income retirees. Results may or may not be different for retirees with higher income and asset levels. The research team believes that the lack of a clear distinction between voluntary and involuntary retirement is a new finding, and one that should be of interest to human resource professionals. It also doesn't seem to be a direct result of the recession since some of the focus group participants had been retired for 5-10 years.

Differences by gender: The research team decided to separate the focus groups by gender which turned out to provide more striking insights than we anticipated. Actuaries have long known about longevity differences, differences in earnings and family status between men and women. While we have known that typical roles in the family are different, the focus groups offered new insights. The women had different motivations for retirement and seemed to have very different perceptions and confidence about how well off they were in retirement. Three of the actuaries who observed the focus groups from outside of the room provided some comments about the differences:

Actuary 1: "I noticed the women were more involved in care-giving roles. Some had left their jobs for care-giving and others had taken on various care-giving roles since retiring. Of more concern, the women were using their financial resources to help in the care-giving duties. One woman recognized she did not have the resources to continue and expressed some regret for her past decisions.

Contrasted to the women, few men left their jobs for care-giving duties. In general, they did not express concerns and did not expect to take on care-giving roles. A few men had significant care-giving roles for their wives who had a debilitating disease."

Actuary 2: "Most of the men in the Baltimore group said they did not think much at all about life expectancy since there was no use in trying to predict it. About half the women said they had thought about it and those that hadn't felt like they should.

Also, some of the men had trouble keeping busy and filling their days but that didn't come across from the women."

Actuary 3: "Observing the two Chicago focus groups, I immediately noticed a change in tone and demeanor of the groups. The atmosphere in the men's focus group was fairly easygoing, while the discussion became much more serious in the women's group. The difference was striking."

This research strongly indicates significant differences between men and women in the concerns and feelings about retirement, views of care-giving obligations and family

relationships, level of optimism, and vulnerability and planning behavior. The men appear optimistic, confident and more likely than women to think they will be able to adapt to any financial situation that arises. Women seemed much more concerned about financial security than men and more concerned about running out of assets, needing long-term care, being a burden on their children, and impacting the financial success of their children. Women appeared more sociable than men and more family oriented. While it has long been known that there are differences in retirement situations by sex, this report highlights areas of difference not often considered. However, the concerns of women seem appropriate given their longer average life expectancy and the general tendency of women to marry older men. This means they could outlive their spouse by several years and hence justify their concern about financial security in general and the need for receiving long-term care in particular.

Social Security claiming decisions: For these individuals, Social Security is a very important part of their income. Note one of our criterion for the focus groups was that they not have more than $2,500 a month of income from a defined benefit plan or rental income. However, most of the participants claimed Social Security at age 62, and they commonly did a simplified type of "break-even" analysis. This frames the claiming decision in terms of how long people must live to "break-even" if they claim later. Such an analysis generally ignores longevity risk, inflation and spousal benefits and can result in an adverse result for people who live longer than the actuarial tables indicated as their expected average lifetime. Employers can help by encouraging people to evaluate their options more carefully.

Financial management in retirement:

"My main concern is the expenses I have no control over. In the past year, my long-term care insurance, my taxes, my homeowners have all gone up. I can't do anything about that." Male, Chicago

Many of the focus group participants showed common behaviors and actions:

- Participants were very aware of their regular income and expenses, and they managed expenses based on their estimated daily expenses. They are very resilient and adaptable with regard to spending decisions and reduce spending when needed. They are accustomed to making trade-offs when necessary.
- The major strategy for managing their assets is to preserve them. Most did not have a plan to systematically withdraw assets from their retirement accounts. Those who had reached age 70½ use the legally mandated Required Minimum Distribution rules to withdraw funds from their Individual Retirement Accounts. They did not necessarily think much about volatility and some had more assets now than when they retired.
- Some manage their assets using "dual asset accounts" and have a "slush fund" for discretionary spending. The balance in the second fund lets them know how much money they can spend on travel and other discretionary items.
- Most own their homes, have paid off their mortgage, and appear to be very careful about debt. They had no interest in using a loan or reverse mortgage to access the equity in their home. It does not appear that they have large credit card balances. The findings about debt are different from other findings that indicate that many people are entering n with debt. They also generally plan to stay in their homes, but some plan to downsize.
- The focus groups offered no evidence of retirees spending significant parts

of their assets on luxury items, such as boats or RVs. The retirees do make choices about current spending and a number report reducing the amount they travel and foregoing other discretionary spending when necessary. We felt this was encouraging news in light of a lot of "horror stories" we sometimes hear.

Planning: This research, like other SOA research, showed a relatively short planning horizon and very little longer term planning. Employers have an opportunity to help employees and retirees with planning tools and support. We learned in the study that:

- Planning is focused on expected cash flow in the current year. Participants generally did not consider inflation nor did they factor it into their plans.
- As shown in other research, there are gaps in knowledge about longevity as evidenced by their short-term planning horizons. They didn't think much about their life expectancy but acknowledged that their health was the biggest threat to their security.
- The focus group members for the most part do not explicitly plan for shocks and longer term risks. Their risk management strategies appear to be asset preservation, limiting debt, and controlling spending. They do not focus on financial risk management products, and many are not well prepared to deal with substantial shocks. A few had long-term care insurance, but there is no information about its adequacy.
- Many of the focus group members have not made longer-term calculations to manage their retirement. Some use investment brokers, financial planners or advisors, and those who do use professional support reported getting value from the help they received. They did not make a clear distinction between getting advice from a financial planner versus an investment advisor/broker.

Overall satisfaction: Most of the respondents were generally satisfied with the retirement decisions they made. Some would have preferred to work longer. There was significant variation with how satisfied they were with their life in retirement. Some were lonely, particularly widows. However, they found a value in freedom and stated that their decisions were based on more than just finances. They tended to think more about the quality than the quantity of their retirement years.

Summary: The Focus Groups paint a picture of retirees who appear to be "resource-con-

"MY MAIN CONCERN IS THE EXPENSES I HAVE NO CONTROL OVER. IN THE PAST YEAR, MY LONG-TERM CARE INSURANCE, MY TAXES, MY HOMEOWNERS HAVE ALL GONE UP. I CAN'T DO ANYTHING ABOUT THAT." MALE, CHICAGO

strained" as careful and conservative financial managers in the short term with a focus on current cash flows rather than on shocks and changes over time. They are quite flexible and able to reduce current spending to match their current income. They are reluctant to draw down assets, saving them for emergencies, shocks or an inheritance. They limit what they spend for travel and meeting their dreams. However, they do not plan for significant inflation, substantial long-term care needs, and large unexpected medical expenses. Very few are using insurance products to manage these risks. While some get formal financial advice, many manage their assets on their own.

What does this mean for you?: Here are some possible ideas about how we as actuaries might use this information in working with plan sponsors, individuals, advisors and financial service companies:

- Many of the quotes in the report could be useful for including in client presentations, etc. in terms of bringing retirement issues to life.
- Employers may want to rethink such things as job options and planning tools, with an eye towards providing better support for longer-term planning.
- Financial service companies that offer retirement education with their products may consider different types of messaging tailored by gender.
- Those preparing individual statements may want to look at their content, making sure to include such things as illustrations of multiple retirement ages for some or all employees.
- Advisors should be well-versed in Social Security claiming strategies for both individuals and spouses so they can advise their clients appropriately. A helpful resource for individuals, employers and advisors is our Decision Brief on Social Security claiming which can be found at *http://www.soa.org/research/research-projects/pension/research-managing-retirement-decisions.aspx*.
- Individuals and advisors should be prepared if retirement comes sooner than expected (we also have a Decision Brief on that topic at the website shown above).
- Insurance companies may want to design more customized features in their new and existing products.

We would be interested in other ideas you may have so I encourage you to email Steve Siegel at ssiegel@soa.org with your suggestions. You could also use the SOA Pension Section LinkedIn group if you wish to share your ideas more broadly. ■

INTERESTING PERSPECTIVES ON LIFETIME INCOME

Compiled by Anna Rappaport with assistance from Steve Vernon, Chuck Yanikowski, Ron Gebhardsbauer, and Steve Utkus

In September 2013, the Society of Actuaries released a new Committee on Post Retirement Needs and Risks research report "The Next Evolution in Defined Contribution Retirement Plan Design – a Guide for Plan Sponsors to Implementing Retirement Income Programs." The report is authored by Steve Vernon, and the Society of Actuaries partnered with the Stanford Longevity Center on this project. The report is intended to help plan sponsor fiduciaries understand existing options for retirement income solutions for DC retirement plans. The report provides a rationale for plan sponsors about why such programs are important and includes a roadmap to assist the sponsor in the assessment of their workers' needs and in the design and implementation of a plan that meets those needs in a profit-neutral or profit-advantageous way. The report includes stochastic analyses by Dr. Wade Pfau and a discussion of fiduciaries by representatives of law firm Drinker Biddle & Reath. Also available is a PowerPoint Presentation that summarizes the research, for use by those interested in presenting the material.

The report advocates for retirement income solutions, but within the retirement community there are a range of opinions on when annuitization is desirable, and how much money should be annuitized. The Committee on Post-Retirement Needs and Risks maintains a listserve with many retirement experts participating. When the report was released, there was a discussion of interesting issues surrounding annuitization. This article shares some of that discussion.

Chuck Yanikoski challenges the wisdom of using retirement assets for a defined program of paycheck replacement, while Steve Vernon advocates for it. Additional comments from Ron Gebhardtsbauer also advocate for a programmed stream of retirement income. Steve Utkus provides insight on the prevalence of defined benefit plan income among people retired today, and cautions us not to expect too much annuitization too soon. I have selected excerpts from the conversation and have given the participants a chance to edit what they said. I have also added some personal comments. I encourage all of the readers to use the Pension Section's LinkedIn group to sustain this conversation.

The Discussants:

Ron Gebhartsbauer is a fellow of the Society of Actuaries and the leader of the actuarial program at Penn State. He was previously the senior pension fellow for the American Academy of Actuaries, and served in several governmental and consulting roles.

Steve Utkus oversees the Vanguard Center for Retirement Research, which studies many aspects of retirement in America—from how individuals start saving and investing in the early part of their careers, to how they prepare for actual retirement, to how they spend down their savings once they're retired. Steve is also a visiting scholar at the Wharton School, where he earned his MBA.

Steve Vernon is a fellow of the Society of Actuaries, a writer for CBS Money Watch and a research scholar at the Stanford Longevity Center. For many years he consulted to plan sponsors about their retirement programs.

Chuck Yanikoski is the president of Still River Retirement Planning Software, Inc. He has been an active participant in the work of the Committee on Post-Retirement Needs and Risks. He is a chartered life underwriter and spent 18 years at New England Life before entering the software business.

Anna Rappaport is president of Anna Rappaport Consulting and chairs the Society of Actuaries Committee on Post-Retirement Needs and Risks. Anna is a fellow and past president of the Society of Actuaries.

Chuck Yanikoski: This is an expertly done report on a subject that represents the current direction of the industry, which unfortunately is to help take retirees over a cliff.

There continues to be an assumption that some kind of essentially level (or smoothly inflating) income strategy is what people need. Some people do, but not many. Given the life expectancies documented in this report, and the literally dozens of contingencies (or in some cases, virtual certainties) that can arise over such spans of time, I think we have to assume that for most people, the likelihood of a smooth income need for life has close to zero probability of be-

ing appropriate. Therefore institutionalizing such income patterns is actually harmful to a majority of retirees. Those with smooth withdrawal patterns who will actually need more later will not have it when they need it, while those who need less later (say, because a mortgage will be paid off in 10 years) will be cash-poor in the early retirement years when, probably still having health and leisure, they could benefit most from having more money available to them.

The only thing that makes strategies like these less than totally catastrophic is that many people have additional assets of some kind, so they have some latitude to mitigate the dangerous implications of the proposed options. But many middle income families, and most lower income families, do not have such resources, so the people that are hurt the most are the ones who can least afford to be hurt.

If retirement income really is a fiduciary responsibility, I could easily make the case that adopting any of the strategies in this paper would be a blatant failure on the plan sponsor's part to meet that responsibility. I might not win the case, but I think I would. Unless there is a better answer than any of these, I personally would advise plan sponsors to stay out of it altogether.

Social Security and traditional pensions are everybody's favorite retirement resources because they are perceived as free, or mostly free. Even Social Security is only half paid for by the employee, and for most current retirees will end up being subsidized by the taxpayers as well.

Steve Vernon: Hi Chuck,

I appreciate hearing different points of view. You and I happen to disagree on this point. I will briefly present the case for the point of view expressed in the paper.

While most people are working, they receive a somewhat level form of income through a monthly paycheck. This imposes a powerful financial discipline on most people -- they can't spend much more than their paycheck. Yes, there are lumpy expenses such as insurance, property taxes, and unexpected repairs/medical bills. Yes, the income might be lumpy through bonuses, layoffs, job changes, and other interruptions or additions to monthly income. Workers are accustomed to managing these lumpy income and expense amounts, through loans, credit cards, insurance, liquid emergency funds and budgeting for non-regular expenses.

Most people adhere to some form of regular budget, either on paper or in their head, they know how much they can spend each month. There may be some leeway, but someone who makes $5,000 per month knows they can't spend $10,000 per month indefinitely.

The idea of a regular retirement paycheck is to duplicate the fiscal discipline that most workers have used throughout their working career. When people retire with a lump sum and have no strategy to systematically draw down their retirement savings, most people don't have the financial know-how to make that money last for life, and for many there's a tremendous temptation to spend the lump sum too fast.

Setting up a regular retirement paycheck imposes a financial discipline to make sure your savings last for life, and the paper shows various methods for doing this, with different attributes (lifetime guarantees or not, increasing or decreasing pattern of income, exposure to stock market risk, etc).

If you follow the paycheck strategy, when you're retired, you still need strategies to deal with lumpy and unexpected expenses, and having an emergency fund, line of credit/credit card, and insurance are three ways to do this - similar to when you're working.

There are studies that show that people of the prior retired generation who had significant defined benefit pensions have fared much better in retirement than people without pensions, and they are happier. This result is in an environment with unexpected expenses, medical bills, long-term care bills, etc. The experience of the prior retired generation provides support for our point of view. Our goal is to duplicate a "pension" within a DC plan.

I happen to believe that having a retirement paycheck strategy in place significantly decreases the chances of the majority of retirees "going over a cliff" and of "catastrophic failure."

Thanks again for expressing your opinion. Debating the issues is always healthy.

Ron Gebhardtsbauer: I totally agree with Steve on this point of a "level" income or purchasing power being preferable. When I testified before Congress on this issue, I surveyed retirees on their favorite retirement assets. (***Note: Ron testified before Congress often in his role as senior pension fellow at the American Academy of Actuaries.)***

(1) Invariably, they ranked Social Security higher than their other income, even when their Social Security Benefit was smaller, because they really liked that it always went up with inflation (never down).

(2) Next they liked their flat pension or their variable TIAA-CREF annuity. Often they liked the flat pension better than the variable annuity, because they knew it wouldn't be going down. Maybe it depended on when I was asking (which impacted whether the variable annuity was going up or down). My initial experience on Variable Annuities was in the late 1970s when the benefit went down while inflation was going way up.

(3) Many people never even ranked their other assets, because they were afraid of touching them.

(4) I reminded them that they forgot to mention their home, at which point they would rank that, but often they would still not put their assets on the ranking list.

This depends on whether they had enough income to easily cover all their expenses (i.e., were they really rich and could self-insure?), but I didn't know any fabulously rich people.

Anna Rappaport: Recent focus groups conducted for the Society of Actuaries indicated that average American retirees are very focused on managing their expenses to fit their income, and that their planning is linked to regular income.

Chuck Yanikoski: Thanks, Steve, for your sensible comments, though I am afraid we will continue to (mostly) disagree on this.

Working people have a lot more flexibility than retired people, and when serious "lumpiness" occurs they often go get a second job, they borrow from their parents (or move in with them), they borrow from their retirement plan, sometimes they even get married (or divorced). Generally speaking, these options are not open to retirees, especially older ones. Retirees need to plan more carefully, or just accept the increased likelihood of a bad outcome.

My understanding of the data is that most people who retire with access to a significant sum of DC money do NOT spend it recklessly, and it is more common for them not to touch it at all. They know it won't last forever if they spend it. The problem is that they don't know how much is appropriate for them to spend in any given year. So whether they spend a lot, a little, or none, it is probably not the best amount.

Putting people on a smooth withdrawal strategy helps this situation only a little. It gives them a number that is, or at least intends to be, somewhere between way too much and way too little. But the odds of it being close to the optimal number are still very poor if it is simply based on estimates of how long the money needs to last.

Anyway, the problem is not "lumpiness" so much as permanent changes. In our parents' day, most people with mortgages had them paid off by the time they retired. Today, most long-time homeowners have refinanced several times, and often have extended the terms of their mortgages, so that now it is very common for people to retire with mortgages. At the time they retire, they know their expenses are going to go way down when that mortgage is paid off. How can it make sense not to take that into account? So

maybe you add that to the model, but there are a lot of other things. If one spouse is older or sicker, and there is a strong probability of that spouse dying sooner, then normally, a whole lot of things change when that event occurs, and the survivor could be a whole lot worse off, or a whole lot better off financially, depending on the details. How can it make sense not to take that into account? Or a plan to sell one's house or otherwise relocate in, say, ten years, which will totally change one's living expenses? Or an inheritance that one has a legitimate expectation of receiving? Or some other benefit, or expense, or other change that can be anticipated? Or items that are merely probable (like reductions in most expenses in true old age)?

I guess affluent people have other means to deal with these things, and for them I don't really object to the strategies you discuss. But a lot of retirees always have been, and in our generation tens of millions still will be, living pretty close to the edge. They cannot afford to have their money managed according to a mathematical scheme that merely produces the neatest possible trend line. They need one that is as smart as possible.

I do not mean to say that annuitization, or other simple schemes, never make sense. They often do, but almost never as the total answer. Retirees FIRST need a better way to understand what their cash needs are likely to be over the long haul, and only then can they decide (preferably with help) what's the best way to meet those needs, as well as whatever contingencies they can afford to deal with.

I see no excuse for making a smooth withdrawal plan the normal default, or even the normal recommendation. It's just taking the lazy way out, and people expect more of someone with a fiduciary responsibility.

Steve Vernon: Hi Chuck,

Here's some clarification on our goals for this paper and future research efforts.

Let's start with a quote from a prominent behavioral scientist.

"For many people, being asked to solve their own retirement savings problems is like being asked to build their own cars." — Richard Thaler, "Shifting Our Retirement Savings Into Automatic," *New York Times*, April 6, 2013

Given your comments below, it seems we don't disagree very much.

We don't advocate that people ignore all the life events that you mention below, such as paying off the mortgage, health of a spouse, planning for survivors, relocating, and so on. These are all events that ideally someone should consider when planning for retirement.

We don't advocate that people devote all their retirement savings to a retirement income generator. In fact the paper advocates that plan sponsors give participants flexibility in this regard, allowing for a portion of savings to be paid as a lump sum and another portion devoted to generating a paycheck. You could have good reasons to receive a partial lump sum payment, such as paying off a mortgage or retiring other debt, or holding an emergency reserve.

We are just advocating that plan sponsors provide participants with tools to help secure reliable retirement income, so participants can take this into account in their overall planning. Plan sponsors can also deliver significant advantages to their participants with institutional pricing of retirement income solutions instead of retail pricing.

If a participant works with a financial advisor (a common possibility acknowledged in the paper), ideally the advisor would take into account all the events that you mention when developing a retirement plan for an individual. Such a plan might take advantage of the institutional pricing of retirement income options for the savings that are devoted to generating a retirement paycheck.

We are just advocating that plan sponsors offer tools to plan participants that they (and their advisors) can use to plan a secure retirement.

Thanks for listening.

Chuck Yanikoski: I can accept this, if plan sponsors are made to understand that some kind of preliminary analysis along these lines is an essential element of providing retirement income, and perhaps even that, as with reverse mortgages, a suitability analysis has to be performed before any retirement income arrangement goes through. Plan sponsors wouldn't have to be responsible for doing the analysis, but it would be a requirement before any retirement income option were actually implemented. Otherwise it would be like a doctor giving you medicine before doing a diagnosis—which is a pretty close analogue to what happens in a lot of retirement income planning today.

Steve Utkus: As Anna reminds us from time to time (most recently at Wharton's Pension Research Council), households with substantial financial assets are not the norm. Steve Vernon's analysis focuses on households with $250k-$1million in any type of saving (taxable, tax-deferred), representing about 20 percent of older households today. There's probably another 5 percent who are > $1 million. (This data is from Poterba, Venti, Wise, Composition and Drawdown of Wealth in Retirement, Table 2).

However, if you drop down to $100k or more in financial assets, that represents about 40 percent of older households. So that group is already 4/10, and it is expected to grow.

That said, we know that financial assets and DB plans overlap in the top half of the wealth distribution. So, from some work we are doing at Vanguard, among older households with more than $100k in any savings or investments, more than 70 percent have some DB income. That includes military, federal, state and local, plus private.

The conclusion I draw from this data is that the shift toward lifetime income strategies will be slow. Lots of older households with sizeable financial assets don't need much help because of the "long tail" of corporate DB income.

This is one reason here at Vanguard we hypothesize that you see very limited drawdown from IRAs & K plans in the 60-70 age range—at least today. Many don't draw down unless they have to (starting at age 70.5, the Required Minimum Distribution age).

Still, there is this small but growing group who needs retirement income help.

Anna Rappaport: Thank you all for a very interesting and thought provoking discussion. Some key points from my perspective are:

Planning is essential, and the plan sponsor has a real opportunity to offer tools or support to help their workers

Everyone needs a post-retirement plan

All or nothing solutions are not a good idea

Employers can provide a very important service to employees if they help them understand the range of possibilities and give them a framework for evaluating them

Employers can offer an additional important service by providing access to products using institutional pricing and competitive bidding.

We should also remember that past draw down of financial assets is not likely to be a reliable indicator of what will happen in the future. Earlier studies tended to find that older, wealthier families often had DB benefits, and did not develop an added income plan. Wealthier families also commonly continued to grow their assets during retirement. As new cohorts of retirees have less DB income, building an income plan from invested assets will become much more important.

2013 PENSION SECTION CALL FOR ESSAYS CONTEST

PENSION SECTION CALL FOR ESSAYS CONTEST ON DEFINED CONTRIBUTION PLANS

By Cindy Levering

BACKGROUND

As the uncertainties surrounding the long-term financial security of both current and future retirees continue to grab headlines, few pension actuaries would disagree that defined contribution plans have become an important component of the retirement system. Worthy goals such as alignment, efficiency, and sustainability are not necessarily part of the current system which has evolved in pieces rather than as a strategic policy. It is clear that there is room for improvement.

In reviewing responses from the Pension Section Council's 2012 member survey, the Pension Section Research Team realized that there could be a variety of projects related to defined contribution plans based on the following underlying question:

How can actuaries use our unique skills and perspective in evaluating risk to add value to stakeholders as they continue to face challenges to retirement security, such as the transition from defined benefit to defined contribution, the pressures on social insurance systems, and individual management of longevity and investment risks?

THE CONTEST

In June we issued a call for essays contest, inviting Pension Section members to write an essay related to an aspect of defined contribution plans that could be turned into a larger research project. Essayists were invited to either address the topic as a whole or focus on a particular aspect.

We received a total of eight essays which were evaluated by a committee of four reviewers on the basis of their originality, clarity, thoroughness, and practical applicability. Previously published essays were not considered. Of the eight essays, the following six were chosen for publication and can be found in this issue of the Pension Section News:

TITLE	AUTHOR
Building Better Defined Contribution Plans and the Need for a Quantitative Evaluation Framework	Joe Tomlinson
Investment Choice, and Where the Actuary Chooses to Stand	Mark O'Reilly
Measuring Success to Improve Long-term Economy Security when DC Plans are Primary	Anna Rappaport
Payouts from Defined Contribution Plans: A Collective Risk-Sharing Framework	Rowland Davis
Retirement Income Security: Why Individual Account DC Plans are Not the Answer, But Also What Is	Robert Brown
What's Wrong with DC Plans?	Beverly Orth

"APPETIZERS"

Here are some brief comments on each paper to "whet your appetite":

Joe Tomlinson provides a good summary of existing information but also explores two relatively newer proposed solutions. The essay offers a global perspective and presents meaningful information in a concise and clear manner using a thoughtful choice of assumptions from credible sources in his modeling. He concludes that it would be useful to build a quantitative framework for evaluating retirement systems proposals that could be utilized alongside a qualitative

Cindy Levering, ASA, EA, MAAA, is a retired actuary and SOA volunteer in Baltimore, Md. She can be reached at *leveringcindy@comcast.net.*

framework similar to the one that was used for Retirement 20/20.

Mark O'Reilly recommends that actuaries get involved in the type of research that economists and other financial planning researchers have been working on. The areas of risk tolerance assessment and appropriate mixes of stocks and other investments, with an added focus on lifetime income guarantees, could perhaps be a more fruitful area for actuarial research. While the essay is somewhat theoretical, it does provide interesting perspectives and new insights.

Anna Rappaport develops a specific proposal for a system for ongoing evaluation of defined contribution plans similar to the work that actuaries do in evaluating defined benefit plans. This has the potential to evaluate how well a defined contribution plan is meeting stakeholder needs and will help identify areas for improvement or enhancement. She provides an evaluation checklist and a blueprint for determining success in defined contribution plans, including charts and lists which are helpful in allowing the reader to digest the concepts quickly as well as save for future reference.

Rowland Davis sets out a specific, creative proposal for a new collective structure that overcomes problems such as participant reluctance to annuitize and employer reluctance to assume pension plan risk. He provides a fair degree of modeling and presents his results clearly. Davis suggests it would be advantageous to conduct a more comprehensive evaluation of his specific proposal as a stand-alone project.

Robert Brown advocates for Pooled Target Benefit Plans, seeking lower investment expenses and lower annuity expenses (including low expenses for much needed accompanying advice), and recommending that contributions be mandated. This paper primarily has a Canadian focus. While it was significantly longer than the 2,500 word limit specified in the contest, we felt it was worth publishing since it provides a very good high-level summary of existing principles for operating a target benefit plan as well as the shortcomings of an individual-account-based defined contribution system.

Beverly Orth provides a high-level summary of some existing simple proposed solutions for defined contribution plans by focusing on what can be achieved easily under the current legislative framework (or with theoretically "easier" modifications to the legislation). This essay serves as a good complement to some of the other essays.

AND THE WINNERS ARE…

Here are the three winners:

Rowland Davis - $5,000 for First Place

Joe Tomlinson - $3,000 for Second Place

Anna Rappaport - $2,000 for Third Place

We congratulate the winners and thank all the authors for such thoughtful and practical essays. We look forward to taking all these great ideas to the next level and hope you enjoy reading these as much as we did! As always, we are also interested in your feedback and ideas for future projects. Please email Steve Siegel at ssiegel@soa.org with your comments.

PAYOUTS FROM DEFINED CONTRIBUTION PLANS: A COLLECTIVE RISK-SHARING FRAMEWORK

By Rowland Davis

Editors Note: *This essay won first prize in the Pension Section Call For Essays Contest.*

One of the major weaknesses of the current 401(k) defined contribution model is that payouts at retirement are almost always in the form of lump sum distributions. This leaves retirees struggling to manage these assets in a way that efficiently meets their lifetime retirement income needs. This essay outlines an alternative approach, based on a collective risk-sharing model. I argue that this framework is far better when evaluated against the Retirement for the AGES principles developed by the Society of Actuaries and the American Academy of Actuaries.

Alignment: The large majority of retirees do not have the skills or knowledge required to manage a lump sum distribution in a way that provides an income stream for life. Retail annuity products are available, but rarely purchased, and they often seem to be "overpriced" from the typical retiree's point of view. The framework described in this essay could be used as an option for existing 401k plans, or could be an integral part of a collective savings model encompassing both the accumulation and payout phases. The payouts are in the form of a lifetime income, so retirees can be secure that their income needs will be met in the most efficient way possible, with no actions needed on their part.

Governance: After a lump sum distribution is made, the retiree is on her own—support from plan governance structures disappear. The framework discussed here is a not-for-profit entity managed by a Board of Directors for the exclusive benefit of participating retirees.

Efficiency: Managing a lump sum distribution exposes retirees to an almost infinite variety of choices regarding investment vehicles, and spending patterns. In most cases the result is a combination of high cost mutual funds with application of a conservative spending rule (e.g. the "4% rule")—a very inefficient way to provide lifetime income. In the framework described here, mortality risk is pooled and the investments would be professionally managed at low cost, using passive investment vehicles for the most part. Because of the collective risk-sharing feature, the fund could also prudently take on some equity exposure in order to increase the expected future returns of the fund. With a disciplined structure for sharing risk (i.e., smoothing returns), the higher expected returns provide opportunities for a more efficient pricing of the annuity used to provide the base income stream.

Sustainability: An individual retiree cannot absolutely guarantee a sustainable lifetime income stream from a self-managed lump sum distribution. The only reliable source of a sustainable income is from an annuity, where mortality risks are pooled. At this point, the burden of sustainability shifts to the annuity provider. A collective model using inter-generational risk sharing, such as proposed here, must be structured to provide sustainability – and this structure must be rigorously tested and monitored to ensure that sustainability. As described later in this essay, the key feature used in the framework is a carefully designed benefit adjustment structure that allows both increases and decreases to the base income amount, depending on the actual investment (and mortality) experience of the fund. The most important purpose of this essay is to describe the testing I have done on sustainability and the efficiency of benefit results.

Finally, I believe that one of the most important issues in any retirement system is the linkage—and the trade-offs—between efficiency and sustainability. Efficiency includes the affordability of meeting post-retirement income needs, and in any funded

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retirement system the single most important contributor to affordability will be the level of investment returns. In our economic world higher investment returns are available only by taking on an increased level of risk, as measured by the uncertainty of future returns and in particular by the downside risk that actual future returns from a risky asset may well be less than those from a less risky asset, even if the expected level of return might be higher. This means that taking on investment risk may improve the affordability of a retirement system under most conditions, but may also threaten the sustainability of the system if too much risk is taken on.

Investment risk is, arguably, the most difficult issue to deal with in the design of a retirement system, but because of its over-riding importance it must be dealt with in some way. Unlike many other risks, investment risk cannot be pooled—the investment results for all individuals, or funds, are delivered by the same global capital market system as it unfolds one day at a time. One must choose to either avoid risk (by investing only in safe assets, or by transferring the risk to another for some premium), or to accept risk and find ways to manage it. As all actuaries know, avoiding risk means forgoing the opportunity for higher returns, which will sharply decrease the affordability of adequate retirement benefits. The key parameter for setting the level of investment risk is the investment policy of the fund, primarily the allocation between risky assets (such as equities) and safer assets (such as bonds). But managing risk for sustainability also means making decisions about how risk is shared among the stakeholders in the system. Most hybrid designs are built with risk-sharing as a central feature, typically between the employer/sponsor and the current participants of the plan. However, the recent evolution of the U.S. retirement system indicates that most employers are reluctant to take a role in sharing risk. The 401(k) model leaves all the risk with the individual participant.

If employers will not share in the risk, then the only option left is for participants to share risk amongst themselves, but this can only be done across generations, or age cohorts. The framework I describe here is one which uses inter-generational risk sharing as a way to accept, and manage, risk in a way that improves the affordability and efficiency of the system, while still maintaining sustainability through time. In such a collective risk-sharing framework, some cohorts will end up with better results than those from a regular DC plan (with a comparable investment strategy and cost structure), and some cohorts will end up with worse results than a regular DC. But no cohort knows in advance what their outcome will be. Cohort solidarity depends on worker preference for more certain outcomes, and the belief that they will be treated fairly—that giving away upside potential will be a fair price to pay for gaining insurance against downside risk exposure.

KEY FEATURES

Here I describe the key features of a proto-type framework which I have tested. Obviously, this is just one illustration of a fund that fits into the collective risk-sharing family. Alternative choices for the plan design parameters are plausible (subject to testing for sustainability).

1. There is a single investment pool, invested 35% in equities (U.S. and non-U.S.) and 65% in a core-type fixed income fund. For the most part, I would assume index funds are used to minimize expense charges. (I assume an expense charge of 0.25% each year, including administrative and investment expenses.)

2. At retirement the incoming lump sum is used to purchase a base annuity income. Pricing would be based on a conservative estimate of the long-term

expected return on the portfolio. The pricing structure would remain fixed from year-to-year, but the Board would have authority to change it if there are significant changes in future return expectations, using a phase-in over a period of years. (I use a 5% interest rate for the annuity prices. In my stochastic model, this is approximately the 23rd percentile net return expected over a 30 year period).

3. The base annuity benefit would be increased by a fixed 2% COLA factor each year after retirement, subject to the adjustment features described below.

4. The fund would most often be in a surplus position relative to the liability for the base benefit, using a 5% discount rate. (In my stochastic testing, the funded ratio was between 100% and 150% with about a 70% probability, below 100% with about a 25% probability, and above 150% with about a 5% probability.) If the funded ratio exceeds 110%, then "bonus payments" would become payable for the following year, based on a published schedule. The schedule I used is as follows:

Funded	Bonus (% of Regular ratio benefit)
110%	5.0%
120%	15.0%
130%	25.0%
140%	50.0%

5. These bonus payments are for a single year only—they do not become part of the base benefit future income. However, the Board always has full discretion to make special ad hoc decisions. If the funded position of the plan is very strong, the Board could decide to issue some of the bonus in the form of an increase in the base benefit, increasing the liabilities of the plan. (In my stochastic testing, bonus payments are made in about 55% of the years, and when paid the average bonus was just over 20% of the regular benefit.)

6. If the funded ratio falls below 90% for 2 out of the preceding 3 years, then the 2% COLA is suspended. Once the funded ratio has exceeded 100% for 2 out of the preceding 3 years, the COLA is reinstated. (In my stochastic testing, COLA's were suspended in about 16% of the years.)

7. The Board would always reserve the right to reduce annuity benefits in emergency situations, to maintain sustainability. (In my testing, this type of adjustment might be needed in less than 5% of the cases.)

MODEL FOR TESTING

I used a stochastic model to test this benefit payout structure, and compare it with payouts under a group annuity structure. The economic scenario generator is the same I have used for many years performing AL studies for large public and private pension funds. I set the parameters for expected values to reflect estimates for an economy in an equilibrium condition:

- Price inflation: the distribution of inflation results over long periods has a median value of about 2.45%, and a mean value of about 2.55%.

- Bond yields: the distribution for 10-year Treasury yields has a median value of 4.25%. Credit spreads and yield curve shapes are stochastically modeled.

- Bond returns: the return distribution for a core fixed income portfolio (e.g., Barclay's Aggregate) has a median value of about 4.5%.

- Equity returns: assuming a portfolio of

75% US equities and 25% non-U.S. equities, the return distribution for equity returns over long periods is about 8.0% (i.e., a 3.5% equity risk premium is being used). Fat-tailed distributions are used for the equity model.

The model simulates individuals saving 12% of pay from age 30 to age 67, and investing these contributions in a fund that is 65% equity and 35% fixed income. These accumulated balances at age 67 (expressed as a multiple of final pay) are then used as inputs to the payout model. For the collective risk-sharing framework, I use a multi-cohort approach that develops, and tracks, the results of the fund over 60 years as new cohorts retire each year and commence benefit payments. For the group annuity framework I assume that life annuities with a fixed 2% COLA are purchased at retirement based on the 10-year Treasury yield at that time, plus 50 basis points. For both frameworks I use mortality from a generational unisex RP-2000 table projected to 2048 using Scale BB. The results presented here are based on overlapping cohorts of equal size. Although not shown in this paper, I have also done some analysis that reflects the impact of changes in the size of the cohorts.

BENEFIT RESULTS

The key metric used for benefit analysis is a replacement ratio: annuity benefits divided by pay at retirement. For the collective risk-sharing model, annuity benefits reflect post-retirement bonus payouts and COLA suspensions, based on the performance of the fund. I selected my accumulation period assumptions (12% of pay from age 30 to age 67) with the intent that balances at retirement would have a strong probability of creating replacement ratios of at least 40%. This 40% target, when combined with Social Security benefits (projected age 67 benefits at 2048), provides a total income replacement target of about 75%.

On average, the collective risk-sharing framework resulted in benefits about 15% higher than from a group annuity, with a median replacement ratio of 56% (versus 48% for group annuity) and a mean replacement ratio of 66% (versus 58% for group annuity). The upside opportunity was also improved, with a 95th percentile value of 147% (versus 125% for group annuity). (Note that my group annuity pricing estimate does not include any margins for profits, expenses or contingency reserves – so real-world benefit amounts under the group annuity option would likely be lower than my calculations.)

Of more significance, however, is that downside risk is also more controlled. The probability of failing to reach the 40% target replacement ratio is only 30% (versus 35% for group annuity). The probability of failing to reach a 30% replacement ratio (a significant shortfall to the target) is 17% (versus 19% for group annuity). In the bottom quintile of the result distribution, the average replacement ratio was 31% (versus only 23% for group annuity).

These results are summarized in the following table:

	Collective Plan	Group Annuity
Median replacement ratio	56%	48%
Mean replacement ratio	66%	58%
95th percentile replacement ratio	147%	125%
Shortfall probabilities:		
Replacement ratio below 40%	30%	35%
Replacement ratio below 30%	17%	19%
Average replacement ratio in bottom quintile	31%	23%

SUSTAINABILITY

For a collective risk-sharing framework,

nothing is more critical than sustainability. In my testing I tracked the funded ratio of the fund (assets divided by liability, using a 5% discount rate) over the 60 year multi-cohort test period for each scenario from the simulation engine. Although a funded ratio below 100% occurs with a probability of about 25%, in most cases the fund recovers to a fully funded position relatively quickly (due to fund performance, plus the effect of COLA suspensions). In about 75% of the cases full funding is restored within 5 years, and in about 90% of the cases full funding is restored within 10 years.

When underfunding persists for a long period, the board would presumably exercise its right to reduce benefits in order to maintain sustainability. I have not yet tried to incorporate such adjustments into my testing process, so this is an area for further work. Also, if an ad hoc benefit reduction is made and the fund then returns to a surplus position, it seems likely that the board would then use any available "bonus credits" to first restore any previous cuts. This complicates the modeling process to some degree.

AREAS FOR FURTHER RESEARCH

Some of the further work on this framework is fairly routine: test some alternative parameters for benefit adjustments, annuity pricing and investment strategies, and develop some sensitivity factors; test alternative parameters for the underlying economic simulation engine, to ensure that the test results are robust; explore demographic assumptions that deviate from a stable population model.

There are also some new areas to explore. One that seems very interesting to me is whether this basic framework can also be applied to support a modified payout structure—in particular, one that uses late-age deferred annuities (deferred to age 85) coupled with a structured payout discipline prior to commencement of the deferred annuity. Presumably both of these components would have participating features that adjust benefit payouts depending on fund performance.

Finally, practical issues relating to implementation, governance and administration need to be more fully addressed. The Senate HELP Committee, under Senator Harkin's leadership, is currently exploring the possible use of collective savings arrangements, so the timing is opportune to develop the ideas more completely. ■

BUILDING BETTER DEFINED CONTRIBUTION PLANS AND THE NEED FOR A QUANTITATIVE EVALUATION FRAMEWORK

By Joseph A. Tomlinson

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It has become increasingly clear that defined contribution plans need to do more than simply offer participants a menu of investment choices—the average worker is not building a secure retirement. Because both employers and employees face constraints, the solution is not as straightforward as delaying retirement or boosting contributions. Features like automatic enrollment can help somewhat, but are not enough. Truly innovative solutions are needed.

There are numerous different proposals for improved retirement plans, both in the United States and internationally. The 2010 Society of Actuaries *Retirement 20/20* initiative generated 18 submissions; the *RetirementUSA* website contains 21 full or partial proposals; and the U.K. government-sponsored *Defined Ambition* project offers an example of what other countries are doing. Individual proposals often contain an evaluation section dealing with benefits and risks, but what is lacking is a full quantitative evaluation framework that can be uniformly applied to a number of different proposals. The *Retirement 20/20* project developed a qualitative Measurement Framework to evaluate plans, but a companion quantitative framework is needed.

In this essay, I'll lay the groundwork for a potential research project to build such a quantitative assessment framework. I'll first discuss some of the issues involved, and get more specific by examining two proposals—one advocating investment return guarantees and another proposing special structuring to mitigate investment risks. I'll be focusing on the accumulation phase in DC plans, but a logical extension would be a similar approach for the retirement phase.

THE BASIC CHALLENGE FOR DC PLANS

For DC plans to meet the needs of participants, they must: (1) produce adequate average retirement accumulations, and (2) minimize shortfalls. A quantitative evaluation framework should focus on these two objectives.

I'll begin the discussion of issues with an example of a straightforward DC plan with no special features and show how it does in meeting these two objectives. The example is based on historical average investment returns and an average level of contributions for U.S. plan participants.[1] The basic performance measure I use is the replacement ratio, where I divide the income that could be generated by purchasing an inflation-adjusted annuity at retirement by income immediately before retirement. Replacement ratios, although not very useful for individual financial planning, provide an informative measure for overall evaluations of retirement plans.

Chart 1
DC Replacement Ratios Based on Historical Investment Returns

Asset Allocation	Average Annual Return	Median Replacement Ratio	10th Percentile Replacement Ratio
100% Bonds	4.50%	21%	16%
25% Stocks, 75% Bonds	6.08%	28%	20%
50% Stocks, 50% Bonds	7.65%	35%	21%
75% Stocks, 25% Bonds	9.23%	42%	21%
100% Stocks	10.80%	52%	22%

This chart highlights the basic challenge that DC plans face. If we assume that Social Security replaces about 40% of pre-retirement income, and aim for an overall replacement ratio of 75% (commonly used in retirement adequacy analysis), it appears that today's median contribution rate is reasonably adequate as long as there is at least a 50% allocation to stocks. However, producing satisfactory results on average is not good enough for individual participants. The rightmost column indicates the need for significantly higher contributions to be 90% sure of achieving retirement adequacy. Unlike the median column, allocating more to stocks does not improve results. For example, with a 50/50 stock/bond allocation, the 9.6% contribution would need to rise to 13.4% (9.6% x 35/25) to be 90% sure of reaching the overall 75% target.

So there are reasons to be concerned, and it turns out that, if we take a closer look at assumptions, there may be even more cause for concern. We need to pay special attention to investment returns and the replacement ratio.

INVESTMENT ASSUMPTIONS

Using historical investment returns may provide credibility to an analysis, but there are well-supported arguments that we are likely to see lower returns for both stocks and bonds in the future. . However, the problem with attempting to use lower return assumptions is deciding which particular assumptions to choose. With regard to stock returns, the most credible source I have found involved a panel of notable economists and investment experts assembled by the CFA Institute in 2011 to predict returns over the next 10 years. Compared to the 11.8% historical stock return I used for Chart 1, this group of experts produced predictions ranging from roughly 7% to 11%, with the consensus toward the upper end of the range.

As for bonds, the past 30 years has seen bonds produce significant capital gains that have boosted returns. Over the longer history since 1926, the average return used in Chart 1 was 5.5% compared to today's current yield of about 2% for 10-year Treasuries. If real yields (after inflation) go back up to the historical average of about 2% (from today's zero or less as measured by TIPS rates), and we add an inflation premium of 2.3% based on the current Treasury/TIPS spread, that gets us only to 4.3%. For evaluating proposed retirement plans, it would seem prudent to use lower-than-historical returns for both stock and bonds. And given the uncertainty, it would also make sense to run additional sensitivity tests with a further lowering of returns.

I prepared this chart to show the impact of modestly lower returns (10.3% for stocks and 4.3% for bonds). The impact on both medians and 10th percentiles is significant. A more pessimistic scenario would have an even greater impact.

Chart 2
DC Replacement Ratios based on Lower Returns

Asset Allocation	Average Annual Return	Median Replacement Ratio	10th Percentile Replacement Ratio
100% Bonds	3.30%	18%	14%
25% Stocks, 75% Bonds	4.80%	24%	17%
50% Stocks, 50% Bonds	6.30%	30%	18%
75% Stocks, 25% Bonds	7.80%	37%	18%
100% Stocks	9.30%	40%	16%

REPLACEMENT RATIOS

The replacement ratio is a popular measure used to evaluate DB plans and, more recently has been applied to DC plans. It can be a useful measure for evaluating and comparing different retirement plans (and plan

proposals), both in terms of expected performance and risk.

The recurring Aon/Georgia State Replacement Ratio studies have served as a standard for pension actuaries in estimating the average replacement ratio needed to maintain pre-retirement living standards after retirement. A 75% replacement ratio has been a commonly used benchmark based on these studies. However, a 2012 study from Aon Hewitt entitled "The Real Deal" uses updated assumptions for investment returns, longevity, and medical costs, and increases the required average replacement ratio to 85%.

The replacement ratio from Social Security also figures into the analysis. Based on the Trustees Report, the current average Social Security replacement ratio for a 65-year-old is about 41%, but will gradually drop to about 36% as the effect of increasing the full retirement age to 67 phases in. Of course, any future reductions in benefits to shore up Social Security's finances will likely further lower the ratio.

In terms of establishing a framework for evaluating proposed plans, these investment return and replacement ratio considerations definitely point to increased challenges ahead. I'll now examine two specific proposals for reducing risk in DC plans, while keeping these challenges in mind. This will provide more specifics about things to take into account in building an evaluation framework.

GUARANTEES

One way to reduce the variability of retirement outcomes is by providing guarantees. Professor Teresa Ghilarducci of the New School for Social Research has been a strong advocate for guarantees, as described in her 2008 book, *When I'm Sixty-Four*. She proposed replacing 401(k)s with Guaranteed Retirement Accounts (GRAs) offering Federally guaranteed real returns of at least 3%.

This chart shows the effect on replacement rates of various levels of real rate guarantees. Compared to Chart 2, we can see that even a 1% real rate guarantee would improve 10th percentile outcomes. However, it would require a more aggressive guarantee than Professor Ghilarducci's proposed 3% to get close to providing full assurance of retirement adequacy.

Chart 3
Effect of Guarantees

Real Rate Guarantee	Resulting Replacement Ratio
0%	16%
1%	19%
2%	22%
3%	26%
4%	33%
5%	40%

To evaluate the feasibility of offering guarantees, we need to consider affordability, and this was the subject of a 2009 study by the Center for Retirement Research at Boston College (CRR) entitled, "What Does it Cost to Guarantee Returns?" They examined affordability both retrospectively using historical return data and prospectively based on financial market options pricing. These two approaches led to strikingly different conclusions. The historical view showed that guarantees as high as 3% real for DC savings over a hypothetical full working career would not have required any support payments from the government guarantor. They also showed that guarantees locking in 6% (with any overages kept by the government) would have made money for the government. So both results were good news for guarantee advocates.

However, when they applied financial market options theory and took a prospective view, they came to the conclusion that, unless the government is willing to bear more risk than the private market, it would not be feasible to offer any guarantee greater than the real risk free rate—about 2 percent historically and close to zero currently. In effect, any guarantee greater than the risk free rate would involve taxpayers providing retirement savers with a financial put option and not being paid for it. The CRR study did, however, leave open the question of whether the government might be better positioned to bear risk than the private market, which could be used to argue in favor of government guarantees greater than the risk free rate.

As part of building an overall framework for evaluating retirement plan proposals, it would be worthwhile to further examine the CRR analysis on guarantees. In particular, it would be worth examining the practical effects. For example, an economic theory argument against offering guarantees above the risk free rate is that such guarantees would create an arbitrage opportunity, which certain market participants could play to their advantage. It might therefore be necessary to limit allocations to stocks and other equity-like asset classes. But with such restrictions in place, guarantees might end up serving the useful purpose of encouraging plan participants to save more than they would otherwise—turning a theoretical problem into a positive practical benefit.

SPECIAL STRUCTURING

A completely different approach than using guarantees to shore up the performance of DC plans would involve building more structure into the plans than simply offering participants a bunch of different investment choices. One such structural approach that has gained a lot of popularity is the use of target-date funds that reduce stock allocations as a function of participant age, thus lowering volatility as the participant gets closer to retirement. However, just offering target-date funds does not sufficiently reduce investment risk as was demonstrated in the article by Bodie, et al. listed in the references—so more is needed.

An example of a structural approach that attempts to do more by adding other features to a target-date structure is "The Tracker Plan" developed by actuary Rowland Davis for his *Retirement 20/20* proposal. Besides offering a well-thought-out plan, he provides an evaluation of his plan that could serve as a template in developing a generalized evaluation framework.

The Tracker Plan adds the following structural elements to further improve plan performance:

- Operating rules to shift to more conservative allocations when investments perform better than expected
- Operating rules calling for additional plan sponsor contributions when performance falls below tracking targets
- A safety valve of participants delaying retirement by as much as a year under the poorest performing investment scenarios
- Total contributions from plan sponsors and participants at a significantly higher level than today's DC plan averages
- Costs of investment management and plan administration held down to miniscule levels.

The Tracker Plan calls for employee contributions of 4% in the early years grading up to 8% by age 33 with a 100% employer match. That's 16% total for most of the working years and consistent with others like EBRI and Aon Hewitt who argue for total contributions of at least 15%. No one is contending that today's average of around 10% will get the job done.

Davis provides a detailed demonstration showing that his multifaceted approach will meet the retirement adequacy objectives, while keeping risk at reasonable levels. However, this proposal was developed more than three years ago and used historical investment returns and a minimum target of a 75% replacement ratio, so it would likely need to be adjusted to adapt to more challenging assumptions. But what is perhaps the most useful aspect of The Tracker Plan is the way Davis provides a full evaluation in terms of replacement ratios. In particular, Davis provides a demonstration that starts with a standard DC plan and shows how adding each separate element of the Tracker Plan narrows the range of outcomes.

CONCLUSION

This essay has provided an overview of the types of considerations that will need to go into the development of a comprehensive quantitative framework for evaluating retirement plan proposals. The Tracker Plan can provide a template for developing the evaluation framework, but investment return assumptions, replacement ratio targets, and the affordability of any guarantees will all need special attention. . Given the crucial need to build better DC retirement plans, it will be most useful to have better quantitative assessment tools that can be applied to existing proposals and, more importantly, to new ones as they come along. Actuaries are uniquely equipped to play the lead role in carrying this development effort forward.

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ENDNOTES

[1] The specific assumptions used were that the individual works 35 years with annual increases of 3.3% for inflation plus promotion, and retires at age 65. I assumed combined employer and employee contributions of 9.6% of pay, which is the median for participants reported in Vanguard's 2012 *How America Saves* report. For investment returns, I used *Ibbotson®* averages going back to 1926—11.8% for large-company stocks and 5.5% for intermediate-term government bonds. I deducted 1.00% for total plan costs, which is the approximate average for large plans in 2012 reported in the *401k Averages Book*. Savings balances at retirement were converted into income using a payout rate for an inflation-adjusted immediate annuity of 5.75%, which I priced to be consistent with the bond return assumption. Monte Carlo simulations were used to generate the outcomes.

MEASURING SUCCESS TO IMPROVE LONG-TERM ECONOMIC SECURITY WHEN DC PLANS ARE PRIMARY

By Anna M. Rappaport

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INTRODUCTION AND CURRENT SITUATION

Individuals are subject to a wide range of risks in retirement.[1] The U.S. retirement system has experienced a major shift away from primary DB plans to primary DC plans. The risks facing individuals do not change with the type of plan, but the extent to which they are handled in the plan changes drastically, with much more risk shifted to the individual with the DC plan. Within a DC environment, successful retirement for the population depends on success within DC plans and it also depends on management of the shocks outside of the plan. Success in the plan depends on adequate contributions, success in investing, and not using money too early. Overall success must also consider several potential shocks: pre-retirement disability, job loss, health problems, premature death or loss of a spouse, and adverse family issues. I believe that there is no general agreement on what constitutes success overall in retirement security in a DC environment and how it should be measured. A focus on these issues and the supporting research is an important opportunity for the actuarial profession.

The system today consists of a combination of social benefits and employer-provided benefits. Social benefits are vital for the population as a base layer. The employer-based second tier system today works very well for some people and not at all well for others. This essay focuses on elements of success in a system linked to employment. Employment-based systems can be mandated or voluntary, and if voluntary, voluntary at the level of the employer and/or at the level of the employee. The focus of the essay is success in specific voluntary employer sponsored DC systems, with a major focus on the employer and the individual. I believe that success within a voluntary market DC-based system depends on four elements: mindset, measurement tools, in-plan program structure and management, and out-of-plan life and risk management to complement the plan. In this essay, I discuss mindset and measurement, ideas for supporting research, and the role of the actuary. To set the stage, I highlight decisions on the path to security. As part of the potential outcome from research, I present elements of a checklist. While this essay is primarily about mindset and measurement and the related role of the actuary, the decisions on the path to security and checklist elements provide brief insight into some of the important in- and out-of-plan issues.[2] Program structure is beyond the scope of the essay.

DECISIONS ON THE PATH TO SECURITY

In a DC environment, there are a number of decisions that must be made to ensure security. The structure of the benefit package will determine to what extent employees must make decisions, and to what extent the program will make the decisions for them.

Early and Mid-career Decisions

DECISION	EMPLOYER ROLE	EMPLOYEE ROLE AND COMMENTS
Participate in the plan	Decide whether to offer auto-enrollment and if so for how much; establish process and communications to encourage participation	Depends on enrollment. Much more likely to participate if auto-enrolled The earlier savings starts the better
How much to save	May be built into auto-enrollment; match gives incentive with regard to how much to save	Employee needs way to understand how much must be saved to produce adequate income at retirement. Motivation is essential. The amount needed is linked to retirement age.
How to invest	Designing investment options and defaults; providing education; providing feedback to participants	Depends on plan structure Make decisions and monitor results (including appropriate changes)
Don't spend money too early	Plan structuring and education	Depends on managing finances so that there will not be a need to withdraw funds
Disability coverage (likely out of plan)	Offer disability coverage—to all or voluntary program; possibly include added coverage to cover retirement savings; educate employees about the importance of this issue	Participate in employer LTD if available; if not or if not adequate, consider buying individual LTD (some individual policies offer riders to protect retirement savings)
Emergency funds to weather challenges (usually entirely separate from plan except to extent plan includes loan and hardship provisions)	Education and encouragement; loan and hardship provisions can make plan funds available for some emergencies	It is purely up to employee to do this; failure to do this makes plan vulnerable to being used as an emergency fund

Near and at Time of Retirement

DECISION	EMPLOYER ROLE	EMPLOYEE ROLE AND COMMENTS
How to use funds during retirement	Decide whether to offer employees option to leave funds in plan, what payout options including access to annuities, education Employer can create culture encouraging focus on paycheck replacement	Employee makes decisions and selects options. Competitive pricing is very important. Decisions should be coordinated with Social Security planning.

MINDSET

Where retirement benefits are provided through DC plans, decisions are needed throughout the individual's working life, at retirement, and after retirement for long-term success. Fundamental to such long-term success is a mindset focused on long-term security. Mindset issues affect both the plan sponsor and the individual. This list applies to the plan sponsor, but some of the issues apply to the individual as well.

- Recognizing the importance of longer-term planning and goal setting
- Focusing on the importance of benefit adequacy and what it means
- Creating a culture of measurement of progress along the way
- Fostering holistic thinking about long-term security—do we focus on the plan or the bigger picture?
- Incorporating risk management thinking into decision making
- Focusing on paycheck replacement in retirement as a goal of the program
- Recognizing the reality of how individuals make decisions and the issues they face
- Recognizing the potential to influence behavior through messaging, program structure, and support tools
- Recognizing marketplace realities
- Deciding how active a role the plan sponsor wants to take in ensuring security

Mindset defines what we think is important and what we are interested in measuring.

MEASUREMENT

Students of corporate and personal behavior have observed that what gets measured gets managed. It is much more likely that we will focus attention on what is measured, particularly when it is visible and when there is a

Link to other work:

The Society of Actuaries Retirement 20/20 Measurement Framework focused on how well broad plan designs met the needs of society at large, employers, individuals, and markets. This essay focuses on specific DC plan implementations, and looks primarily on individuals and employers, but the approach could be expanded to include society at large and markets.

Measurements of benefit adequacy could build on Society of Actuaries research project: Measures of Benefit Adequacy[3].

Measurements of investment success are well established, and it well established that investment managers should be measured regularly and chosen in a rational manner. This essay focuses on issues going beyond investment success.

shared interest in the measurement. In many areas of society, index values are very important in how we view what is happening. In the economy, we pay attention to market indexes, the consumer price index, rates of employment and unemployment.

The actuarial valuation is central to the management of DB plans. There is no similar process for DC plans, but in reality their success depends on accumulating enough money and not using it too early. However, there is no commonly accepted measure of success for the plan sponsor and for the employee participating.

What is needed is a good definition of success measurement from both plan sponsor and employee perspectives, some professional agreement about how they are derived, and acceptance of their validity. There is a role for the actuarial professional in defining these measurements at the conceptual level and in supporting research about alternative measurements and their value. There is a role for the marketplace in implementing these measurements for individuals.

Benefit structures have a major influence on the outcome with regard to benefit adequacy. A measurement system could include a rating methodology to consider the likelihood of meeting plan goals. Plan provisions that would probably be considered would include level of match, auto-features, encouragements to participate, etc. One of the potential research questions is the feasibility and definition of evaluation systems that would define likelihood of meeting certain goals.

A culture of measurement may provide for items such as:

- Clearly articulated goals for the plan.
- A regular periodic set of measurements at the plan and individual level linked to plan goals and a system of communicating these results to the right people.
- A periodic report (possibly annual) on DC plans that included items such as participation rates, definition of adequacy, contribution rates needed for retirement success based on entry age and assumed retirement age, percentage of employees on track for success, evaluation of the investment decisions made by employees, etc.
- Planning tools focused on paycheck replacement and long-term success using the plan.
- Statements that linked the plan to paycheck replacement and illustrated what level of income replacement was forecasted by current contributions.

There is a role for the actuary in defining and implementing the measurement systems. Longer-term, there is also a role in defining best practices and/or minimum standards. While these concepts sound relatively simple when first stated, there are a variety of different things that can be measured and different time periods that can be used. There are different ways to state the measurements to make them clear. Longer-term measurements depend on assumed rates of return, inflation rates, and changes in the cost of living. Goals affect what should be measured. It is a major challenge to translate such measurements into clear information that provides a sense of progress and that encourages action. Business organizations may want to benchmark results against goals and competitors. Indexes would be very helpful. Uncertainty is important and challenging to deal with. Longer-term calculations involving uncertainty may be executed on a stochastic basis, with scenarios or both. There are issues of explanation and interpretation of the results. Protection of retirement savings in the event of disability falls between the cracks of disability and retirement plans. There is a question of how to recognize and evaluate this risk in a measurement system.

SUPPORTING RESEARCH

I recommend a major research project focused on the use of measurements, indexes and benchmarks to enhance DC plan success. This might include perspectives of the employer/plan sponsor, the individual, the market and society at large. There should be an accumulation phase and a spend-down phase part of this project. One potential path would be to start with a Delphi exercise on identifying and defining success measurements. Phase two could be an exploration of how to calculate and communicate success measurements including issues surrounding uncertainty, assumptions, etc. In parallel with phase two could be an approach to gaining acceptance of the ideas. Phase two could be staged by issue. Actuaries can be particularly valuable in dealing with issues that require consideration of risks over a longer time horizon.

A "dream" I would suggest is an "actuaries' index of DC plan success." One of the outcomes of such a project could be to explore whether there are indexes or benchmarks that could be provided by the profession. The Melbourne Mercer Global Pension Index rates retirement systems; a system could be derived to rate plans.

Mindset helps drive what we want to focus on as we think about research, and also suggests an added research agenda. Some of that agenda includes understanding current mindsets and behavior, understanding how behavioral finance affects decisions and understanding current economic realities.

A CHECKLIST AND RATING SYSTEM FOR RETIREMENT SECURITY SUCCESS IN A DC ENVIRONMENT

One of the outcomes of the research may well be a checklist for retirement system success in a DC environment. One of the key decisions in structuring a checklist is whether it focuses solely on the plan, or on the plan and elements outside of the plan needed for a successful outcome. I have assumed the broader interpretation. These are examples of what might be included on such a checklist. The research could also provide criteria for meeting each item. While some items might be yes or no, a system of ratings would be very helpful for others. This could be a focus of the research, and measurements could be developed and refined over time. Possibly, they would then be accepted by the marketplace.

Examples of items that might be included in a checklist/rating system

- System to measure plan success
- System to measure benefit program success in meeting retirement security needs
- Defined goals for plan and total retirement security strategy
- Regular communication to participants about what they have and what would be needed to maintain their standard of living
- Tools available to help participants model different scenarios
- Organized approach to dealing with uncertainty within tools and communication to participants
- Strategy in place to encourage participation
- Shared understanding of benefit adequacy situation between employer and plan participants and strategy to increase savings when more savings is needed
- Method of providing disability coverage to maintain retirement security in the event of long-term disability (probably out of plan)
- Rational process to define number and types of investment options

- Default options to support plan participation goals
- Default options to support plan investment goals
- Default options to support employer goals with regard to the payout period
- Information provided about methods of paycheck replacement
- Access to efficient methods of implementing paycheck replacement including at least one option with income guaranteed for life
- Method of providing death benefit coverage to support surviving spouses in the event of death (out of plan)
- Strategy to discourage use of funds too early
- Strategies to minimize expense charges and to disclose them to participants
- Strategy with regard to rollovers from other plans at job change
- Method to provide participants unbiased guidance and advice
- Effectiveness of participant communications measured

CONCLUSION AND ROLES FOR ACTUARIES

I believe that there are great opportunities to improve overall retirement security in a DC environment by changing mindsets, developing new measurements, and measuring success in new ways. Actuaries can help with both research and synthesis of the research ideas so that they are useful both to plans sponsors and to individuals. Once there is some agreement about a desirable checklist, it would be best to select an area or two for further development. Priority areas for actuaries could be tools for measurement of adequacy in a DC context including the impact of uncertainty, treatment of assumptions within such tools, and the handling of disability coverage. ■

ENDNOTES

[1] Managing Post-Retirement Risks, Society of Actuaries, 2011

[2] For more insight into in-plan vs. out-of-plan issues, see "Improving Retirement Security in a Heavily DC World" by Anna Rappaport, Stacy L. Schaus and Jeff B. Clymer, Benefits Quarterly, Third Quarter, 2011.

INVESTMENT CHOICE, AND WHERE THE ACTUARY CHOOSES TO STAND

By Mark O'Reilly

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A new employee enrolls in a defined-contribution plan and reviews the investment funds available. There is no lack of choice: bond, stock and balanced funds, large and small cap, income and growth, domestic and international, passive and active; there may be industry sectors and commodities. There are performance histories and probably some measure of risk/return category. In terms of advice, there are general words about long-term savings, but they don't help much with the detailed fund menu. If the employee is rolling over funds, prior choices are probably a big influence. If it's new money going in, the monthly amounts don't seem so large to agonize about just yet. A gut choice is made, and the uncomfortable feeling created by the fund menu eases as the employee clicks "done." That moment's gut choice may well determine many years later how comfortably the employee will survive in retirement.

For professional advisors, investment strategy is the third rail of private retirement plans today. We know how important performance is to the end result, and we know how little the average employee knows about financial markets. We give employees the online tools to buy high and sell low, chasing yesterday's winners in response to powerful advertising and superficial media coverage. Yet we are wary of offering much advice which may well be proved wrong. We constantly repeat that past performance is no guide to future performance, yet all our advice refers to past performance because we have no other way of justifying our equity and other investment guidelines. We may mention percentages of different asset types in a retirement portfolio and even relate them to the employee's age, but no convincing justification is given. Similarly vague words are offered about diversification, rebalancing and "buy and hold"—this last one having been ridiculed widely in the media during the 2008/9 collapse.

I am fully aware of the pitfalls actuaries face should they offer more specific advice. Not only is there a danger of being proven wrong or even appearing wrong, but there are potential conflicts with the marketing of our own industry's services and products. Given the flood of market advice available, would our advice as actuaries be heeded anyway? And how sure are we that we are right? Even academics have fundamental disagreements about the underlying workings of markets. Should we actuaries express our opinions for the good of the small investor, at the risk of our free advice being drowned out? Do we even share a common, coherent message?

As a profession we are already discussing some sensible, positive steps related to investment choices. An example is the "nudge" approach born of behavioral economics. Through nudging, more sensible investment options are made a default rather than an active choice. Assuming we can decide on the most sensible approach, we actuaries can approve of appropriate nudging, but few people would recognize us as experts in such design. For the media to listen to us and create a wider audience for our advice, the advice needs to involve concepts of measurable risk and its mitigation. Risk measurement is also a key to the level of interest we can generate. If we can show areas where retirement investors over-estimate or under-estimate risk, this can be perceived as news. For our advice to be useful, it needs to gain attention, and interesting news is the best path.

The great majority of today's investment material focuses on achieving the highest return. It is not so difficult to show with recent market history why such a goal is seriously flawed. Before this century, superficial cases could be made for an aggressive equity strategy. From the birth of the 401(k) plan until 2001, all the experience of participants had pointed that way. Recent market recovery

notwithstanding, there is now rich material to show that pitfalls exist for every distinct strategy aiming for the highest return. In my view, a convincing argument can be made that the extra earnings attempted are fully balanced by an equally large risk of loss. When effectively illustrated, the general risk-aversion of most small investors should be sufficient to have them consider alternative strategies, which is what I hope we can offer them.

I believe it makes little sense to design strategies without a good understanding of the investor's personal preferences. I don't believe individual counseling is needed (and is cost-prohibitive to the vast majority if truly independent) because most people's preferences can be grouped into broad but distinct categories. The first step on our journey to better investment advice is to understand the range of potential preferences, and their relative popularity. Useful existing data is available, but I think it would be more newsworthy if we make the effort to gather some of our own. Results are often highly sensitive to the phrasing of a question, and ours would be quite specific. Here are some examples (suitably abbreviated) which would have carefully crafted, multiple-choice answers:

- How frequently do you check the markets, and/or their impact on your investments' value?
- What is your response to your portfolio losing a year's salary in half that time?
- What is your response to your portfolio gaining a year's salary in half that time?
- What is the likelihood you would move to a lower-cost region after you retire?
- What is the likelihood you would sell your home and get a much smaller one after you retire?
- What will keep you busy in retirement, and how much money will it cost/make/risk?
- If you are reasonably comfortable in retirement, how much would it concern you if your investments had substantially underperformed those of your peers?
- Would you be willing to stay with a long-term investment strategy if it performed consistently poorly over a three-year period? A seven-year period?

These examples illustrate the two broad types of preference to explore. The first relates to financial needs in retirement, and requires a strategy to improve the chances of meeting those needs. The second relates to risk tolerance, and importantly includes the investor's willingness to maintain a risk strategy even when it appears to be delivering poor results. There is little purpose in suggesting a given risk strategy, no matter how appropriate, if interim performance loses the investor's confidence.

These two types of preference—needs and risk tolerance—are also interdependent, and explaining their relationship is an important aspect of investment advice. For instance, we do not know exactly how much money we will need in retirement, but instead develop ranges from "basically adequate" to "more than adequate but useful anyway." Beyond this range is what we might call "surplus"—investment savings which, no matter how nice to own, we are unlikely to need. Our view of Investment risks will therefore depend upon how likely we are to meet our needs. A potential $10,000 gain into the surplus area should not be seen as balancing a potential $10,000 loss in the target range, which in turn is not as bad as an equal loss below the target range.

There is another link between financial need and risk tolerance which is subtler and there-

fore less well understood, but which I believe is of even greater importance and an area custom-made for actuaries. It is the link between our ability to achieve a certain standard of living in the distant future, and the inflation-related returns available on equities, commodities, and other securities. The case for commodities and inflation-linked bonds is clearer, though I would guess that very few investors use commodities as part of a "financial need" strategy rather than a "highest return" strategy. Let's consider the less obvious case of the general equity market.

When markets plummet, as they did in late 2008 and early 2009, many investors fear further losses and start selling. They then face the dilemma of when to buy again when the market recovers. Unless they sold early—and there was little reason for doing so, given that markets frequently correct – they will lose a good part of the later upswing. It can be argued that the loss represents an insurance premium paid to avoid even steeper losses. Did it make sense to pay that premium?

When a market falls sharply, there are broadly three potential outcomes. First, it can bounce back relatively quickly and resume its course as if nothing had happened, as most markets did in 1987. Second, it can stay down for an extended period; gradually regain its old ground. For example, the 1929-32 decline was not fully put behind investors until the 1950s; the Dow Industrials touched 1000 in 1966, but did not stay permanently above that level until 1982. Third, some markets can fail to return to their original levels even over many years, e.g. the Japanese stockmarket and the NASDAQ.

Each scenario remains a plausible one for any country's stockmarket. How should investors view such a prospect, and what should be their response at the various stages the market would go through?

I believe there are three cornerstones to explaining an appropriate strategy, each of which can have practical rules based on economic analysis. First, define within a fairly narrow range how much of our retirement savings should be subject to the equity market. Under a financial-needs strategy, the portion is likely to be lower than we are typically advised today, because of a general "no sell" discipline. Second, define what can be classified as a dangerous, speculative bubble, triggering rare, defensive steps. Third, explain the relationship between the performance of the equity market and the cost of living. A proper explanation of the third cornerstone permits us to provide more precise measurement for the other two.

In retrospect, most people can accept that the Japanese market in the late 1980s, and the NASDAQ in the late 1990s, were dangerously inflated. Long-term, negative equity-risk premiums required long-term future growth at levels unknown in history – possible, but hardly likely. By contrast, it can be argued that most major economies' broad stockmarket indices, once stripped of "fad stocks" (e.g., 1990s technology and 1840s railways) may have been frothy at times but never in such bubble territory. Their occasional, extended collapses were triggered by one of two types of fear: runaway inflation (1970s) and chronic deflation (1929-32 and 2008-09.) It is vital to understand these reasons because of their impact upon the cost of living in retirement.

First, deflation. By collapsing, the market is expressing its fear of extended weakness in pricing power for businesses, as spending and credit enter a downward spiral. Let's assume our investor is holding 50% equities and 50% cash. The equity holding is cut in half by the market collapse and the portfolio is down 25%. If deflation does not occur, it's because pricing power has returned and the market recovers. If long-term deflation does

result, and the market stays down, it is now a highly relevant question to ask if the investor's spending needs in retirement have reduced by 25%, in line with the portfolio value.

I hope it is becoming clearer what role actuaries can play in developing an answer. We can help determine both the most appropriate percentage of equities and also the most suitable types of equity. No one can know the long-term direction of the market at any time, and Japan demonstrates that past, long-term success can be followed by more than a generation of economic loss. But I believe there are meaningful correlations to be found between market responses to bad news, and the relationship of that bad news to consumer price forecasts. Most importantly, we are telling long-term investors why not to constantly fear falling markets. There is good reason to believe that a suitable, global-equity portfolio, if balanced with an equal amount of cash or near-cash, will never be subject to long-term, wealth-destroying forces in *real terms*.

Commodities are a key link between future consumer prices and equity markets. They are the building blocks of our basic costs of living. Changes in commodity prices affect commodity-producing and commodity-consuming businesses, and the resulting pattern of their market prices can be explored. The beauty of commodity prices is that they work for inflation as well as deflation. A heavily energy-weighted portfolio would have relieved an investor of much of the pain of the 1970s bear market. The implications of this observation runs counter to much standard investment literature today: because of their volatility, commodity investments are typically viewed as being the "speculative end" of equities. But, *in appropriate proportions*, history shows how they have acted as a valuable inflation hedge. The educational task is to explain how, even when certain investments decline in nominal terms temporarily, their hedge in real terms remains intact.

Pure cost-of-living maintenance is not the whole story. Depending upon our survey results, I suspect we will find that most people attach a premium to maintaining their living standards *relative* to their peers. If others are better off and we are not, we feel we have fallen behind. Such a preference can justify equity investment in technology, healthcare and entertainment—again, in the appropriate proportions. Investment products can be scientifically designed to reflect these proportions, so our advice as actuaries can be supported by a commercially viable section of the fund-management industry.

An important clue to the adequacy of our investment performance is the value of the currency in which we measure our assets. Between 2002 and 2012, rising U.S. equity indices were broadly accompanied by a falling US dollar, yet media coverage largely ignored this "global devaluation" of dollar-denominated assets. In May 2013 we heard about U.S. market indices' "new records," but exchange rates, dividend yields and inflation make five-year comparisons meaningless. I would also argue that the level of the market needs to be viewed in the context of the equity risk premium. New indices are sorely needed, and which gain similar following to the Case-Shiller housing index.

Fifty years ago, the United States could be viewed as a relatively self-contained economy. Now the U.S. dollar is more a market mechanism by which globally-set prices determine much of our living costs, even if we never go abroad. Some basket of currencies, ultimately feeding price levels through exports and imports, will signal the future spending power of our savings. It may be impossible to define the precise basket, but any reasonable attempt will give a better

measure than the U.S. dollar alone. Fortunately, we now have good mechanisms for investing in other economies at low cost. Unfortunately, all too often the rationale offered is to chase higher returns, rather than to hedge rising import prices and a weakening currency. Careful weighting of global portfolios can reduce future spending-power risk, yet the current "dollar" approach to returns characterizes foreign funds as "high risk."

The small investor is confused by this century's experience, and needs to understand better what markets are guessing about the future. Actuaries can, and should, provide better guidance and supporting illustrations. I believe we can be uniquely trusted to provide good-faith advice. The challenge is to make it both attractive and convincing. ■

WHAT'S WRONG WITH DC PLANS?

By Beverly J. Orth

As defined benefit (DB) plans fade from the picture, virtually around the globe, the vast majority of future retirees will depend primarily on defined contribution (DC) plan assets to supplement their first pillar benefits (Social Security in the United States). If designed and used properly, DC plans can provide adequate retirement savings. Unfortunately, legislative restrictions and design flaws doom many DC plans to failure. Only the most sophisticated—and luckiest—DC plan participants can be assured of having sufficient assets to last a lifetime. I won't attempt to describe all the potential problems and barriers that DC plan participants face. Instead, I will focus on some of the low-hanging fruit: barriers that can be eliminated by legislative action or by simple changes that plan sponsors can make under existing rules.

SOLUTION ONE: ELIMINATE "VOLUNTARY"

The foremost problem, at least in the United States, is that retirement plans in the workplace are entirely voluntary. Employers are not required to offer anything more than Social Security, and about half don't offer anything. Even when offered a plan that requires voluntary employee contributions in order to receive an employer-paid benefit, a high percentage of employees fail to contribute, due to inadequate wages or an inadequate understanding of the implications of not participating.

The cure is simple, but requires Congress to back away from its *laissez-faire* approach to workplace benefits. The passage of the Patient Protection and Affordability Act of 2010, which will require large employers to "pay or play" with regard to health benefits, is a chink in the wall. To extend the concept to retirement benefits, two changes are necessary. First, all employers should be required to offer a minimum level of employer-paid benefit, either DB or DC or a combination. Second, employee participation should no longer be voluntary. Automatic enrollment is a step in the right direction, but allowing employees to opt out means many employees fail to accumulate enough assets for a successful retirement. The ones who opt out tend to be in the youngest groups, at the precise time when contributions should be maximized to take advantage of time and the power of compounding investment returns.

SOLUTION TWO: ELIMINATE "CATCH-UPS"

Congress thought they were doing workers a favor by legislating catch-up contributions for DC and IRA participants. The problem with catch-ups is that they occur too late to do much good. As I observed earlier, the most valuable, most impactful contributions are those that happen early in a working career, when a participant has time on her side. By the time she has fifteen years of service with one employer (for 403(b) plans) or is age 50 (for 401(k) or governmental 457 plans or IRAs) or is within three years of retirement age (for 457 plans), she is dangerously close to retirement. There is little time left to generate investment gains. Furthermore, if her timing is bad, she could see those extra contributions lost to market downturns in those few years just prior to her anticipated retirement date. The idea of "catching up" just before retirement also might falsely reassure younger participants that they can save little or nothing now because they can "make it up later." This type of planning is worse than no planning. It is a fallacy to suggest to a young worker that timing does not matter. An essential rule for successful retirement saving is to start as early as possible.

Instead of allowing larger contributions by near retirees, Congress should consider offering government matching funds for contributions made by participants under age 35, both to boost early contributions and to provide incentives for young workers to contribute more than the mandatory minimum I advocate in Solution One.

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SOLUTION THREE: ELIMINATE "LEAKAGE"

Plan sponsors are well aware of the many forms of retirement savings leakage that occur, especially from DC plans. Participants fail to roll over their plan assets when they change jobs, they take hardship withdrawals in order to buy a house or to pay college expenses, or they take a plan loan and fail to repay it completely. Availability of loans and hardship withdrawals gives participants comfort that they have access to their funds and these plan features are shown to increase voluntary participation rates. But we won't need such enticements if Congress makes participation mandatory. Even if participation remains voluntary, hardship withdrawals should be severely restricted. Houses and college are expenses that can be planned for. For low-income households, there are many housing and college assistance programs available. There is no logical justification for using retirement savings for these unrelated purposes.

Many plan sponsors complain that their plan loan programs have turned into short-term savings accounts for many participants. As soon as the participant's account balance reaches $1,000 (a common minimum loan amount in many plans), the participant takes out another loan. The solutions are simple: either impose a much higher minimum, require a longer period between loan payoff and a new loan, or eliminate all future loans from the plan. If plan sponsors are afraid of antagonizing their participants, they can lobby Congress to impose new restrictions. Plan sponsors can then claim that the new limits are outside of their control.

Leakage upon termination of employment is easy to prevent. Again, it takes only some political will by Congress to make rollovers mandatory for all distributions larger than $5,000 (or an even smaller amount) for employees under age 55. At age 55 or older, distributions should be limited to an annuity or periodic distributions absent a severe financial hardship such as medical or long term care needs.

The Internal Revenue Service should put an end to IRA owners investing their IRA assets in the owner's own start-up business. Why this strategy isn't considered a violation of the prohibited transaction rules for IRAs is beyond my comprehension. If there is a loophole that makes this strategy legal, it should be closed. Using IRA assets to start a business is clever but not conducive to preserving retirement assets for retirement purposes.

SOLUTION FOUR: SIMPLIFY NONDISCRIMINATION TESTING

Plan sponsors currently spend huge amounts of time and money to demonstrate that their retirement plans do not discriminate in favor of highly compensated employees (HCEs). The purpose of the nondiscrimination rules is laudable, but the lengths that employers go to in order to give more benefits to HCEs without crossing the line is often laughable. As a consultant, I find the rules interesting and challenging to apply, but I think the time and money could be better spent on providing benefits. The dilemma is that our current U.S. retirement system is centered on the workplace rather than on the worker. Providing broad-based benefits in exchange for tax benefits seems sensible and fair, but many employees work for employers that are not subject to the nondiscrimination rules, making the current rules difficult to justify.

A logical first step would be to simplify the nondiscrimination requirements. For example, we could eliminate the convoluted ADP (actual deferral percentage) test for employee voluntary deferrals by adding a percentage of pay limit to Section 402(g), such as the lesser of $17,500 or 15 percent of pay up to $150,000. Many plans already cap HCEs' contributions to a percentage of pay or a lower dollar amount in order to avoid having to make refunds due to an ADP test failure.

An even simpler alternative would be to apply the Section 403(b) approach to 401(k) plans. Require that virtually all employees have the opportunity to make voluntary deferrals and eliminate the testing requirement entirely.

SOLUTION FIVE: ELIMINATE "DO-IT-YOURSELF" INVESTING

Yes, it sounds empowering to give employees the right to direct their own investments in DC plans. But the reality is that most employees aren't up to the task and don't appreciate the freedom to make a mistake with their largest financial asset, their DC plan account. Let's put the ERISA 404(c) genie back in the bottle and ask plan sponsors to take back fiduciary responsibility for DC plan investments. Study after study has shown that participant-directed investment returns lag both the returns of the broad market (e.g., S&P 500) and the average returns of DB plans. The experiment has been a failure. Let's stop gambling with the retirement savings of even more generations of workers.

CONCLUSIONS

There are more problems with DC plans that I could address, and I've addressed some of them in other papers. (See, for example, my July 2006 *NAAJ* paper on mandatory annuitization, or my December 1998 paper on revising the minimum required distribution rules.) My goal is not to convince you that my suggestions are the best way to proceed. Rather, my goal is to start a discussion.

Incremental changes around "automating" participant behavior have helped, but they are too timid in their approach. If we could start over in legislating and designing retirement plans for the 21st century, we would likely end up with something quite different from our current system, which is high in flexibility but also laden with complexity and low in achieving retirement security. I believe that if we try, we can do better.

The opinions expressed herein are solely the author's and do not reflect the position of the author's employer or any other organization. ■

RETIREMENT INCOME SECURITY: WHY INDIVIDUAL ACCOUNT DC PLANS ARE NOT THE ANSWER (BUT ALSO WHAT IS)

By Robert L. Brown

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Much of this article depends heavily on a paper recently written by the above author and a co-author, Tyler Meredith; namely: Brown, R. L. and T. Meredith (2012). Institute for Research on Public Policy. Study No. 27: Pooled Target-Benefit Pension Plans.

WHAT TO AVOID IN DESIGNING A RETIREMENT INCOME SECURITY SYSTEM?

A simple statement is that one must design a retirement income security system in a manner that absolutely minimizes the expense burden on the participants and the risks that the participants must assume. That being the case, it becomes rapidly apparent that the worst way to design a retirement income security system is as an "Individual Account Defined Contribution" system.

Such a system makes a number of assumptions that are just patently false.

1. Workers are capable of optimal investing and asset management.
2. If they are not capable themselves, then they can purchase asset management at a very low expense ratio.
3. Workers, if given investment fund options, will choose wisely and will also follow a life-cycle model of investing where they slowly move from a high equity portfolio to more fixed income as they near retirement (or, even better, they buy deferred annuities as they near retirement).
4. Workers can buy individual life annuities as a fair actuarial price.

Each of these assumptions is false.

1. Workers are capable of optimal investing and asset management.

How can an individual worker who has no training or education in business or economics be expected to invest wisely and manage their assets prudently?

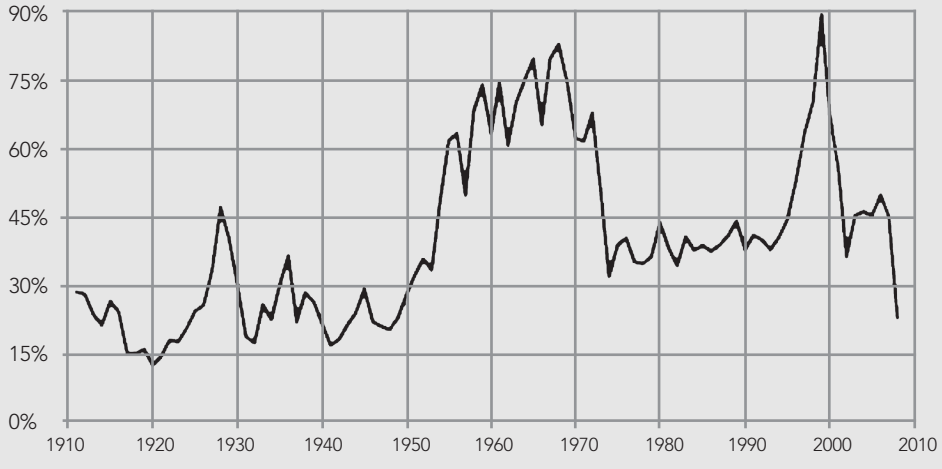
As the following graph shows the choice of one's investment portfolio and the timing of the cash flows can clearly have a huge impact on one's standard of living upon retirement.

In the graph above, we see replacement ratios as high as 90 percent and as low as 14 percent. And the only variable is the period over which one is working and saving.

Clearly, the worker can decrease the investment risk by choosing less volatile investments such as government bonds. While it is true that the volatility decreases markedly, so too do the Replacement Ratios as seen in Figure 2.

That is, the worker has two choices. Invest heavily in stocks and face a level of

FIGURE 1
Replacement Rate
(Annuity /Final wage)



Source: Burtless, (2009)

volatility that is probably unacceptable. Or, invest more heavily in bonds and fixed-income securities and mitigate the volatility risk but guarantee living at a much lower standard of living in retirement.

The replacement ratios in the above graphs also indicate the impact of the timing risk. This is the risk of being forced to liquidate your assets at depressed values while also buying an annuity when interest rates are low and annuity prices are, therefore, high (as in 2009).

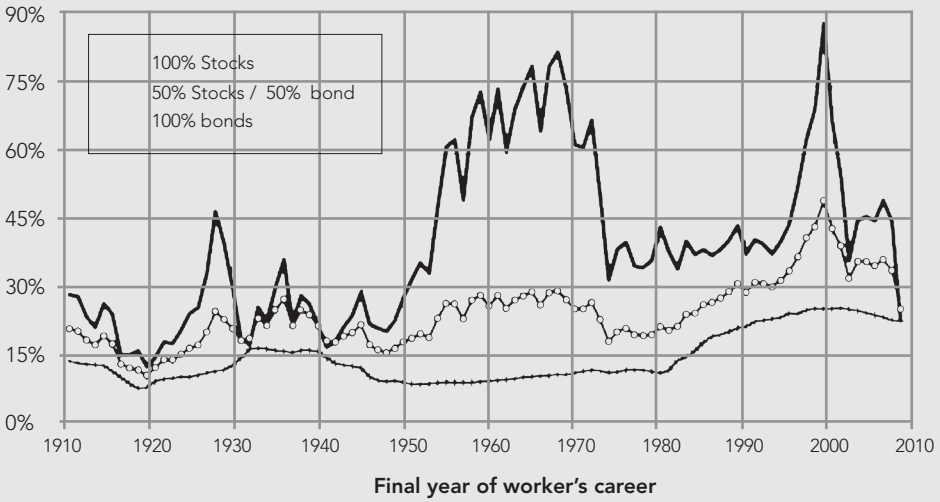
The responsibility of investing and liquidating one's assets is one for which the average worker has little capability. The literature indicates that if individuals are responsible for managing their own capital accumulation, they do so conservatively and achieve lower rates of return.

2. If they are not capable themselves, then they can purchase asset management at a very low expense ratio.

One can legitimately argue that there are professionals who can be paid to manage the funds even in the de-accumulation phase. While that is true, it comes at a high cost. It is not unreasonable to assume that a professional fund manager will charge 2 percent of assets each year as their management fee. A 2 percent per annum fee decreases the ultimate retirement fund (assuming a 35-year experience) by 31.7 percent (Ambachtsheer, 2008).

Looked at in a slightly different manner, Table 1 tracks the impact of investment expense ratios and shows how profoundly they can affect the aggregate pension benefits and working income replacement ratios of retired plan members. The data assume an annual contribution to a plan of $10,000 over 40 years for a worker making $50,000 per year.

FIGURE 1
Replacement Rate
(Annuity /Final wage)



Source: ibid.

Table 1: Impact of Investment Expense Ratios on Pension Adequacy

Expense Ratio	0%	0.4%	1.5%	3%	5%
Accumulated Value	$777,000	$707,000	$551,000	$400,000	$272,000
(after 40 years)					
Annual Pension	$45,000	$41,000	$32,000	$23,000	$16,000
Payout					
Replacement Ratio	90%	82%	64%	46%	32%

Ambachtsheer, 2008.

Munnell et al (2013) found that:

> "fees have a significant effect on how much an individual will have at retirement. An additional 100 basis points over a 40-year period reduces final assets by about one fifth. Many studies have also shown that actively-managed funds underperform index funds, even before accounting for the higher fees charged by the former. But broker-sold mutual funds

perform worst of all. One estimate is that broker-sold funds underperform average actively-managed stock funds by 23 to 255 basis points a year. The problem is big because the number of people rolling over into IRAs has increased dramatically.

…

The rollover of balances from 401(k) s to IRAs is extraordinary given that participants are typically passive in their interactions with their 401(k) plans. They rarely change their contribution rate or rebalance their portfolios in response to market fluctuations or as they age.

Some households may be attracted by the opportunity to obtain a wider menu of investment options or to consolidate their account holdings. But others may be seduced by advertisements from financial service firms urging participants to move their funds out of their "old," "tired" 401(k) plan into a new IRA."

Finally, if we are going to depend upon a DC system, at the least it should be run as a large, "collective" fund. This is because size matters.

Table 2: Investment Fees by Size of Pension Fund

Size of Pension Fund	Investment Fees for Large-Cap Equities
Individual Account	250-300 basis points
$10 million	60 basis points
$1 billion	42 basis points
$10 billion	28-35 basis points

Ambachtsheer, 2008.

Further, and importantly, a large collective fund can invest more widely than any Individual Account, in, for example, private equity or infrastructure. This effectively gives the worker a less risky portfolio.

3. Workers, if given investment fund options, will chose wisely and will also follow a life-cycle model of investing where they slowly move from a high equity portfolio to more fixed income as they near retirement (or, even better, they buy deferred annuities as they near retirement).

There is no support in the literature for this contention (see Munnell (2013) above). The more choice you give as to investment funds for Individual Accounts, the more likely it is that savings end up in the default option. In Australia, 80 percent of participants went to the default investment option. This does not have to be totally negative. For example, in Sweden, which offered 456 investment options, the majority of participants ended up in the default fund, but the default fund out-performed nearly all of the other funds, so the story ended well.

Nor is there any support in the literature for any evidence that workers use a life cycle approach to the management of their portfolio. (ibid)

Finally, buying fair market value life annuities may be very difficult.

4. Workers can buy individual life annuities at a fair actuarial price.

When we move into the de-accumulation phase, the worker can always manage the longevity risk by buying a life annuity. Simple enough, until we look at the cost, especially given today's very low interest rates. However, wherever interest rates happen to be at a given moment, a consistent cause of the high price of life annuities is the factor that the insurance company must include to cover anti-selection (James et al, 2008). Anti-selection occurs because the insurance company can never know as much about the annuitant's health and life expectancy as does the annuitant purchaser (the Principle of Information Asymmetry). Under

this Principle, workers who know they are in good health are more likely to buy life annuities or to buy larger amounts. Those who know they are in poor health will not buy life annuities at all. Thus, the insurance company must price the annuity assuming a five-star risk. That is, they price the annuity assuming the purchaser will have very high life expectancy.

In most countries, there is no risk classification for annuities (except in extreme cases where the seriously ill or injured can purchase a Settlement Annuity). Thus, the norm is that a coal miner who is over-weight and smokes pays the same price for an annuity as a non-smoking school teacher who jogs. Clearly they are not equivalent risks, but they are normally priced as if they are both five star applicants.

This has the further negative impact of being regressive. There is clear data (Brown and Prus, 2004, Whitehouse and Zaidi, 2008) that wealthier people live longer. And this is not because healthier people make more money. It is because of the stability, socialization and access to care that result from wealth and education (Brown and McDaid, 2003). Thus, if you charge the same rate for all life annuities, you are penalizing the poor who, it might be argued, are those in most need of being able to transfer the longevity risk. It is thus debatable as to whether a poorer worker should annuitize at retirement.

If the worker does not buy an annuity, effectively, they must self annuitize. That is, they must determine a program of income withdrawal that is optimal for them. Depending on their desire to leave a bequest (which we ignore here), they will want to take out the maximum income possible without creating the threat of outliving their assets. That is a lot to ask. Who knows their life expectancy? And covering your life expectancy is not enough. One would be wise to cover at least one's life expectancy plus one standard deviation. So, if workers want to be sure that they will not outlive their assets, they make conservative withdrawals. That means they live at a lower standard of living than is necessary. If they take more aggressive withdrawals, then they increase the probability of outliving their assets and thus becoming dependent on government programs for their continued consumption. (This should also be a concern to taxpayers who will pay those welfare benefits).

Individual Accounts also create a counter-cyclical macro-economic bias. For example, when a country's economy is hot, one would expect asset values to rise but also one would expect increased demand for labor. When the stock market is hot, holders of Individual Accounts will see an ability to retire and will then leave the labor force, exactly what the economy does not want. The reverse holds when the economy cools. Individual Account values go down and the account holders see that they must remain in the work force, just when you would like them to leave. (MacDonald and Cairns, 2007).

In short, in the case of a system based on individual accounts where the workers invest their funds, inadequate education of the public, lack of any smart default option and inadequate regulation and supervision of the investment managers may result in poor investment choices, high transaction costs, and thus lower than expected net returns. To conclude, there appears to be little economic support for Individual Accounts retirement income security systems (see also de Mesa, 1997, Gill, Packard and Yermo, 2004, Sinha and Yanez, 2008, Diamond, 2004 and Diamond and Orzag, 2004).

"THERE NOW APPEARS TO BE GENERAL ACCEPTANCE THAT NEITHER A PURE DB NOR DC PLAN IS OPTIMAL FOR THE FUTURE."

FINDING A MIDDLE GROUND: POOLED TARGET BENEFIT PENSION PLANS

There now appears to be general acceptance that neither a pure DB nor DC plan is optimal for the future. Can an innovative pension plan design be found which would maximize the advantages of these two classical systems and still address the range of challenges we have outlined?

In this effort four government panels have reported in as many years with proposed changes to Canada's retirement income system. These include:

- Quebec: Regies des rentes, Member-funded Pension Plans (2007)
- Ontario: Ontario Expert Commission on Pensions, Jointly Governed Target Benefit Pension Plans (JGTBPPs) (2008)
- Alberta/British Columbia: ABC Joint Expert Panel on Pension Standards, A new ABC joint provincial pension plan (2008)[1]
- Nova Scotia Pension Review Panel, a new Province-wide plan that would be a DC Target Benefit plan administered by an independent agency (2009).

While these reports differ in their detailed recommendations, each suggests new mechanisms to expand coverage, improve pension incomes and achieve more effective savings and pension options for Canadians.

This paper draws from many parts of the body of ideas put forward by the expert reports mentioned above. It attempts to distill from these various models a practical application of the key principles for reform set out below that could conceivably be implemented in the current legislative and policy framework for pension reform. Many of the features put forward in this paper also build on the real-world examples of Ontario traditional MEPPs and JSPPs and the TIAA-CREF pension model in the United States.

THE CONCEPT

The paper's answer to these principles is the Pooled Target Benefit Pension Plan (PTBPP). In broad terms, it is a target benefit pension plan that blends the elements of pooled risk often found in traditional MEPPs with the cost predictability of a DC plan. This hybrid design yields a pension vehicle in which participants gain an expectation as to their retirement income (within a reasonable range), greater portability across the labor market and professional third-party investment management in a cost-efficient and effective saving alternative.

It is important to note, however, that the proposal entails gains and losses for both employers and workers. This is consistent with the intent of the PTBPP to more effectively balance the allocation of risks than current classic DB and DC pensions permit. But whatever gains and losses the proposal may create for the parties in moving to the PTBPP model, it is designed to balance them out overall and be acceptable to both sides. This section describes each of the elements and key assumptions central to the proposal. How the model can best be implemented within current federal and provincial legislative frameworks is discussed in the next section.

POOLING

This model is premised on the pooling of assets and risk on a comprehensive basis. This means accounts would exist only notionally—assets would be booked by respective plan and participant, although no assets would be segregated per se. Assets would be invested and managed globally across the pool. By operating with such a high degree of comingling, the plan will be able to leverage relatively low management expense ra-

tios and a collectivization of risk that should provide for smoother actuarial costs. Such pooling, while mitigating investment risk, will not eliminate it. For example, a market fall of the significance of 2008/09 would still have a measurable negative impact on these pooled funds.

Both employers and individual investors would be able to participate in the plan either by registering new pensions or transferring existing assets (including RRSP accounts) to the pool(s). This would include access for self-employed individuals. For current single-employer pension plans, particularly those of small and medium-sized enterprises where plan membership is small, participation in the PTBPP would provide the cost-efficiency of larger pension funds. In this context, it is important to emphasize that having a comingled asset portfolio does not mean that all participant plans need to be identical. The participant plans could, as necessary, operate with differing contribution rates and target benefit ranges. Larger participating plans would also have the discretion to define a portion of their investment portfolio within established parameters.

The plan itself is therefore a large umbrella under which a number of different plans and investments are comingled to realize size efficiencies. Provincial and federal regulators would also be able to make use of this vehicle by transferring in "orphaned" pensions in the event of wind-up or bankruptcy. While several provinces[2] already have the power to designate a particular agency to "receive or hold" the assets of a registered pension plan under extenuating circumstances, by virtue of its design as a pooled entity the PTBPP could be an ideal host. This would ease administrative burdens during the transition process and provide greater protection of pension benefits in provinces where such powers do not currently exist.

To ensure an efficient scale is reached, pool(s) operating under the plan would be required to maintain a minimum portfolio of, for example, $10 billion, a size generally considered large enough to generate significant cost-efficiency (see Table 2) and to allow for specialized investments (e.g., private placements). It should also be noted that, in contrast to other proposals for pension reform, the PTBPP would not require mandatory enrolment of employers or workers—it is a voluntary pension. Many studies have shown that a system where participation is the default option and where workers (and employers) must take an action to opt out does produce higher participation levels. While we favor this design characteristic, we do not believe it is necessary for achieving the required economy of scale.

CONTRIBUTION RATES AND COST MINIMIZATION

Pooling provides a useful structure in which to mitigate some of the actuarial risks and management costs related to a pension fund, but it is not an end-point. The effectiveness

of a pension plan depends on a number of factors, including: whether contributions are to come from both employers and employees, what rate of income replacement is provided, who is responsible for supplementing the under-performance of assets, and what policies exist with respect to management expenses.

For the plan's sponsor (employer), the PTBPP appears as a traditional DC plan. In this respect, contributions would be mandatory for both parties, but the employer's contribution would be known and fixed within certain limits. The minimum contribution rate would be tied to a level appropriate for the target benefit set out in the plan, with contributions being matched by the employer up to a set rate (which may vary by plan). Similar to most DC plans, employee contributions would be permitted above this level but within the limits of the Income Tax Act.[3] The employer would not be responsible for any additional funding of the plan should asset values fall below the target range of benefits. As described further on in the paper, this responsibility would fall either to employees or be reconciled through a corresponding reduction in benefits. For existing DB sponsors this framework releases them from significant liabilities inherent in a classic DB plan.

While the plan is pure DC to the employer in the short term, in an extended period of low investment returns, one would anticipate that workers would wish to renegotiate the level of the employer contribution. Similarly, in an extended period of high returns, it would be expected that employers might wish to lower their required contributions.

One should not expect PTGPP plans to exist with low employer/employee contributions. As Mintz (2011) has suggested, an important source of under-saving behavior is related to inadequate minimum contribution rates among DC plans. The aim of the PTBPP, therefore, is as much on improving income replacement as it is on cost-efficiency. The intent is not to reduce costs to allow lower rates of saving, but rather to achieve greater saving efficiency and generate higher rates of income replacement. What, then, is an appropriate contribution rate for participating plans?

Work by the Organization for Economic Co-operation and Development (OECD 2009) indicates that a contribution rate of 5 percent would provide an income replacement ratio of 25.3 percent, while a contribution rate of 10 percent would double that to 50.7 percent (a one percent rate increase therefore raises the replacement ratio 5 percentage points, ceteris paribus). These figures assume 40 years of contributions and a balanced growth portfolio split between 40 percent domestic government bonds and 60 percent domestic equities. Although plans will differ based on the needs of workers, combined contribution rates would ideally range between 10 percent and 18 percent of pay (i.e., within the existing Income Tax limits), thus providing between 50 to 90 percent income replacement in retirement. The 50 percent replacement rate would satisfy the needs of an average worker who also gets a 39 percent replacement from OAS plus CPP. The 90 percent would apply only to the very wealthy where OAS and CPP provide a very low replacement ratio.

According to the 2009 Capital Benchmark Report the average combined employer/employee contribution rate to Canadian DC plans was 8.7 percent last year, having grown steadily over the previous three years (Great West Life 2010). Compared to these figures participation in the PTBPP would represent at least a modest uptick in contributions for many sponsors.

While additional contributions would likely be required on the part of some participants the cost-efficiency of corresponding investments would be vastly superior to the current mutual fund type offerings in the finan-

cial services marketplace (Exchange Traded Funds, or ETFs, are more competitive, but not well understood). Much has been said already about the drain that management fees impose on capital accumulation. To address this concern, management fees would be capped at 40 basis points after a pool has reached critical mass and an established start-up period has been completed. The MER cap ensures that a plan's assets grow efficiently over the course of a member's working life. This would represent a material advancement for many investors.

In suggesting a 40 basis points cap, it is worthwhile noting that the BC public sector pension plans (Public Service, Colleges, Teachers and Municipal) run at a total expense ratio (investment management and pension administration) of 25 basis points (i.e., 0.25 percent) (Kennedy 2011). Thus, we believe that the 40 basis point limit is fair and achievable as it allows a 15 basis point profit margin.

TARGET BENEFITS

The PTBPP entails a target benefit structure in which, as described earlier in the paper, participants make contributions over the course of their career with the purpose of receiving a retirement benefit within a pre-set range. The initial "target benefit" or its required contribution rate will, of course, depend on the age of the entering participant. A 45-year-old entrant cannot hope to achieve as high a potential benefit as a 25-year-old entrant making the same contribution. For workers who contribute to their retirement solely through personal investments or as part of a traditional DC plan, this moves retirement income beyond mere hope to expectation, but it does not provide the guarantee of a traditional defined benefit. In this respect, the model reflects a more equal sharing of risks than is the case with either traditional DB or DC plans.

After a target benefit range has been established and the plan set up, members would receive an update at least once annually as to the performance of their "account". This would include an indication of the benefit, based on a recent snapshot of plan valuation, that can be expected upon normal retirement, expressed as projected monthly retirement income. For those familiar with traditional DC plans this would relieve the informational burden on members to extrapolate a notional retirement benefit from the present market value of their investment accounts. With this information, members can then establish what replacement ratio their plan would provide and determine what, if any, need exists for supplementary personal savings. There are moves in the United States as this paper is being written to make these projections mandatory for 401(k) plans.

Obviously asset values will go up and down based on market performance, but this need not have a full or immediate impact on the benefit schedule. This is now true with respect to Ontario traditional MEPPs thanks to changes in solvency funding requirements. One must be aware, however, that this flexibility can create conflicts-of-interest. Retirees or those close to retirement will push for solutions that do not decrease benefits (but push the problem onto future generations of participants). Younger workers will want solutions that will not increase contributions. In an environment of prolonged low investment returns, such as today, participants must understand that their benefits are not guaranteed. If, over the medium term, asset values do not keep pace with the plan's target benefit range the plan's trustees would address deficiencies either through supplementary contributions on the part of employees or, as is the case with traditional MEPPs, a reduction in benefits. Conversely, any "excess" returns above the target benefit schedule would be used to improve benefits for those still paying into the plan and pro-

vide inflation-protection for the payouts to those in retirement.

To help mitigate potential funding shortfalls, the plan would use a more conservative method for calculating target benefits than is common in classical DB plans. One example is to set the target benefit based on Career Average Pay where income replacement is calculated on the basis of an employee's average salary throughout their career rather than over the highest earning period. This approach is arguably more consistent with a target benefit model as it spreads benefit costs across the working life more evenly and recognizes, implicitly, that the purpose of the pension plan is not to provide a maximum, fixed benefit upon retirement but rather a reasonable expectation of retirement income.

RISK MANAGEMENT

Having already described the contingency for shortfall in investment performance, any pension plan must also accommodate potential risks arising from extended longevity of retirees, and the sensitivity of benefits to changes in inflation over time. How would the PTBPP respond to these risks within the pension design set out above?

The longevity risk can be addressed in either of two ways. First, the plan could purchase deferred life annuities for plan participants as they near retirement. This would start at a relatively early stage in a member's working life (e.g., age 40), allowing sufficient preparation and vesting of assets. The proportion of an individual worker's plan assets allocated to purchasing deferred annuities would then increase gradually to 100 percent as they near retirement age (not purchasing annuities all at once mitigates the interest rate risk). The Group Annuity market in Canada today is highly competitive and provides good value for this need (personal memo from Dr. M. Milevsky using data from http://www.ifid.ca/payout.htm)

Alternatively, the plan could elect to manage the payout of benefits itself; under this scenario the plan would still benefit from having the investment risk collectivized in a manner vastly superior to a typical DC plan where investment funds are segregated across member selections. We view this as a parallel to the systems used in the United States by the TIAA-CREF. In either eventuality, worker/participants are freed from managing these risks themselves.

Inflation is a major threat to any pension plan in which benefits are fully indexed to changes in CPI. The model we propose would use slightly conservative actuarial assumptions (e.g., taking a financial economics view of the equity risk premium[4] to determine the "target benefit" for members). Again rather than a guarantee of full indexation of benefits, the plan proposes only a "target" in this regard. If actual rates of return exceed actuarial assumptions it would allow for benefit improvements. The approach could be similar to that recently introduced by the Ontario Teachers Pension Plan whereby future accruals (on or after January 1, 2010) are indexed at half the rate of CPI, with the other portion conditional on the funding viability of the plan (OTF 2009). This is also consistent with the approach used in Quebec's MFPP, with the BC public sector pension plans and the Nova Scotia Teachers pension plan.

INVESTMENT MANAGEMENT

A final, unique element of the PTBPP model relates to the plan's management and oversight functions. As compared to self-directed DC plans, where the individual bears the responsibility for investing funds, the plan would rely exclusively on professional, arms-length investment managers. These managers would be responsible both for the day-to-day management of invested funds as well as any pay-out responsibilities undertaken by the plan. Taking over the onus from individual members will significantly

improve the investment capabilities of the plan, and provide a significant advantage for participating workers and small businesses as they no longer would be expected to manage their own assets and the associated investment and actuarial risks.

CONCLUSION

The least desirable design for a retirement income security system is an Individual Account Defined Contribution system. A much better approach is the Pooled Target Benefit Pension Plan outlined in detail in this paper.

It is the expectation of the author that many of the points made in this paper will prove to be contentious. By debating our different viewpoints, it is hoped that we can all arrive at a more complete understanding of how to design a retirement income security system that truly provides retirement income security.

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