REFERENCE LIST
December 2013/January 2014

An Actuarial Perspective on Pension Plan Funding

December 2013 – The Pension Research Council

The Pension Benefit Guaranty Corporation (PBGC) was established by the Employee Retirement Income Security Act (ERISA) to provide "insurance guarantees" for qualified pension plans insufficiently funded to provide accrued vested benefits. The PBGC's annual reports on the liabilities for plans it has taken over and the agency's assets show that the Single Employer Program has seen this "net position" vary from a surplus of almost $10 billion in 2000, to a deficit of over $29 billion in 2012. The PBGC uses a proprietary Pension Insurance Modeling System to model future scenarios for their obligations. This paper offers observations on future pension plan funding and how this could affect the PIMS model, based on the current environment, and how the agency might respond to change.

(*www.pensionresearchcouncil.org/publications/document.php?file=1140*)

Developments in European Pension Regulation: Risks and Challenges

December 2013 – The Pension Research Council

This paper will discuss the proposed regulatory frameworks (market valuation of liabilities) in Europe and the implications it will have on pension provision. The impact on current DB pension schemes and insured solutions with guarantees will be discussed in detail especially on the sustainability of the current guaranteed products. Collective solutions that are capital efficient under the proposed regulatory framework will be outlined as a viable alternative to individual DC.

(*www.pensionresearchcouncil.org/publications/document.php?file=1158*)

Longevity Risk Management, Corporate Finance, and Sustainable Pensions

December 2013 – The Pension Research Council

Historically, unexpected improvements in mortality rates have led to large, unanticipated increases in life expectancy, with accompanying increases in the value of defined benefit pension liabilities. As a result, longevity risk needs to be measured and managed alongside the financial risks facing these plans. The emergence of new instruments for hedging

longevity risk means that a complete toolkit is now available for managing these plans in a way that is sustainable over the long term. Decisions to hedge or eliminate longevity risk need to be made in a holistic framework. For corporate pension plans this means taking account of the corporate finance perspective, as well as the interdependencies between the sponsor and the plan. This paper addresses the importance of measuring and managing longevity risk and presents a holistic framework for sustainable pension plan management that facilitates longevity risk management decision-making.

(www.pensionresearchcouncil.org/publications/document.php?file=1151)

Modeling and Management of Longevity Risk

December 2013 – The Pension Research Council

This article review the state of play in the use of stochastic models for measurement and management of longevity risk. A focus of the discussion concerns how robust these models are relative to a variety of inputs: something that is particularly important in formulating a risk management strategy. On the modeling front much still needs to be done on robust multi-population mortality models, and on the risk management front to develop a better understanding of what the objectives are of pension plans that need to be optimized. It propose a variety of ways forward on both counts.

(www.pensionresearchcouncil.org/publications/document.php?file=1150)

Extreme risks and the retirement anomaly

December 2013 – The Pension Research Council

Extreme risks are potential events that are very unlikely to occur but which would have a significant impact should they happen. The global financial crisis and its aftermath have demonstrated that risk management cannot afford to stop at the 95th percentile (VaR95) and a holistic risk management framework should include very unlikely, but potentially high impact, events. In essence this paper walls for an overweighting', whether of attention or resources, to be applied to the very low-probability, but bad, outcomes. Why? Because humans only live once. Much of finance and economics assume that humans have infinite lives all running in parallel. This means that the impact of extreme risks can be masked in expected return calculations by frequent positive outcomes. For an individual planning for retirement, a one-in-a-million chance matters because they live in a single universe and face problems in series, not parallel. If that individual gets the one-in-a-million path it could well be terminal and how they would have fared on the other 999,999 paths is of no useful interest.

This paper considers a number of extreme risks. The focus is directed more towards non-economic risks on the grounds that these have received less attention than the more obvious financial and economic risks. However there is one economic risk that we do not think is getting enough attention, namely whether it is possible for society to provide the retirements to which its citizens aspire. The current consensus, among practitioners if not the general population, is that people must save more for their retirement unless they are willing to work until they are very old. While a sensible course of action for an individual, can this be done in aggregate? Is this not a modern version of Keynes's paradox of thrift? In the context of

humanity's entire history could the recent invention of retirement be seen as an aberration from the norm (of working till you drop, or are supported by family)?

(*http://www.pensionresearchcouncil.org/publications/document.php?file=1159*)

Risk Budgeting and Longevity Insurance: Strategies for Sustainable Defined Benefit Pension Funds

December 2013 – The Pension Research Council

1. Today, many defined benefit pension funds across the world are closing in response to twelve years of intense market volatility and dramatic increases in life expectancy. To the casual observer, it must seem as though the risk of maintaining a defined benefit pension fund has contributed to its rapid decline. Certainly, a defined benefit pension is a very significant promise for the plan sponsor, who has pledged to pay the plan participants for as long as they live and no matter what happens to the assets. The key question today is whether the defined benefit plans that remain open and accruing benefits for employees can be sustained. In fact, a sustainability model may be emerging in the best practices of a few pension plans. These plans generally have three things in common:
   They have engaged in a rigorous risk budgeting process, involving an analysis of their risk, an estimation of the potential losses in their pension funds and a decision regarding how much they can afford to lose.

2. They have dramatically reduced their asset risk in an effort to keep pension losses within the risk budget and they may have two-thirds or more of their assets invested in a low volatility strategy such as fixed income or total return.

3. They have a strategy for longevity risk, which may involve longevity insurance to ensure that the quantum of their liability is known and knowable so that funding and investing activities can be carried out with certainty as to the ultimate liability.
   While these strategies may seem less exciting than using risky assets to reach for high returns, they are rooted in the premise that investing in equities, private equity, commodities, property and other risky assets actually involves risk and to the extent that those strategies expose the plan sponsor to more risk than the sponsor can afford, too much risk is likely to lead to the closure of the pension fund and the elimination of the defined benefit from the employees' future retirement security. Perhaps risk budgeting and disciplined risk management, combined with new techniques to insure longevity risk can be used to sustain more pension funds and safeguard the health of the plan sponsors.

(*http://www.pensionresearchcouncil.org/publications/document.php?file=1160*)

Recreating retirement sustainability

December 2013 – The Pension Research Council

The financial crisis and the ensuring Great Recession have alerted those concerned with old-age security to the extreme risk confronting our retirement system. This volume provides an in-depth analysis of the black-swans' threatening pension plans around the world. Longevity

risk, capital market shocks, regulatory and political risk, and model risk all have profound consequences for pension plan participants, plan sponsors, regulators, and consultants. This book also sketches various ways to manage and finance these risks, with a view to rebuilding a more resilient retirement system. In particular, the ensuing chapters take on longevity risk, capital market risk, model risk, and regulatory risk.

(http://www.pensionresearchcouncil.org/publications/document.php?file=1149)

Are City Woes Widespread? Are Pensions the Cause?

December 2013 – Center for Retirement Research at Boston College

The brief's key findings are:

- Detroit's bankruptcy and Chicago's fiscal problems have led some to question whether cities nationwide are in trouble and if pensions are the reason.
- But research for cities identified by the media as financially troubled found only a small number overall; with about one-third located in California.
- And, among the financially troubled cities, pensions are only a minor factor; the main drivers are poor financial management and weak economies.
- Thus, the answer to both questions appears to be "no".

(*http://crr.bc.edu/briefs/are-city-fiscal-woes-widespread-are-pensions-the-cause*)

The Government's Redesigned Mortgage Program

January 2014 – Center for Retirement Research at Boston College

The brief's key findings are:

- Reverse mortgages, which allows retirees to tap their home equity, are insured by the government.
- The financial crisis hurt both the government's insurance fund and the borrowers.
    1. - Declining home prices led to losses when homes were sold
    2. - More borrowers defaulted.
- In response, the government has redesigned the program by:
    1.-creating a single loan option with a lower limit and fees:
    2. - limiting initial withdrawals; and
    3. - requiring financial assessments of borrowers.
- These changes should help reduce pressure on the insurance fund and make defaults less likely.

(http://crr.bc.edu/briefs/the-government's-redesigned-reverse-mortgage-program)

How Will More Obesity and Less Smoking Affect Life Expectancy?

January 2014 – Center for Retirement Research at Boston College

The brief's key findings are:

- Obesity is on the rise and smoking is on the decline, so a key issue is the net effect of these two trends on future life expectancy.
- The analysis examines how each behavior currently affects mortality and applies the results to an estimate of the future prevalence of each behavior.
- The results show that, in 2040, the benefits of reduced smoking trump the damage from rising obesity.
- However, the story differs by gender, with a solid gain form men and only a small improvement for women, who see less of a decline in smoking during the period.

(http://crr.bc.edu/briefs/how-will-more-obesity-and-less-smoking-affect-life-expectancy)

How do subjective longevity expectations influence retirement plans?

January 2014 – Center for Retirement Research at Boston College

Increasing life expectancy has made working longer both more necessary and more possible, but the relationship between an individual's survival expectations and his planned retirement age is unclear in the existing literature. This study uses the Health and Retirement Study and an instrumental variables (IV) approach to examine how subjective life expectancy influences planned retirement ages and expectations of working at older ages, and how individuals update those expectations when they receive new information. The estimates in this paper suggest a large and statistically significant relationship between subjective life expectancy and retirement expectations: a one-standard-deviation increase in optimism about living to ages 75 or 85 is associated with an 8-percent to 24-percent increase over the mean probability of working at these ages. Actual retirement behavior also increases with subjective life expectancy, but the relationship is somewhat weaker. Our IV estimates using parents' longevity as instruments are largely consistent with our reduced form estimates, strengthening the conclusion that subjective life expectancy impacts both retirement planning and actual retirement behaviors. Finally, we find that increases over time in subjective life expectancy are associated with increases in the probability of planning to work at ages 62 and 65. The results further our understanding of how survival and retirement expectations are "anchored" to the previous generation's experience and suggest how targeted efforts at increasing knowledge about rising life expectancy may increase the proportion of younger cohorts who decide to work longer.

(http://crr.bc.edu/working-papers/how-do-subjective-longevity-expectations-influence-retirement-plans)

Parent's Longevity Sways Plans to Retire

January 2014 – Center for Retirement Research at Boston College

This report shows that the age at which people exit the labor force is related to how long they expect to live. How we arrive at our personal estimates of our life expectancy and provides new insight into the critical retirement decision and how this "subjective life expectancy" is linked with when older workers plan to retire, as well as when they actually do retire.

(http://squaredawayblog.bc.edu/squared-away/parents'-longevity-sways-plans-to-retire)

Confidence Key to Retirement Planning

January 2014 – Center for Retirement Research at Boston College

This paper describes the conclusions that Andrew Parker, a behavioral scientist in Pittsburgh, get after the research of the psychological factors that motivates those who dive in and plan for their future with a retirement planning.

(http://squaredawayblog.bc.edu/squared-away/confidence-key-to-retirement-planning)

Laid-off Boomers: Retirement as Default

December 2013 – Center for Retirement Research at Boston College

The natural reaction to losing a job is to get a new one. But when older people become unemployed, some view it as a dilemma: look for work or just retire?
The presence of financial safety net significantly increases the likelihood that an older, unemployed person will retire. And that decision often comes quickly after they lose their job, concluded a new study by Matt Rutledge, an economist for the Center for Retirement Research.
His findings get to the heart of the difficult choices facing older workers when they are laid off.

(http://squaredawayblog.bc.edu/squared-away/laid-off-boomers-retirement-as-default)

Retirement Delayed to Pay the Mortgage

January 2014 – Center for Retirement Research at Boston College

Here are the main findings:

- Nearly half of all people in their 60s with debts continue to work, compared with only one-third of those who have no debt.
- Mortgages seem to have a greater influence on their decisions than credit card bills or other consumer debt. At age 64 more than two-thirds of homeowners with mortgages still work, compared with just over half of homeowners who've paid them off.

(http://squaredawayblog.bc.edu/squared-away/retirement-delayed-to-pay-the-mortgage-2)