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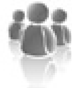

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CHAIRPERSON'S CORNER

By Faisal Siddiqi

This year has started off in a very exciting way for the Society of Actuaries' Pension Section. Many of the initiatives that we started to develop during 2012 are coming together and we have received excellent responses to them from our membership in terms of attendance and participation in our webcasts, attendance at the SOA Annual Meeting pension sessions, submission of articles for the *Pension Section News*, and furthering the research activities of the section.

In addition to these tangible metrics, the Pension Section Council has been working on various new ideas for projects beyond 2013 that we hope our membership will find valuable.

Annual Meeting Sessions, Webcasts, and Podcasts

Our offering for continuing education opportunities has never been better and the attendance and participation at these events has been excellent. We offered 16 different pension related sessions at the 2012 SOA Annual Meeting. Topics covered included funding relief, de-risking, mortality and longevity, disability issues in retirement, sustainability of pension plans, and public pension plan issues. All of the feedback we received indicated the high quality of our speakers and topics selected. In 2013, in San Diego, we are also planning to have around 16 sessions covering the following themes: providing retirement income in a challenging economy, improving retirement designs: current state and new approaches, funding and investments for DB plans, mortality and longevity topics, and ethics courses for those of you looking to complete your EA requirements this year. As you've come to know, these meetings are a great way to learn, connect with your friends and meet new ones.

2012 was one of the busiest and most successful years ever for webcasts. We offered ten sessions (three of which were jointly sponsored

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with the Conference of Consulting Actuaries) and the topics seemed to be spot on. Again, much of the feedback was positive. In 2013, we have started with six initial sessions (with more in the works) and are running a pilot subscription service for larger actuarial employers. The pilot subscription service provides organizations that have many offices a flat fee to allow all their staff to participate in our six webcasts.

We posted four podcasts by early March and expect to have another five to six more by June. The podcasts are a response to last year's Pension Section Survey where many respondents asked for us to produce podcasts for CE purposes. We have taken this challenge on and produced podcasts which highlight some of our newest research reports as well as excerpts from our annual meeting sessions that we feel our membership will find of value. Try them out! Most are five to 10 minutes in length, cover relevant/interesting topics, and they are available through the SOA's podcast "channel" on iTunes or the SOA Pension Section webpage.

New Ideas

As mentioned in the January 2013 *PSN*, the Pension Section Council has been busy developing new ideas for future projects and bringing to life ideas that were put forth during 2011/2012. Some of the ideas we are working on are as follows:

- *Pension Plan Design and Governance:* using ideas from the four winning papers developed under the *Retirement 20/20* initiative, we are working on developing important principles to help pension actuaries think through future plan designs and assist with pension governance. This applies to both single-employer private plans and public plans as all types of plans are facing increasing funding and administration challenges. These are complex issues to work through, however, if attempted from an independent view, it will help our publics (plan members, plan sponsors, and regulators) in the long run.
- *Mortality and Longevity Education:* using the work of the Society of Actuaries' Retirement Plans Experience Committee (RPEC) and input from various interested stakeholders, the Pension Section is putting together a "toolkit" for pension actuaries: information in a presentation format you need to know (and can use) in helping clients understand the key issues around mortality improvement and the implications for setting mortality table (and mortality improvement) assumptions. We are also providing financial support on a Longevity Calculator being developed with an American Academy of Actuaries working group which will help individuals and couples understand how long they will survive individually or jointly, respectively, and help to plan their finances accordingly. Finally, we are also planning to build a reference resource for

pension actuaries which involves consolidating and presenting in cohesive manner the current thinking on mortality and mortality improvement. As you can see, this is a rich and dense topic and we hope to make it easier to understand through our work.

- *Brainstorming In General:* using the great amount of research that the Pension Section has already conducted, is currently conducting, and the vast experience and knowledge of our council members and section membership, we are currently brainstorming topics to pursue with respect to defined contribution pension plans, pension plan investments and de-risking efforts, and general plan design. A lot of this thinking is based on the responses from our section membership for more detailed research to help them with their consulting needs and to advance the thinking of the profession which has broad application going forward. As we formulate and refine our thinking on these topics, we will update you.

As I mentioned at the beginning, we are working on some very exciting projects that are both intellectually stimulating and of practical value to our section membership. We look forward to your attendance at our meetings and webcasts and your participation in the new ideas we are developing for the future.

Faisal Siddiqi, FSA, FCIA, is principal and consulting actuary at Buck Consultants in Toronto, ON. He can be reached at Faisal.Siddiqi@buckconsultants.com.

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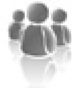

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By Raymond Berry

This issue has a variety of articles that you will find of interest.

Topics include retirement risks as well as disability risk before retirement. These articles provide insight into these risks. Other topics covered include mortality and obesity, retirement issues for women, and measuring benefit adequacy—more than replacement ratios.

The equity risk premiums article is a summary of a Pension Section sponsored research paper, "Estimating Equity Risk Premiums," which in this post Great Recession period is of more interest. We also reference the recent SOA study regarding input and output smoothing techniques and their impact on pension funding.

Thanks to the authors for their contributions to this issue.

Have you recently read an interesting article that may be of interest to others in the Pension Section? If so, please forward to us.

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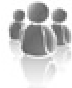
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A VIEW FROM THE SOA'S STAFF FELLOW FOR RETIREMENT

By Andrew Peterson

I recently had the opportunity to attend the SOA's Investment Symposium event held in New York in mid-March (co-sponsored by PRMIA). For the last two years, this conference has included a specific track of retirement focused sessions, so I was quite interested to see what was being presented and how many people attended. Overall the event was very well done and the retirement track featured a high-caliber of speakers including Bob Merton (a Nobel Prize winning economist at MIT), Olivia Mitchell (executive director of the Pension Research Council) and others.

While there were many interesting ideas, I found the luncheon speech by Emanuel Derman, a professor at Columbia and author of "Models Behaving Badly" (2011) and "My Life as a Quant: Reflections on Physics and Finance" (2004), to be quite interesting. His presentation was based on his most recent book and focused on his views about our modes of understanding in a world where we seem to be enamored by the concept of "big data."

The concept of analyzing "big data" is being thrown around a lot these days—whether in the context of focused marketing, in setting more precise insurance rates or even in targeting voters for the recent U.S. presidential elections. What I found interesting was his skepticism towards the current view that with computer-aided analysis of patterns in big data, the traditional methods of discovering truth will be replaced in the areas of medicine and social sciences. However, Professor Derman suggested that we need to remember and hold on to the key modes of understanding that have been reflected through-out the centuries. He listed these as:

1. **Intuition:** Here he described the work of scientists like Kepler, Newton and Einstein who used their intuition to develop theories that were based on careful observation and painstaking effort. In

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this context he described intuition as a merging of the observer with the observed.

2. **Theories:** These are "deep descriptions of the laws of the world" and according to Derman can be right, partially right or totally wrong. Theories are not analogies—they just "are."
3. **Models:** A model compares something that we don't understand to something we do. Unlike theories, models *are* analogies. Black-Scholes option pricing is a model, which is useful to a point, but it is not fact.
4. **Data & Statistics:** This involves the analysis behind big data—using statistics to find past tendencies and correlations in data. But correlation does not imply causation and often people falsely assume that past trends will persist.

The key point made by Professor Derman, as I understood it, is that while using statistical analysis is important and helpful, the three other modes: intuition, theories and models, are necessary to evaluate the results provided through any big data analysis to evaluate cause and interpret results. As I think about this and the application for actuaries working with retirement plans, I believe there are several application points. We receive lots of data points as actuaries, yet we need to use our skills of intuition to evaluate what is important in interpreting results. In addition, it is important not to simply accept results we get from a model (e.g., valuation program) without testing and evaluating whether it fits with our intuition and other relevant data points. Two specific examples for pension actuaries come to mind:

- As we set future economic assumptions, we have significant amounts of historical data that can be analyzed for averages, statistical correlations, variance, etc. Yet simply using the past as a guide for the future may not be the best as we need to add our own intuition about how the future may differ from the past—due to changing economic situations, demographic trends, shifting global economy, etc.
- In developing mortality assumptions, we have typically relied on actual past historical experience to predict future mortality rates, perhaps with an additional improvement factor included. Today we have more sophisticated models that can blend past actual experience with future expectations based on our input and best estimates. We need to combine what those models can do with new sources of information telling us how mortality rates are or aren't improving depending on the particular demographic or socioeconomic group involved.

This all sounds complex doesn't it? Yet, this is ultimately a risk management exercise that allows us as actuaries to blend our quantitative analysis with our critical thinking skills…and hopefully that is the key

reason we became actuaries.

If you have thoughts or comments on this column, feel free to contact me at the SOA.

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.

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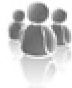
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PERSPECTIVES FROM ANNA: THE RELATIVITY OF "SUCCESS" AND "FAILURE"

By Anna Rappaport

This perspective focuses on information that has made me think over the last year. I find some of these issues troublesome. I hope that the readers will be interested in a dialogue with professional colleagues and might consider using the SOA Pension Section LinkedIn site as a vehicle for carrying forth this dialogue.

Retirement Security in America: Success or Failure?

During my adult life, I have seen a great deal of growth in the U.S. retirement system, and a lot of changes—some positive and some negative. Unfortunately, media reports focus more often on the negatives. (This is also true about press reports in general, what generally gets reported are large fires and other catastrophic events, murders, etc. and not the day to day success stories.)

When I have given talks about the pension system and its future, some of the points I have made include:

- Social Security is critically important and it has been a huge factor in retirement resources, particularly for the lower income and asset groups. At the same time, it is currently financially out of balance and periodic adjustments have been needed to improve its solvency. Success or failure? Huge success in terms of retirement income security, but periodic, politically difficult adjustments are needed, so we might put aspects of it in both columns. (Note that the adjustments currently being considered are generally modest, and I would consider the need for adjustments to be a challenge and a normal part of the system management, but not a failure).
- Poverty and near poverty rates for the elderly have declined over time, but they are still way too high among unmarried women. Poverty rates for the elderly are below the rates for some other

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groups. Success or failure? It depends on your expectations and viewpoint. I can argue either way.

- Defined benefit (DB) plans have made an important contribution to the security of retirees for many decades, and they continue to be a very effective way to provide retirement income security for longer-term employees. A National Institute on Retirement Security Study found that rates of poverty in 2010 among older households lacking DB pension income were approximately nine times greater than the rates among older households with DB pension income—up from six times greater in 2006. But DB plans, particularly in the private sector, are in a major state of decline. The combination of today's funding and accounting rules, low interest rates, and severe market fluctuations in the 21st century have made funding these plans a challenge for plan sponsors. These plans remain a very important part of the compensation package for public employees, but are creating increasing challenges for the governments that sponsor them. Success or failure? It depends on your expectations and viewpoint. If you talk to enough different experts, you will get widely different views.
- Defined contribution (DC) plans and IRA rollovers are also making an important contribution to retirement security. People with a number of years of participation in these plans can accumulate significant balances. Critics of these plans point to average balances that are inadequate, to failure to save enough and invest appropriately, to leakage, and to lump sums. Others point to the much larger balances of people with longer service near retirement and to the dramatic growth of retirement system assets in general. Many people are much more likely to save within an employer sponsored plan than on their own. There are widely differing views on whether 401(k) plans have been a success. Some critics would prefer to see the 401(k) system replaced with a mandatory layer of retirement savings in addition to Social Security. I disagree. I would prefer to see the continuation of an employer system together with an income-based Social Security system.

The Society of Actuaries 2012 Research Project on Running Out of Money provides background research including information on which groups are likely to run out of money during their retirement years. That study found that 71 percent of older adults are adequately prepared for retirement according to their definition, but that outcomes vary substantially by marital status—80 percent of married adults are adequately prepared compared with only 55 percent of single adults. This assumes a 10 percent reduction in consumption following retirement. Without this 10 percent reduction in consumption, the researchers providing background information found that 77 percent of married couples and 49 percent of single adults would be adequately prepared. The background also showed

that outcomes differ substantially by other demographic characteristics. For example, only 29 percent of single older women without high school degrees are adequately prepared for retirement, even after reducing consumption by 10 percent. This background analysis is based on the paper submitted as background for the project authored by Michael Hurd and Susan Rohwedder from Rand.

EBRI uses a projection model to estimate retirement security and their estimates show that more people are unprepared for retirement. Their 2012 updated calculations (May, 2012 EBRI notes) find that for Early Baby Boomers (individuals born between 1948 and 1954), Late Baby Boomers (born between 1955 and 1964) and Generation Xers (born between 1965 and 1974), about 44 percent of the people in these groups were projected to lack adequate retirement income for basic expenses and uninsured health care costs. They found some improvement since 2003: the "at risk" percentages were reduced largely due to increasing auto-enrollment in 401(k) plans. They estimate the drop in the "at risk" levels to be in the 5 percent to 8 percent range. While there are differences in opinion about the right way to estimate who is prepared and how many people are prepared, the various estimates show a significant of lack of preparation in a general sense. From my perspective, these levels of unpreparedness are unacceptable, i.e., they reflect failure.

Finding a Balanced Perspective

One of my concerns for many years has been that much of what is reported about the retirement system related to the failures rather than a balanced view of successes and failures. I have tried to provide a balanced view in many of the presentations I've done over the years. In December 2012, I attended the Women's Institute for a Secure Retirement (WISER) symposium, and was pleased to hear about successes as well as gaps. In this column I comment on some of what I encountered in the last year in both the successes and gaps columns.

Sarah Holden from the Investment Company Institute (ICI) was one of the WISER Symposium presenters (all of the presentations from the symposium are available online at the WISER website.) She focused specifically on The Success of the U.S. Retirement System. Her presentation is heavily linked to a new report from the ICI. I thought it was very good report and presents an important story. Here are some of the things that caught my eye from that report:

- Older Americans are better off than younger Americans when measured by poverty rates. In 2011, 9 percent of Americans age 65 or older were in poverty compared to 14 percent at ages 18 to 64 and 22 percent of the population under age 18. The report states that successive generations have been better off than those

before them. (Of course, today, many people are asking whether future generations of seniors will be worse off.)

- The report provides an analysis indicating that the shift from DB to DC is unlikely to reduce retirement preparedness. This is a very different view from that provided by the National Institute on Retirement Security. I encourage actuaries to think about the ICI analysis and see whether they agree. I observe that neither system will do a good job for someone unless an individual has a number of years of work with coverage, that assets are invested wisely and that the funds saved for retirement are used for retirement. The employer based retirement system only works for people with longer-term employment and longer-term retirement savings. It was never intended to be any other way. Either type of plan can work well if benefits / amounts contributed are adequately generous. DC plans certainly offer the potential to do a better job for people who have several jobs during their careers.

The ICI analysis presents the idea of a retirement security pyramid (with five layers) rather than the traditional 20th century three legged stool. The five layers include financial assets both inside and outside of qualified plans, the value of Social Security, the value of DB benefits and DC accounts, both private sector and public employers, the value of IRAs, and the net value of housing. The analysis reflects people approaching retirement age today. Below is a summary of ICI calculations based on estimates of retirement wealth by Gustman, Steinmeier, and Tabatabai, presented by pyramid layer and wealth quintile. The analysis reflects the importance of housing wealth as a source of retirement income.

Estimates of the Components of the Retirement Resource Pyramids for Households Approaching Retirement
Percentage of Augmented Wealth for Each Wealth Quintile
(includes households with at least one member born between 1948 and 1953)

Wealth Quintile	First	Second	Third	Fourth	Fifth
Estimated augmented wealth	$93,500	$294,000	$543,000	$904,000	$2,000,000
		Percentages of Total Wealth			
Value of Social Security benefits	82 percent	58 percent	41 percent	28 percent	14 percent
Net housing wealth	8	18	22	23	23
Value of DB benefits	3	9	14	19	15
Retirement assets	3	8	11	15	18
Other assets	4	8	11	15	11

Source: Figure 16, Investment Company Institute, The Success of the U.S. Retirement System, 2012
Note: Calculations exclude the top and bottom 1 percent of the population, quintiles established based on 2006. The value of DB and Social Security income streams is included. Health and Retirement Study data, analyzed by Gustman, Steinmeier, and Tabatai, underlies this analysis.

(Percentages may not add to 100 due to rounding)

The ICI report also provides an interesting analysis of coverage among near-retiree households. They estimate that of households with a working head aged 55 to 64, in 2010, 81 percent had accrued pension benefits. More specifically, 10 percent had DB only, 31 percent both DB and DC or IRA, and 40 percent DC or IRA assets only.

The ICI report catalogues areas of success today and points out areas of challenge for individuals, including retiring early due to poor health and having low levels of attachment to the labor force. I have a number of concerns with regard to future retirement security, and would encourage a debate about what is working well and what is not. Some of my concerns are as follows:

- Longer-term disability can easily derail retirement security, particularly for people who do not have long-term disability coverage and a DB plan.
- That part of the population who did not have longer-term employment in a reasonably paying job is also likely to face problems in retirement.
- Some people withdraw and use their retirement assets prematurely.
- In a voluntary savings system, some people will not save enough and they may not make good investment choices.
- Non-couples, and particularly women, are much less well off than couples.
- Many people do not do enough planning and do not have enough resources for retirement. This may increase in the future.
- There is not enough focus on developing and implementing an organized post-retirement financial plan. There is a specific need for better planning for "shocks" including catastrophic health care, the need for long-term care, and the possibility of poor investment results, particularly early in retirement.
- There is considerable uncertainty about future changes in taxation, Social Security and other government programs.

I hope that this discussion will encourage a dialogue about successes and failures.

Thinking about Disability

Moving in a different direction, I have been concerned about the interaction of DC plans and disability coverage. In a separate article in this issue, David Kaleda and I talk about the specific issues related to disability derailing retirement security.

The 2012 ERISA Advisory Council looked into the issue of *Disability*

Coverage in a World of Individual Responsibility. I encouraged that topic and was delighted that the council decided to focus on this as one of their three study topics. I learned several new things that go beyond the issue of the connection between disability and DC retirement plans:

- The public is poorly informed about disability and underestimates how big a problem this can be for those affected (the disabled person and his/her family).
- Only 31 percent of the labor force has employer sponsored long-term disability (LTD) insurance. While Social Security disability benefits are available to almost everyone, the benefits are too low (and, arguably, too restrictive) to provide an adequate income for much of the population.
- Among those who have LTD coverage, misunderstandings are not uncommon. Offsets are a potential area for misunderstanding. The most common plan design for employer sponsored benefits is to offer a total benefit that replaces 60 percent to 65 percent of pay. This design provides for an offset of Social Security disability benefits if they should be payable. However, while reviewing the testimony presented to the 2012 ERISA Advisory Council, I also learned that there are a variety of other offsets that can be applied to disability benefits, including family Social Security disability benefits, retirement benefits, Worker's Compensation, Veteran's benefits and others. I did not learn how common some of these other offsets are. Plaintiff's attorneys who submitted testimony about them were very concerned about them. This is an area to learn more about.

During recent discussions, I was also reminded that homemakers and family caregivers have no access to disability coverage, but their families may have a serious problem if they are disabled. The SOA Committee on Post- Retirement Risk is working with Rick Miller and other representatives of NAPFA "University"—a continuing education program for NAPFA members—on education for financial planners about disability benefits.

Dilemmas about Advice

Many comments are made about how important advice is for the middle market, but at the same time there is a lot of focus on the fact that this group is underserved. The 2012 Wharton Pension Research Council symposium was focused on the market for retirement financial advice, and there are several working papers available from that conference. To complicate this further, I have heard concerns expressed about potential conflicts of interest when advice is provided, and questions about whether advice addresses the right issues. The Society of Actuaries Committee on Post-Retirement Risk sponsored a project in 2011-2012 focused on *Running Out of Money*. Some of the background information is cited above. That project focused on thinking about some of the challenges in

the retirement system today. Look at that report and the Pension Research Council papers to see some discussion about the middle market and concerns relative to advice.

Too Many Trade-offs

Risk protection is a vital issue when it comes to retirement security. Yet when we think about important risk protection products, we find that there are trade-offs when considering whether to buy these products. For most people there are too many immediate needs competing for the limited amounts of money available to them. People need to make choices and focus on trade-offs. They are often complex.

Uncertainty about Public Policy

Taxation is very important in structuring retirement savings and how retirement funds are used. In spite of the claimed "permanence" of the recent tax changes, there is still considerable uncertainty about future tax policy in both the income tax and estate tax arenas. Tax deferral rules may also change. There are also fiscal imbalances in Social Security, Medicare and Medicaid, and substantial concerns with regard to how these programs may evolve. These public policy uncertainties create challenges for people as they plan for retirement.

Closing Comments

I hope this perspective will encourage you to share and discuss your ideas with your professional colleagues. I believe that the story of the retirement system is indeed a mixed story of successes and failures and that it would be helpful if each us wrote down and shared what we view as the successes and which areas need further work. Then we can focus on how we can help to make the system better.

Anna Rappaport, FSA, MAAA, is an internationally known researcher, speaker, and author. She chairs the Society of Actuaries Committee on Post Retirement Needs and Risks and is a Past President of the SOA. She founded Anna Rappaport Consulting in 2005 after retiring from Mercer. She will complete 50 years as a Fellow in 2013.

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DON'T LET DISABILITY DERAIL RETIREMENT SECURITY

By David Kaleda and Anna Rappaport

Prior to the rise to prominence of defined contribution retirement plans, traditional benefit planning focused on the mitigation against risk and the design of benefit programs that worked together as an integrated whole. The programs considered loss of income from retirement, disability and death as well as health care expenses, which in many cases would be catastrophic but for the integrated program. It was common for disability to be recognized through a combination of salary continuation benefits, disability provisions embedded in defined benefit pension plans, waiver of premium provisions in life insurance plans, and at times, continuation of medical benefits to disabled employees. However, with the shift away from DB plans to DC plans the disability provisions that protected retirement security have often been lost, significantly increasing the risk that mid- or late-career disability will derail retirement security.

While the problem (and the solutions) might seem straightforward, both DB and DC plans are subject to extensive regulation. This article sets forth the conceptual and regulatory issues involved in providing disability benefits embedded within or as an add-on to DC plans in the United States, from an ERISA regulatory standpoint.

> The 2012 Department of Labor ERISA Advisory Council studied the topic of disability and how it relates to retirement security. The testimony presented to the council laying out the concerns of witnesses representing different perspectives can be obtained from the ERISA Advisory Council. The authors served on the ERISA Advisory Council during 2012 and worked on the disability topic. This article draws on testimony submitted to the council as well as the authors' research. This article represents the views of the authors and not that of the council or of the Department of Labor, or any

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organization with which either of the authors is affiliated.

While many actuaries and other benefits professionals work with retirement programs and disability programs, the intersection of disability risk and retirement security is often not on the retirement security radar screen, and the issue is often forgotten. In fact, the professionals who structure retirement programs often are not the same people who deal with disability risk. This is particularly unfortunate since only 31 percent of the labor force is covered by long- term disability benefits, and disability risk is underestimated by many Americans.

When employees turn to employer-sponsored programs for benefits and risk protection, disability is often far down on their list of priorities because they do not understand how financially devastating an extended disability can be to an individual and his/her family. Not only does the employee experience a loss of income by not working, but other family members may also need to curtail or abandon their own job(s) in order to care for the disabled family member at the same time as the disabled employee's medical costs escalate. Moreover, the employee and possibly other family members stop saving for retirement because DC plan benefits meaningfully accrue only during periods of active employment. We hope that this article will encourage all who read it to thoughtfully address the issues surrounding disability and retirement security in light of the increased prominence of DC plans.

Differences between DB and DC Disability Benefit Practices

The U.S. pension laws recognize the need for disability benefits in retirement plans, but that need is not adequately supported by appropriate regulations with regard to DC plans. Both ERISA and the Internal Revenue Code allow for a "qualified disability benefit," defined as a benefit at normal retirement age that does not exceed the benefit the plan participant would have earned had he or she not become disabled.[1] A qualified disability benefit may be included in either a DB plan or a DC plan. While some sort of disability retirement benefits are a common feature in DB plans, employers have not been as willing to implement disability retirement income benefit features within or next to their DC programs. This lack of "take up" by DC plan sponsors may be tied to how such plans work in comparison to DB plans and to the fact that DC plans generally transfer a sizeable portion of retirement benefit funding risk to plan participants. In addition, lack of clarity in applicable regulations makes implementation of disability retirement programs in DC plans unattractive for employers who may otherwise be interested in doing so.

Defined Benefit Plans

In a DB plan, the plan provides for a pension benefit payable to a participant at normal retirement age with some plans offering reduced benefits on earlier retirement. The plan sponsor bears the risk of investment loss and thus whether sufficient assets are held by the plan to pay the promised benefits. Disability retirement benefits may be offered through the DB plan in a number of ways. The following are some examples:

- **Continued Benefit Accruals during Periods of Disability:** The plan may provide that participants will continue to accrue benefits while disabled. For example, the plan may continue counting accrual service during the disability period. In this case the plan usually assumes that the participant will earn compensation during the disability period at the same rate he or she was compensated immediately before the disability occured.[2]
- **Disability Retirement Pension Benefits:** The plan may provide that a participant will begin to receive his or her accrued pension benefit upon becoming disabled prior to normal retirement age. In many cases, the benefit is subsidized by the employer. This means that the participant may immediately begin receiving the same benefit (or a significant portion thereof) that he or she would have received at normal retirement age (e.g., 65) if he/she had left the company at the point of disablement. The disability retirement pension is paid until the participant dies, with a death benefit payable to his or her spouse.[3]
- **Supplemental Payments during Disability:** The plan may provide for a supplemental retirement benefit as a set dollar amount per month (such as $100) for the disability period until normal retirement age or, if earlier, upon the participant's becoming eligible for Social Security Disability Income (SSDI). This supplemental benefit is paid in addition to the early retirement benefit described in the immediately preceding bullet point and bridges the gap between becoming unable to work by reason of a disability and becoming eligible for SSDI.

Effectively, in all of the above examples, the disability retirement benefit is built into the plan's benefit formula and allows the participant to keep accruing a benefit or to receive benefits during the disability period as well as have the opportunity to receive benefits at normal retirement (generally age 65). The employer bears the risk for this benefit and the funding of such benefits is included in the plan's actuarially-determined annual funding requirements. If the plan is contributory, the cost is typically split in some fashion between employer and employee.

Defined Contribution Plans

In a DC plan, the employer and/or the participant make contributions to an individual account within the plan on behalf of the participant. The participant bears the risk of investment loss. Contributions are typically based upon compensation (e.g., a percentage of a participant's compensation) though other allocation methods may be applied (e.g., flat dollar). The total retirement benefit available to the participant at retirement (or some other permitted distribution event) is based upon his or her account balance, which consists of employer and participant contributions and any investment gains realized on those contributions. Whereas at one time, DC plans were most often supplemental plans operating next to DB plans, today's DC plans are often the primary or even the only employee retirement benefit. Logically, it makes sense to offer the equivalent of a waiver of premium provision and include continued savings in the DC plan or in a separate fund, but this is not usual practice. This issue is much more important when the DC plan is the primary retirement vehicle.

Any period during which a participant cannot continue contributing to his or her account balance can have a significant impact on the participant's savings at retirement. An employee who is disabled from ages 50 to 55 will lose five years of retirement savings that he will not be able to restore over his remaining working career. Furthermore, unlike in a DB plan in which benefits are in most cases paid as a stream of monthly benefit payments (e.g., an annuity), most DC plan benefits are paid in the form of a single lump sum. Thus, even if the DC plan provides for payment of benefits upon disability, many participants receive the lump sum at which point they may spend that money to meet current expenses thereby making those funds no longer available for their retirement years.

Some plan sponsors and their advisors have recognized that an extended period of disability can have a very severe negative impact on employees' retirement savings and have implemented different strategies to help participants to continue to accrue benefits. The following are some examples of approaches that can be used to make up the lost savings:

- **Continue Contributions during Disability Period:** To the extent permitted under Section 415(c) of the Code[4], the plan provides that the employer may continue to make contributions to a participant's account during a period of total and permanent disability.
- **Implement Alternative Savings Option Outside of DC Plan:** The employer purchases additional Long-Term Disability (LTD) insurance (i.e., current income replacement insurance) on behalf of its employees. Upon the occurrence of a disability and the

subsequent triggering of payments under the LTD policy, the proceeds from this additional coverage are invested in an annuity or IRA on behalf of the participant. The proceeds of such annuity or IRA would then supplement the retirement benefit otherwise accumulated under the defined contribution plan. The intent of this arrangement is to make up for the contributions that would have been made to the defined contribution plan absent the disability.

- **Purchase of "LTD 401(k) Insurance" as an Investment in the DC Plan:** The participant elects to have a portion of his or her own contributions (e.g., pre-tax deferrals) and possibly employer contributions (matching contributions, profit sharing contributions, etc.) to purchase LTD coverage that is offered as an investment option under the plan. Such insurance is funded either through a LTD policy issued by an insurance company or through a Voluntary Employee Benefits Association (VEBA) established by or on behalf of one or more employers. In the event the participant becomes disabled, the insurance carrier pays cash to the participant's account in the amount of the contributions he or she was making (and possibly the employer was making) prior to disability.[5] These arrangements were presented as "LTD 401(k) Insurance" in testimony to the Council and are referred to as such throughout this report.

From an actuarial point of view, each of these approaches works well but none is trouble free in the current regulatory environment. The issues linked to each approach are discussed below.

Regulatory Barriers to Defined Contribution Plan Disability Benefits

Section 415 Limits of the Code

While Section 415 of the Code permits employers to make contributions on behalf of participants who are disabled, the ability to take advantage of this is limited because Section 415 permits such contributions only if the participant is "permanently and totally disabled" as defined in Section 22(e)(3) of the Code, which in essence requires that the disability cause the person to be unable to work in any occupation[6]. This definition of disability is not consistent with the definition of disability in many LTD plans, which often provide only that the disability result in the employee's inability to work in his or her own occupation. Thus, while the employee may be eligible for LTD income replacement benefits offered by the employer, he or she in many cases will not qualify for disability replacement contributions under Section 415 of the Code.[7]

Challenges to Implementing Options Outside of the DC Plan

As stated above, some plan sponsors have implemented an arrangement designed to make up for the lack of accrual of disability benefits under a DC plan with an "out of plan" option. A portion of LTD insurance benefits paid by an insurer was contributed to an IRA or individual retirement annuity from which benefits could be paid at the time the employee retired. Another idea would be for an insurer to issue a LTD policy that is designed to provide both current income and retirement income. However, both of these arrangements pose administrative or legal issues.

Payments made pursuant to a LTD insurance policy used to fund an IRA or individual retirement annuity pose administrative and compliance issues including the following:

- The transmission of LTD payments from the insurance company to the IRA provider can be administratively difficult because a mechanism for transmitting payments from an insurance company to an IRA or annuity provider, without first paying the money to the participant, typically does not exist.
- The receipt of the disability benefit payments by an IRA or annuity provider could result in prohibited transaction issues under ERISA and the Code if such provider is an affiliate of the insurer providing the insured LTD benefits.
- An employer offering an arrangement whereby payments pursuant to a LTD insurance policy were directed to an IRA or annuity may result in the IRA/annuity being viewed as part of an "employee benefit plan" for purposes of ERISA, thus causing the IRA to be viewed as an ERISA-governed employer-sponsored plan. This raises issues regarding whether ERISA's trust and other fiduciary requirements can be met, whether Form 5500 reporting is required, what participant disclosures must be satisfied, and other ERISA-related issues.
- Some or all of the LTD benefit payments may be includible in income during the year of payment even if they are then immediately contributed to an IRA. Furthermore, the Code's limits on contributions to IRAs and individual retirement annuities may limit an employee's ability to make the contributions on a pre-tax basis or even an after-tax basis. In either case, the effectiveness of the arrangement is very limited when compared to the tax advantages of a qualified retirement plan that allows for continued accruals during periods of disability.

The above administrative and compliance issues were key reasons why plan sponsors and service providers turned to "in plan" options such as the LTD 401(k) Insurance option discussed earlier.[8]

Another possible solution is for an employer-sponsored LTD arrangement,

whether insured or self-insured, to be designed to provide disability retirement income replacement benefits (i.e., lost retirement benefits), not just current income replacement benefits (i.e., lost wages). However, a concern about this idea is that an insured or self-insured arrangement that by its terms provided post-retirement LTD benefits could be viewed by the DOL as a "pension benefit plan" rather than a "welfare benefit plan." If the former were the case, the arrangement would be subject to certain ERISA provisions that do not apply to welfare plans, such as minimum participation and coverage, vesting, funding, and other requirements. In this case, such an arrangement would not be attractive to most employers. (The authors understand that riders are available to be added to individual disability coverage to provide added coverage to replace retirement savings, but such riders are rarely used.)

Lack of Clarity on Tax Treatment of "LTD 401(k) Insurance" Arrangements

The position taken by the IRS in two private letter rulings[9] (the "Rulings") is conducive to employers implementing LTD 401(k) Insurance or similar products within defined contribution plans. However, some proposed regulations issued by the IRS in 2007 have called into question the IRS' position in the Rulings and have stymied the implementation and growth of such arrangements. The authors' understanding is that prior to the 2007 proposed regulations some employers implemented this type of program, but that new implementations have in large part stopped until the regulations are further clarified. Trade associations representing both plan sponsors and the financial service industry support such clarification. For example, the American Benefits Council indicated their support for such clarification in testimony to the ERISA Advisory Council.

In the Rulings, the IRS effectively took the position that the LTD insurance was an investment option offered under the plan. As a result, contributions used to pay premiums were not taxed at the time of such payment and the payment of LTD insurance benefits by the insurer to the participant's plan account did not result in current taxable income to the participant[10]. In addition, amounts paid pursuant to the LTD policy were not counted as contributions for Code limits on tax-qualified plans such as those found in Sections 415 and 402(g) of the Code. As a result, the IRS' position in the Rulings reduced the significant tax and recordkeeping consequences that would result if the portion of the plan contributions used to pay premiums were taxed at a different time than when the participant received a distribution from the plan or if payments under the policy counted against IRS limits.[11]

However, the Treasury Department subsequently proposed regulations in 2007 addressing the tax effects of using defined contribution plan assets to fund non-retiree health benefits[12]. These proposed regulations

suggested to the plan sponsor and practitioner communities a possible shift in how the IRS would now rule on LTD 401(k) Insurance offerings. In such regulations, the IRS concluded that DC plan contributions used to pay health insurance premiums would be included in income in the year such payments were made. In addition, any benefits payable under the health benefits policy would be treated as contributions subject to the Code limits mentioned above. The proposal, in effect, required an income tax result exactly the opposite of what was established in the Rulings pertaining to LTD 401(k) Insurance.

While the Proposal was directed at the funding of health benefits, language in the Preamble indicated that the IRS may be considering changing its position with respect to payment of “in plan” LTD benefits such as LTD 401(k) Insurance. The resulting regulatory uncertainty appears to be responsible for a decline in service provider and plan sponsor interest in developing and implementing LTD 401(k) Insurance and similar arrangements.

The 2012 ERISA Advisory Council made recommendations to the DOL designed to secure clarification of the unresolved regulatory issues and to educate the public and plan sponsors about concerns related to disability protection. The report is available on the ERISA Advisory Council website

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What Actuaries Might Do to Enhance Security in a DC World

It is important for actuaries and consultants working with DC plans to think beyond the plan. What are the goals of the program? Are there risks that are not being protected against? Ideally, plan sponsors will be able to provide more employee-friendly direct disability benefits integrated within DC plans, but in the interim, there are some possible strategies to be considered:

- Provide a generous after-tax group LTD program, and encourage employees to make contributions to a tax qualified plan and an IRA up to the applicable limits.
- Provide a voluntary disability benefits program to purchase added coverage on an individual basis to make up retirement savings. Encourage that the money be saved for retirement.
- Communicate with employees about the importance of not dipping into retirement savings during disability.

None of these strategies are ideal in and of themselves. These ideas are

presented with the hope that practitioners, sponsors, and employees will engage in a dialogue around this issue, and that better ideas will emerge in so doing. In addition, more people may add voices to those who are already trying to get the regulatory issues unscrambled.

Conclusion

The authors' research indicates that the continued accumulation of retirement benefits in employer sponsored DC plans during extended periods of disability is very important, but also difficult. They hope that this will change but that in the meantime, the issue will not be ignored. While DB plans commonly offered disability benefits so that the program would not fail on disability, these plans are in decline. The reality of the employer marketplace today, which continues to move toward offering only DC plans, requires employers who wish to provide employees with the opportunity to have adequate retirement benefits in the event of disability to consider additional options such as the "in plan" and "out of plan" options discussed above. The authors hope that the Federal regulatory agencies will issue guidance to clear up the uncertainties surrounding this topic, and hope that the readers of this article will focus on these issues along with the system stakeholders they serve.

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[1] I.R.C. § 411(a)(9); ERISA § 3(22).

[2] These provisions are often designed to work side-by-side with LTD plans providing current income replacement benefits. They are analogous to the waiver of premium provisions commonly found in life insurance programs.

[3] These provisions might be offered in lieu of LTD plans providing current income replacement benefits, or coordinated with such benefits (e.g., the disability pension benefit is offset against the LTD plan benefit).

[4] Section 415(c) of the Code limits the amount of allocations, which include contributions, to a participants defined contribution plan account

during a measurement period (generally, the calendar year) to the lesser of (i) 100% of the participant's compensation, as defined under Section 415 of the Code or (ii) a dollar amount that is indexed to inflation ($50,000 in 2012). Because a participant is disabled and not actively employed, he or she does not receive "compensation" as defined for purposes of the Section 415 limits. Thus, the Section 415 limits effectively prevent any contributions being made on behalf a participant that does not receive compensation from the employer.

[5] Testimony presented to the 2012 ERISA Advisory Council suggests that there is a considerable amount of flexibility available in such an arrangement. For example, employee contributions and/or employer contributions could be used to purchase the insurance. In addition, to mitigate against the costs associated with adverse selection, the plan could be designed to make up contributions based upon the participant's contribution rate effective during the immediately preceding plan year rather that the contributions made immediately before the disability period began.

[6] Specifically, Section 22(e)(3) of the Code provides that the person "is unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months."

[7] We also note that Section 415 of the Code does not permit such contributions to be made on behalf of highly compensated employees. Thus, employees who made over $115,000 in 2012 or owned more than 5% of his or her employer in 2013 or 2012 could not make or receive contributions even if they were in fact "permanently and totally disabled."

[8] LTD disability retirement benefits paid pursuant to an insured or self-insured LTD plan (offered outside of a defined contribution retirement plan) are taxable pursuant to Section 105 of the Code and the underlying Treasury Regulations. Disability income benefits are subject to income tax to the extent that the cost of the coverage was born by the employer and has not been included in the income of employees. So, where coverage is paid for entirely by the employer, the benefit is fully taxable. It is also fully taxable if the entire cost of coverage is paid for by employees on a pre-tax basis (i.e. through a cafeteria plan under IRC § 125). Conversely, the disability income benefit is not subject to income tax when paid if it is paid for by employees on a post-tax basis (conventional payroll deduction).

On the other hand, in a LTD 401(k) Insurance arrangement, the disability benefits are treated more favorably from an income tax standpoint. As a general rule, contributions made by an employee to a defined contribution

plan are made on a pretax basis. Thus, such contributions made to the plan (and any investment gains thereon) are not included in income for federal income tax purposes until they are distributed to the employee. Under the LTD 401(k) Insurance arrangement, a portion of those pretax contributions are used to purchase LTD insurance premiums. Under the above-cited Private Letter Rulings, the use of those assets to purchase premiums does not result in current income tax inclusion with respect to such assets. Furthermore, in the event of disability, payments pursuant to the LTD policy used to make additional pretax contributions to the employee's plan account for the disability period are not included in income at that time even though the insurance was purchased with pretax dollars. Rather, the employee recognizes income only upon taking a distribution from the plan just as if he or she made or received pre-tax contributions throughout both the period of employment and the period of disability.

[9] See Private Letter Ruling 200031060 & Private Letter Ruling 200235043.

[10] More specifically, in the Rulings, the IRS concluded the following:
The portion of the contributions used to pay for LTD insurance premiums was not currently included in the income of the participants;Benefits paid by the insurer to the plan account (i.e., contributions) pursuant to the LTD insurance policy were not includible in the participant's income or subject to the Code section 415(c) limits on contributions at the time such benefits were paid; andDistributions from the plan, which would include the benefits (i.e., contributions) paid to the plan pursuant to the LTD insurance policy would be taxed just like any other distribution from the plan.

[11] See Footnote below for further discussion regarding taxation of disability benefits.

[12] 72 Fed. Reg. 46421 (August 20, 2007).

SOCIETY OF ACTUARIES

PENSION SECTION NEWS

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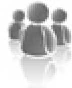

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OBESITY AND THE PENSION ACTUARY

By Sam Gutterman

Background

Today's abundant calorie-rich food often overwhelms the body's weight regulatory system to such an extent that, with many individuals unable to regulate all of this input, a massive societal (especially, but not exclusively in the United States) weight gain has occurred over the past 35 years in all population segments. The current era of obesity and inactivity is threatening the substantial progress made in the modern era in postponing illness and death.

The fundamental causes of the increase in obesity are rooted in the nature of current Western culture with its wealth, incentives to live in an increasingly sedentary manner and to consume a high-fat, energy-dense diet, while spending an ever-smaller share of income on food. While historically people were mostly occupied by simply obtaining food, they now think more about how to enjoy it.

Although it has been estimated that genetics is the source of 40 to 50 percent of obesity prevalence, the rapid upturn in weight during the last third of the twentieth century points to a major role being played by behavioral shifts. These can be influenced by ineffective personal control mechanisms and environmental, lifestyle and nutritional factors (e.g., size of servings, inadequate amount of fruits and vegetables, excessive fructose sugar-flavored drinks, lack of physical activity and dieting failures). Possibly interacting with genetic susceptibility, these behavioral effects contribute not only directly to an individual's weight, but can themselves constitute risk factors contributing to chronic disease.

The current prevalence of obesity (for adults, popularly defined as a body mass index (BMI) greater than 30; the "overweight" category is between 25 and 30 BMI) of about 35 percent of the adult population in the United

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States, seen in Figure 1, is a significant concern to society and to practicing actuaries. The trend in childhood obesity has also been adverse, with potential serious long-term effects.

Not only has average weight increased over the last few decades, but the percentage in excess of given weight levels have shifted the prevalence distribution. Although the overall obesity level has been stabilizing but is still increasing somewhat, in the 2000s, the population of those morbidly obese (class II and greater—a BMI of at least 40) category continues to get worse. This BMI prevalence curve shift (highlighted in Figure 2, especially in the very obese) is of significant concern, because the morbidly obese experience extremely high mortality and health care costs. This is unfortunately an area in which Americans stand out.

Figure 1

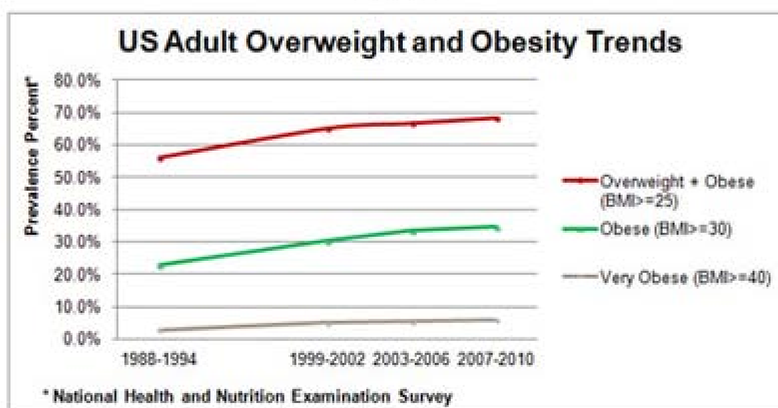
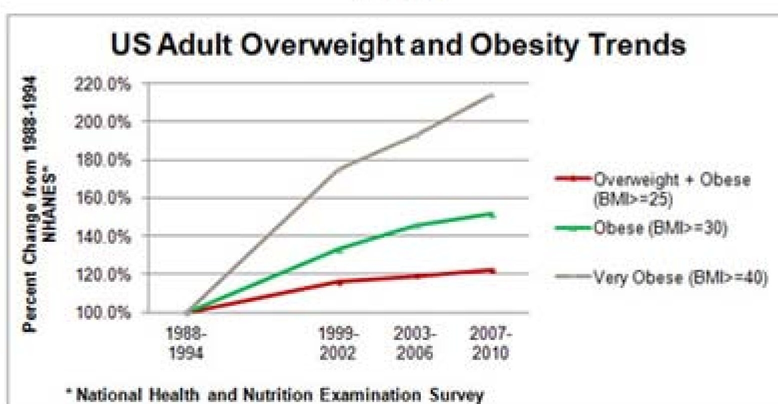


Figure 2



Mortality

Obesity directly contributes to conditions such as diabetes and hypertension, while to others such as stroke and heart disease, indirectly. Diseases and conditions often associated with obesity include:

- Type 2 diabetes. Associated with a doubling of the risk of heart

disease and stroke as well as a leading cause of blindness, kidney failure and non-traumatic amputations. Almost 90 percent of diabetes sufferers are overweight or obese.

- Cardiovascular and heart disease. Associated with numerous cardiac complications such as coronary heart disease, congestive heart failure and sudden death.
- Cardiovascular risk factors, including hypertension and adverse cholesterol levels.
- Cancers. The American Cancer Society has indicated that overweight and obesity contribute to between 14 percent and 20 percent of all cancer-related deaths.
- Kidney and liver diseases.
- Psychological disorders, including depression, anxiety, stress, bipolar disorder, schizophrenia, sleep apnea, sex disorders, weight stigma and dementia.
- Others, including musculoskeletal problems, arthritis and asthma.

Although these associations generally apply to all categories of the obese, they particularly apply to the extremely obese. Compared with those in the ideal BMI range (usually assigned to those with BMIs between 22.5 and 24.9), extremely obese adults have, for example, seven times the risk of diabetes, six times the risk of hypertension, four times the risk of arthritis and three times the risk of asthma.

Nevertheless, it can be difficult to attribute premature mortality and health-related costs directly to obesity; in 2002 a quarter of the obese had six or more adverse medical conditions. This difficulty in attribution, in part as a result of the complex nature of and inter-relationships among health processes, exacerbated by the lag between cause and effect, all affect the findings of any study of the sources of mortality and health care costs.

Many studies have found either J-curve or U-curve relationships between BMI and mortality rates relative to those ratios for those in the ideal BMI group. These curves are hazard rates (the ratios of mortality rates to a benchmark rate, in this case that for those in the ideal BMI range), with higher relative mortality rates for both the underweight and the obese, the difference being the degree of additional relative mortality rates for those in the highest obese category. This relationship between BMI and mortality is usually more evident in those studies with a long observation period, reflecting the lag between the obesity condition and subsequent mortality, especially with respect to adverse cardiovascular conditions. For example, the well-known Framingham Heart Study has found that being overweight can be an independent, long-term predictor of cardiovascular disease, associated with large decreases in life expectancy and increases in premature mortality.

In contrast, other studies have reported what has been referred to as an

obesity paradox, in which mortality rates for those overweight and mildly obese are lower than for those in the so-called ideal BMI category. Note that some of these studies have involved relatively short follow-up periods, considering the long lag between excess adiposity and resulting adverse mortality. For example, a wide-ranging meta-analysis of many research studies conducted by Flegal et.al. (2013) indicated that those overweight have experienced better mortality than those in the ideal BMI category, with no adverse experience observed until the higher levels of obesity.

Of particular concern to pension actuaries is the effect of obesity on mortality of those over age 65, especially in light of the seemingly continuous favorable trends in overall mortality that we have experienced over the last century that are embedded and incorporated in many of our mortality tables. Certainly, because of the lengthy lags between certain behaviors and consequential mortality, any negative effect on mortality levels from the increase in the prevalence of obesity has been overwhelmed by favorable changes that have resulted from the dramatic reductions in smoking and enhanced control of other cardiovascular risk factors over the last few decades.

On an overall basis, little, if any, additional mortality for the elderly (say, over age 75) has been observed in population studies for those overweight or at moderate obesity levels. But several observations are necessary to put this in the proper context.

- The metric for obesity. Most studies of obesity have been based on BMI, a function of weight and height, a surrogate or indirect estimate of adiposity, used in large part because of its simplicity in measurement. However, such an aggregate measure may underestimate the adverse effects of excess adiposity (fat) tissues in older adults compared to that of younger adults. Due to the loss in muscle and bone mass that can be the result of inactivity, illness, or simply aging, the interpretation of the effect of measures based on weight and height can be problematic. Thus BMI is a less useful indicator of adiposity's effects, particularly for those at advanced ages, whose fat tends to shift from peripheral to central body sites, with a resultant increase in their waist-to-hip ratio, but with no change in BMI. As a result, waist circumference or an abdominal measure has been shown in some studies to be a better at-risk measure at these ages. Unlike younger ages, a BMI somewhat greater than 25 may be a more appropriate upper range cut-off point for an ideal class for older adults.
- When measured. The cumulative exposure to additional weight and adiposity tissues has a greater influence on health and contributes to higher mortality rates than such exposure at a particular point in time. An example illustrates a reason for low

> observed correlation between current weight and current additional deaths where an insufficient follow-up period is provided for. An individual might be obese in her 40s with an onset of diabetes in her 50s, which in turn might lead to a myocardial infarction in her 60s, heart failure and weight loss at age 70 with death occurring a year later. In this case, an epidemiological study of the relationship between BMI on mortality that only measures BMI at age 70 after the weight loss occurs would be unable to identify the original cause of the premature death. So, studies with an insufficiently long follow-up experience period to properly recognize the cumulative effect of the obesity surge that began in the 1970s may not properly capture the effect of this surge.

The long lag between being obese and eventual death can lead to misleading results where a short follow-up period between body measurement and study period is provided for, as many interim adverse chronic conditions and diseases can lead to weight loss at older ages. Studies with longer follow-up periods and exclusions of pre-existing conditions (e.g., those who previously smoked or had cancer) can provide a better perspective on the relationship between obesity and mortality in the elderly than if measured concurrently. In any event, to obtain more useful results, it is desirable to segment experience by major age categories.

Studies of mortality of the aged have shown inconsistent results. For example, two meta-analyses focusing on those older than 65 showed somewhat different results—Janssen and Marks (2007), incorporating the results of 26 independent studies, found an average hazard rate (compared with those in the ideal BMI range) of 1.0 for those overweight (not obese), while for those of moderate obesity it was 1.10. In contrast Heiat (2001), incorporating 13 studies with follow-up periods of between three and 23 years, indicated a positive relationship between BMI and mortality. However, the latter meta-analysis indicated an optimal BMI of at least 27, rather than the 22.5-25.0 range typically found for those at younger ages.

The Cardiovascular Health Study, as described in the former meta-analysis, that provided a follow-up period of up to nine years, indicated a mortality hazard risk for those overweight of 11 percent less than those in the ideal BMI range. Nevertheless, a significantly higher rate of diabetes was noted in recent years at ages greater than 65. Only two studies (the Framingham Heart Study and the American Cancer Society Cancer Prevention Study) included in the second meta-analysis showed a positive relation between BMI and mortality for the obese, with its other studies showing either no or a negative relationship between mortality and BMI. In these studies, there was a U-shaped BMI mortality curve for cardiovascular disease, with BMI at the lowest mortality level not reached

until it reached 31 or 32, with a less steep upward slope at higher BMI values than at younger ages.

Why such counter-intuitive results of so many studies of the aged? As indicated above, some of the results may arise from measuring BMI, a wrong indicator of adverse adiposity at those ages, while others may not contain adequate follow-up periods. In addition, some analysts have hypothesized that: (1) a higher percent of those previously obese had already died by that time, that is, the "selective survivor effect," resulting in a flattening of the weight/mortality curve, with those of higher risk having died at earlier ages, (2) those of greater weight left were relatively stronger and more healthy, (3) current excess body fat becoming less important in the aging process and may provide protective reserves against adverse health conditions, including frailty, and (4) as people age they incur far more frequent multiple health hazards that might mask underlying relationships.

It seems clear that body mass and skeletal structure due to the aging process may result in a higher ideal BMI level. And due to the lags involved, it is possible that the surge in growth of weight hasn't had time to see its cumulative effect fully felt in reported mortality studies.

Physical activity and fitness is also important for the elderly. Fitness has been found to be a significant indicator of mortality (for example, in one study of those over 65 the hazard rate for the leanest quintile of fitness was about one third compared with that of the least-lean quintile), independent of overall or abdominal adiposity. In that study, those class I obese experienced about a 30 percent higher rate of mortality, while those class II or III obese experienced 130 percent higher mortality rates, with those with a waist circumference of greater than 88 cm for women and 102 cm for men having about 30 percent higher mortality rates.

Morbidity

Morbidity can result in both human suffering and adverse financial consequences, measured by the cost of medical services, loss of income and needed assistance in performing activities of daily living (ADLs). Although the focus on obesity has often been on its effects on mortality, a possibly greater concern is its consequential impact on health care costs. Over the last several decades, a simultaneous improvement in mortality rates and increase in health care costs have occurred, in part as a result of improvements in and aggressive treatment of, for example, cardiovascular disease risk factors that can at the same time be adversely affected by obesity.

Those overweight or obese are more likely to have additional functional impairments. Obesity can independently affect the onset of strength

impairment, reduced body mobility and ADL problems. An increase in dementia has also been found to be associated with higher BMI and visceral adiposity. The use of long-term care facilities and home health care by the obese may also increase in the future as those with greater weight reach old ages.

Health care costs for those obese over age 65 are significantly higher than those of normal BMI. One study reported fee-for-service Medicare charges for those severely obese about 95 percent higher, for the class I obese 50 percent higher, and for those overweight 20 percent higher than those in the ideal BMI category.

In contrast to several studies published in the 1990s that indicated that health care expenditures related to obesity were between 5 percent and 7 percent of annual U.S. health care expenditures, two recent studies have estimated that between 9.1 percent and 16.5 percent of total health care costs can be directly attributed to the effect of being overweight or obese. Even the lower percentage in this range seems frightening, with a significantly portion involving costs for the morbidly obese. It has been estimated that up to a third of the increase in overall health care costs as a percent of U.S. gross domestic product (GDP) over the last two decades has been due to the increased prevalence of obesity.

What Can Be Done

There are many individual contributors to today's high prevalence of obesity. Therefore, a program to achieve a healthier population to be tailored in a multi-faceted manner to the individual. It should focus not only on weight, but also on contributing behaviors, primarily involving nutrition and physical activity. The development of effective weight management programs, including dieting, general education campaigns and a healthier attitude among a wide range of the population, will remain a challenge, as human behavior is quite resistant to associated required inconveniences.

The future effects on mortality, morbidity and health care of those who are now overweight and obese, especially the growing population of those morbidly obese should not be ignored. In particular, the resulting health care and disability costs are shared by the public. It has taken decades of intense government and private efforts to gain modest control over smoking. It will take at least as long to win a fight against obesity and sedentary living. In a society in which food is plentiful and affordable, and exercise is no longer necessary for immediate survival, only comprehensive long-term approaches and changes in attitude at both an individual and societal level will lead toward an effective solution.

This article is adapted from a paper presented at the Society of Actuaries' 2011 Living to 100 International Symposium, which was held Jan. 5–7 in

Orlando, Fla. The original paper is included in the symposium monograph.

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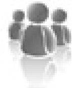

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WOMEN'S RETIREMENT CHALLENGES

By Linda K. Stone

Linda K. Stone is an actuary and advocate for women's retirement security. She is active in the SOA Committee on Post-Retirement Needs and Risks and previously was the East Region Retirement Business Leader for Towers Perrin.

The current state of retirement security in the United States is a national dilemma and it is worse for women than men. Women earn less than men, take more time out of the workforce for care giving of both children and parents, live longer and are more likely to live alone. As a result, they have lower employer-provided benefits when they do have access to a plan and they have a higher likelihood of outliving their resources.

WISER (Women's Institute for a Secure Retirement) held their annual symposium, *Overcoming Retirement Hurdles: The Financial Realities for Women*, on December 6 & 7, 2012 in Washington, DC. WISER is a non-profit organization that works to help women, educators and policymakers understand the important issues surrounding women's retirement income. The speakers represented financial services companies, think-tanks, government agencies, industry groups and Congress. They presented various perspectives and research on the current and future state of women's long-term financial security as well as solutions to improve the situation.

The Government Accountability Office (GAO) presented highlights from their 2012 report, *Retirement Security: Older Women at Risk*, which showed that over the past decade, the median household incomes of women over age 65 were 25 percent lower than their male counterparts. The report also showed that poverty rates are higher for women and life changes like divorce and widowhood are more financially devastating to women than men. While over the past decade the percentage of women

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working for an employer who sponsored a retirement plan has increased relative to men, this result was achieved only because the percentage of men in employer sponsored plans has declined. The number of women who actually participated in a plan was less than men likely due to their lower earnings and /or working part-time. The GAO study includes detailed breakdowns of the composition of household income by sex and age as well as by race and ethnicity which may be of further interest.

Lincoln Financial Group (LFG) in their *2012 Participant Study* found that women are more concerned and less optimistic than men about saving enough to retire on and maintaining their lifestyle in retirement. Their research showed that women's decisions about how much to save and how to invest were most influenced by hope and fear while men were most influenced by hard facts and previous experience. Mass Mutual found that 54 percent of women liked learning about investments while 71 percent of men did. The research also showed that married women are much less likely than men to be the primary decision-makers of the household for saving and investment decisions.

Fidelity presented an assessment based on their data that showed that, currently, women's 401(k) account balances are 74 percent of men's balances. Women actually save at a higher percentage than men do—so the lower balance is due to lower earnings and years working less than full-time or not at all. The study found some areas in which female performed better than men, such as the fact that females invest more age-appropriately than men and that they "stay the course" in their investment selection. These investing behaviors result in getting the same investment returns as men over time with less risk.

So, what can be done to overcome these retirement hurdles for women? Putting aside the pay disparity issue, there are a limited number of specific levers to be pulled outside of changing individual behaviors. One reason for this is the erosion of employer sponsored defined benefit plans. The shift to a greater reliance on defined contribution plans has increased individual's financial risk. Even worse, only 50 percent of the population has access to any employer sponsored plan which leaves the rest to their own resources.

Some potential levers were offered by Congressional staffers and government officials. They talked about potential legislative changes and policy options that could address some of these challenges. Ideas included broadening access to tax-efficient savings by payroll deductions to IRAs, increasing savings rates by plan changes and providing additional annuity options for lifetime income in both defined benefit and 401(k) plans to address longevity risk. Enhancing communication by adding account balance annuity equivalents to 401(k) statements was also discussed.

As these policy changes play out, there are steps that plan sponsors can take to help women have better outcomes. The LFG research found that only 27 percent of women were fully or somewhat engaged with their retirement plan where engagement was measured by indicators such as knowing how much money was in your plan or reading informational materials. LFG's proposal to increase women's engagement, motivation to save more and understand their retirement readiness situation better was to provide more opportunities for face-to-face meetings, either individually or in a group. Also, it is best to focus on personal outcomes and goals rather than details about the process. Fidelity found that women are more likely to take action such as increasing their savings rate after meetings or phone contact and they respond best to positive messages that inspire action versus doom and gloom scenarios. This information would be useful to share with plan sponsors as you work with them on their education and communication programs.

Social Security is a critical component of women's retirement security due to their longer life expectancy and the inflation protection that it provides. Also, women rely on it more due to their lower retirement savings. The GAO study found that women overall are more dependent on Social Security than men and that widows rely on Social Security for 58 percent of their retirement income. Prudential presented strategies for claiming Social Security benefits that can benefit women in a number of situations. These strategies, despite being covered in the Wall Street Journal and as a subject of the SOA Managing Retirement Decisions Series, *Deciding When To Claim Social Security,* are not widely known. Married women and divorced women who are eligible for a spousal benefit can take best advantage of these strategies. Married couples can coordinate their claiming dates to insure that the potential widow's benefit is as high as possible. There are also options that significantly maximize the present value of the lifetime benefits received. The study by Jim Mahaney on Prudential's website, *Innovative Strategies To Help Maximize Social Security Benefits*, is must-reading for anyone who is close to Social Security eligibility and deciding when to claim their benefit.

The financial realities of retirement for women were clear at the close of the symposium as well as some ways forward to address those challenges that depend on changes in government policy, employer-sponsored plans and individual behavior.

Visit the WISER website, WiserWomen.org, for copies of the conference presentations and to learn more about these issues. As actuaries, we have valuable insights into these challenges and solutions. We can contribute to the broader dialogue that is happening around policy changes as well as inform and influence plan sponsors and individuals.

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INSIGHTS INTO SOCIAL SECURITY CLAIMING

By Sharon Lacy

A comment from Anna Rappaport: For many Americans, Social Security claiming is a critical retirement decision, but SOA research (as well as other work) shows that many Americans do not understand the issues. I was delighted to meet Sharon Lacy at the 2012 Financial Planning Association retreat and to see her again at the National Academy of Social Insurance 2013 meeting. Sharon is a financial planner who is passionate about this issue and who has done a lot to help people make better decisions, by working with them, through a tool that she developed, and by speaking to groups. This interview provides insights about what she has learned and how others can use that information.

I submitted some questions to Sharon and these are her responses. The questions span the issues, experiences with people, and use of the tool that enables people to calculate the value of different strategies. Thank you, Sharon for sharing this with us.

What are the key issues in Social Security claiming?

The key issues are:

- The majority of Americans over 65 are dependent on Social Security for at least 50 percent of their income
- Almost half of all Americans file for their Social Security benefits at 62 and only about 1 percent delay their benefit until 70
- Claiming your benefit at 62 will mean receiving the lowest benefit available to you (75 percent of your full retirement benefit for baby boomers) and delaying until 70 will mean receiving the highest

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benefit available to you (132 percent of your full retirement age benefit for baby boomers). For the baby boom generation, delaying until 70 will mean a benefit increase of 76 percent over filing at 62 and could provide additional benefits for couples that can coordinate spousal benefits.
- Delaying your benefit until 70 is good for you, but it could also be good for your spouse if they survive you. A surviving spouse is eligible for the higher of their own benefit or your benefit. If they live a very long time they will be grateful for your decision to delay.

If there was one thing I could communicate to every worker that is eligible for Social Security benefits it would be to consider your options carefully and to create a claiming strategy. For a basic overview of the Social Security claiming rules see "Understanding the Benefits" (a Social Security Administration publication). Keep in mind that:

1. Social Security is a valuable benefit. It is a guaranteed, lifetime and inflation adjusted annuity.
2. Think of delaying your Social Security benefit as "longevity insurance." If you live beyond your life expectancy a decision to delay will mean a higher benefit for what could be a very long retirement.

What do you see as the gaps in knowledge about Social Security claiming?

First of all, may people do not understand that, without a claiming strategy, they may be leaving tens of thousands of dollars on the table if they claim their benefits too early.

Also, many people do not understand that it is possible to coordinate spousal benefits. The basic concepts of what a spousal benefit is are explained in "**Retirement Planner: Benefits for You as a Spouse**" (a Social Security publication). Basically, a spousal benefit is equal to one-half of your spouse's full retirement age benefit.

Coordinating spousal benefits allows a couple to increase their total benefits in one of two ways; (1) for couples that each have substantial benefits, both spouses can delay their own benefit and one of the spouses can receive a spousal benefit during the period between their full retirement age and when they claim and (2) for couples with significantly different benefits (one spouse has a benefit that is less than half of the other spouse's benefit), the higher benefit spouse can delay their own benefit and still enable the other spouse to begin their spousal benefit.

Even if you understand the importance of developing a claiming strategy, most people do not understand the complexity of identifying the best

claiming strategy for their unique circumstances. For some people the strategy is straightforward. If you are about the same age and have about the same benefit, both should delay until 70 and the spouse with the smaller benefit should claim a spousal benefit on their spouse's work record. However, if there is an age difference and/or a benefit difference the best claiming strategy can be difficult to identify.

How do you help people understand the issues?

First of all we help people understand the basic rules of Social Security. Then we help people identify the claiming strategies that are available to them (given their unique circumstances) and we help them understand the tradeoffs between different claiming strategies. We also help them identify the "optimal" claiming strategy—the strategy that will produce the highest lifetime benefit.

What information do you calculate with your tool?

The basic inputs to the tool are:

1. Date of birth
2. Full retirement age benefit
3. Marital status

Given this data the tool starts with the following assumptions:

1. Future cost of living adjustments = 2.83 percent (can be changed by user)
2. Discount rate (used by the optimizer) = 5 percent (can be changed)
3. Full retirement age (determined by year of birth)
4. Life expectancy = Social Security Administration actuarial life expectancy with padding (4 years for men, 7 years for women). We pad the life expectancy because most of our clients will live beyond their life expectancy but this input can be changed by the user.
5. Age you plan to stop working = 62 (can be changed by user)

In addition, the user may specify the amount of any pension they or their spouse will receive as a result of working for a government agency or nonprofit organization for which they did not pay into Social Security. This information is used to estimate the effect of the Windfall Elimination Provision (WEP) or the Government Pension Offset (GPO) on their benefit.

Using all of this information the tool will (1) identify the optimal claiming strategy and (2) tell the user exactly when and how to implement that strategy.

Finally, we allow the user to see the details of the strategy (I will receive this benefit starting in this year and switch to that benefit in that year) and to experiment with filing age and life expectancy to see the tradeoffs between claiming strategies.

Where can people get your tool?

The tool is available through our website. A link to the tool (SSAnalyze!) is provided in the lower left corner of the page. The user will need to create a login but we do not see any information about the user.

Can you give us an example or two where you worked with someone and there was a big difference in value between different strategies?

Example 1 - Sam

About a year ago our client, Sam, came in and told us that he had filed for his Social Security benefit about three months earlier. Sam was 66 (full retirement age). I remembered that he was divorced and that his ex-wife was deceased. After discussing the tradeoffs we recommended the following course of action:

1. Sam should withdraw his application for his own benefit and repay the benefits he had already received. He was able to do this because it had been less than 12 months since he started receiving benefits.
2. He should file for a survivor's benefit on his deceased ex-spouse's record.
3. He should delay his own benefit until 70.

As a result of our recommendation Sam will receive 82.5 percent of his deceased ex-spouse's full retirement age benefit (she had filed at 62 but a special provision called the widow's limit guarantees him at least 82.5 percent of her benefit) —almost half of what he would have been receiving otherwise—until he files for his own benefit at 70. When he files for his own benefit he will receive 32 percent more than he would have been receiving if he had filed at 66. The net-present-value of the client's lifetime benefit increased by over $60,000.

Example 2

Our client Lisa remarried in 2010 and the Lisa and John came in for planning shortly thereafter. John was three years older than Lisa. Lisa had not worked enough to have a significant benefit and John had just filed for his benefit at his full retirement age. We recommended the following course of action:

1. John should immediately suspend his benefits. Since he had only received about two months of benefits his benefit at 70 would only be slightly less than 132 percent of full retirement age benefit that he would have received if he had not filed.
2. As soon as they had been married for one year Lisa should claim a spousal benefit based on John's work record.
3. John should restart his benefit at 70.

As a result of our recommendation the net-present-value of John and Lisa's combined benefits increased by almost $40,000. More importantly, since John is older and since his life expectancy is shorter than Lisa's, she can expect to be widowed for at least six years. Because of our recommendation Lisa's survivor's benefit will be 30.67 percent higher if John predeceases her.

How have your clients reacted when you talk to them about this issue? What about other people?

Every client we have spoken to about creating a claiming strategy has been thrilled. For one thing, we have eliminated the need for them to research the process and for another, we have shown them how to optimize their benefits. Both of the clients described above have referred other clients, citing our help with Social Security planning as one of their motivations for doing so.

Most of the people that have attended one of my presentations have understood the basic rules (file early vs. file later) but have been (1) surprised to hear that it was possible coordinate benefits and (2) grateful that I was willing to share my expertise and the tool.

What types of groups do you talk to about these issues?

I have spoken to financial planners at local, regional and national FPA (Financial Planning Association) conferences and I have spoken to a number of senior's groups in the San Francisco Bay area. I am willing to talk to any group that is interested in learning more about the topic.

Postscript from Anna Rappaport: This is a very important societal issue. I applaud Sharon and am delighted to see that she is working with clients, with planners and with the social insurance community through the National Academy of Social Insurance. I hope that her work will encourage actuaries to also go out into your communities and talk to people about the importance of making this decision thoughtfully.

Sharon Lacy, CFP® is the wealth planning manager at Bedrock Capital Management in Los Altos, California. She can be reached at Sharon@bedrockcapital.com.

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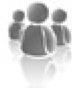

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EQUITY RISK PREMIUMS

By Victor Modugno

Introduction

This is a summary of my paper, "Estimating Equity Risk Premiums," published online by the Society of Actuaries[1]. The purpose was to help actuaries develop forward thinking long-term estimates of future equity risk premiums. Equity risk premium is the amount by which the total return of a stock market index exceeds that of government bonds. Equity risk premiums, calculated from historical data, have been used to project long term values of equity portfolios in retirement plans. The validity of using historical data to project future equity returns was examined along with other forward looking methods.

My paper was primarily a literature review. The Bibliography contains summaries of 25 papers reviewed. References for the data in this summary can also be found in there. The best papers include Damodaran (2012), which contains a description of methods and the CFA Institute (2011), which contains an update of 11 papers published before the financial crisis. Most of the economic literature focuses on individuals who are concerned with short term losses and inflation. U.S. private sector defined benefit plans typically pay fixed dollar benefits with less concern about market fluctuations and inflation. There was one actuarial paper, Derrig and Orr (2004 – pre-financial crisis) on this topic.

An excel model was constructed to back test equity forecasts based on various methods of calculating equity risk premiums. One conclusion reached was that arithmetic mean of historical returns produced estimates that were consistently too high and geometric mean was a better estimator.

Historical Equity Risk Premiums

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The historical equity risk premium (ERP), also referred to as the realized ERP, ex post ERP or the excess return, can be defined as the return of a stock market index minus the risk free return calculated as an annual percent over some historical period. The historical ERP can be expressed as an arithmetic average of the annual rates or a geometric average, which is the total return over the period. In the U.S., the S&P 500 index or its predecessors are frequently used to measure stock market returns while the 6 month Treasury (T) bill or 10 year T-bond are used for the risk free rate. The 10 year T-bond is used here due to its long history and the long term nature of pension benefits.

From the founding of the New York Stock Exchange, which commenced trading five bank stocks and government bonds in 1792, to the present, the geometric excess return of stocks over 10 year U.S. T-bonds is 3 percent. There have been long periods where bonds have outperformed stocks, including a 40 year period from 1969 to 2009. Table 1 below breaks this return down by century while Table 2 shows international comparison.

Table I U.S. Geometric Real Annual Returns

Century	Stocks	Bonds	Difference
19	6.7%	4.4%	2.3%
20	6.9%	2.1%	4.8%
21	-1.4%	5.7%	-7.1%

Table 2 Annual Excess of Stock Returns over Bonds 1900-2010

		Canada	3.7%		
		U.K.	3.9%		
		U.S.	4.4%		
		World	3.8%		

The following Table decomposes equity returns by source:

Table 3 Decomposing Historical Equity Returns in US$ 1900 to 2010

Country	Geometric Mean Dividend Yield	plus Real Dividend Growth Rate	plus Expansion in the P/D Ratio	plus Change in Real Exchange Rate	equals Equity Returns in U.S. $
Canada	4.39%	0.84%	0.56%	0.09%	4.94%
U.K.	4.63%	0.46%	0.20%	-0.06%	4.27%
U.S.	4.24%	1.37%	0.56%	0.00%	5.26%
World US$	4.11%	0.83%	0.48%	0.00%	4.49%

Issues in Using Historical Data to Determine the Ex Ante ERP

Using historical stock and bond market performance data to estimate future performance raises a number of issues beyond simply what time period and data series to use. These include the validity of using historical data to project future returns and whether arithmetic or geometric mean or some other measurement should be used.

Standard Error

The standard error of a sample is standard deviation divided by the square root of the number in a sample. Plus or minus two standard errors should cover 95 percent of the outcomes. Table 4 shows that even with 50 years of U.S. data, we cannot be confident that the equity premium is greater than 0. The standard error would be larger if the returns are correlated.

Table 4 – Standard Error of Arithmetic Mean of ERP (T-bonds)

Period	Arithmetic Mean	Standard Error	95% Confidence Interval		
1928-2011	5.79%	2.36%	10.51%	to	1.08%
1962-2011	3.36%	2.68%	8.73%	to	-2.00%
2002-2011	-1.92%	8.94%	15.96%	to	-19.79%

Stationarity

A data series is stationary if the mean and standard deviation do not change over time. The U.S. went from a developing agricultural economy to an industrial economy in the mid-19th to 20th centuries to a service and technology based economy today. The stocks comprising the market that are being measured have changed significantly. The earlier market performance may not be predictive of the future. Significant stock market changes in the 20th century bring in to question the stationarity of the return series:

Table 5 U.S. Stocks Sector Weightings

Sector	1900	2000
Information Tech	0.0%	23.1%
Railroads	62.8%	0.2%
Banks	6.7%	12.9%
Pharmaceuticals	0.0%	11.2%
Utilities	4.8%	3.8%
Tobacco	4.0%	0.8%

Geometric Versus Arithmetic Mean

The arithmetic mean of a sample of n entries is the sum of the entries divided by n while the geometric mean is the nth root of the product of the

entries. In much of the statistical work, the historical returns each year are assumed to be independent and identically distributed random variables. However, investment returns are serially negatively correlated. As an extreme example, an investor with $100 has returns of 50 percent and minus 50 percent over two years. The arithmetic mean of these two returns is 0, but the investor ends up with $75.

Jacquier developed an unbiased estimate of the mean (U) from historical data by weighing the geometric (G) and arithmetic (A) means by the ratio of number of years in the projection (P) to the number of years in the sample (S):

$$U = A*(1-P/S) + G*(P/S)$$

As the projection time gets longer, the geometric mean becomes more important. When the projection time equals the sample time the geometric mean is the unbiased estimate of the mean. Since most pension work involves long projection periods, the geometric mean is a more appropriate measure for future projections.

Using Market Based Factors to Estimate ERP

Another method is using current market value measures to determine the ERP. The most commonly used of these implicit methods is the Dividend Discount Method. Under this method the value of equity is the present value of all future dividends. Assuming a constant growth rate in dividends (the Gordon Model):

ERP = Dividend Yield + (Dividend Growth Rate – Risk Free Rate)

The unknown quantity is the dividend growth rate. Payout ratios have fallen recently as firms use stock buybacks instead of dividends, so share buybacks less new issuance could be added. Retained earnings, whether used for share buybacks or reinvested should yield higher future dividend growth. If retained earnings are reinvested at the expected equity return rate (ERP + Risk Free Rate) with a constant payout ratio, then:

ERP = (Earnings/Price) – Risk Free Rate

Here the expected return on stocks is simply the earnings yield, 1/ (Price Earnings Ratio). Since earnings are an accounting construct that can change drastically each year, Shiller uses a rolling 10 year historical average. Both the Dividend growth and earnings yield models are consistent with long term historical equity returns.

Damodaran's model uses cash dividends plus an estimate of share buybacks (averaging 4.7 percent over the past 10 years) with projected

growth using consensus analysts' earnings estimates for the next five years and then the risk free rate thereafter to obtain the total expected return on stocks.

Issues in Using Market Based Factors to Determine the ERP

In addition to determining what should be included in dividends and the growth rate for dividends, the ERP under implicit methods will be changing significantly over business cycles unlike historical ERPs, which change only gradually as new years are added to the historical data.

Dividends

Dividend yields have been declining, partially due to a decline in payout ratios. Rather than using dividends, share buybacks have become a common way to return capital to shareholders. Prior to 2001, capital gains had lower tax rates than dividends. Also it's easier to change or stop buybacks. By increasing share prices, buybacks increase the value of stock options, which have become a major component of executive compensation. Dividends could be adjusted to add buybacks less new issuance at the firm level. Looking at the market as a whole, all share purchases for cash (buybacks, LBOs) less share issuance (stock options, IPOs) could be added to dividends. These quantities vary significantly by year, but on average 2.2 percent of shares are bought back compared to 2 percent new issuance, leaving a net addition to dividends of .2 percent. Free cash flow (funds available to pay dividends) could also be used instead of dividends in these formulas.

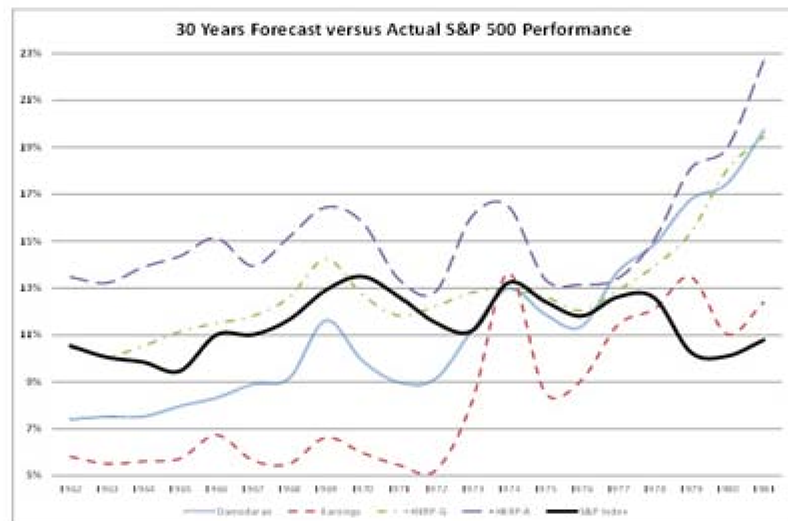
Dividend Growth Rate

One possible assumption is continuation of the 1.34 percent per year real long term historical growth in dividends. Another is that dividends will increase with earnings (constant payout ratio), which is proportional to the increase with GDP. Since a portion of increased earnings will be captured by executives and entrepreneurs (stock options and IPOs), a lower amount such as per capita GDP could be used for existing shareholders.

Model of Long-Term Forecasting Accuracy

An excel model was developed to test the forecasting accuracy of four different methods for 50, 40, 30, and 20 year time periods starting in January 1, 1962. The most common method is to use geometric total return of historical stock data going back to 1926 minus the total return of 10 year T-bonds during that period (HERP-G). The next most common is arithmetic mean of the same historical data minus the arithmetic return of T-bills for during that period (HERP-A). The next two are implied methods

DAMDARAN and EARNINGS (reflecting the annual earnings yield). For Historical ERPs, data is used from 1927 to end of the year prior to the date of projection. For implied methods using T-bills or bonds for the risk free rate produces the same forecast. The following chart shows the accuracy of 30 year forecasts made in years between 1962–1982



This and other Charts in the paper show that long-term forecasts based upon the historical ERP using the arithmetic mean are far too high, with a few exceptions. The geometric mean is the better historical ERP forecast. The earnings yield forecasts are usually below the actual returns but tend to follow them.

ERP and Long-Term Stock Market Forecast 2012

As of 12/30/2011, the 6 month T-bill yielded .06 percent, while the 10 year bond was at 1.94 percent. The 10 year inflation adjusted yield was -.11 percent. The 30 year rates were 2.98 percent nominal and .78 percent for inflation indexed. The ERP and stock market return forecast using the methods in the last section and a few other ones are shown below. The ERP is based upon the 10 year T-bond except for the historical ERP based upon arithmetic mean, which uses T-bills. The dividend yield on the S&P 500 was 2.06 percent.

Basis for Estimate	ERP	Stock Market Forecast
Earnings Yield	5.78%	7.72%
Shiller 10 Year Earnings Yield	2.67%	4.61%
Damodaran	6.04%	7.98%
Historical Geometric from 1927	4.10%	6.04%
Historical Arithmetic from 1927 [2]	7.62%	7.68%
Historical Geometric from 1792	3.00%	4.94%
Hassatt	2.87%	4.81%
Fernandez	4.00%	5.94%
1.96 x Baa Credit Spread	5.64%	7.58%

Gordon DDM[3]	3.60%	5.54%

Conclusions

Stationarity and standard error would indicate that there is significant uncertainty in using any historical ERP estimate to forecast returns. On both theoretical and empirical grounds, the geometric mean is preferred to the arithmetic mean for pension plans. Using the arithmetic mean would have led to forecast returns substantially higher than those actually realized.

Implicit or market based ERP methods have the advantage of reflecting current market conditions. When pension plan stocks are valued at market as of the date of valuation, it would be consistent to have an ERP calculated as of the same day. Implied ERPs fall in bull markets and rise in bear markets, while historical ERPs do the opposite. Prior to 2000, the historical ERPs produced higher forecasts than implicit methods, but after 12 years of poor performance, the historical and implied ERPs are much closer.

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[1] http://www.soa.org/Research/Research-Projects/Pension/research-est-equity-risk-premiums.aspx

[2] The Arithmetic Mean uses T-bills as the risk free rate, while all others use 10-year T-bonds.

[3] Dividend Discount Model using 2.06 percent dividend yield plus .2 percent net buybacks and real growth based upon 50 year historic average of 1.34 percent.

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FOCUSING ON MEASURING BENEFIT ADEQUACY: NEW INSIGHTS FOR ACTUARIES

By Vickie Bajtelsmit, Anna Rappaport, and LeAndra Foster

This article provides a summary of issues for actuaries, findings and implications of the Society of Actuaries Study, "Measures of Benefit Adequacy: Which, Why, for Whom and How Much." The research team for the study is Vickie Bajtelsmit, Anna Rappaport, and LeAndra Foster. An overview of the study was presented in an SOA webcast on Feb. 6, 2013.

Introduction

A key role for pension actuaries is helping employers design and manage employee benefits. Actuaries help plan sponsors think about the balance between appealing to employees and meeting their needs with corporate cost and risk management. A key challenge is to help stakeholders determine whether projected benefits will be adequate to meet future retirement income needs. Pension actuaries often find that they are heavily focused on cost and risk issues. However, an additional and important role for the actuary is to encourage clients to consider the benefit delivery side of the equation. A new Society of Actuaries study provides unique insights into retirement benefit adequacy.

This SOA-sponsored research study focuses on measuring retirement benefit adequacy in light of both expected and unexpected expenses in retirement and linking the measurement to the needs and objectives of different stakeholder groups. The study begins with a conceptual discussion of benefit adequacy and the various ways it has been and can be measured. It then develops a simulation model that allows for quantitative analysis of retirement income adequacy and tests several

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scenarios for improving retirement outcomes.

The study describes three different approaches to measuring benefit adequacy, looks at each from diverse stakeholders' perspectives, and considers their uses and limitations. Adequacy measures examined include replacement ratios, projected expenditures, and minimum societal standards. Both income needs and lump sum equivalents are considered. Different measures are better suited to the needs of different stakeholders and at different life stages. Actuaries may find that the discussion of suitability of each method for different stakeholders will be very helpful. This is a topic for further discussion within the profession.

Methods of Measuring Adequacy

The three methods are:

- **Replacement Ratio** – this is most often used by actuaries to help plan sponsors understand plan design alternatives and how they affect groups of individuals, but also for plan sponsors to compare their plans to those of other employers. This is also a useful method for policyholders. This method has limitations when used by individuals. The study includes a discussion of the Aon /Georgia State Study, which is widely used and recognized in the United States.
- **Minimum Needs Measure** – this is generally used by policymakers. The study uses the Elder Economic Security Standard TM Index (Elder Index) to outline national averages for minimum needs for various household types and specific geographic areas. This measure can help actuaries to understand whether what is provided supports a minimum standard of living. If an individual's resources do not meet the index standard, they cannot afford to retire without significant financial deprivation.
- **Cash Flow Analysis** – a detailed, personalized cash flow forecast is the best way for individuals to prepare for and manage their retirement needs. This approach would normally not be directly used by those preparing approaches to work for groups of individuals but it might be embedded in education or tools offered to individuals. Financial planners and advisors would often use this approach.

Research Approach and Findings

This SOA research focuses on measuring retirement benefit adequacy in light of both expected and unexpected expenses in retirement and linking the measurement to the needs and objectives of different stakeholder groups. The report begins with a conceptual discussion of benefit adequacy and the various ways it has been and can be measured.

Adequacy measures examined include replacement ratios, projected expenditures, and minimum societal standards. Both income needs and lump sum equivalents are considered. Different measures are better suited to the needs of different stakeholders and at different life stages. Under each of these methods of defining adequacy, there are similar issues in converting income needs to "a number," the lump sum needed to fund the required income.

To investigate the impact of various risks on retiree welfare, the researchers develop a simulation model of retirement spending, incorporating standard of living goals as well as investment, inflation, life, health, and long-term care risks, with distributional assumptions for each random variable. This approach is different from the approaches commonly used today in that it more realistically considers the combined impact of many of the risk factors faced by retirees. Most stochastic approaches focus on investment and inflation risks and do not model uncertain cash flows stochastically. In thinking about results, it is critical to understand what has been treated on a stochastic basis. The SOA research study is a theoretical evaluation, but the ideas presented should be helpful to actuaries working with different stakeholders in helping them think about how to unify thinking about retirement risks and their impact on retirement security.

The median American married couple at retirement earns approximately $60,000 a year and has approximately $100,000 in non-housing wealth (based on the 2010 Survey of Consumer Finances, adjusted for wage inflation and recent market performance). For this couple, the model shows there is a 29 percent chance median households will have positive wealth at death. The assets needed to meet cash flow needs 50 percent of the time would be approximately $170,000 compared to approximately $685,000 for a 95 percent success rate. In addition to the base case household, the study presents results for five alternative income and wealth combinations. The other two income levels represent the 50th and 90th percentiles of income.

To consider the effect of risk-mitigating household decisions, the researchers also tested several common retiree decisions that are expected to impact adequacy, including reducing the post-retirement standard of living, buying an annuity, buying long-term care insurance, delayed and early retirement, and the decision to pay off a home mortgage prior to retirement. The results include the probability of having remaining wealth at death, and its amount, as well as the number of years income is insufficient and the amount of wealth that would have been sufficient to meet needs.

Some Interesting Issues

The findings and research include some results that are expected and some that may not be expected. The study confirms that many of the next generation of retirees may face a significant drop in their standard of living when they retire. As shown in other studies, it also confirms the importance of retirement age and delaying retirement.

Other findings may be more surprising. Retirement planning often focuses on investment and inflation risk components, particularly in the wake of the recent financial crisis. However, the study shows that low probability health and long-term care shocks have a much larger potential to derail retirement plans, especially for low to median income/wealth households. Retirement savings and decumulation recommendations are often based on strategies that will be successful “on average.” The tendency to focus on averages is problematic because it ignores or disguises the impact of shock events, such as unexpected health and long-term care costs. The best strategies to preserve assets without shocks may not be the best strategies once shock events are considered. One of the most important issues raised by the study is the extreme difference between the median (50th percentile) and worst or best case scenarios (95th percentile). These differences illustrate the problems associated with focusing on averages. In the base case studies, even if retiree households have sufficient income to meet their needs on average, there is still at least a 5 percent risk that they will have a long period of shortfall (9 to 24 years, depending on wealth and income). Although not apparent from the tables shown in the report , extreme tail risks, such as early onset long-term care needs, investment declines (particularly in the early years of retirement), inflation risk, and unexpected health costs all contribute to the likelihood of retirement income inadequacy. Not surprisingly, higher wealth at retirement improves the odds of making it through retirement without financial difficulties.

Retirement planning needs to continue after retirement as situations change. Individuals should also take a "holistic" approach that incorporates the interactions between various decisions and events. There is a huge opportunity for financial service companies and employers to help their customers and employees think about sensible planning and to offer planning support. SOA research has shown that the middle market is underserved when it comes to planning. Two of the biggest challenges for planning are understanding shock events and incorporating multiple types of shocks in a “holistic” plan. For example, actuaries will want to consider that benefits provided by the employer may protect against some shocks, and the employer may be able to offer employees and retirees access to risk protection products that are paid for by the employee. Through the group insurance mechanism, employers may be able to provide employees with access to better products at more favorable prices than they can buy on their own.

Other SOA research has shown that cutting spending is a popular risk management strategy both chosen by and recommended for retirees and those nearing retirement. This study shows that moderate and higher income households can successfully retire with 20 percent less savings if they are willing to cut their discretionary spending by 15 percent. But reduced spending does not significantly reduce the impact of depleting assets for the median family because shocks are the major driver of asset depletion.

The End of the Story or the Beginning of More Explorations?

The most important contributions of this study are 1) demonstrating the importance of integrating a variety of shocks in retirement needs forecasts and 2) quantifying the difference between retirement plans that work "on average" versus those that work most of the time. The researchers considered several different combinations of retirement and risk mitigating decisions in order to compare outcomes, but the results still leave many questions unanswered. The authors suggest a number of areas for further exploration. Future research may include refining the scenarios, adding more scenarios, and looking at additional combinations of retirement decisions. The report identifies a number of areas for further research. Of particular interest is further refinement of the stochastic risk assumptions and exploring alternatives with regard to retirement timing and benefit claiming decisions. The study also looked very briefly at annuitization, and there is an area for important further research. Long-term care and health cost management strategies are also important areas for research. The study raises questions about protecting against shocks vs. longevity risk. Although the model is not intended as a planning tool to be used by individuals and planners, the ideas presented should provide "seeds" for the development of tools and for further research.

Conclusions

Actuaries focus on adequacy to help those they work with design benefit programs, financial and planning products. Some actuaries directly advise individuals. This study shows that some of the most important decisions that employees make are when they retire and when they claim Social Security. It also shows that shock events are very important and that risk management is important. It makes clear that planning that is heavily focused on investment management and the pre-retirement period does only a small part of the total job. It encourages actuaries to move beyond conventional wisdom and think about how the interaction of different factors may lead them to new conclusions and approaches.

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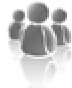
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OBSERVATIONS ON OUR OBSERVATIONS

By Joseph J. Silvestri

Following the release of our first Rapid Retirement Research report, The Rising Tide of Pension Contributions, the SOA decided to begin an investigation of ways to address the volatility of statutory funding requirements for U.S. private sector defined benefit plans. The Rising Tide report discussed perceptions of volatility in the funding rules and identified potential stress to the single-employer system in the form of cash contributions that would be required of plan sponsors. Consequently, we believed there would be demand for greater smoothing of contribution requirements and we saw an opportunity to provide insight into discussions about a topic with clear actuarial implications.

Our most recent report, Observations on Input and Output Smoothing Methods: How do they affect the funding of defined benefit plans?, provides a high-level comparison of input and output smoothing methods in the context of U.S. statutory requirements for private single-employer DB plans. The report offers several observations about how these two general categories of smoothing methods operate, including:

- Input and output smoothing methodologies can have similar effects on plan solvency and the predictability of statutory requirements, because any rate of experience recognition can be determined under either form.
- Input methods smooth specific sources of volatility and may affect multiple statutory requirements. In contrast, output methods smooth the effects of multiple sources of volatility for specific statutory requirements.
- Input smoothing methodologies change the relationship between market-based and reported values of assets and liabilities, but output methods do not. In order to use this information appropriately, we believe users need to understand the

relationship.

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The report uses several deterministic illustrations of how hypothetical input and output smoothing alternatives would affect statutory requirements for private DB plans as a way to demonstrate these observations. To be clear, the illustrations do not constitute an analysis of the smoothing alternatives in the report. The scenarios were designed to illustrate the observations and isolate effects for purposes of comparison. For that matter, this report is not intended to advocate a position for or against the use of smoothing methodologies, or for or against the use of any particular smoothing methodology. It is intended to provide an objective, principles-based comparison of two categories of smoothing that are used in our work.

The report was written for a policy maker audience, and I expect that many pension actuaries are familiar with the observations we made. For those who are not, the report may serve as an introduction to the topic. Regardless of familiarity with the topic, I hope that actuaries use the report to help other stakeholders in the defined benefit system understand that they have options. To the extent that one smoothing method has a desired degree of smoothing but lacks in another characteristic, perhaps there is another method with a comparable degree of smoothing that would improve on the undesirable characteristic. Smoothing is a topic that actuaries have unparalleled expertise in, and I believe that our members can develop the best solution for a smoothing problem.

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