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Authors should submit their papers in Word format to the editor of *The Pension Forum* at apeterson@soa.org. Text should be left-justified and in 12-point font. Formatting should be kept to a minimum. Headings and subheadings should follow the style of the current *Pension Forum* (e.g., headings are typed upper and lower case). All papers will include a byline (name and professional designations) to give you full credit for your effort. The Pension Section Communications Team will make the final determination as to which papers are suitable for publication. Information concerning the make-up of this committee can be found at <http://www.soa.org/professional-interests/section-committees/pension-committees/pen-sect-com-team.aspx>.

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Editor's Introduction

Welcome to the 2012 *Pension Forum*!

In 2010, the SOA's *Retirement 20/20* initiative focused on a call for models "contest." The call for models asked individuals to submit their ideas for new "Tier II" retirement systems—i.e., what is typically thought of as employer-provided retirement benefits that fit between social insurance and private savings. The call for models was the culmination of the *Retirement 20/20* work to date, including three conferences that explored needs and risks for stakeholders in the retirement system (individuals, society, employers and the markets). Submissions were judged based on how well they met the criteria of the *Retirement 20/20* Measurement Framework (which considers needs and risks for the various stakeholders) and how well they handled issues of risk, governance, administration, transparency and transition. The Pension Section Council's stated goal was to find several papers—not just one—with very different, but equally worthy, ways of rethinking the retirement system.

As a result of the call for models, the SOA received 18 paper submissions from Canadian and American authors. Four papers were selected as winners:

- "The SERIOUS System: A New Model for Retirement Income Success," by Ken Beckman, ASA, ACAS, MAAA, CFA
- "The Tracker Plan: A Controlled Risk Defined-Contribution Retirement Program," by Rowland M. Davis, FSA
- "Affordable Retirement Income through Savings and Annuities," by Donald E. Fuerst, FSA, FCA, EA, MAAA
- "The Total Career Benchmark Model," by Thomas J. Walker, FSA, FCIA

The prize-winning papers, and four other papers, formed the basis for the first conference event, *Retirement 20/20: New Designs for a New Century*, held June 2–3 in Washington, DC. (See <http://retirement20/20.soa.org/new-designs-agenda-pres.aspx>, for access to the event agenda and presentations.) A second conference, in cooperation with the C.D. Howe Institute and the Canadian Institute of Actuaries, *Getting Pension Reform Done: Issues, Options and Next Steps*, was held on Dec. 8, 2010, in Toronto. It featured two *Retirement 20/20* papers as well as other papers written for the Canadian context.

The Pension Forum features the four winning papers along with discussant comments and author responses. We welcome your feedback on the ideas presented in this issue. Further information about *Retirement 20/20* including a report from the conference can be found at <http://retirement2020.soa.org>.

Andrew Peterson, FSA, EA, FCA, MAAA
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The SERIOUS System: A New Model For Retirement Income Success

By Ken Beckman

Executive Summary

The Successful Employee Retirement Income Outcomes in the United States (SERIOUS) system is a comprehensive model providing for the delivery of employment-based retirement income. In contrast to traditional Tier II retirement systems dependent upon an employer or industry to sponsor a retirement plan, the SERIOUS system offers a new approach by allowing employees to select from their choice of competing independent plan sponsors. As such, all employees have access to this new retirement system and the access is unaffected by a job change or job loss. The system is funded by voluntary contributions from both employers and employees, although many proven, as well as new, methods are used to encourage participation. Employers are required to enroll all employees into the system and transmit contributions to a central clearinghouse that handles all administrative functions. Plan sponsors are responsible for all investment decisions and use both external markets and an internal adjustment mechanism to manage various risks that allow the system to function effectively even in extreme conditions. While the plan sponsors share risk with employees, certain guarantees are provided so that expected retirement income volatility is minimized, particularly for those employees nearing retirement. Benefits are required to be paid as inflation-protected life annuities, although options for alternative payment methods are provided. Employees are given the responsibility to make sufficient contributions throughout their career. The central clearinghouse allows fulfillment of this responsibility by providing an online interface that clearly shows how an employee's contribution level directly impacts the achievement of a desired retirement income. The system is regulated by a nationwide governing board independent of any plan sponsor, employer, employee group and the federal government. The governing board uses a flexible, risk-based system of regulation to minimize the risk of moral hazard and ensure the solvency of plan sponsors. In exchange for modest, regular contributions, the system provides all employees the opportunity to earn an attractive retirement income and minimizes the prospect of future tax increases to provide for otherwise financially unprepared retirees. While the use of independent plan sponsors in a centralized system will require legislative changes, the SERIOUS system proposal satisfies the needs of all stakeholders and provides an opportunity for a universally accessible and sustainable retirement system that can be realistically achieved.

1. Introduction and Background

The existing Tier II U.S. retirement programs traditionally sponsored by employers are failing to provide an acceptable level of retirement income to a large number of employees. Defined-benefit (DB) plans continue to provide valuable benefits for certain workers, but as they impose large financial and regulatory burdens on employers, they are rapidly disappearing and are unlikely to return. Employer-sponsored defined-contribution (DC) plans, originally intended to supplement DB plans, are now the primary retirement plan for most individuals in the private sector (U.S. Department of Labor 2009). Without any comprehensive national retirement income policy to provide direction, the shift from DB to DC is a natural evolution. Most employers still want to assist employees in saving for retirement, but face ever-increasing demands from investors to abandon any activities (e.g., sponsoring volatile DB plans) that do not support the core business purpose, thus the movement to DC.

While DC plans have provided employers with a way to reduce their costs, employees must confront a number of risks that impact their ability to meet retirement income needs. To assist employees with the inherent investment risk in DC plans, employers and plan administrators have initiated well-meaning, but generally unsuccessful, efforts to provide education about basic investment principles such as risk tolerance, compound interest and diversification (Choi et al. 2001). One outgrowth of these unsuccessful education efforts has been the development of target-date retirement funds that automate the asset allocation process with the retirement date of the employee in mind. While these funds were designed to protect employees from poor investment choices, they do little to actually shield employees from sudden market declines that potentially have devastating effects on their future retirement security. A recent example was the 2008 performance of 2010 target-date funds. These funds were designed for those with less than two years until retirement and declined an average of 23.7 percent (Charlson et al. 2009). In contrast to DB plans that commonly provide annuities, DC plans typically give employees a lump sum upon retirement. Most often, these lump sums are transferred to individual accounts and the employees are responsible for finding a way to make the money last the remainder of their lives. Although life annuities from insurance companies are available to mitigate the resulting longevity risk, they are used by fewer than 20 percent of employees (Sabelhaus et al. 2008). While the problems and risks facing DB and DC participants (both employees and employers) are well known, perhaps less attention has been given to the fact that only about half of private industry workers are even covered by a retirement plan (U.S. Department of Labor 2009).

Society (represented by taxpayers) faces serious challenges then, to not only address deficiencies in existing retirement plans, but also to provide an opportunity for all employees to participate in a functional and sustainable retirement system. If these challenges are not successfully met, society faces unpleasant outcomes in terms of increased taxes and related social costs to provide for financially unprepared retirees. This paper proposes a comprehensive Tier II retirement income system called Successful Employee Retirement Income Outcomes in the United States (SERIOUS). This system is specifically designed to meet the present challenges by using an approach that relies on shared responsibility from employees, employers and society, without requiring any of these stakeholders to bear unaffordable costs, assume excessive risk, or perform unreasonable tasks. Section 2 of the paper provides a brief overview of the structure of the system, while Sections 3 through 9 provide a detailed description of its seven major components. Section 10 discusses some of the implementation and transition issues that would be involved, while Section 11 provides further analysis of the results that can be expected if this system is implemented. Section 12 concludes.

2. Structure of the SERIOUS System

A successful retirement income system must meet the basic needs of all its stakeholders throughout various periods of economic, demographic, social and political change. It must be able to adjust to these and other changes without requiring structural modification or legislative intervention. Many of the individual components and design features of the SERIOUS system are familiar and have, in various forms, been proposed before and even implemented on a limited scale. However, only by combining all these components together can the system successfully meet the needs of all stakeholders. Each of the components will be discussed in greater detail in the following sections, but in order to understand the basic structure of the system and how the various features work together, a brief introduction is provided here.

- The SERIOUS system uses third-party plan sponsors independent of any employer and employee group. Employers will transmit plan contributions using payroll systems, but are no longer burdened with the fiduciary responsibility and associated costs of sponsoring retirement plans. All investment and asset allocation decisions are the responsibility of the independent plan sponsor.
- While plan sponsors can effectively use traditional risk management techniques, the system also contains an adjustment mechanism that allows for investment, inflation and longevity risk to be shared with employees. While this mechanism has the potential to create volatility in expected future retirement income, certain guarantees are provided to control the amount of risk that is shared with employees. The adjustment mechanism and guarantees are key features in promoting the sustainability of the system.
- The system relies on voluntary contributions from both employees and employers, but a variety of incentives and methods, such as automatic enrollment, are used to increase participation. The ability of employers to cost-effectively promote retirement savings, especially among low-income employees, is utilized.
- Using an online interface, employees are provided with information that is easy to understand (requires no investment or mathematical knowledge) and allows informed decisions to be made regarding the appropriate contribution level. The interface also promotes competition and provides cost transparency since the level of benefits being provided by each plan sponsor is shown in an identical format. Employees can use this interface to change contribution levels or plan sponsors at any time.
- Retirement benefits are required to be paid as inflation-protected life annuities. The system allows annuitization to occur in phases at times selected by the employee rather than all at once. Provisions for a limited amount of lump sums and accelerated payments for long-term care needs are also included.
- The system will be established by an act of Congress, but will be operated and regulated by a board independent of the federal government. The board will require that certain levels of reserves and capital be held to ensure solvency. The amount of capital required will consider the ability of each plan sponsor to manage its specific risks, even under extreme scenarios, rather than relying on static factors or restricted investment lists.
- The system is designed to utilize existing markets to manage risk and provide an attractive level of benefits. The SERIOUS system has the potential to stimulate demand for a more diverse and larger supply of certain market instruments that could allow plan sponsors to increase the level of benefits provided.

3. Independent Third Party as Plan Sponsor

Even though Tier II retirement systems have typically been sponsored by employers, this fact is actually one of the reasons so many employees end their career with inadequate retirement income. Employers are under intense pressure to operate efficiently and meet earnings expectations, while employee retirement plans are not a high priority. Even so, many employers, for competitive and other reasons, would still like to contribute to a retirement plan for their employees. However, there are many costs to sponsoring a plan in the current regulatory structure that cause many employers not to sponsor a plan

or reduce the amount that could potentially be spent on employee retirement benefits. This fact is particularly noticeable among smaller employers where only about half even offer a retirement plan compared to over 80 percent for larger employers (U.S. Department of Labor 2009). Any new retirement system needs to recognize the reality that a significant number of employers will never voluntarily sponsor retirement plans and that a government mandate to do so would potentially have a negative financial impact on many employers and on the economy as a whole.

The SERIOUS system reflects this reality and relieves employers from the regulatory, fiduciary and other burdens by using third parties, independent from any employer or employee group, to be plan sponsors. These plan sponsors would be special purpose companies whose sole function is to invest employee and employer contributions in order to provide retirement income benefits. These companies could operate either on a for-profit or nonprofit basis. It is anticipated that the plan sponsor companies would be created by existing entities that have experience in managing pensions, such as insurance companies, but would operate independently of any existing company. Plan sponsors would be required to provide a standardized benefit structure (discussed in Section 7) and provide certain guarantees (discussed in Section 4), although they would be free to invest contributions and determine benefit pricing entirely at their discretion. A central clearinghouse would be created and funded by the participating plan sponsors that would provide all necessary administrative services, such as processing contributions and disbursing benefits. The central clearinghouse would maintain an online interface where employees would be able to compare the level of benefits being provided by each competing plan sponsor in a standardized format. By centralizing administrative functions, using the clearinghouse website to eliminate sales and distribution costs, and having a standardized set of benefits with transparent pricing to minimize marketing costs, plan sponsors will have an extremely low cost structure relative to current financial services firms such as insurance companies and mutual funds.

By moving plan sponsorship responsibilities to independent companies, both large and small employers should be able to devote more company resources to the direct funding of employee retirement benefits. Employees would no longer be concerned that their employer might eliminate their retirement plan. When changing jobs, employees would not have to determine how to roll over a prior balance (e.g., DC plans), lose the benefit of prior years of service (e.g., DB plans), or encounter the possibility that the new employer might not sponsor a retirement plan. Regardless of employer, or even if unemployed or self-employed, all employees can make contributions to a plan sponsor of their choice at all times.

4. Risk Management

The SERIOUS system is not simply a “new plan” that generates retirement income, but rather a comprehensive, sustainable system specifically designed to address the risks that negatively impact the achievement of retirement income goals under a variety of conditions. Since the SERIOUS system is fully funded, the risk of a large demographic shift (such as the one facing pay-as-you-go social security systems) is avoided. By pooling the experience of a large number of individuals, plan sponsors minimize their non-systematic longevity risk. The longevity risk for individuals is eliminated by using life annuities as the primary method of benefit payment. Investment, inflation and systematic longevity risks cannot be eliminated by traditional insurance pooling mechanisms, but can be managed by using external markets and are discussed further in Section 9. However, using markets, while valuable and necessary, would be too costly (or potentially impossible) to eliminate all of these risks. For example, a plan sponsor could invest employee contributions in the S&P 500 and buy a long-term put option to protect against loss until retirement, but the cost of such a market strategy makes it impractical. Since markets do not provide a complete solution, plan sponsors share these risks with employees. However,

the system uses guarantees to minimize the potential negative impact of these risks on employees and also to guide plan sponsors in their use of the markets.

First, while these guarantees will be discussed in the context of individual contributions, it should be clarified that the actual contributions are invested in aggregate at the discretion of the plan sponsor. The plan sponsor is required to guarantee employees a specific amount of retirement income for each contribution; once a contribution is made, the amount of retirement income earned for that contribution cannot be adjusted. In this way the system provides a defined benefit for each contribution, although an employee's total retirement benefit is not fully defined until contributions cease, since plan sponsors can adjust guarantees on future contributions at their discretion. For example, a plan sponsor could guarantee an employee a \$250 annuity at age 67 for a \$1,000 contribution at time A. Even if the guarantee changed to \$225 per \$1,000 for contributions at time B, the employee would still receive the \$250 annuity at age 67 for the \$1,000 contribution at time A. The total retirement benefit for this employee would be the \$250 earned at time A plus the \$225 earned at time B, plus the sum of all the other income amounts earned for each contribution over the entire career. In order to calculate these income amounts, sponsors would specify a table of guaranteed interest and mortality rates.¹ In any year prior to annuitization, the inflation rate² is used in the calculation if it exceeds the rate of guaranteed interest in the table for that year.³ While this provision does not guarantee that contributions grow at a fixed real rate of return, it ensures contributions at least keep pace with inflation. Once an employee chooses to receive a benefit, the guaranteed income amounts purchased by each contribution are calculated (based on the guaranteed interest and mortality rates associated with each contribution) and summed to produce the total annuity payment. This annuity payment will be fully inflation-protected, increasing or decreasing with the inflation rate, but guaranteed to never decline below the initial payment. Essentially, the employee is using his contributions to purchase a series of single-premium deferred annuities, each with (potentially) unique guarantees.

Table 1 provides an illustration of how these guarantees are applied to a single contribution. In this illustration, a 60-year-old participant contributes \$1,000 that has a 3.5 percent interest rate guarantee for all years. The \$1,000 accumulates at the guaranteed rate each year, except during the third year when inflation is 4 percent. Upon retirement at age 65, the accumulated contribution is applied to the annuity factor calculated from the table of guaranteed interest and mortality rates producing a \$79.60 annual benefit.⁴ The next year, the annuity payment is increased 1 percent because of inflation, but then reverts to the original payment amount due to -2 percent inflation (or deflation). Recall that this illustration is only for a single contribution, and the total retirement annuity for this employee comprises the \$79.60 benefit calculated for this contribution and the sum of the income amounts calculated for each previous and subsequent contribution.

¹ This mortality table does not have to be an industry standard mortality table such as Annuity 2000. It simply needs to be a table of mortality rates that the plan sponsor is comfortable using based on its anticipated experience.

² The term inflation here and throughout the paper is used generally and makes no attempts to determine which specific measure of inflation, such as CPI-W, CPI-U, CPI-E, is the best to use for purposes of the SERIOUS system. See Barnes et al. (2009) for a further discussion of these various measures.

³ It would be a prudent risk management measure to include a cap on the amount of inflation protection provided prior to annuitization. Since this inflation guarantee will likely be managed with derivatives, an upper limit would reduce the cost of providing this protection.

⁴ This table represents an employee contribution. As will be discussed further in Section 7, employee contributions are fully refundable with interest upon death prior to annuitization. Therefore, the annuity factor based on the retirement age is applied to the accumulated balance at the time of annuitization. Had this been an employer contribution, which is not refundable at death prior to annuitization, a deferred annuity factor based on the contribution age would have been calculated and applied to the initial contribution, producing a larger annuity amount.

TABLE 1						
Pre-retirement				Post-retirement		
Age	Accumulated Contribution (EOY)	Inflation Rate	Interest Rate Applied	Age	Annuity Benefit	Inflation Prior Year
60	1,035.00	0%	3.5%	65	79.60	n/a
61	1,071.23	1%	3.5%	66	80.40	1%
62	1,114.07	4%	4.0%	67	79.60	-2%
63	1,153.07	3%	3.5%	68	81.99	3%
64	1,193.42	2%	3.5%	69	83.63	2%
Guaranteed Interest Rate: 3.5%				Annuity Factor at age 65: 0.0667		
Base Annuity Benefit = 1,193.42 × .0667 = 79.60						

While employees are guaranteed not to lose any money on prior contributions, they do face the prospect of volatility (risk) in the amount of retirement income that can be purchased with future contributions if guarantees change. However, this potential volatility is actually advantageous to employees. If a plan sponsor had to establish one guarantee that would apply to all future participant contributions, the guarantee would be set very low because of the difficulty of predicting investment yields available to match an uncertain amount of future contributions. Since the guarantees can be adjusted for future contributions, it allows plan sponsors to reflect current (or currently projected) interest rates, mortality experience, and supply and cost of market instruments (market instruments are discussed further in Section 9). By sharing risk with employees through this adjustment mechanism, it allows the system to be sustainable through both routine and extreme economic, demographic and other conditions. In contrast to other retirement systems with fixed defined benefits or systems that have automatic adjustment mechanisms that rely on certain models (that cannot always handle extreme scenarios), the SERIOUS adjustment mechanism allows the independent plan sponsors to use their professional judgment on how best to set benefit levels (i.e., guarantees) to match current and future expected conditions. Since these adjustments are controlled by the plan sponsor (who is not inclined to lose money) in the context of a competitive marketplace, the risk of moral hazard is much less than if a government, union or industry group had the ability to override the adjustment mechanism, resulting in an unsustainable level of benefits.

Not only can prospective experience be reflected in future guarantees, but past experience can as well. If past experience (e.g., investment earnings, mortality experience) is better than expected, then some of these gains can be reflected in the form of higher guaranteed benefits for future contributions. To provide a numerical example of the adjustment mechanism, assume mortality has suddenly declined nationwide by 2 percent in all age cohorts, causing an increase in expected future benefits. Plan sponsors would naturally reduce their future mortality guarantee by 2 percent, but could also reduce the guarantee more than 2 percent to compensate for the past (incorrect) mortality assumption on prior contributions that cannot be adjusted. Plan sponsors are providing stability to the system, while minimizing the impact on employees, by amortizing the unanticipated increase in benefits on prior contributions over some period of future contributions. Although allowing adjustments to future guarantees could invite the risk of moral hazard, the competitive nature of the system helps to deter that possibility. For example, assume one plan sponsor offered guarantees similar to other plan sponsors, but invested contributions in overly speculative investments. If the investments performed well, the plan sponsor would benefit; but if the

investments performed poorly, the plan sponsor would either have to absorb the losses in terms of reduced profits or could reduce future guarantees to compensate. However, since these losses were specific to this one plan sponsor (rather than a more systematic change such as mortality improvement), the ability to lower future benefit levels is constrained (as is the temptation to invest in inappropriate assets) since lower benefit guarantees reduce the ability to attract future contributions, relative to the other plan sponsors.

Although employees will experience volatility in the total expected amount of retirement income until contributions cease, the level of volatility will be different for each employee. An example will be useful in this case. Assume two workers, ages 25 and 55, make equal regular contributions throughout a career starting at age 20 and ending at age 65 with past contributions guaranteed at 4 percent. If future contributions are also assumed to use a 4 percent guarantee, both employees are projected to receive \$20,000 per year at age 65. However, due to lower expected interest rates, the plan sponsor reduces the interest guarantee on future contributions from 4 percent to 3 percent, causing the expected retirement benefit for the younger worker to be \$17,000 compared to \$19,000 for the older worker. It is important to remember that at no time did the retirement benefit attributable to past contributions actually decrease, only the projected benefit based on future contributions changed, causing the total expected benefit to change. The fact that the benefit for the older employee changed less than for the younger employee is simply a mathematical result of the older worker having a larger proportion of guaranteed (past) contributions than the younger worker. However, the guarantee structure that produces this result is actually one of the most important ways in which the SERIOUS system manages risk facing employees and is consistent with the human life cycle model from economics discussed next.

Bodie, Treussard and Willen (2007) define total wealth as the sum of both financial wealth (stocks, bonds, retirement income) and human wealth (future labor income). They show that the typical present value of human wealth for a 25-year-old high school graduate is about three times that of a 55-year-old. Conversely, financial wealth for older workers is typically higher than that of younger workers. While the risk of loss to human wealth is easily insured by purchasing life and disability insurance, it is difficult for individuals to recover from lost financial wealth in a short period of time. Generally speaking, younger workers have a much greater ability to alter their human wealth (e.g., improve their future earnings through further education) than older workers and can use this increased human wealth to recover losses in financial wealth.

Applying this model to the earlier example, the younger employee has suffered a decline in projected financial wealth (i.e., the retirement benefit) that is much greater than that of the older worker. To offset these losses, the employees could alter their human wealth by earning more money by working overtime, obtaining raises, etc. The younger worker would need to earn more money to cover the loss, but would likely have a greater ability to do so. More formally, the amount of loss that must be covered (and thus the amount of risk that is shared) is positively correlated with the amount of human wealth for each employee. In this example, the 25-year-old with a \$3,000 expected benefit reduction has three times as much human wealth as the 55-year-old worker having a \$1,000 reduction. Each employee faces the same dollar reduction in financial wealth per unit of human wealth.⁵ This means that the adjustment mechanism of the SERIOUS system shares risk in a manner that considers the ability of the employee to handle that risk. In reality, the system is unlikely to share risk as perfectly as shown here

⁵ $\frac{\text{Financial Wealth Reduction}}{\text{Units of Human Wealth}} = \frac{\$3,000}{3} = \frac{\$1,000}{1}$

since it does not consider characteristics of specific individuals (e.g., an employee in poor health or having an irregular contribution pattern). However, it allows the system to be administered efficiently while ensuring that workers nearing retirement do not experience a large reduction in their expected amount of retirement income. For those employees that have ceased contributions (i.e., retirees), their entire benefit is fully protected from investment, inflation and longevity risk.

5. Employer Roles and Responsibilities

In exchange for eliminating the fiduciary and administrative burdens of employers who wish to provide retirement benefits for their employees, the SERIOUS system assigns employers new responsibilities, but without distracting from their core business or by imposing excessive costs. All employers, without exception, would be required to automatically enroll employees into the SERIOUS system.⁶ Employees could opt out and not participate, but by requiring automatic enrollment it would protect those individuals who, because of inertia and other reasons, do not participate in voluntary retirement plans. A variety of studies have shown automatic enrollment in existing DC plans increases participation, in some cases up to 95 percent (Bovbjerg 2009). Although the percentage of employees who opt out is initially small, the percentage appears to increase as time passes (Nessmith et al. 2007). To mitigate this factor, those who do opt out will be automatically enrolled each year and will have to opt out again if desired.

Much like payroll tax deductions submitted by the employer to the government, contributions to the SERIOUS plan sponsors are transmitted by the employer to the central clearinghouse. Upon changing jobs, employees stay enrolled in the system and the same percentage of salary will be deducted by the new employer, unless the employee initiates any changes. The initial default contribution rate will be set at 6 percent, although employees will be free to adjust this percentage at any time. Currently, many DC plans have a 50 percent employer match on the first 6 percent of income so assuming employers will provide a similar match in the SERIOUS system, the choice of 6 percent allows the employees to take full advantage of funds offered by their employers. An additional reason for selecting 6 percent rather than something lower is that research has shown that the rate of employee participation in automatic enrollment is unaffected by the magnitude of a default contribution rate (i.e., higher default contribution rates do not cause greater opt-out rates) (Nessmith et al. 2007). Finally, assuming a lifetime 6 percent employee contribution rate, an employer match of 3 percent and a conservative 3.5 percent interest rate, the SERIOUS system would replace over 40 percent of an employee's final salary starting at age 67.⁷ Regardless of whether an employee accepts the default or selects another value, the contribution rate will be automatically increased each year by one percent of salary. Again, employees would be allowed to adjust this increased amount at any time.

Employers would not be required to make contributions to the SERIOUS system on behalf of employees, but would be provided with strong incentives to do so through the use of tax-deductible

⁶ Automatic enrollment by the employer would simply require providing the name (and potentially other identifying information) of each employee to the central clearinghouse. After that, all interaction (e.g., selecting contribution levels, requesting benefits) is between the employee and the central clearinghouse rather than the employer. The self-employed could enroll directly through the central clearinghouse

⁷ Based on author's calculations assuming an employee making annual contributions from age 25 through age 66 with 1.5 percent annual real wage growth. An inflation-protected annuity taken at age 67 based on the Annuity 2000 mortality table (50 percent male/50 percent female) would provide payments replacing 41.6 percent of the employee's final income. The Annuity 2000 mortality table is found in Johansen (1996) and is used for calculations throughout the paper. The Social Security replacement rate for a medium-earnings worker is also about 41 percent (Trustees 2009), producing a combined income replacement rate of over 80 percent for the average-income worker.

contributions (identical to current deductions for employer-sponsored retirement plans) and a tiered bonus tax incentive. To qualify for these tax incentives employers would be required to make at least a minimum contribution of 1.5 percent of salary⁸ for all employees—even for those who opted not to make any contributions themselves. Instant vesting would be required for the 1.5 percent employer contribution (employee contributions are always fully vested) but employers would be allowed to make additional contributions subject to a maximum five-year vesting period in order to facilitate retention of employees. The tiered bonus tax deduction acts to not only offset the cost of employer contributions, but is also a form of incentive compensation for employers to use their status as an unbiased advisor to educate employees about the SERIOUS system and the benefits of participating.⁹ For an employer where at least 95 percent of employees contribute, the additional bonus deduction would be equal to 100 percent of the minimum 1.5 percent contributions. The bonus deduction would gradually decline and go to zero for employers having less than 50 percent participation.¹⁰ By effectively lowering the cost of contributions, it should allow employers to provide a higher overall level of contributions than they might otherwise be able to afford.

The SERIOUS system includes a number of features that assist in providing retirement income to all employees, however, many employees are not able to take advantage of the tax deductions since they do not earn enough to pay any taxes. Because of this, the minimum 1.5 percent employer contribution is of particular benefit for lower income workers. Based on this 1.5 percent employer contribution alone, the average low-income employee would see his retirement income increased by approximately 20 percent over that provided by Social Security, bringing his total income replacement rate to about two-thirds of final salary.¹¹ Currently, only 43 percent of employees in the bottom wage quartile are even eligible for an employer-sponsored retirement plan, and only half of those participate compared to greater than 80 percent eligibility and participation rates in the highest wage quartile (U.S. Department of Labor 2009). Mandatory automatic enrollment will help improve these numbers, but the minimum 1.5 percent employer contribution for nonparticipating employees is still needed. Even in existing DC plans with automatic enrollment, lower-income employees opt out at much higher levels than higher-income workers, presumably because they require most or all of their income in order to provide basic needs for themselves and their families. For example, a recent study showed that 23 percent of employees earning less than \$30,000 annually opted out of automatic enrollment in their 401(k) plans compared to only about 7 percent for workers earning more than \$50,000 (Nessmith et al. 2007). While the immediate impact of the minimum 1.5 percent contribution by employers is to assist those least able to afford retirement saving, it should provide additional benefits in the future. Madrian and Shea (2001) use the “endowment” effect from behavioral economics to propose that once individuals become owners of a retirement plan, they value the plan more than if they did not have one. By having an employer contribute a modest amount to a plan owned by the employee, it is anticipated that employees will value the plan more and, as their income grows over time, will be more likely to contribute their own funds as well.

⁸ The minimum 1.5 percent employer contribution is required only on the portion of salary that is less than 45 percent of the national average wage index. For example, if the national average wage is \$40,000, then, regardless of an employee's actual salary, the maximum annual required employer contribution under this provision is $\$270 = \$40,000 \times 45\% \times 1.5\%$.

⁹ To maintain credibility as unbiased advisors, employers would be prohibited from accepting compensation from plan sponsors or directing employees to use one plan sponsor over another.

¹⁰ There would also need to be certain specific definitions on what constitutes employee “participation.” The point is to encourage employees to contribute at least at a minimum level throughout the year. For example, a contribution of 1 percent of salary for one pay period would not qualify as “participation” when determining the employer tax bonus.

¹¹ Based on annual contributions of 1.5 percent of a constant salary (no real wage growth assumed) for a 25-year-old working until age 67 using the Annuity 2000 mortality table and a 3.5 percent rate of interest. The SERIOUS system benefit based on these calculations provides an income replacement rate of 11.0 percent of final salary. The Social Security replacement rate for a low-earnings worker is 55.4 percent (Trustees 2009).

6. Employee Roles and Responsibilities

In most current and proposed contribution-based systems, employees have to simultaneously choose a percentage of salary to contribute and select specific investment funds or asset classes in which to invest. To properly make these decisions, the employee should consider and make estimates of potential future investment returns, interest rates and inflation, among other variables. However, given the fact participants spend very little time making these decisions, it can be assumed that most employees consider very few of these factors.¹² These decisions can be avoided in some plans by relying on defaults, but this is no guarantee that the default (usually risky) investment fund is appropriate for the risk tolerance of the individual employee. In the SERIOUS system, investment decisions are made by the plan sponsors so employees need to only select a plan sponsor and a contribution percentage. These two decisions, which can be changed at any time, are simplified by using an online interface that will allow employees to understand how the system works, what choices need to and can be made, and the impact of those choices. The interface will allow these choices to be made in an educated and timely manner without having to consider a large range of additional factors or make independent complex calculations.

This online interface, maintained by the central clearinghouse, will be similar to Figure 1. The interface shows the amount of projected retirement income at various retirement ages and contribution levels, and is based on the unique characteristics of each employee (e.g., age, current salary).¹³ While Figure 1 only shows the projected retirement income for one particular plan sponsor, the actual interface would include this identical information from each of the competing plan sponsors to assist employees in selecting an initial (or changing to a new) plan sponsor.

Employee Contribution Rate							
Retirement Age	1.5%	3.0%	5.0%	7.5%	10.0%	12.5%	15.0%
61	3,171	6,341	10,569	15,854	21,138	26,423	31,707
63	3,660	7,320	12,200	18,299	24,399	30,499	36,599
65	4,260	8,520	14,200	21,300	28,400	35,499	42,599
67	4,749	9,498	15,829	23,744	31,659	39,573	47,488
69	5,423	10,846	18,076	27,114	36,152	45,190	54,228
71	6,437	12,873	21,455	32,183	42,910	53,638	64,366
73	7,319	14,638	24,397	36,595	48,794	60,992	73,191
75	8,208	16,415	27,358	41,038	54,717	68,396	82,075
77	9,498	18,995	31,658	47,488	63,317	79,146	94,975
79	11,360	22,721	37,868	56,802	75,736	94,670	113,604
81	13,217	26,434	44,057	66,086	88,115	110,143	132,172

¹² A study by Benartzi and Thaler (1999) showed that 58 percent of plan participants in one DC plan spent less than one hour making contribution rate and investment decisions.

¹³ Before actual implementation, various focus groups and further analysis should be done to present the data in the best possible way in order to avoid any unintended framing. For example, if showing age 61 as the first age on the interface would encourage more people to retire at that age, then changes to the interface should be made. The intent is for the system to be retirement age neutral.

If the employee represented in Figure 1 was a new enrollee to the system, an inflation-protected life annuity of \$15,829 would be earned if retirement occurred at age 67 and 5 percent of a constant salary was contributed each year, using this particular plan sponsor.¹⁴ Although employee contribution rates are shown across the top of the interface, the actual retirement income amounts shown would also automatically reflect any employer matching contributions that might be applicable. For employees who have already been contributing to the system, their current contribution rate is highlighted (5 percent in Figure 1), although as discussed in Section 4, the total projected retirement income is based upon both prior contributions (benefits are defined and cannot change) and future contributions (benefits are subject to change). For example, if Figure 1 instead represented an employee who had made prior contributions, the \$15,829 benefit in the 5 percent column might represent a \$3,000 guaranteed benefit based on prior contributions plus a \$12,829 projected benefit for future contributions that would be subject to adjustment. Likewise, the \$9,498 benefit shown in the 3 percent column would comprise the same \$3,000 guaranteed benefit, but only a \$6,498 projected benefit for future contributions.

Employees use the online interface to initially choose a plan sponsor and contribution level, but they also use it to monitor their retirement benefit throughout a career and make desired changes to these initial choices. If there is a change in plan sponsor guarantees or other variables, (e.g., salary, employer match), the interface will be updated instantly. The system is neutral with respect to the appropriate time for employees to retire, and, therefore, there is no “normal” retirement age. The interface supports this goal by allowing employees to see the trade-offs in dollar terms of various retirement ages and lets them make unbiased decisions about what works best for their particular circumstances. If an employee should change plan sponsors, the interface automatically combines the benefits earned using any prior sponsors with the benefits earned using the current sponsor. Employees would not have to be concerned with rollovers to another account or keeping track of multiple accounts. Implicit in the determination of the benefit amounts would be various expense assumptions since plan sponsors would not be allowed to charge any fees directly to employees or employers. Due to the transparent nature of the interface and standardized product design, employees need only compare the income amounts for each plan sponsor, since these amounts have already incorporated the impact of expenses.

In current contribution-based plans, the focus tends to be on the size of the current account balance, asset allocation and potential future investment returns, rather than the amount of savings needed to achieve a target retirement income. A system with highly variable investment returns and uncertain future annuity purchase rates allows an employee to assume a higher rate of return, making his future benefit look larger and often provides an excuse for not saving enough for a secure retirement. Venti and Wise (2000) have contributed a valuable study concluding that the most important factor in determining the amount of retirement wealth accumulation is the amount chosen to save (rather than spend) during the working years.¹⁵ They found that investment choices that individuals make do have some effect on wealth accumulation, but the impact of these choices is relatively minor. The design of the SERIOUS system is consistent with and attempts to take advantage of these findings. The clearinghouse interface does not show the total accumulated contributions or guaranteed interest rates

¹⁴ This calculation assumes a 3.5 percent interest rate, the Annuity 2000 mortality table and a single life installment refund annuity for a new employee earning \$50,000 annually. Employer contributions in the form of a life only (i.e., no installment refund feature) would be added to these amounts if the employer also contributed. Additional options, such as showing a joint and survivor annuity, could also be shown on this interface.

¹⁵ The study controls for income levels and in fact shows that the variability among savings levels is not restricted to certain income brackets. Venti and Wise found that there are significant numbers of high-income households that save little and many low-income households that save significant sums.

so that the employee's choice of contribution level is framed as the most important factor in determining a desired income at retirement.¹⁶ By eliminating both the need to consider a range of complex factors and the possibility of assuming unrealistic investment returns, it reduces the opportunity for excuses and poor decision making and the employee responsibility for saving appropriately can be realistically fulfilled.

While the clearinghouse interface is a valuable tool that can be understood even by those without financial sophistication, it is a certainty that due to inertia or lack of interest in financial matters, some employees will rarely (or never) use the interface to monitor their retirement benefit or change their contribution level. While this could be problematic in plans that use low default contribution rates and risky default funds, the SERIOUS system offers protection to these inattentive employees. Since the contribution rate increases automatically each year and certain minimum guarantees are provided, these employees who remain in the system and simply "do nothing" will have an attractive benefit upon retirement.

7. Benefits

As discussed in prior sections, the SERIOUS system benefits are always expressed in terms of an annuity. More specifically, benefits are in the form of an inflation-protected life annuity with joint and survivor options available. By using life annuities as the primary form of benefit payment, it protects employees from the well-known risk of outliving their money, but actually has an additional less commonly discussed benefit. It provides a more optimal and balanced way of spending retirement savings. While it is certainly common for retirees to spend their retirement savings too soon, Copeland (2005) has observed that many retirees, in the absence of annuities, might actually be conserving too much of their savings by trying to manage longevity risk themselves.

It has been well documented that individuals with below-average health avoid annuitization, causing existing life annuities to be more costly than they would be in the absence of this anti-selection. However, prices are lower for compulsory annuities, which necessarily have a lower level of anti-selection, than those annuities sold on a voluntary basis (Poterba 2001). In addition to the high cost of annuities in the voluntary marketplace, objections about loss of control of principal for large cash needs and bequest motives have caused the voluntary rate of annuitization from existing retirement funds to be very low. In the SERIOUS system, annuitization is mandatory, which will expand the pool of risks and bring down the cost, relative to the current price of voluntary annuities.

Commencing annuity payments would typically be limited to a minimum attained age, such as age 60.¹⁷ Each annuity payment is the sum of (1) an amount based on employer contributions and (2) an amount based on employee contributions. The amount per dollar of employer contribution is greater than the amount per dollar of employee contribution due to the way in which these two quantities are calculated. The amount based on employer contributions is simply a life-only (or joint life) annuity that

¹⁶ The guaranteed interest rates and the total amount of contributions accumulated would be available; these would just not be part of the clearinghouse interface.

¹⁷ The choice of age 60 may need to be adjusted in the future as circumstances change, but is currently based on two primary factors. Currently, many individuals who leave the workforce near age 60 need substantial amounts of money to pay for health care costs until they are eligible for Medicare at age 65. This fact may change depending upon the outcome of national health insurance reform. Also, an individual does not begin to see a significant gain from annuitization prior to age 60 due to the fact that mortality credits from assumed deaths prior to age 60 are limited. Theoretically, the SERIOUS system could support annuitization at any age since the plan sponsor is required to specify a table of guaranteed mortality rates for all ages, but the choice of a minimum age is more of a consumer protection feature for employees.

ceases all payments upon death. If an employee dies before annuitization, no refund of employer contributions is provided. The amount based on employee contributions is a life annuity with an installment refund feature that upon death would, if applicable, continue payments to a beneficiary until total payments were equal to the employee contributions accumulated at the guaranteed interest rates up to the time of annuitization. If death occurs prior to annuitization, employee contributions accumulated at the guaranteed interest rates up to the time of death are paid to the beneficiary. By allowing employee contributions to be refundable, it removes the argument that these funds will be “lost” if death occurs prematurely. Those employees with strong bequest motives and sufficient other assets can simply never annuitize (or only partially annuitize) and their accumulated contributions would be payable to the beneficiary upon death.¹⁸

Partial annuitization would be allowed in order to facilitate a phased or nontraditional retirement arrangement or simply provide flexibility on when to take annuitized income. An employee could annuitize at various points in time (at their discretion), even while making further contributions to the plan. A common situation might be an employee who at age 65 wanted to (or needed to for health reasons) continue working only on a part-time basis. Having earned a \$1,500 monthly benefit, the employee could choose to receive 50 percent (or another percentage) of his earned benefit by taking a \$750 annuity. The other 50 percent of his benefit would continue to increase based on the guaranteed interest and mortality factors and could be augmented with additional contributions and annuitized at a later date.¹⁹ Partial annuitization would also allow employees to take advantage of the fact that annuities provide more generous income at older ages. An employee who stops working entirely could take a portion of his benefit upon retirement and defer the remainder until some of his other sources of income were exhausted. For example, if an employee retired at age 67 and deferred a portion of his retirement benefit until age 80, that portion would be more than three times greater than if it had been taken at age 67, even without any additional contributions.²⁰

There would be limited exceptions to receiving payments prior to age 60. If an employee became permanently disabled, annuity payments could be requested based on his current age and accumulated contributions. Supplemental annuity payments could also be requested if an employee or employee’s spouse needed long-term care. Since the cost of long-term care might exceed the annuity payment an employee would be normally be entitled to, the normal annuity payment can be increased up to the amount needed to cover the cost of long-term care. The total additional amount payable under this provision is limited to the accumulated amount of employee contributions at the point of annuitization less any prior annuity payments received. For example, assume an employee whose contributions have accumulated to \$100,000 producing a \$1,000 monthly benefit at age 65. At age 70, the retiree needs long-term care costing \$2,000 per month, leaving a \$1,000 monthly shortfall that could be taken as an addition to the normal payment. Since the retiree has already received \$60,000 (5 years × 12 months × \$1,000/mo) in annuity payments, there would be \$40,000 (\$100,000 accumulated contributions – \$60,000 prior benefits) available to cover the additional long-term care cost for 20 (\$40,000/\$2,000/mo) months. If still living at the end of 20 months, the retiree would continue to receive the original \$1,000 monthly. This approach would not be an option for those who had already received more annuity payments than their accumulated contributions, but it does allow some individuals needing long-term care to access funds on an accelerated basis that would have been paid out in any event.

¹⁸ This would be a taxable event.

¹⁹ There would be not be limits on the number of times an employee could annuitize, but restrictions requiring that payments meet a minimum threshold would be appropriate.

²⁰ This example is illustrated in Table 3 in Section 11.

Access to the commuted value of future annuity payments would also be allowed in the event of certain extremely rare situations, such as an organ transplant not covered by existing health insurance. Loans, common in DC plans for such events as purchasing a home or providing for educational expenses, would not be permitted.

Lump sums after age 60 would be allowed up to a maximum of 25 percent of the accumulated balance.²¹ However, there is an explicit cost since providing an option to take a lump sum (even on a limited basis) has the potential to reduce the amount of benefits available to other employees. When an annuity benefit is calculated it assumes a certain life expectancy based on the guaranteed mortality rates. However, it would be expected that a significant portion of the individuals requesting a lump sum would have a lower-than-average life expectancy since taking a lump sum would be a valuable option for them. Rather than compensating for this anticipated anti-selection by having plan sponsors lower prospective guaranteed mortality rates for everyone, plan sponsors would be allowed to apply an actuarially justified reduction factor to the lump sum. For example, an employee who requests a lump sum of \$100,000 would be provided a statement prior to processing the request showing that a 3 percent reduction factor will be applied and the available lump sum is \$97,000.²² By allowing a limited amount of lump sums with an explicit cost, the system provides flexibility while also signaling to the employee that the primary goal should be to take retirement income in the form of an annuity that cannot be outlived.

8. Regulation and Governance

New legislation will be required to establish the SERIOUS system since many of its necessary provisions would not be feasible under existing laws. There are already a number of existing insurance companies that could provide some of the functionality of the SERIOUS plan sponsors, but the current industry infrastructure is not efficiently designed to deliver the maximum level of retirement income. Each company currently has its own administrative operations, has to contend with regulation from multiple state jurisdictions, and spends vast resources on sales and marketing costs. Most importantly, then, the new SERIOUS legislation will allow third-party plan sponsors to operate as part of a system with centralized administration (i.e., central clearinghouse) and a single nationwide governing board. The new legislation will also need to codify the requirements of plan sponsors and employers and make necessary adjustments to tax laws.

The governing board created by the SERIOUS legislation will provide oversight of the system and its member plans. Board members will be appointed by the president, but the board and the SERIOUS system itself will not be a part of or affiliated with the federal government. Funding for the board and its central clearinghouse will be provided by the plan sponsors participating in the system, although plan sponsors will not have a role in determining board policy.²³ The most important function of the board is to ensure solvency, and it will employ a multifaceted approach so that employees will be confident that benefits will be paid according to sponsor guarantees.

²¹ This 25 percent would be determined at the point where the first distribution is taken. For example, if the accumulated balance is \$100,000 when the lump sum is first requested, a total of \$25,000 in lump sums could be taken over the future lifetime of the employee even though the accumulated balance could potentially grow again over \$100,000 if the lump sum was small and annuitization was deferred much later in life.

²² This factor could be tiered. For example, a plan sponsor could choose to make half of the lump-sum amount not subject to the anti-selection factor, but apply a 5 percent factor to the other half.

²³ There will be a need for some additional start-up funding provided by the government, but after the system is fully operational no government funds will be used.

The first solvency measure will require that the SERIOUS plans be fully funded by holding appropriate reserves. Since the SERIOUS system provides for a series of single premiums payable in return for a series of benefit payments in the future, the reserve is simply the present value of future benefit payments. Each future benefit would be discounted by a rate of interest found on a market yield curve reflecting nearly default-free interest rates (i.e., there would be recognition of credit risk).²⁴ The yield curve used would be the same for all plan sponsors. The mortality table used in the present value calculation is based on each plan sponsor's current expectation of future mortality experience.²⁵

While the basic reserves should be adequate to provide for benefits during periods of stability, an additional level of protection is needed to protect employees and beneficiaries from more severe conditions. The plan sponsors would be required to put in place a system of risk measurement and establish a level of capital consistent with the specific risks taken. Similar to current requirements for variable annuities that provide for a principle-based capital calculation, the level of capital required should consider how the sponsor uses hedging or other techniques to manage its asset/liability risks under a wide range of scenarios, including tail scenarios. The board would determine basic guidelines for the establishment of capital and take an active role in auditing²⁶ the risk measurement systems, but individual plan sponsors would use assumptions and experience specific to their plan. If a plan sponsor did not have a sufficient level of capital, the board would be authorized to take corrective actions, similar to state insurance regulators when companies have impaired levels of risk-based capital. The general concept behind this capital calculation can be illustrated using a simplified example that ignores expenses. Assume a plan sponsor invests a contribution guaranteed at 4 percent in a 5 percent risk-free fixed rate bond. If the inflation rate goes above 5 percent, the return on the asset would be insufficient to provide for the inflation guarantee. If this risk was simply assumed by the company, additional capital requirements over the basic reserve would be required. Alternatively, if the company could buy a derivative instrument that would pay off if the inflation rate exceeded 5 percent, any additional capital requirements could be reduced or potentially eliminated. The goal is to provide plan sponsors with an incentive to manage risk appropriately so that obligations can be met even under extreme conditions, while at the same time not requiring excessive amounts of capital.

The board would also create a system-wide insurance fund that would reimburse affected employees up to certain limits in the unlikely event that a plan sponsor is unable to meet its obligations. Payments (or premiums) to this fund would be based on two factors. The first factor is fixed and is the same for all plan sponsors. The second factor is based on the relative risk assumed by each plan sponsor as determined by the analysis done to calculate the additional capital requirements. The product of these two factors is applied to plan sponsor assets and results in an insurance fund payment (premium) that is based on risk-adjusted asset size. Thus, if two similarly sized sponsors have widely different risk profiles, the plan sponsor assuming more risk will pay more into the fund. Anytime an insurance fund such as this is established, the risk of moral hazard is created since some plan sponsors could take excessive risk knowing there is an insurance fund that will provide for employees. However, with effective and timely oversight by the SERIOUS board and by making both the capital requirements and payments into the

²⁴ The specific rate on the yield curve used would be for a maturity that would match the expected time until payment of the benefit. For example, a benefit cash flow expected in 20 years would be discounted at the 20-year interest rate found on the yield curve.

²⁵ The board will need to ensure that the table used in the reserve calculation is appropriate for the specific liabilities of the plan sponsor. It would be anticipated that the mortality table used for the reserve would be the same or similar to the mortality table that is being guaranteed on current contributions.

²⁶ Since some state insurance regulators might have objections to having a single nationwide regulator of what are essentially special-purpose insurance companies, the SERIOUS board should consider using the expertise of state insurance department personnel in auditing plan sponsors.

insurance fund directly related to the level of plan sponsor risk, the opportunity for moral hazard is greatly reduced.

9. Use of Markets

As discussed in Section 4, plan sponsors can use the adjustment mechanism to share certain risks with employees. As such, plan sponsors are reliant upon the use of external markets²⁷ to set and manage their guarantees to determine how much risk is shared with employees and what level of retirement benefits will be provided. For example, if the guarantees are unable to be managed effectively using the markets, there is more uncertainty (risk) associated with offering guarantees, and this will be reflected in the (lower) level of benefits provided by plan sponsors. This section discusses how the SERIOUS system is designed to provide attractive benefits by effectively using existing markets to minimize risk to both plan sponsors and employees.

Since plan sponsors are operating in a competitive environment with a standardized benefit structure, sponsors will want to offer an attractive level of benefits. However, taking excessive risk in an attempt to offer an aggressive level of benefits is very costly, in terms of additional capital or hedging costs. Efficient markets provide a way to measure the natural trade-off between the costs and benefits of risk. For example, a risk-free inflation-indexed security such as U.S. Treasury Inflation-Protected Securities (TIPS) could be used to match plan sponsor liabilities, but by investing solely in TIPS the yield would unlikely be high enough to attract contributions. Rather, plan sponsors could invest primarily in a high-quality diversified portfolio of corporate bonds, with a small portion of the portfolio potentially reserved for securities with a higher risk-return profile. To hedge the inflation guarantee, the plan sponsor could use a derivative product, such as an inflation cap, that would pay if inflation exceeded a certain level.²⁸ Assuming the additional costs (e.g., capital, hedging) of this portfolio are covered by the additional yield, the plan sponsor's effective use of the markets has minimized the risks involved and allows for a higher guarantee to be provided relative to the TIPS-only portfolio.

In discussing the use of markets, it is not the intent to restrict the creative strategies of plan sponsors or require the use of specific market investments, such as corporate bonds and inflation caps in the prior example. However, it is anticipated that plan sponsors will primarily use fixed-income investments rather than equity since, unlike traditional DB plans, the SERIOUS sponsors cannot rely on a cash infusion from an employer or government to compensate for large investment losses. Life insurance companies, which also have long-term liabilities containing guarantees, have consistently favored fixed income, with over 70 percent of industry assets in bonds in 2007 (ACLI 2008). The SERIOUS system interest guarantee structure is designed to allow plan sponsors to optimize the use of fixed-income markets and accommodate a variety of strategies. As discussed in Section 4, a plan sponsor specifies a table of guaranteed interest rates that is applied to each contribution. Once a contribution is made, the table of guaranteed interest rates attached to it cannot be changed. However, for future contributions, the table can be adjusted at the discretion of the plan sponsor at any time. This allows the plan sponsor

²⁷ The use of "external markets" means markets outside the retirement system itself, such as stock, bond, derivative or insurance markets. For example, as discussed in Section 4, nonsystematic longevity risk is eliminated by pooling the experience of participants within the plan; thus this would be use of an "internal" market.

²⁸ Note that the structure of the inflation guarantee prior to annuitization reduces the hedging cost. If a plan sponsor had to guarantee a fixed return plus inflation (rather than the greater of a fixed return or inflation), it would cause the guaranteed interest rate to be reduced because of the hedging cost involved. Inflation caps are actively traded at a variety of strike prices and maturities up to 30 years (Armann 2008). Armann (2008) and Barclays Capital (2005) demonstrate a variety of ways that inflation derivatives can be used to manage inflation risk.

to price the guaranteed benefits based on current and expected market interest rates and the available supply and cost of investments and hedging instruments. In this way, plan sponsors are able to reflect the current market environment in the level of benefits provided rather than be forced to take unnecessary risk in order to meet fixed benefit targets that may be unrealistic, especially under more severe market conditions. For example, assume a plan sponsor is limited by current market supply to investing contributions for a 30-year-old cohort in 30-year corporate bonds with a 7 percent market yield. When this cohort begins to annuitize in 30 years, there is risk that the matured proceeds cannot be reinvested at 7 percent.²⁹ However, even if the matured proceeds could be reinvested at 7 percent, the plan sponsor may want to use a different investment or hedging strategy (e.g., invest in TIPS) during the annuitization phase since annuity payments are fully inflation-protected. In recognition of reinvestment risk and to facilitate the use of different investment or hedging strategies, the table of guaranteed interest rates attached to these contributions (ignoring pre-annuitization hedging costs, expenses and profit) might contain a 7 percent rate for the first 30 years and 5 percent thereafter. If the plan sponsor was investing for a 40-year-old cohort instead of the 30-year-old cohort, 20-year bonds (having a lower yield) might be more appropriate for the accumulation phase. As such, the table of guaranteed interest rates can be based on the age of employees at the time contributions are made. In this example, the plan sponsor could accurately reflect the reality that fixed-income yields vary with time to maturity by providing a table of guaranteed interest rates to the 40-year-old cohort that is different (e.g., 6 percent for the first 20 years and 5 percent thereafter) than that applied to the 30-year-old cohort.

Although the prior examples focus on a plan sponsor with assets maturing at the end of the accumulation phase and being reinvested for the annuitization phase, one of the major structural advantages of the SERIOUS system is that it does not require large quantities of assets to mature (or be sold) when the accumulation phase ends and an entirely new set of assets to be purchased when the annuitization phase begins. In theory, if a plan sponsor could obtain bonds with sufficient maturity to cover both phases, the sponsor would simply need to alter its inflation hedging strategy at the point of annuitization. Assuming a working lifetime from age 30 to 60 and a potential retirement lifetime of age 60 to 90, investing for both the accumulation and annuitization phases using a single long-term bond would allow sponsors to invest in 30- to 60-year maturities compared to a maximum maturity of only 30 years if two different entities were handling each phase. By investing for as long as the market will allow, plan sponsors can provide employees with the best possible guarantee by minimizing reinvestment risk and taking advantage of the normal upward sloping yield curve (i.e., longer maturities have higher yields).

Another feature that benefits both employees and plan sponsors while promoting efficient use of the markets is the requirement that once contributions are made, they cannot be withdrawn (other than through one of the benefit options) or transferred to another plan sponsor. If plan sponsors were faced with the prospect of ongoing unpredictable short-term liquidity needs, they would either have to hold a cash reserve at a below-market yield or sell long-term assets at a potential loss (to meet withdrawals). Either way, the guarantees provided would be reduced to reflect the cost of this employee withdrawal option. Not allowing withdrawals and transfers also provides stability to the system. If one particular plan sponsor was facing financial difficulty and was forced to lower its future guarantees, many employees would likely consider changing to another plan sponsor. If employees were also allowed to transfer their prior balance to a new sponsor, it could contribute to the further deterioration of the prior sponsor's financial condition and potentially lead to a run-on-the-bank situation.

²⁹ Pelsler (2003) has proposed an interesting and potentially effective strategy using swaptions to hedge the risk that interest rates are lower at the time of annuitization.

It is also possible to use both the derivatives and insurance markets to hedge systematic longevity risk. While mortality has improved dramatically over time, most of these changes occur relatively slowly and can be accommodated internally by having plan sponsors lower guarantees on future contributions as discussed in Section 4. If mortality is monitored closely, the impact of these gradual adjustments on employees will be minimized. However, in an instance where a dramatic medical breakthrough causes a sudden unexpected significant decline in future mortality, markets provide an alternative solution. Reinsurance companies have extensive experience with mortality that may offer some solutions to plan sponsors. Also, longevity swaps have recently been implemented in the United Kingdom and represent a potentially useful market solution to manage systematic longevity risk (Slaughter and May 2008, Towers Perrin 2009). The concept of longevity (or survivor) bonds has also been discussed as a way to hedge this risk (Blake, Cairns and Dowd 2006).

Although the SERIOUS system does not require any new types of securities that do not already exist, movement toward more developed markets will allow plan sponsors to better manage risk and provide more attractive guarantees. Since the structure of the SERIOUS system is well-defined with standardized benefits, demand for certain market instruments (e.g., inflation hedges) will be strong, allowing markets to develop and meet these demands. Xiao and Xiao (2009) have shown that the current amount of DB assets significantly exceeds the available supply of corporate and government bonds, especially those with longer maturities. Thus, as the SERIOUS system grows there will be a need for an expanded supply of long-term fixed-income securities. The system should also increase the demand for inflation-linked securities, but the U.S. market is almost exclusively comprised of TIPS. A more diversified inflation-linked security market including higher-yield non-governmental issues, especially at longer maturities, could potentially provide a more cost-effective alternative than inflation derivatives. Society, through its government, can play a helpful role in this area. For example, Goldenberg (2007) reported that the U.K. Debt Management Office issued a 50-year inflation-indexed note that had the effect of dramatically increasing the supply of corporate inflation-linked securities.

10. Implementation and Transition

Now that the structure of the SERIOUS system has been defined, issues regarding implementation of, and transition to, the new system are examined. While the ability of a proposed retirement system to provide an adequate level of retirement income is extremely important, the likelihood that the system can be implemented successfully must also be considered. The SERIOUS system has a number of advantages that will be useful in achieving passage of legislation authorizing its creation. First and most important is that all the primary stakeholders are better off under the SERIOUS system than under current Tier II retirement systems. Employers would no longer face the burden of establishing and maintaining retirement plans and would be provided enhanced tax incentives to contribute on behalf of their employees. Employees are given the opportunity to earn an attractive retirement benefit that is protected from a variety of risks, especially near the end of a career. Society assumes no new liabilities and is not burdened by the prospect of higher future social insurance or welfare costs that otherwise might be demanded by financially unprepared retirees. Markets are used effectively and the probability for the development of more complete markets is enhanced. While certain parties that benefit financially or otherwise from the current system may raise objections, the focus must remain on the true stakeholders and how each benefits from the proposed system.

Any consideration of legislation impacting the Tier II retirement income structure will naturally bring up discussion of the Tier I Social Security system. Due to demographic and other reasons, Social Security will require adjustments in the future such as benefit reductions, tax increases or retirement age increases. These are complex and politically difficult decisions that will have to be made. While it would be possible to address the problems with Tier I and Tier II simultaneously, it would be practically much more difficult to reach an agreement and pass such a far-reaching piece of legislation. However, while the SERIOUS system operates independently of Social Security (and does not propose or require any changes to Social Security), it offers lawmakers a potential future solution to the challenges facing the Social Security system. Once the SERIOUS system is implemented and has had a chance to operate through various economic cycles, the system can be evaluated. If the system is meeting the needs of its stakeholders and providing attractive benefits, it would create an opportunity for future Social Security reform. One plausible proposal would decrease future Social Security benefits in exchange for increased government subsidies that would promote additional contributions to the SERIOUS system. This would provide an increased SERIOUS benefit to compensate for a lower Social Security benefit with the goal of having the total amount retirement income (Tier I + Tier II) largely unchanged. Although this is simply an example and not a formal proposal, it does demonstrate a potential solution to relieve the financial pressures on Social Security while maintaining (or improving) the overall benefits of future retirees by allocating limited government resources to a more effective system.

One final consideration in examining the likelihood that the SERIOUS legislation can be passed is its impact on government revenues. As with current retirement systems, the SERIOUS system relies on tax incentives for employee and employer contributions. While it is unlikely that lawmakers would want to reduce these incentives for privately provided retirement income, especially among lower-income employees, it is possible the limit on tax-deductible contributions could be reduced. The relative high limit on tax-deductible contributions to DC plans, according to a number of studies, does not promote additional retirement savings among most employees and has primarily been a benefit to high-income employees.³⁰ The SERIOUS system recognizes this and will institute a lower annual contribution limit relative to current DC plans. The tax revenue gained by having a lower contribution limit will offset the cost of the additional bonus tax credit offered to employers discussed in Section 5.³¹ Although greater participation will certainly result in a larger total tax subsidy than currently exists, the intent of the SERIOUS system is to be revenue-neutral on a per participant basis. Existing DB plans could continue to coexist along with the new system. Individual retirement accounts (IRAs) and DC plans could also be maintained as tax-deferred vehicles, up to certain limits, but future contributions would no longer be eligible for tax deductions.

Once the enabling legislation is passed, transition to the new system can begin. The SERIOUS board will need to be appointed and define certain detailed requirements not addressed by the implementing legislation, such as setting a minimum level of initial capital to qualify as a SERIOUS plan sponsor. Given the fact that there are many existing companies with experience in managing risk and investments, the creation of plan sponsor companies could occur rapidly. Since the system relies on the

³⁰ Holden and VanDerhei (2001), Burman et al. (2004) and Bovbjerg (2001) show that high-income employees comprise a significant portion of those who are able to contribute to existing DC plans near or at the contribution limits.

³¹ Based on the data from the Urban-Brookings Tax Policy Center Microsimulation Model as shown in Burman et al. (2004). Author's calculation assumes that the current average employee and employer contributions to DC plans for individuals with incomes greater than \$200,000 were reduced by \$5,000, producing a reduction in total tax deductions of about \$25 billion. Assuming the SERIOUS system had about 95 million participants whose employers received the full bonus tax deduction as described in Section 5, the total tax deduction increase would also be about \$25 billion. The exact alterations to the tax code will be made by Congress, but this demonstrates it would be possible to compensate for the proposed new bonus tax deduction by reducing existing contribution limits.

existing widespread practice of payroll deductions and employer matching, and the impact of these contributions can easily be seen on the clearinghouse interface, educating and transitioning employees to the new system should not be difficult. SERIOUS plan sponsors could choose to allow employees to roll over contributions from prior DC plans into the new system. Finally, although this discussion has focused on the U.S. perspective, the SERIOUS system also has the potential to be successfully implemented in other countries.

11. Results and Analysis

While the SERIOUS system contains a number of features that promote retirement savings among a greater portion of the population, there could be concerns about the ability of the system to provide adequate retirement income, especially in the presence of guarantees. However, using conservative assumptions, it can be shown that the SERIOUS system is capable of providing an attractive level of benefits. Table 2 provides the income replacement rates for three different combinations of employee/ employer contributions for a 25-year-old with 1.5 percent real wage growth from age 25 until retirement.³² Mortality is based on individual annuitant mortality (Annuity 2000 table) which would generally be much lower than the broader population expected to participate in a nationwide system with mandatory annuitization. If mortality improves significantly in the future, the system will provide lower replacement rates through the adjustment mechanism. While increases in life expectancy do not necessarily provide all employees the ability to increase their working lifetime to offset lower income replacement rates, it does provide an incentive for many employees to work longer. Since the actual guaranteed interest rates necessarily vary, the 3.5 percent and 5.5 percent interest assumptions used in Table 2 represent a weighted average of the guaranteed interest rates earned over a career. The Appendix demonstrates that it can be reasonably expected that the average guaranteed interest rate will be between 3.5 percent and 5.5 percent. Using the 5.5 percent interest rate assumption, an employee who contributed 3 percent of his salary that was matched by his employer from age 25 until retirement at age 65 would have an income replacement rate of 49.4 percent. If the employee's final salary was \$50,000, his annuity would pay \$24,700 ($\$50,000 \times 49.4\%$) starting at age 65 and be adjusted for inflation each subsequent year. While Table 2 provides a good picture of the range of benefits provided by the SERIOUS system, it is also useful to combine these values with projected Social Security income replacement rates. Currently, the average contribution to DC plans is approximately 7 percent by employees and 3 percent by employers (EBRI 2009, PSCA 2009). If these contribution rates are continued under the SERIOUS structure, the system would replace 46 percent of income at age 67, assuming a 3.5 percent interest rate. While Social Security replacement rates vary by income level, the average wage earner would replace about 41 percent of income at age 67 (Trustees 2009). By combining the SERIOUS benefit with Social Security, the average income worker would have a retirement income replacing about 87 percent of his salary. Combined income replacement rates including Social Security could easily exceed 100 percent using more optimistic interest assumptions. While the Appendix discusses the likelihood that the average guaranteed interest rate will be between 3.5 percent and 5.5 percent, it is also useful to examine the income replacement rate based on one additional scenario—0 percent interest for all years. Assuming a 7 percent employee and 3 percent employer contribution rate, a 0 percent guaranteed interest rate would still replace a respectable 25 percent of income at age 67. Although a 0 percent scenario is extremely unlikely, it demonstrates the ability of the SERIOUS system to provide an adequate level of retirement income even under extreme scenarios.

³² One and one-half percent real wage growth is the historical average from the U.S. Census Bureau (2009).

Table 2
Percent of Final Income Replaced by the SERIOUS System

	Interest Rate Guarantee = 3.5%			Interest Rate Guarantee = 5.5%		
	Employee/Employer Contribution			Employee/Employer Contribution		
Retirement Age	1.5%/1.5%	3.0%/3.0%	7.0%/3.0%	1.5%/1.5%	3.0%/3.0%	7.0%/3.0%
65	12.7	25.4	41.4	24.7	49.4	81.4
67	14.2	28.5	46.0	28.2	56.3	91.7
70	17.5	35.1	56.4	35.3	70.6	113.8
75	24.9	49.7	77.6	53.2	106.4	167.8

The previous analysis focused primarily on the impact of the guaranteed interest rate on the benefit amount, but there are two additional features of the SERIOUS system that help provide an attractive benefit level. In other current (e.g., DC) and proposed systems, contributions are accumulated in some manner and then an annuity is purchased on the open market. Not only are there potential transaction costs incurred in a system where the parties doing the accumulating and annuitizing are different, but there is a risk that current long-term interest rates are low at the time the annuity is priced, producing an unexpected and unsatisfactory level of retirement income. The retiree could choose to wait until interest rates increase, but in that case is faced with the prospect of investing the funds at a low rate for an indefinite period of time. Conversely, for employees in the SERIOUS system who contribute over their entire career, the annuitization rate used is essentially a weighted average of guaranteed interest rates attached to their previous contributions rather than a current (and potentially low) market rate. To provide a numerical example, two employees, one using SERIOUS and one using DC, earn a constant 5 percent interest rate throughout their careers. Suddenly, when they retire, market interest rates drop to 4 percent, which has no impact on the SERIOUS annuity, but leaves the DC participant with a choice between purchasing an annuity that provides about 8 percent less income than expected or waiting until interest rates rise and managing his funds appropriately until that time.³³

In addition to potential interest rate differences, by purchasing what amounts to a series of deferred annuities throughout a career, SERIOUS participants have an advantage relative to purchasers of lump-sum annuities. With a typical life-contingent annuity, no further payments are made after death, allowing the annuity benefit to be larger than if a refund was payable for annuitants who died before recovering their original investment. These “mortality credits” occur both for the SERIOUS system (on employer contributions only) and annuities purchased with a lump sum in the open market. However, since SERIOUS annuities are purchased over time, far in advance of receiving payments, they benefit much more than lump-sum annuities from these mortality credits. Table 3 provides some numerical examples (using employer contributions only) illustrating this advantage. The employee shown in Table 3 had employer contributions throughout a career that have accumulated to \$100,000 upon retirement at age 67. If the employee were in the SERIOUS system, the annuity benefit at age 67 would be 9 percent larger than an employee faced with purchasing an annuity in the open market. Essentially, employer contributions made for employees not surviving to age 67 are redistributed to surviving plan participants in the form of higher annuity payments. Since a lump-sum purchaser does not commit funds much in advance of receiving benefits, he is unable to earn these mortality credits prior to

³³ Eight percent is the reduction in an annuity calculated at 4 percent vs. 5 percent at age 67 using the Annuity 2000 mortality table.

annuitization. While the still-significant difference is only 9 percent at age 67, since prior mortality is relatively modest, the difference accelerates at more advanced ages. The SERIOUS benefit is 42 percent more than an annuity purchased with a lump sum if annuitization is delayed until age 80. Another way to interpret this number is that the lump-sum purchaser would have had to come up with 42 percent more money (through increased savings or investment earnings) in order to match the benefit provided by the SERIOUS system.

Age of Annuitization	SERIOUS Annuity	Annuity Purchased with Lump Sum	% Difference
67	8,376	7,678	9%
72	12,787	11,019	16%
80	29,738	20,978	42%

The values in Table 3 illustrate the impact of mortality credits on pure life-contingent annuities purchased in advance compared to those purchased with a lump sum, so to the extent that an employee has made (refundable) contributions, the differences shown in the table will be reduced. However, the impact of anti-selection will have the opposite effect. For example, assume this 67-year-old retiree takes an annuity at age 72 and over his lifetime has contributed half of the \$100,000 and his employer has contributed the other half. Based on Table 3, it is expected that employer contributions purchase an annuity that provides about 16 percent more income than if an annuity was purchased with a lump sum. There should be no difference in the annuity purchased by employee contributions since mortality credits prior to annuitization are eliminated due to the refund feature. However, if there is 10 percent anti-selection in the open market (impacting both employee and employer contributions) the overall SERIOUS annuity would be about 19 percent greater than the open market annuity purchased with a lump sum.³⁵

While this analysis demonstrates the ability of the SERIOUS system to provide attractive benefits, some employees might feel the system should consider their specific risk tolerance level by investing more in equity to provide an opportunity to earn even greater benefits. However, even if employee-specific risk tolerance could be accurately quantified, there is no guarantee (in the absence of additional funding from government or an employer) that such a system would provide adequate retirement income to all employees. Even with more complex self-adjusting mechanisms than presented here, it is difficult to comprehend how a system reliant on equity investments could be sustainable through certain extreme market events, such as in Japan where the major stock index has lost over 70 percent of its value in the last 20 years.³⁶ It must be remembered that this is a retirement income system, not a brokerage account or even a savings account. As such, the focus is on how best to meet the conflicting needs of each

³⁴ Table 3 is based on an employee with a starting salary of \$21,347, annual real wage growth of 1.5 percent and annual employer contributions of 3 percent. Contributions accumulate at 4.5 percent and reach \$100,000 at age 67. Contributions cease at age 67. For annuitization shown after age 67, the \$100,000 continues to grow at 4.5 percent until annuitization. The Annuity 2000 mortality table and a 4.5 percent annuitization rate are used.

³⁵ $(1.16 \times 1.1 \times 0.5)$ for employer contributions + $(1 \times 1.1 \times 0.5)$ for employee contributions = 1.19. The 10 percent is consistent with the anti-selection that Poterba (2001) found in the voluntary vs. compulsory annuities markets.

³⁶ Nikkei.com (2009) reports that the Nikkei 225 stock index reached a high of 38,915.87 on Dec. 29, 1989, and in December 2009 was around the 10,000 level.

stakeholder, rather than providing direct government tax subsidies for potentially high-risk investment activity. While tax deductions for investments made outside the SERIOUS system will be eliminated, there will still be many ways (IRAs, variable annuities, etc.) to accumulate retirement wealth on a tax-deferred basis that will accommodate a wide range of individual risk preferences. Simply stated, by using the fixed-income markets, the SERIOUS system is able to provide income replacement nearing 50 percent for all employees with a modest level of regular contributions and protects those employees nearing and in retirement from volatility in their expected income.

12. Conclusion

Under current retirement systems (DB or DC) there are numerous possible causes for an employee to have an insufficient level of retirement income—inadequate employee financial knowledge, poor investment performance, inflation, employer bankruptcy, job turnover, lack of access to retirement plans and many others. One or more of these causes affect millions of employees and are extremely difficult to address in existing Tier II retirement income systems. The SERIOUS system addresses each of these issues and only by total lack of employee participation can inadequate retirement income result. However, by using automatic universal enrollment, automatic annual re-enrollment for employees who opt out, and automatic annual contribution increases, employee non-participation is minimized, providing a realistic opportunity for all employees to achieve a financially secure retirement future.

The SERIOUS system is a new model for the delivery of employer-based retirement income that considers both the needs and the available skills of affected stakeholders. The use of competing independent plan sponsors requires a new way of thinking, but it is fundamental in allowing optimal alignment of roles and responsibilities that can realistically be fulfilled with the existing skills of each stakeholder. Society establishes the system structure that is adjustable to changing conditions and provides for strong and efficient governance free from political influence and arbitrary benefit adjustments. Employers play a key role in achieving universal access to retirement savings without distracting from their core business operations. Employees are given both the responsibility and the necessary information to make sound decisions about preparing for retirement. Markets are utilized effectively in order to manage risk and provide an attractive level of benefits. By carrying out each of these roles successfully, the conflicting needs of each stakeholder can be satisfied to the maximum extent possible, and the SERIOUS system can be a sustainable retirement system for the 21st century and beyond.

Appendix

Table 2 in Section 11 has provided projections of income replacement rates generated by the SERIOUS system using guaranteed interest rates that are applied uniformly to all contributions. Since interest rates can differ by age and duration and for each contribution throughout a career, the interest assumptions used in Table 2 actually represent a weighted average of each of the guaranteed interest rates applied to each contribution. This Appendix demonstrates how the 3.5 percent and 5.5 percent interest assumptions were developed as a range for the actual weighted average that can reasonably be expected over a career.

As discussed in Section 9, it is expected that SERIOUS plan sponsors will primarily use fixed-income instruments, although some insurance company immediate annuity managers have used small amounts of equity to back these long liabilities (Santoloci 1991). Additionally, sponsors that have sufficient capital in excess of regulatory requirements could use equity or other alternative assets, allowing them, if successful, to provide a higher level of guarantee. Nevertheless, the focus here will be on the fixed-income markets and how the available yields relate to the level of guarantees provided by plan sponsors. Traditionally, long-term bonds have been used by insurance companies to fund their income annuity liabilities, and a review of long-term corporate bond yields shows that over the past 90 years the average annual yield has been about 6.5 percent.³⁷ This is just a starting point as plan sponsors still need to provide for expenses, allow for risk, and earn a profit. The SERIOUS system has an advantage over traditional insurance companies in that there are no commission and distribution expenses because of the central clearinghouse. Administrative expenses will be very low since the clearinghouse assumes many routine functions and spreads the cost among the plan sponsors. Both the SERIOUS system and traditional annuities must allow for asset default risk, reinvestment risk (discussed in Section 9), and the risk that mortality will decrease in a systematic fashion more than expected. Based on a number of studies, a conservative estimate would reduce yields about 1 percent annually, providing a net average yield of 5.5 percent.³⁸

However, costs for hedging inflation must also be considered. It is anticipated that plan sponsors will use a variety of techniques, such as inflation caps or swaps, to offset this risk. Hedging costs using these instruments are highly dependent upon the current and expected levels of inflation, the specific inflation guarantee involved (e.g., providing for inflation over 6 percent versus over 3 percent), among many other variables. In certain extreme scenarios it may even be cost-prohibitive to use some of these derivatives. As such, it is difficult to define an “average” inflation hedging cost. However, by constructing a hedge that does not depend on actual prices from the derivatives market, it shows not only that

³⁷ The 6.5 percent is calculated by the monthly average of the Moody's (2009) seasoned corporate bond index assuming an equally weighted portfolio of AAA and BAA bonds. This same index is used to determine the interest rate used in the calculation of statutory reserves for life insurance and annuities. BAA bonds, which are used in the often cited study of money's worth of annuities by Mitchell et al. (1999), have an average yield of 7.1 percent over the past 90 years based on the Moody's index. The net average rate of return on life insurance company fixed-income portfolios is 7.3 percent over the past 50 years (ACLI 2008).

³⁸ Page (2004) uses information from the Thrift Savings Plan to suggest that mandatory annuities purchased on a group basis through a central clearinghouse would reduce annuity benefits by at most about 5 percent (actual range given is 1 percent to 5 percent). The effect varies by age, but 5 percent of an annuity payment is equivalent to a 50–75 bps reduction in the interest rate. James and Song (2001) estimate that traditional immediate annuity providers reduce premiums about 6 percent, which is equivalent to a 70–90 bps interest rate reduction for administrative and investment expenses and reserves for mortality, reinvestment and other risks. Their commission and distribution expenses are not included in this figure. Milevsky and Young (2005) report that low-cost variable-payout immediate annuity providers have a mortality risk fee of 50 bps or less and charge an investment management fee of 5–50 bps. Poterba and Warshawsky (2000) report that administrative and investment expenses for the TIAA-CREF pension system are 30–35 bps. Claire (1988) stated that based on an informal survey of insurance company structured settlement providers, 100 bps is an average reduction in interest rate to cover expenses, reinvestment risk and profit.

the system can function in extreme scenarios, but also provides an upper bound on actual hedging costs that will be incurred. For example, a plan sponsor could invest a cohort of contributions in corporate bond. At the same time, a nominal Treasury bond can be sold short and TIPS bond purchased with the proceeds. The net yield to the plan sponsor is the real yield plus inflation provided by the TIPS plus the credit spread between the corporate bond and nominal Treasury. To illustrate using a numerical example, a corporate bond yielding 6.5 percent and a TIPS yielding 3 percent are purchased, and a Treasury bond yielding 5 percent is sold short. The result is a portfolio that will pay 4.5 percent plus inflation, which is the sum of the 3 percent real TIPS yield and the 1.5 percent credit spread between the corporate bond and the nominal Treasury. Subtracting the assumed 1 percent margin for expenses and risk, the plan sponsor is able to provide an interest guarantee of 3.5 percent that is fully protected from inflation. As the long-term real interest rate is about 3 percent, and the average spread between long-term corporate bonds and similar maturity Treasuries is close to 1.5 percent, a plan sponsor should be able to, without using any derivatives and regardless of the nominal market interest rates, provide a provide an average guarantee of about 3.5 percent.³⁹

While the hedge illustrated in the previous paragraph is appropriate for matching inflation-protected annuity payments, it actually provides too much protection, as only inflation exceeding the guaranteed interest rate needs to be hedged prior to annuitization. By using the derivatives market, a more appropriate hedge can be obtained at potentially lower cost. Since a 5.5 percent guarantee can be provided with no inflation protection and a 3.5 percent guarantee can be provided with full inflation protection, the plan sponsor can logically spend up to 2 percent on hedging costs. For example, if an appropriate hedge could be purchased for 1 percent in the derivatives market, then the guarantee could be set at 4.5 percent (6.5% yield – 1% hedge – 1% expenses). While available market yields and hedging costs will vary continuously, this analysis has demonstrated that plan sponsors who use long-term bonds to fund their liabilities should be able provide a career average guaranteed interest rate of between 3.5 percent and 5.5 percent.

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³⁹ A study by Girola (2005) found that the long-term real rate of interest is about 3 percent. For the credit spread assumption, the monthly average of the Moody's (2009) seasoned corporate bond index assuming an equally weighted portfolio of AAA and BAA bonds was used. Based on this portfolio, a spread of 1.3 percent was obtained over the Long-Term Government Securities from 1925–2000 and a spread of 1.4 percent was obtained over the 30-Year Treasury Constant Maturity Rate from 1977–2009, excluding a portion of 2002–2006 when the series was discontinued (Federal Reserve 2009). Since typical insurance portfolios appear to be weighted more heavily toward BAA bonds, a slightly higher 1.5 percent spread was used.

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“The SERIOUS System: A New Model for Retirement Income Success”

by Cynthia J. Levering

1. Overview

Ken Beckman’s “Successful Employee Retirement Income Outcomes in the U.S. (SERIOUS)” creates a comprehensive Tier II system using deferred annuities to create secure retirement. It is a plan in which more workers should end up with Tier II benefits than today after participating in a voluntary, less risky system that is expected to be less costly to employers. The system is a comprehensive design using existing products and structures that meets most stakeholder needs. While some market and governance issues would need to be addressed, they are likely not insurmountable. It is designed to be simple and easy for employees to understand.

Beckman admits many of the features of his system have been around for a while and some have already been implemented. What he feels he has done is to bring the components together to create a comprehensive system that better meets the needs of all stakeholders. A few issues are either not 100 percent clear or need to be resolved, including the time and costs to transition to this new system, which will require legislative action.

2. Key Elements of the System

The system’s strengths are in auto-enrollment, flexibility of contribution levels (for employers and employees), use of deferred annuities to provide longevity and inflation protection, and centralized plan sponsors. The employers’ role is generally limited to collecting and transmitting contributions to the sponsor of the employee’s choice, which relieves the employer of establishing and maintaining a plan. Their job will be to make sure contributions (employee and employer, if provided) are transmitted to a central clearing house that handles all administrative services (e.g., processing contributions, disbursing benefits). This change could have two positive outcomes:

- (1) Employers without existing plans, especially small employers (and even self-employed individuals), might be willing to start contributing on behalf of their employees, and
- (2) Employers with existing plans might contribute more to the new system once they no longer face the same costs of sponsoring their own plans. (Existing plans could coexist with SERIOUS, so costs for the present system would not necessarily drop to zero.)

While the benefits aren’t portable, a centralized administration system would provide information on all benefits accumulated to date to help employees track their progress in accumulating retirement income. The system permits some lump-sum payments, while keeping the primary focus on annuity income at retirement, including novel ideas for supporting the costs of long-term care. Details about the oversight and governance would need to be determined, and there could be a long ramp-up time (and high cost) to get plan sponsors established.

The SERIOUS system is actually quite simple and should be easy for employees to understand—always a good thing. Investment and asset allocation decisions will be taken over by independent plan sponsors. Employers will be relieved of the burden of establishing and maintaining retirement plans.

SERIOUS is a voluntary system, which is a plus because a mandatory Tier II system does not seem politically feasible in the United States at the present time. However, voluntary systems mean some people will remain unprotected. Automatic enrollment is designed to increase participation. Workers can opt out, but they will be automatically reenrolled every year, another feature that should increase participation.

Tax deductible contributions and a tiered bonus tax incentive are designed to encourage employer participation. To qualify for the tiered bonus tax incentive, employers must make a minimum contribution of 1.5 percent of a capped salary for all employees, even those who do not contribute on their own. This ensures all employees will end up with something in the way of SERIOUS benefits. It might not be much, but perhaps some workers who see the modest accumulations will realize they need more and will begin to augment them with their own contributions.

Employees will have a minimum of decisions to make—selecting a plan sponsor and a contribution percentage. Some may look unfavorably upon this limited involvement, but it is probably the best approach for most workers given the lack of financial literacy in the general population. Those who want to manage their own investments can do so with Tier III individual accounts.

3. Pros

- Initial and annual auto-enrollment encourages broad labor force participation.
- No contributions are required of employees or employers—individuals set their own levels. In addition, the contribution rate will increase automatically each year (auto-escalation), meaning greater savings build up as earnings (presumably) increase with tenure.
- Limited lumpsums from employee contributions could be made available. This might encourage more participation from workers who do not want to see all their money tied up in an annuity but who want to hedge their longevity risks. However, lifetime income rather than the accumulation of assets will be the main focus.
- Mandated annuity purchases at the time the contribution is made and post-retirement inflation indexation would protect against longevity risk as well as enhance robustness and sustainability.
- Post-retirement income levels are reasonably predictable, with the degree of predictability increasing throughout the contribution period.
- Supplemental annuity payments will be available in the event long-term care is needed. This is another feature that might make annuitization more attractive to workers who like the idea of some guarantee but do not want all their money tied up in case of an emergency.
- Investment decisions reside with the plan sponsor so there is no need for individual investment skills.

- Employers are relieved of the burden of sponsoring and administering plans and there would be no fiduciary, business or regulatory risk for employers, although employers would have to auto-enroll all their employees each year.
- Employers can still attract and retain employees by setting a more generous employer contribution level with a related vesting schedule.
- The large size of the resulting plans could assist in achieving strong governance practices and reducing moral hazard, especially since third party plan sponsors would be independent of any employer or employee group. Large plans providing centralized administration and oversight also promote economies of scale and should result in lower administrative costs and greater efficiency.
- A system-wide insurance fund would reimburse impacted investors up to certain limits if a plan sponsor could not meet obligations.
- Risk would be borne by individuals but it is designed to be hedged which should encourage markets to develop new hedging instruments.
- The plans will presumably be able to handle extreme events but plan sponsors will have to have a system of risk management and establish a level of capital to deal with risks taken.

4. Cons

- While both employers and employees prefer voluntary contributions, this poses a risk that sufficient retirement income won't be provided.
- Attainment of a reasonable level of benefit would be dependent on a contribution level of at least 6 percent of pay over the employee's working lifetime.
- Standardized benefits may not be responsive to family needs.
- Allowing annuitization beginning at age 60 could send a signal that this is an appropriate retirement age. In addition, no early retirement subsidies are provided.
- Members choose their plan sponsor which requires some level of knowledge and expertise and will depend on the quality of the communication provided.
- The long-term care benefit may not be sufficient.
- There is no effective enforcement mechanism for capital/insurance requirements—it is unclear whether trust or insurance law would govern.
- The large nature of the resulting plans could lead to concentration of decision-making authority and impact the strength of governance, such as politically oriented board appointments.

- Since adjustment is limited to future contributions, where rates will be very visible and participants have full latitude to choose a plan sponsor, a sponsor could potentially spiral downward very quickly.
- It is not clear costs will be transparent.
- The funding of the clearinghouse and plan sponsor market oversight is unclear and ensuring appropriate reserves from the outset may take some time.
- It would seem to take a while to get the plan sponsors up and running. It is possible existing companies could spin these off fairly quickly, but it may require a great deal of regulatory change.
- A significant amount of infrastructure must be set up before implementation, including such things as centralized administrators, oversight boards, competitive markets for long-deferred annuities, and special statutes.

5. Questions for the Author

- Will lower-paid employees be able to participate, even at a modest level?
- Who monitors or regulates the information provided to individuals? Would employees be given enough standardized information to be able to compare the various plan sponsors?
- Will competition for participants drive up advertising/administration costs?
- Are the assumptions used to produce a 40 percent replacement rate reasonable?
- How sensitive are the benefits to modest changes in assumptions?
- Do these plans function as insurers or trusts?
- How will the clearinghouse be funded?
- What safeguards could be used to prevent large plan sponsors from abusing their authority?
- Since existing plans could coexist with SERIOUS, how would the transition from the current system be encouraged or incentivized besides using tax incentives?
- What could be done to minimize the cost of the system and feasibility of providing guarantees?
- What happens if plan sponsors take on excessive risks?
- Since the underlying investments are more geared to fixed income than equity, what impact will this have on the capital markets?
- Could a similar system work in the Canadian context?

6. Conclusion

The main strengths of the SERIOUS system are in its simplicity, auto-enrollment, flexibility of contribution levels (for both employers and employees), use of deferred annuities to provide longevity and inflation protection, and centralized plan sponsors. The employer's role is limited to collecting and transmitting contributions to the sponsor of the employee's choice which may appeal to employers of all sizes. The benefits aren't necessarily portable but a centralized administration system will communicate all benefits earned to date to help employees track progress in accumulating retirement income. The system permits some lump-sum payments, while keeping the primary focus on annuity income at retirement, including novel ideas for supporting the costs of long-term care. Details about the oversight and governance would need to be determined and there could be a long ramp-up time to get plan sponsors established. The cost of the system and feasibility of providing these guarantees could also be greater than the author anticipated. However, the system is a comprehensive design that meets many stakeholder needs; market and governance issues would need to be addressed but are likely not insurmountable. Most importantly, if the assumptions the author used in his projections hold out, employees should, with SERIOUS, be able to provide themselves with a reasonable income to supplement Social Security.

Cynthia J. Levering, ASA, MAAA, EA, is a retired actuary in Baltimore, Md.

Author's Response to Comments by Cynthia J. Levering

By Ken Beckman

This is not a response to a specific question, but I noticed in a couple of places Ms. Levering states “the benefits aren't portable.” To be clear, no benefits are lost when someone changes from one plan sponsor to another. The contributions always stay with the plan sponsor where they were originally made, but the retirement income projections (and subsequent benefit payments) from all plan sponsors that an individual may have used are automatically combined by the clearinghouse.

- **Will lower-paid employees be able to participate, even at a modest level?**

One of the primary benefits of the SERIOUS system is to make a retirement system available to all employees, regardless of income. Currently, only 43% of employees in the bottom wage quartile are even eligible for an employer-sponsored retirement plan (p.10). Additionally, in order for employers to qualify for tax incentives they are required to contribute 1.5%—even for employees who do not contribute themselves (p. 10). This should increase the participation among lower-paid employees significantly.

- **Who monitors or regulates the information provided to individuals? Would employees be given enough standardized information to be able to compare the various plan sponsors?**

The governing board of the SERIOUS system would monitor (p.15). The primary information used to compare the plan sponsors will be the interface showing the annual income amounts at various contribution rates and retirement ages (p.11). However, it may also be appropriate to include some type of standardized qualitative information about the plan sponsors.

- **Will competition for participants drive up advertising/administration costs?**

This is certainly a possibility, but the intent is for participants to primarily rely on the interface (p.11) showing annual income amounts at various contribution rates and retirement ages rather than be influenced by expensive marketing campaigns.

- **Are the assumptions used to produce a 40 percent replacement rate reasonable?**

The 40% replacement rate is based on 6% employee and 3% employer contributions at a 3.5% interest rate and Annuity 2000 mortality table (p.9). While it may be true that a significant number of employees and employers will never contribute at these rates, for those that do, I believe these underlying assumptions to reach the 40% replacement rate are reasonable.

- **How sensitive are the benefits to modest changes in assumptions?**

The table included in the paper (p.22) does indicate that benefits are sensitive to the assumed guaranteed interest rate, but it is also stated that even with a 0% interest rate assumption for all years and modest employee and employer contributions, a 25% replacement rate can be achieved at retirement age 67.

- **Do these plans function as insurers or trusts?**

I would leave this detail to the SERIOUS board to determine.

- **How will the clearinghouse be funded?**

By the participating plan sponsors (p. 5).

- **What safeguards could be used to prevent large plan sponsors from abusing their authority?**

The SERIOUS board will establish certain safeguards against abusive practices. In addition to regulation, continuing education/communication coordinated by the board would let participants know they can change plan sponsors at any time without penalty, which also serves as a safeguard.

- **Since existing plans could coexist with SERIOUS, how would the transition from the current system be encouraged or incentivized besides using tax incentives?**

One option (p. 21) is to allow rollovers from existing DC plans into SERIOUS.

- **What could be done to minimize the cost of the system and feasibility of providing guarantees?**

A concern highlighted in the paper (p. 19) is the need for an increased supply of inflation-linked securities. An increased supply of these instruments would likely be most helpful in minimizing the cost of providing guarantees.

- **What happens if plan sponsors take on excessive risks?**

The risk measurement system and capital requirements (p. 16) required for each plan sponsor with oversight by the SERIOUS board would mitigate this possibility.

- **Since the underlying investments are more geared to fixed income than equity, what impact will this have on the capital markets?**

Clearly, the demand for fixed income, especially inflation-linked instruments, should increase under the SERIOUS system, but I don't have any estimates on what the impact will be to the capital markets overall.

- **Could a similar system work in the Canadian context?**

The SERIOUS system was designed specifically for the U.S. market, but it does have the potential to be implemented in other countries (p. 21), although I do not have sufficient knowledge of Canadian or other markets to comment further.

The Tracker Plan: A Controlled Risk Defined-Contribution Retirement Program

By Rowland M. Davis

Abstract

The U.S. retirement system is not working. Reform is needed, and this paper explores one idea to help expand coverage and increase the level of retirement savings among all workers. The Tracker Plan is designed so that financial risk can be shared between the participant and employer, but it is a defined-contribution program in the sense that any residual risk ultimately falls to the participant. The employer obligations are subject to a hard cap. Various features are utilized to ensure that the level of shortfall risk to the participant is carefully controlled, with specific probability targets for successful outcomes. The paper describes how the Tracker Plan can be structured and tests the effectiveness relative to specific, measurable goals. Public policy choices are explored, and suggestions are offered.

1. Introduction

The U.S. retirement system is in the early stages of a slow-motion crisis. Numerous articles and books have provided the dismal details, but the conclusion is always the same: most of today's workers are headed for an insecure retirement. If not corrected, the current retirement system will lead to some combination of the following:

- Dramatic reductions in the living standards for many senior citizens and/or
- Significant increases in the public support provided to senior citizens (in effect, another deferred obligation that we will be passing on to future generations of workers and taxpayers, albeit a largely hidden obligation).

The current retirement system can be characterized as a relatively modest paygo defined-benefit Social Security program, supplemented by a highly fragmented collection of voluntary savings and benefit arrangements. At the employer level, the voluntary nature of the system has resulted in no coverage at all for nearly half of the workforce, and sudden sharp reductions in coverage for many others when plans are closed or frozen. At the individual level, workers are often being asked to make a wide variety of complex financial decisions for which they are poorly prepared.

Furthermore, these arrangements are clustered at the two extremes of the risk-sharing spectrum. At one end are the so-called "traditional" pension plans, where a fixed benefit is determined at retirement based on a specific formula, and that benefit is payable for life. The financial obligation, and risks, of meeting that promise fall to the sponsor. (However, the worker is actually exposed to a significant amount of risk as long as the arrangement is voluntary. If the sponsor decides to close the plan, the worker in mid-career absorbs a major financial shock. This hidden risk factor for voluntary pension plans has become apparent in recent years as sponsors have abandoned their pension arrangements.) At the other end of the spectrum are the "traditional" defined-contribution plans, such as 401(k) arrangements, where the sponsor merely matches some portion of employee contributions. The individual decides how much to save and how to invest the funds, and the uncertain outcome of these decisions leaves the

worker at significant risk. This framework has not worked. Nobel Laureate Robert Merton summarized the situation well in a recent address: “The essence of the current challenge is thus: Defined-benefit is expensive to the sponsor, but its beneficiaries very much like the simplicity and security of the payout pattern it offers as base coverage. Defined-contribution is a lot less expensive and well-defined in terms of risk exposure for the sponsor but is too complex and too risky for the end user.”

A new framework is needed—one that significantly increases our aggregate savings, spreads it among all workers, and shares risk in a way that makes it manageable for all parties. And this new framework is needed soon. Although the crisis unfolds in slow motion, and thus is not very prominent on the public’s radar, retirement savings are a very long-term endeavor, and delays make the problems much larger and more difficult to solve. Lost savings opportunities cannot be back-filled, especially in the challenging economic environment we now face.

Most benefit professionals believe that the best structures for the future are risk-sharing arrangements that combine many of the best elements from the current traditional plans. This article presents the Tracker Plan, which is just such a risk-sharing arrangement, and describes how it could fit into a restructured retirement system. The article will proceed as follows. Section 2 describes the overall framework for thinking about retirement systems, showing where the Tracker Plan fits and the role it is designed to fill. Section 3 provides details on how the Tracker Plan is structured. Section 4 shows the results of back testing the Tracker Plan using historical experience and measures the effectiveness through the use of a Monte Carlo simulation model. Section 5 describes the major choices available to policymakers and offers some suggestions and the rationale for these suggestions. Separate subsections will look at coverage provisions, uniformity, the size of benefits and employer cost, the operational framework, the investment framework, and supplemental plan arrangements. Section 6 compares the Tracker Plan with a closely comparable defined-benefit arrangement. Section 7 introduces a way to quantify results in a simple manner, so that different design options can be easily compared.

2. Retirement System Framework

The most comprehensive framework for describing retirement systems is one used by the World Bank in its *Pension Reform Primer*. This framework describes five separate components, or pillars:

- Zero Pillar—noncontributory basic benefit financed by the government.
- First Pillar—mandatory paygo government plan with contributions linked to earnings and objective of partial income replacement.
- Second Pillar—mandatory defined-contribution plan with independent investment management.
- Third Pillar—voluntary pension and retirement savings plans, both employer-sponsored and individual.
- Fourth Pillar—informal support (e.g., family), other formal social programs (e.g., health care, housing), and other individual assets (e.g., home ownership).

In the United States there is really no broad-based Zero Pillar program specifically for senior citizens, and Social Security provides the First Pillar benefits. There are no mandatory Second Pillar programs, and all the various plans that makeup our private retirement system fall into the Third Pillar.

In this paper I assume that the Social Security system remains largely in its current form, where all workers must participate and contribute, and where benefits will be based on a formula that creates a progressive structure of partial income replacement at projected levels based on indexed career earnings. (Specifically, my retirement accumulation targets use projected Social Security benefits in 2049, at which time benefits for an average worker will be about 20 percent less than for currently retiring workers.) The Tracker Plan fits into the Second Pillar, although there is a policy choice of a completely mandatory program or one based on auto-enrollment with an opt-out provision. I also assume that a strong set of options will be available in the Third Pillar to provide supplemental benefits on a voluntary basis. The Third Pillar might function much like today's system, but with benefits resized and redesigned to reflect the new Tracker Plan benefits from the Second Pillar.

Here is my rationale for this choice of overall structure. The current system of voluntary Third Pillar plans is failing—with very weak coverage and with inadequate benefits for many of those that are covered. The U.S. government is in no position now, or anytime soon, to offer more tax incentives to broaden coverage—but failing to expand coverage and savings is just another form of deferred obligation for future generations. The only viable solution is to create a universal program that is mandatory, or at least a nearly universal program through a combination of mandates and automatic default provisions. Any such program must be fully funded, and, because of the need for some level of mandates, it cannot impose significant financial risks or administrative burdens on employers.

I also believe that trying to accomplish everything through a single program is unrealistic. So the Tracker Plan should be limited in scope, and a robust set of Third Pillar arrangements would complete the overall system. The goal for the Tracker Plan is to provide a structure where workers can meet their basic retirement needs easily, without the need for complex decisions or choices. This indicates that a highly standardized set of provisions is needed, where the primary decision is to be in the plan (the default option) or to be out, and that a strong emphasis on risk control is paramount. Supplemental Third Pillar plans can offer the flexibility and choice that some workers desire, and because of the controlled level of risk in the base Tracker Plan benefits, these supplemental plans can offer opportunities for enhanced returns that would entail more risk and uncertainty.

3. The Tracker Plan

This section describes the specific operation of the Tracker Plan—the particulars of how money flows into the plan, how it is invested, and what happens at retirement. Where choices are available for certain plan parameters, I indicate the selections I am using to present the analysis in this paper and the rationale for these selections. Section 5 will provide more discussion of policy choices that are required before implementation. However the program is implemented, I strongly believe that the parameters for the program must be uniform, or very nearly uniform, across the full U.S. workforce. Without this uniformity the Tracker Plan concept loses a great deal of its strength.

3.1 Overview

At the participant level, the major goals for the Tracker Plan are to:

- Provide an automatic path for participants to follow in accumulating the assets required to meet their retirement income needs.
- Control the risk of adverse outcomes, where assets are insufficient to meet needs.

- Provide full portability throughout a career with multiple employers.

At the macroprogram level, the major goals are to:

- Have universal coverage.
- Operate the plan(s) and manage the investments efficiently, professionally and at a low cost to the participants.
- Keep employer obligations, both financial and administrative, at reasonable and manageable levels, with a known upper limit on annual cost under worst case conditions.
- Never have any unfunded obligations.

With traditional defined-contribution arrangements, two of the most common criticisms are that they are too risky for participants, and that participants lack the skills and training needed to make the critical financial and investment choices required for successful outcomes. The Tracker Plan meets these problems with a primary emphasis on risk control and simplicity:

- For each participant there is a single investment vehicle that gradually decreases risk over the course of a career (i.e., the target-date fund concept is utilized—but at a lower level of risk than is common in today's funds).
- There is a standard contribution pattern to follow throughout the participant's career, designed to accumulate to the required target amount at retirement.
- Progress toward the target is monitored, and adjustments are made according to a fixed set of operational rules based on tracking error:
 - o If performance is adverse and the fund is tracking below the desired target path, then additional contributions may be triggered, up to a fixed maximum add-on.
 - o If performance is favorable and the fund is tracking above the desired target path, then the investment risk may be reduced to preserve the cushion.

Risk control is a critical objective, and specific measures and standards are needed to determine whether the amount of risk is contained within reasonable levels. My selected standards are that (1) with about 90 percent confidence, the participant will meet or exceed the desired target asset accumulation and (2) for those cases where the target is not met, the shortfall can be managed with relatively painless steps, which would include working no longer than one year beyond the regular retirement date. These specific standards became my benchmark test for each design option I analyzed with the Monte Carlo simulator. Through an iterative process I refined each of the design parameters to optimize the risk control results. The remaining subsections describe the specific Tracker Plan model that resulted from this process. There are subjective calls made along the way, but mostly these were to maintain simplicity of design unless there were noticeable improvements in the risk control outcomes.

3.2 Scope of Coverage

The Tracker Plan is designed as a Pillar 2 program to ensure that workers can maintain a reasonable standard of living in their retirement years. I would characterize it as a core benefit, to work in combination with Social Security. To maintain this emphasis on core benefits and to control employer costs for this Pillar 2 program, I suggest that an earnings cap apply when contributions are determined. A cap that would not restrict contribution levels for median income workers seems reasonable, and the level of the cap should then be tied to the median level of earnings for workers in the latter portion of their careers, when merit and seniority effects are embedded in their pay levels. Based on the 2008 Current Population Survey information from the Census Bureau, the median earnings for workers aged 55 to 64 years old is \$50,000. For administrative simplicity, the cap could be tied to some other average wage figure already in use by the government for other purposes. A good candidate might be the Average Wage Index (AWI), which is used in the calculation of Social Security benefits. In 2008, Social Security benefits were calculated on the basis of earnings indexed up to the 2006 AWI of \$38,651, so the earnings cap could be pegged at something like 130 percent of the AWI from two years prior.

For workers with pay that exceeds the cap, supplemental plans may be offered by employers to provide a more complete retirement savings package. Possible supplemental arrangements are discussed in Section 5.

Broad participation is a critical goal, so auto-enrollment procedures should be used. A mandatory participation framework could also be considered, but that may be a difficult political choice. Employers would be required to enroll workers automatically at hire, and I believe there should be a schedule of later auto-enrollment events for those not participating, perhaps at age 35 and again at age 40. These scheduled events would also provide a focal point for communication with all workers about the need for adequate retirement savings.

3.3 Retirement Income Target

The first parameter choice is to select a target level for retirement income. I choose a target 75 percent income replacement ratio at age 65, inclusive of Social Security, for a worker with median career earnings. This means that at age 65 the total income available from Social Security benefits plus the Tracker Plan benefits will be equal to 75 percent of the gross income at the time of retirement. The Tracker Plan benefits are based on annuitizing the accumulated funds at age 65, with an assumed post-retirement increase factor of 2.5 percent per year. The Social Security benefit used is based on retirement at age 65 in 2049, and this produces a 32 percent replacement ratio for Social Security alone. To meet the 75 percent overall target, the Tracker Plan benefit should replace 43 percent of pre-retirement income.

More specifically, recognizing the risk control objectives stated in the previous section, the Tracker Plan benefit should equal or exceed 43 percent of final pay with about a 90 percent probability, and should almost never fall much below 38 percent of final pay (a 5 percent to 6 percent shortfall is about what a worker can expect to recover by working to age 66 instead of to age 65).

The 75 percent income replacement target is well supported by various researchers as one that will generally allow medium-level earners to maintain their standard of living after retirement, reflecting the changes that occur in their tax and saving situations. In particular, the long-running Georgia State University/Aon Insurance project on replacement rates shows that medium earners need 74 percent of

their pre-retirement income in order to maintain the same standard of living after retirement. However, some experts note that a higher income replacement target is required when medical costs after retirement are more carefully recognized. Two key factors are the future rate of medical cost inflation, and potential reforms that might shift more of the cost to retirees.

Forty years into the future, the retirement age for full Social Security benefits will be age 67. I choose age 65 as my target retirement age to reflect that many workers retire before the age when they can receive full Social Security benefits, and also because delayed retirement becomes the ultimate tool available for participants to deal with adverse investment experience in any defined-contribution arrangement. Choosing a target retirement age later than age 65 would effectively remove, or at least diminish, this important risk management option for workers when they must bear the residual risk from a defined-contribution program.

3.4 Fund Investments

Accumulated contributions to the Tracker Plan for each participant will be invested in a single tracker fund, which has a declining allocation to equity assets as the worker moves toward retirement age. This is the now well-accepted idea behind target-date funds, based on the life cycle financial framework (recognizing both financial assets and the human capital provided by future income-earning years). However, within the Tracker Plan framework the risk control objectives play a very important role in determining the proper level of investment risk. To keep the retirement benefit risk within the desired constraints, the overall investment risk should be significantly lower than what is commonly embedded in many of the target-date funds in use today.

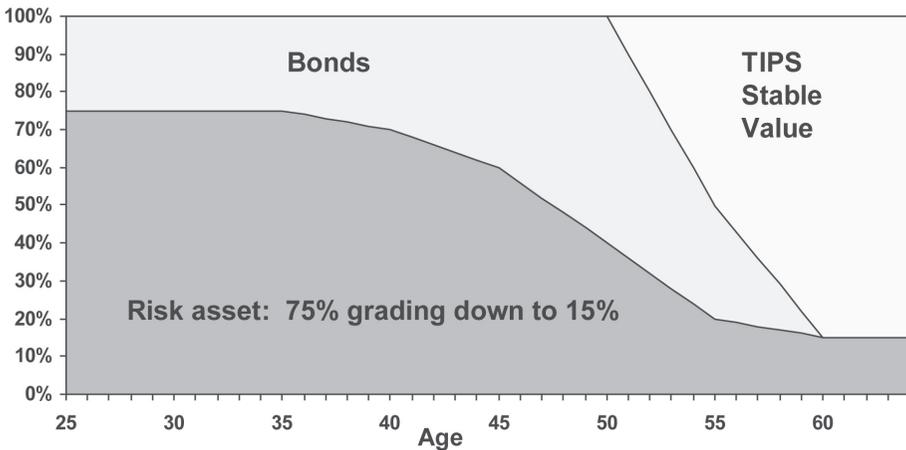
The fund allocations will be among three separate investment pools: (1) a risk asset portfolio, which would be a diversified portfolio of equities and other assets that has the objective of earning the best long-term risk premium possible; (2) a fixed-income portfolio, which would include core bond holdings similar to the Barclay's Aggregate Bond Index; and (3) a stable value fund invested in Treasury inflation-protected securities (TIPS), which has the objective of earning a stable real return. For a core benefit arrangement like the Tracker Plan, the investment process must meet two critical standards:

- *Controlled Risk*—Risk cannot be avoided, but the fund investment decisions must always focus on the long-term goal of accumulating toward a fixed target amount with a very limited risk of shortfall at retirement age.
- *Low Expenses*—A low expense ratio is extremely important for the fund, which can be accomplished through managing funds on a large scale (discussed more fully as part of the organizational structure of the plan), and likely use of passive investment funds for a substantial portion of the assets.

After testing a wide range of alternatives with the Monte Carlo simulation model, Chart 1 shows the allocation pattern, or glide path, that maximizes the return while keeping downside risk within the required range.

Chart 1

Tracker Plan Glide Path



The fund starts with a 75 percent allocation to the risk asset portfolio and a 25 percent allocation to the fixed-income portfolio. The equity allocation begins to decline at age 35, and the decline becomes more pronounced at age 45. By age 60 the equity allocation reaches 15 percent and remains at that level until retirement (subject to a possible dynamic adjustment discussed in the section on the tracker adjustment process). Between ages 50 and 60 there is also a shift from the fixed-income portfolio to the stable value fund. This is to provide protection against unexpected inflation in the years just prior to retirement, which can cause major investment losses in a standard fixed-income portfolio at the worst possible portion of the asset accumulation process.

In theory, there would be a separate tracker fund for each age cohort, but since the allocation remains steady until age 35, that is the age when a worker would enter his specific tracker fund. Prior to age 35 everyone will be in a common 75/25 fund. Furthermore, the Tracker Plan concept should work well even if three-year age groups are consolidated into a single tracker fund. Eventually there would then be 10 separate tracker funds maintained at any one time for workers between ages 35 and 65. Each of these would own the appropriate number of units in each of the three portfolios to maintain their allocation targets.

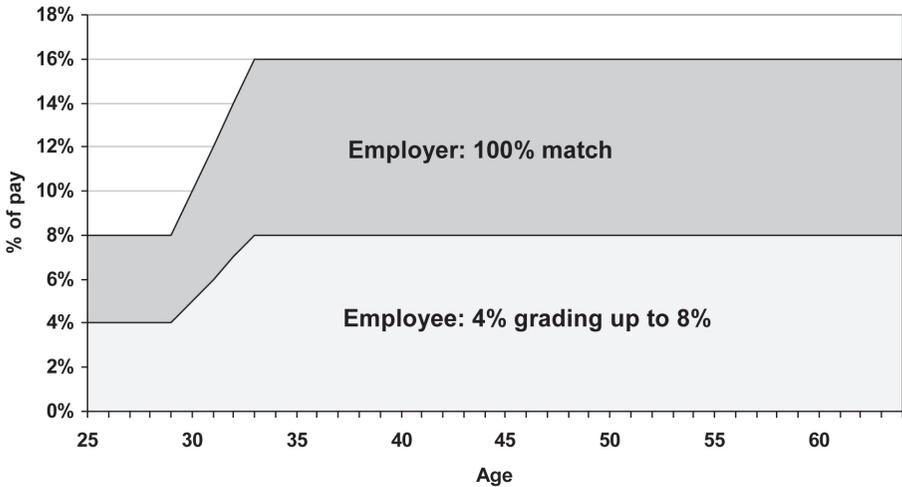
3.5 Contribution Schedule

To provide a lifetime income equal to 43 percent of final pay requires a total fund accumulation equal to 7.5 times final pay at age 65, assuming a 2.5 percent annual increase in the benefit after retirement and using a real yield rate of 2 percent and projected future mortality rates to price an annuity factor. However, the pre-retirement investment and inflation risk factors mean that any future accumulation amount can only be described by a distribution of possible amounts, and the goal of the Tracker Plan is to create a distribution where about 90 percent of the possible outcomes would equal or exceed the required 7.5 multiple. The 7.5 multiple is really something of a “soft floor” value, and the actual

working target amount will need to be larger. With any set of economic assumptions, the range of the distribution is a function of the investment risk. Since we defined a specific investment process in the previous section, the Monte Carlo simulation model can be used to determine what the median accumulation target is for a distribution that meets the 90 percent confidence objective. The process actually involves an iterative test of multiple variables, but in the illustrations used for this paper I derived a target accumulation at age 65 equal to 8.85 times final pay.

With this working target amount at age 65, plus a specific investment process, we can find various contribution schedules that will meet the target under a set of economic assumptions. Chart 2 shows the contribution schedule that I am using for this paper.

Chart 2
Tracker Plan Contribution Schedule



Total contributions start at age 25 equal to 8 percent of pay, and then increase in 2 percent steps for each year between ages 30 and 33, reaching an ultimate level of 16 percent of pay from age 33 through retirement. The way that the contributions are split between employee and employer is a political choice parameter discussed later, but for the illustrations in this paper I have assumed that contributions are split evenly.

The graded pattern of contributions seems preferable to a flat schedule, as it reflects the kind of choices typically made by participants in 401(k) programs. These observed patterns presumably reveal the desired preferences of workers, and reflect the fact that younger workers put less value on retirement savings, as compared with other financial needs.

For many people, these contribution rates may seem surprisingly high, but they reflect what is really needed to meet the required target with about a 90 percent level of confidence. The rates really reflect the always present trade-off between risk and reward—an arrangement with low risk will require larger inputs to meet the required target. Many employers in the United States have walked away from

defined-benefit programs because they do not like the financial risk exposure. Workers should reasonably expect that their risk in a defined-contribution arrangement will be restricted to a manageable level. There is a cost for this protection, but I believe it is an essential part of any Pillar 2 core benefit arrangement. These issues are discussed more in Section 5.3.

3.6 Automatic Tracking Adjustments

The truly unique feature of the Tracker Plan is a set of automatic adjustments that will help to keep accumulations on the desired path toward the required target. These adjustment provisions are a key part of the risk control process, and they facilitate a sharing of risk between workers and employers. There are two types of adjustments:

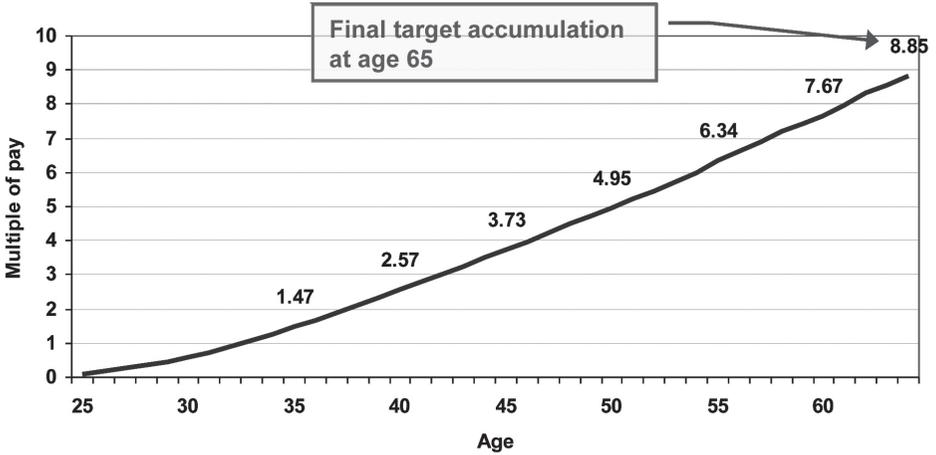
- If performance is adverse and the fund is tracking below the desired target path, then additional contributions may be triggered, up to a fixed maximum add-on.
- If performance is favorable and the fund is tracking above the desired target path, then the investment risk may be reduced to preserve the cushion.

The tracking process does not need to be done at the individual participant level, as long as all plan features remain standardized. A hypothetical account can be tracked for each of the tracker funds, based on the assumption of a median income worker making the scheduled contributions, and earning the investment returns actually realized by that tracker fund. The tracking error for this hypothetical account will be monitored, and on an annual basis the level of the tracking error will be used to trigger any needed automatic adjustments for all of the workers in that tracker fund. Within each tracker fund, workers will all be treated in exactly the same way.

First, we need to develop the accumulation path that will serve as the tracking benchmark. Making assumptions about expected returns and inflation, and reflecting the uncertainty of these by using the Monte Carlo simulation model, we can input the year-by-year contribution rates from the schedule described in Section 3.5 and accumulate these fund returns based on the tracker fund allocations described in Section 3.4. The resulting accumulation values at each age can be expressed as a percent of pay, and we then have the range of pay multiples at each age that might be expected. The median value from this simulation range can then be used as our tracking benchmark. Tracking error will be measured against this benchmark, and the tracking error will determine what kind of automatic adjustment, if any, needs to be made for all the participants in that tracker fund. Chart 3 shows the benchmark pay multiples that I am using for this paper. Note that the ending value at age 65 is the 8.85 value mentioned in the previous section.

Chart 3

Tracker Plan Target Accumulation



The schedule of adjustments based on tracking error was developed using the Monte Carlo simulation model to iteratively test and then refine various choices for these adjustment factors, until the level of risk control could not be further improved without adding significant complexity. The resulting adjustment factors used for this paper are shown in Chart 4. I have chosen to begin the adjustment process at age 40, which was about the latest age where the process could control downside risk to the needed degree.

Chart 4

Tracker Plan Automatic Adjustments

If experience is favorable and tracking error after age 40 is greater than +5%, reduce investment risk:

- Reduce the allocation to the risk asset portfolio by one percentage point for every percentage point that the tracking error exceeds +5%
- If adjustment is made, switch to the bond portfolio
- Example: tracking error at age 48 of +15% triggers a 10% reduction in the risk asset allocation, and a 10% increase in the bond portfolio allocation.

If experience is unfavorable and tracking error after age 40 is less than trigger level, employer makes additional contributions:

- The tracking error trigger level is -15% from age 40 to 44, -10% from age 45 to 49, and -5% from 50 to retirement.
- Additional contribution rate is 0.6% of pay for every percentage point that the tracking error is below the trigger level, up to a maximum of 7% pay.
- Example: tracking error at age 48 of -12% triggers an additional contribution of 1.2% pay.

One issue is whether any additional adjustment contributions should be shared between the worker and the employer. This is certainly possible, but in my illustrations I assume that all additional contributions are from the employer. I believe this is the preferred approach since the worker ends up taking on any residual risk under any defined-contribution plan, including the Tracker Plan, so the additional contributions are the primary way for the employer to share in the overall risk of the program.

Another issue is whether some sort of claw-back arrangement could be used if the employer made additional contributions, which later became unnecessary if strong investment performance created a significantly positive tracking error. Again, this is possible and would lower the expected cost somewhat, but my view is that the additional complexity does not warrant such a feature.

The need for additional contributions is fairly obvious when a significant negative tracking error develops, but the adjustment to a lower risk investment policy in response to a positive tracking error may be less intuitive. The idea is that if a sufficiently large safety cushion has developed, relative to the 75 percent total income replacement target, then downside risk can be further controlled by effectively locking in the safety margin. The amount of incremental risk control is actually fairly modest in the Monte Carlo simulation, but we will see later how effective this feature would have been for workers retiring in 2009—essentially dodging the 2008 market turbulence. Because of this I believe the feature is worthwhile.

3.7 Participant Communication and Retirement Planning

I believe the Tracker Plan provides an extremely useful frame of reference for communication with participants. They should all get regular communication materials on how well their tracker fund is progressing toward the desired target—for the hypothetical worker that serves as the benchmark for their age cohort they will see what the current accumulation is as a multiple of pay, and how this compares with the target multiple at that age. If they have contributed fully since at least age 25, then they will also know how well they are progressing, as their own accumulation should closely track that of the benchmark. Accumulated funds as a multiple of current pay become a very powerful and intuitive metric when there is a benchmark multiple to compare with. Workers who have not made full contributions, or whose pay has exceeded the cap, can quickly see how much less their own pay multiple is than the current multiple achieved by their tracker fund, and also with the target pay multiple for their age. Convenient online tools could show how additional supplemental savings might be used to close the gap. Also, the Tracker Plan has some natural points during the career when retirement planning communication efforts could be more concentrated and focused—such as age 35 when they first enter their tracker fund, and again at age 40 when the first automatic adjustments may be made.

3.8 Portability and Plan Distributions

Portability is a measure of how well benefits are preserved when a career is broken into many segments with different employers. Full portability means that workers would get exactly the same benefit if they work for a single employer during their entire career, or if they work for 15 or 20 different employers. For a core Pillar 2 benefit arrangement, full portability is very important. All defined-contribution plans start from a position of strength because the benefits are embedded in an actual account balance. For the Tracker Plan all that is needed for full portability is immediate 100 percent vesting, and a requirement that the account be preserved in their current tracker fund until they are re-employed and then transferred to an equivalent tracker fund—which would always be available since Tracker Plan provisions and tracker funds are standardized and employers are mandated to enroll new workers in a plan. The worker would resume participation under the same conditions with the new employer (contribution schedule, investment risk, and adjustment process), staying on the same path toward their target.

In-service hardship withdrawals and loans could probably be allowed, but the conditions and administration of these provisions should be such that retirement savings objectives are not compromised. Only restricted amounts should be made available for such distributions.

Finally, the form of distribution at retirement should focus on preserving the standard of living through the worker's remaining lifetime. This is an area where new ideas are developing, and I would want the Tracker Plan to remain flexible enough to benefit from these new developments. I would suggest, However, that the plan include at least some level of mandated "long life" protection so that old age poverty is prevented for almost all workers.

My current thinking is that the best way to accomplish this may be through a late-age deferred annuity (e.g., with benefits commencing at age 80 or 85) where the benefit payable would be based on some reasonable multiple of the poverty level, less available Social Security benefits, indexed at a fixed percentage such as 2 percent or 2.5 percent per year. This insurance could be through private insurers, or through something like a cooperative beneficial fund maintained (with some governmental back-up)

for a large pool of retired workers. The cost of this annuity protection at retirement could perhaps be based on an assumed 2 percent real return to avoid fluctuating annuity buy-in prices, with some form of participating adjustment made when payments commence, to reflect actual investment experience and mortality patterns that have emerged over the deferral period. If the initial pricing was conservative enough, then the participation effects would usually create a positive adjustment.

For remaining funds after the purchase of the late-age deferred annuity, I suggest a default into a conservatively invested fund, with some kind of structured payout pattern. If lump-sum distributions are allowed, they might be restricted in size to some fraction of final pay, and there might be some modest tax penalties imposed to discourage lump-sum payouts. A range of other lifetime annuity options should also be made available.

4. Tests of Effectiveness

In this section we will look at how well the Tracker Plan concept works. In Section 4.1 we illustrate how the Tracker Plan would have operated through two specific periods that replicate historical periods. Section 4.2 summarizes the key outcomes across a complete range of periods that replicate all historical experience since 1926. Finally, Section 4.3 shows the distributions of results under the Monte Carlo simulation model.

4.1 Two Illustrations

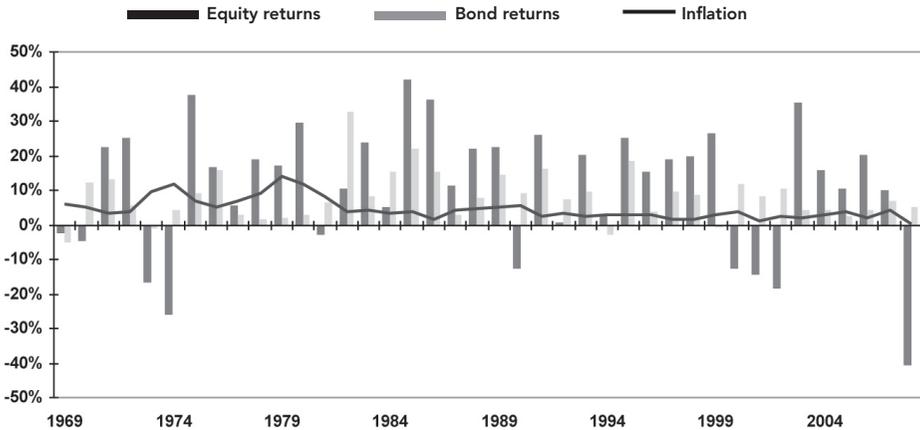
This section will show how the tracking process works over two specific illustrative periods, both based on actual historical experience for inflation, wage inflation and investment returns. Specifically, I have used investment experience as follows to illustrate how the accumulation and tracking adjustments would operate:

- *Risk asset portfolio*: For these returns I have used a portfolio of 60 percent U.S. equities (total stock market) and 40 percent non-U.S. equities (developed markets, plus emerging markets since 1988).
- *Bond portfolio*: For these returns I have used the Barclays Capital Aggregate Index since 1976, and long-term government bonds prior to that.
- *Real stable value portfolio*: For these returns I have used inflation plus 2 percent.

The first illustrative period covers the 40 years from 1969 through 2008. This period is of special interest because it is the most recent, and ends with the turbulent market results of 2008—which created significant trauma for many individuals who will be reaching retirement age in the near future. Chart 5 shows the year-by-year investment returns for the risk portfolio, the bond portfolio, and CPI results and shows average compound results over the full period, as well as over the last 15 years. In a defined-contribution plan the last 15 years are especially important because that is when account balances are large and returns carry more weight on the ultimate outcome.

Chart 5

First Illustrative Period: 1969–2008 Experience



	-Avg. Real Returns-		
	<u>Avg. Inflation</u>	<u>Equity</u>	<u>Bond</u>
1989 to 2008	2.82%	3.68%	4.48%
1942 to 1981	4.55%	4.54%	3.20%

This time period reflects the following characteristics:

- High inflation early on, during the 1970s and early 1980s, followed by relatively low and stable inflation.
- Very good equity returns prior to 2008; and even with 2008 the average real returns on equities are reasonable, although below the long-term average real return of 6.0 percent for 1926 through 2008.
- Weak bond returns early on as a result of the unexpected inflation during the 1970s and early 1980s, followed by very strong bond returns thereafter. The 4.5 percent real bond return during the last 15 years is well above the long-term average real return of 2.1 percent for 1926 through 2008.

The Tracker Plan would have performed very well with this experience:

- The final total replacement ratio (including the same 32.0 percent Social Security benefit mentioned earlier for a 2049 retirement at age 65) is 93.8 percent—18.8 percentage points higher than the 75 percent minimum target.
- No additional contributions were triggered at all during this 40-year period.

- Because of strong tracker fund returns, a significantly positive tracking error developed. This led to reductions in the risk asset allocation starting at age 42, and the fund had no risk asset exposure after age 60. Because of these adjustments the large negative equity returns for 2008 had no impact at all on the final outcome.

Chart 6 shows the accumulation pattern, relative to the target path. Chart 7 shows the way that the asset allocation was adjusted.

Chart 6
First Illustrative Period: Accumulation Pattern

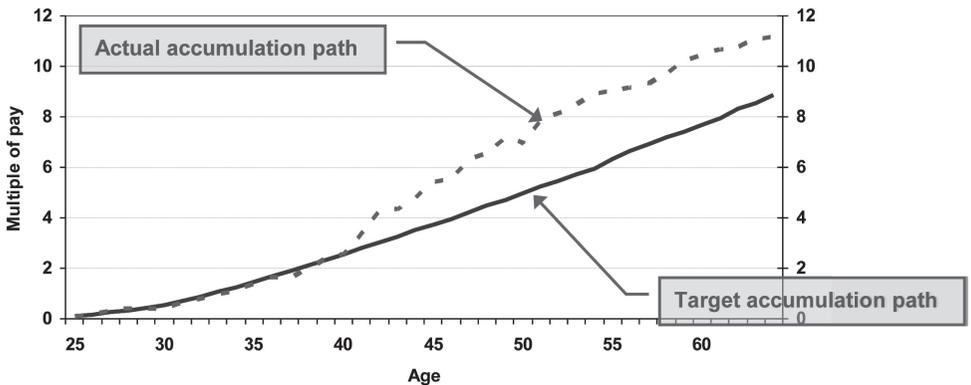
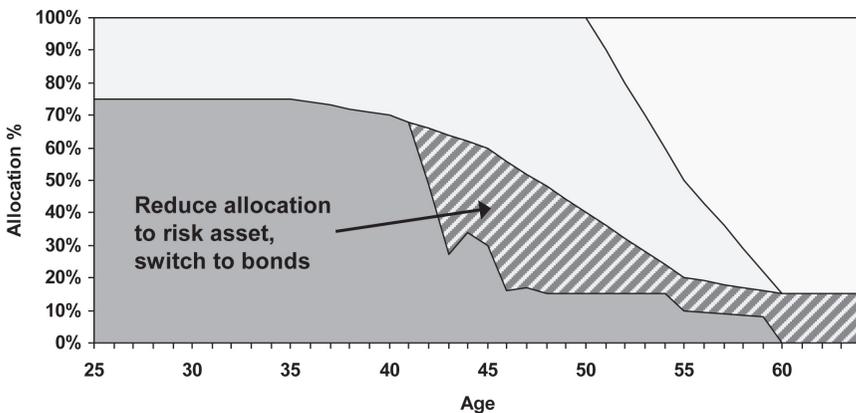
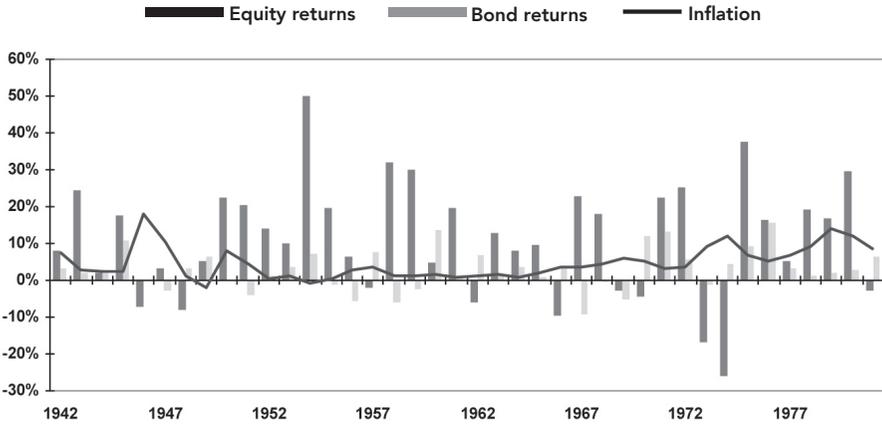


Chart 7
First Illustrative Period: Accumulation Adjustments



The second illustrative period covers the 40 years from 1942 through 1981. This period is of special interest because it is one of the most difficult periods overall for long-term retirement savings during the last 80+ years. Chart 8 shows the year-by-year investment returns for the risk portfolio, the bond portfolio, and CPI results and shows average compound results over the full period, as well as over the last 15 years.

Chart 8
Second Illustrative Period: 1942–1981 Experience



	Avg. Inflation	–Avg. Real Returns–	
		Equity	Bond
1962 to 1981	5.89%	1.53%	-2.14%
1942 to 1981	4.58%	5.30%	-1.73%

This time period reflects the following characteristics:

- Periods of high inflation early on during the post–World War II period, and then again during the 1970s and early 1980s, the period just before retirement. High and unexpected inflation just before retirement is one of the major risk factors for retirement savings. Income needs become quickly inflated, and this is accompanied by sharply negative bond returns and also usually by poor equity returns, with no time to recover losses before retirement. For this period the average price inflation over the last 15 years is almost 6 percent.
- Over the whole period the average real return on equities was 5.3 percent, fairly close to the long-term average of 6.0 percent. However, over the critical final 15-year period the average real return was only 1.5 percent.

- Real bond returns were extremely poor, with an average of -1.7 percent for the full period and -2.1 percent during the final 15-year period. This is the reason that a real stable value fund using TIPS investments can be an important risk control tool for the years just before retirement.

Despite this very difficult economic environment, the Tracker Plan would have performed reasonably well with this experience:

- The final total replacement ratio (including the same 32.0 percent Social Security benefit mentioned earlier for a 2049 retirement at age 65) is 79.5 percent—4.5 percentage points higher than the 75 percent minimum target.
- The key reason for the favorable outcome was that the automatic tracking and adjustment process triggered additional contributions during 12 of the final 14 years. During these 12 years the average additional contribution was 3.9 percent of pay.
- Because of strong tracker fund returns in the early years, the automatic adjustment process led to some reductions in the risk asset allocation between ages 40 and 50, but by age 50 the normal allocations had been restored.

Chart 9 compares the accumulation pattern with the target path. Chart 10 shows the pattern of additional contributions, and Chart 11 shows the way that the asset allocation was adjusted.

Chart 9
Second Illustrative Period: Accumulation Pattern

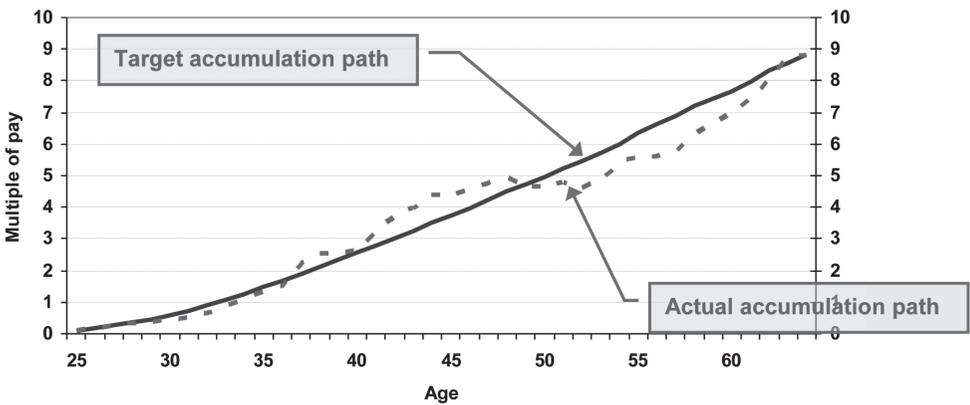


Chart 10

Second Illustrative Period: Additional Contributions

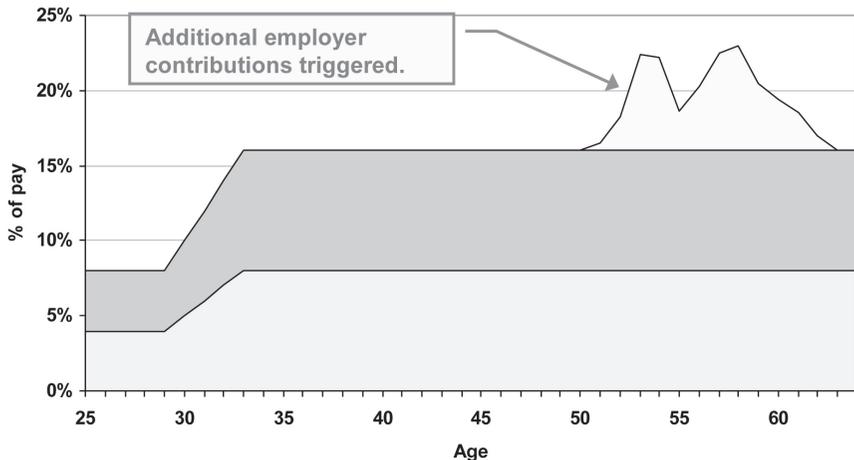
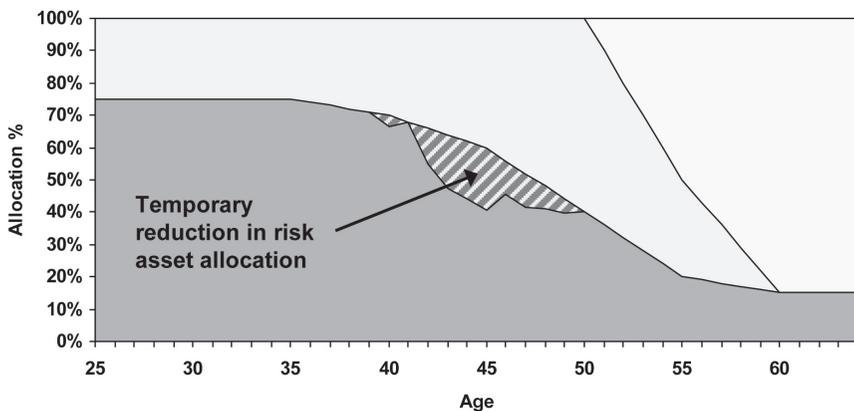


Chart 11

Second Illustrative Period: Allocation Adjustments



4.2 Complete Historical Replication

I now extend the same type of analysis used in the preceding section and show how the Tracker Plan would have performed over all rolling 40-year time periods between 1926 and 2008. Chart 12 shows the total replacement ratio outcomes for all of these periods, or cohorts, representing what individuals retiring in each year from 1966 through 2009 would have received from the Tracker Plan plus Social Security (always using the same 32.0 percent Social Security benefit from 2049). As a benchmark for comparison, I have also plotted the replacement ratios that would have been achieved by a typical 401(k) participant under the same economic conditions. For a typical 401(k) plan, I have assumed the following:

- Full participation from age 25 through age 65 retirement, with employee contributions of 6 percent of pay each year.
- Employer contributions each year equal to 3 percent of pay, based on a 50 percent match.
- Investment in a target-date fund typical of those currently used by 401(k) plans, with an initial allocation to equities of 90 percent, starting to grade down at age 35 to an ultimate level of 50 percent at age 65.
- Note that the results do not reflect a typical participant—they reflect a (rare) participant who continuously maximizes participation from age 25 up to age 65 in a typical plan.

Chart 12

Complete Historical Replication: Replacement Ratios

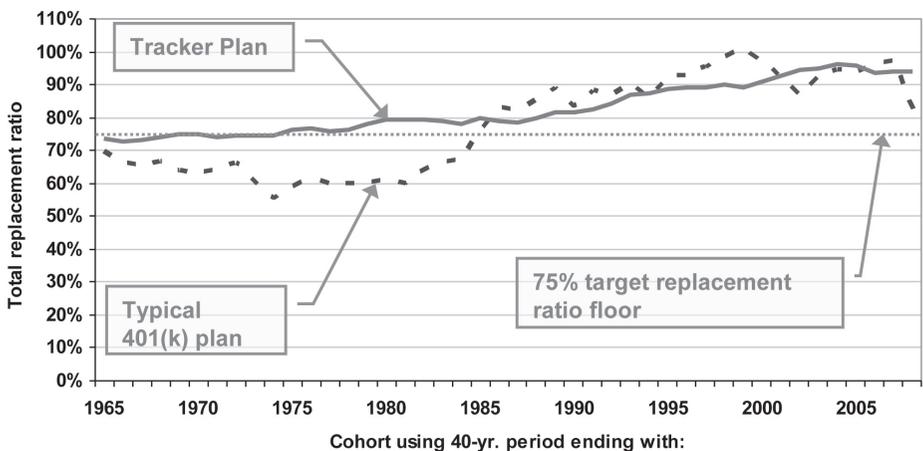
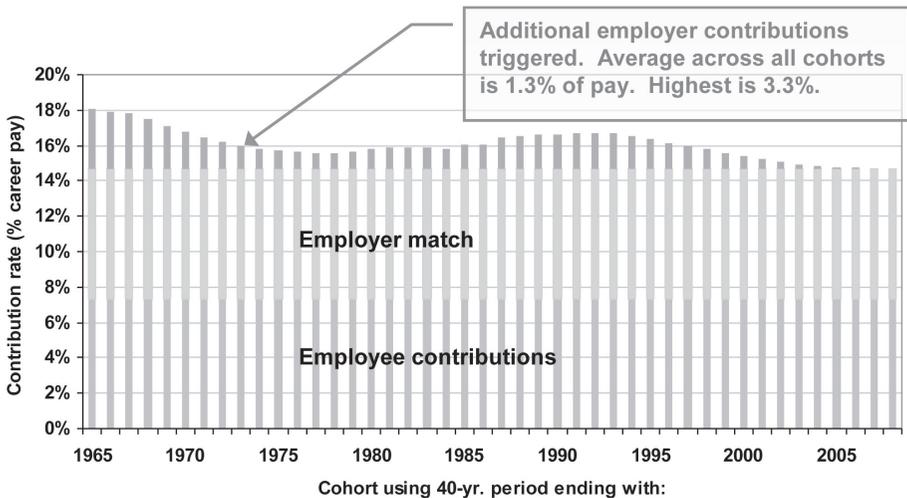


Chart 12 shows that the Tracker Plan total replacement rates are almost always above the 75 percent floor target. Only for the first 10 cohorts (reflecting retirements from 1966 through 1975) are there shortfalls, usually less than 1.0 percentage point and never more than 2.5 percentage points. After this point all of the cohorts are above the 75 percent floor target, usually by very substantial margins for the later cohorts. On the other hand, the 401(k) benefits are much more volatile, with the first 20 cohorts experiencing replacement ratios below the critical level of 70 percent (critical because it is very hard for a median income worker to handle that level of shortfall). Six of these 401(k) cohorts experience replacement ratios at or below the 60 percent level, which I would characterize as an extreme shortfall for a core retirement benefit. Across all 44 cohorts the average replacement ratios are 82.6 percent for the Tracker Plan and 77.8 percent for the typical 401(k) plan. The Tracker Plan contributions are significantly higher than the 401(k) plan, but the key result is the stability of results and the downside risk protection—driven by a less risky investment profile and by the automatic adjustment process.

Chart 13 shows the average contribution rates made for each of the 44 cohorts in this analysis, including the regular employee contributions and the 100 percent matching employer contributions, plus any additional contributions triggered for that cohort by the automatic adjustment process. For this purpose I have assumed that every individual in the cohort is at or below the pay cap for their entire career, and all rates are averaged over the 40-year career.

Chart 13

Full Historical Replication: Contributions by Cohort

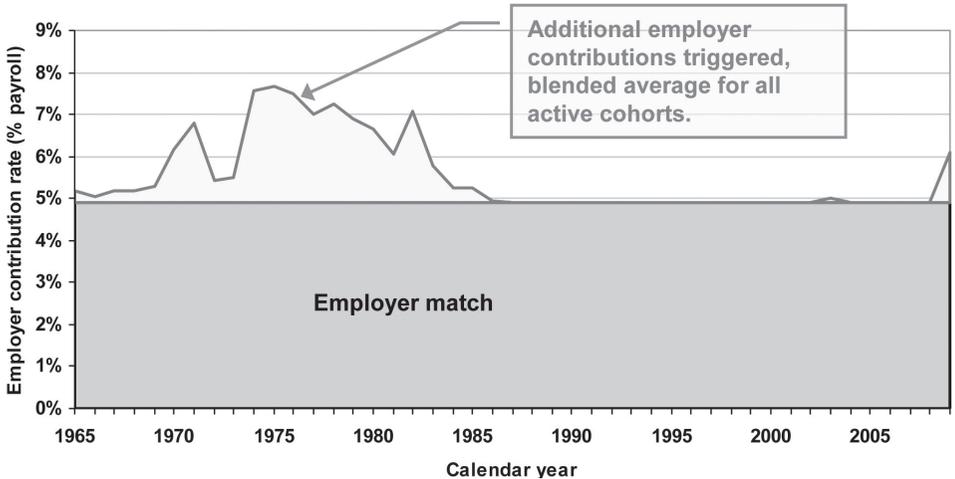


Some additional contributions were triggered for almost all of the cohorts, with the exception of the last three. The average additional rate across all 44 cohorts is 1.3 percent of pay. The highest value is 3.3 percent for the very first cohort (reflecting an individual retiring in 1966, who started contributing in 1926). After the 1972 cohort the additional contributions never exceed 2 percent of career pay.

Of course, the way employers would actually experience additional contributions for any year is a blended average of the 25 cohorts between ages 40 and 64, since these are the only ages when additional contributions would be triggered. Some of these cohorts may have additional contributions triggered because of poor tracker fund results, while others may have no additional contributions. Chart 14 shows the blended average employer contribution rates (the regular 100 percent match, plus any additional contributions for all cohorts) expressed as a percentage of total payroll. The total payroll used reflects a distribution of individuals at different ages and at different pay levels, based on U.S. Census Bureau data from the 2008 Current Population Survey for individuals who worked full time on a year-round basis. This includes individuals below age 25, for whom I assumed no contributions were made, and individuals with pay above the \$50,000 pay cap, where I reflected only contributions made on pay up to the cap. Above age 25 I assumed 100 percent participation in the Tracker Plan, up to the pay cap.

Chart 14

Full Historical Replication: Employer Contributions by Calendar Year



The chart shows that the regular 100 percent matching contribution on pay up to a \$50,000 cap works out to just less than 5 percent of total payroll. Additional contributions were triggered for each of the first 22 years, driven to a large extent by the combination of very high and unexpected inflation during the 1970s and early 1980s plus very poor real rates of investment returns. However, except for a few years the additional contributions do not exceed 2 percent of total payroll, and for the highest year the additional contribution rate was 2.75 percent of total payroll. After that we see no additional contributions

until 2009, where the 2008 equity market losses would have triggered additional contributions equal to 1.2 percent of total payroll.

The results in Charts 12 and 14 have important implications, I believe. The interpretation is that a Tracker Plan framework, if in place over the last 80+ years, would have done the following: (1) provided all retired workers at or below the median income level with a secure, and fully funded, retirement benefit sufficient for maintenance of their standard of living through-out retirement; (2) provided all retired workers above the median income level with a secure, and fully funded, base benefit that would prevent their standard of living from falling below that of a medium-earning worker; (3) provided all current workers with a fully funded account balance that is on track toward meeting their retirement needs; and (4) required annual employer contributions within a range of about 5 percent to 7.75 percent of payroll (and no exposure to unfunded liabilities). Compared to what our current system offers, I think these results offer a powerful indication of the aggregate economic efficiency of the Tracker Plan approach.

4.3 Monte Carlo Simulation Analysis

This section provides the results of a Monte Carlo simulation of Tracker Plan results. The simulation analysis creates the full range of possible outcomes under reasonable assumptions about the expected levels of future returns and inflation, but also reflecting the degree of uncertainty about each of these assumptions. This uncertainty is the fundamental source of financial risk, and the simulation analysis thus becomes the most critical tool for shaping the risk control mechanisms of the Tracker Plan to minimize the probability of unacceptable shortfall outcomes.

The simulation model I use is essentially the same one I use in my work with large defined-benefit pension plans to help the sponsors understand the financial risk of investment policy decisions. Some of the key assumptions and model features are discussed below:

- *Price inflation:* I use an average price inflation assumption of 2.8 percent, which is the same as that used by the Social Security actuaries for their intermediate long-term projections. The model I use is a nonlinear one that includes both mean reversion effects (i.e., the operation of the Federal Reserve), but also surprise inflation events that can become persistent through self-reinforcing effects. The resulting distributions of rates of inflation are skewed to the high end, so while the mean value for any year (or period of years) is 2.8 percent, the median value is 2.6 percent.
- *Wage inflation:* Real wage growth is assumed to average 1.15 percent per year, again matching the intermediate assumption used by the Social Security actuaries.
- *Merit and promotional pay increases:* For the median-income earner used in my analysis, I assumed starting pay at age 25 equal to \$30,000. The level of pay is then increased by 1.6 percent each year until it reaches \$44,613 at age 50. After that I assume increases in the pay level of 0.25 percent each year. The final pay level at age 65 is \$46,613. This career pattern for pay growth very closely matches the observed pattern for medium earners.
- *Bond returns:* The long-term real return on bonds is assumed to average 2.9 percent, and the uncertainty is based on historical experience. The return distributions reflect the combined effects of inflation, inflation risk premiums, real yield rates, and credit spreads.

- *Returns on the risk asset portfolio:* For this analysis I have modeled the risk asset portfolio as a simple blend of 60 percent U.S. equities and 40 percent non-U.S. equities. In actual practice I would expect a more diversified approach, similar to what a sophisticated defined-benefit sponsor might use for its risk asset portfolio construction. For the blended equity portfolio in the model I assume an average long-term (i.e., compound, or geometric average) real return of 5.35 percent. The resulting equity risk premium (spread of equity returns over bond returns) is 2.35 percent. Both of these average values are less than historical averages (from 1926 through 2008 the average real return on this type of portfolio would have been 6.0 percent, and the average equity risk premium would have been 3.8 percent). This reflects both a deliberate choice on my part to be slightly conservative, but also a forward-looking view of real economic growth potential—which is a primary driver of equity returns over the long term. The uncertainty for risk asset returns is based on historical experience, and produces a standard deviation of 16.5 percent. However, the returns are not normally distributed, as I have used a model that reflects the potential for periods (such as the 2008–2009 period) where markets become very turbulent and large negative returns are likely. Specifically, I am using a regime-switching lognormal model, and the resulting distribution of returns can be characterized as having a “fat tail” that captures extra downside risk, especially over shorter time periods.

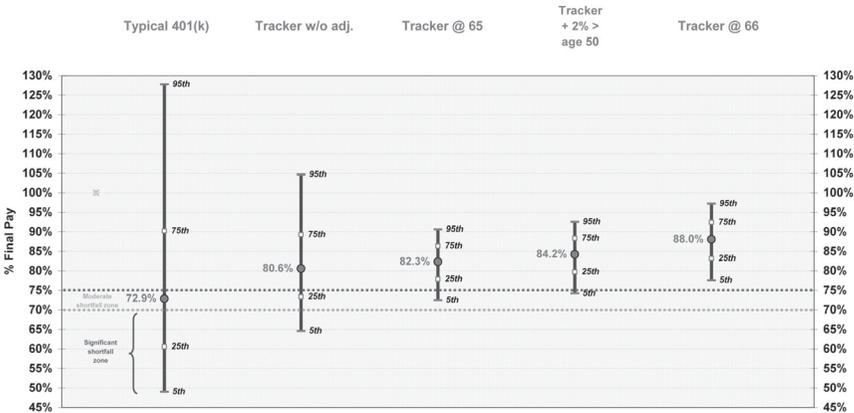
Based on these assumptions, we can now model the range of outcomes from the Tracker Plan for our hypothetical median-wage worker who participates from age 25 through retirement (normally age 65, except I use an age-66 retirement for one of the examples). Chart 15 uses “floating bar” style graphics to show the percentile distributions for the total replacement ratio outcomes, and the table shows the probability of shortfalls for the 70 percent to 75 percent range, and for below 70 percent. These shortfall probabilities are the key metric for risk control, and my own goals were for the total shortfall probability (below 75 percent replacement ratio) to be around 10 percent for retirement at age 65, and to be close to zero for retirement at age 66. The chart shows results for various scenarios:

- The leftmost bar is a benchmark for comparison that is based on 40 years of continuous participation in a typical 401(k) plan, as described in the previous section. The median replacement ratio here is 73 percent. The total shortfall probability is 53 percent, but included in that is a 45 percent probability of falling below a 70 percent replacement ratio. If we look at just the bottom quartile of results, the average replacement ratio is only 53 percent. To put this in context, that is the equivalent of providing a retirement program to a median-pay worker and telling him that if he participates in the program for 40 years, there is still a one-in-four chance that when he retires he may have to cut his standard of living from what would then be his \$47,000 pay level to the standard of living for someone who was only earning \$33,000. In my opinion, that level of shortfall risk is far too great for a core Pillar 2 retirement program. Higher-income workers may be able to handle this level of risk, but not workers at median income levels.
- The next bar is the Tracker Plan, but without the automatic adjustment features. Relative to the first bar showing results for a typical 401(k) plan, the results in this bar reflect the higher contribution schedule in the Tracker Plan and the lower level of investment risk in the tracker fund from reduced allocations to the risk asset. The median replacement ratio is 81 percent, and the total shortfall risk has been reduced to 29 percent. Good progress, but more risk control is needed.
- The next bar is the Tracker Plan, including the automatic adjustment features. Now the median replacement ratio is a bit higher at 82 percent, but the total shortfall risk has been reduced to 12

percent. This is now close to our goal of having about 90 percent confidence that a worker would meet at least the 75 percent replacement ratio target. Furthermore, when a shortfall does occur it is usually relatively modest—there is less than a 3 percent probability of falling below 70 percent.

- In the next scenario we have just added supplemental contributions of 2 percent of pay starting at age 50. The purpose is to show how the shortfall risk can be reduced for workers who approach retirement and see that they are falling short of the target accumulation path. The total shortfall risk has been reduced to 6 percent.
- Finally, in the last scenario we show the results for a worker retiring at age 66, one year beyond the age-65 retirement used in each of the preceding scenarios. Here the shortfall risk is cut to just 2 percent. This achieves the goal of ensuring that when a shortfall risk does occur, it can be eliminated by working no more than one additional year beyond age 65.

Chart 15
Simulation Analysis: Range of Replacement Ratios



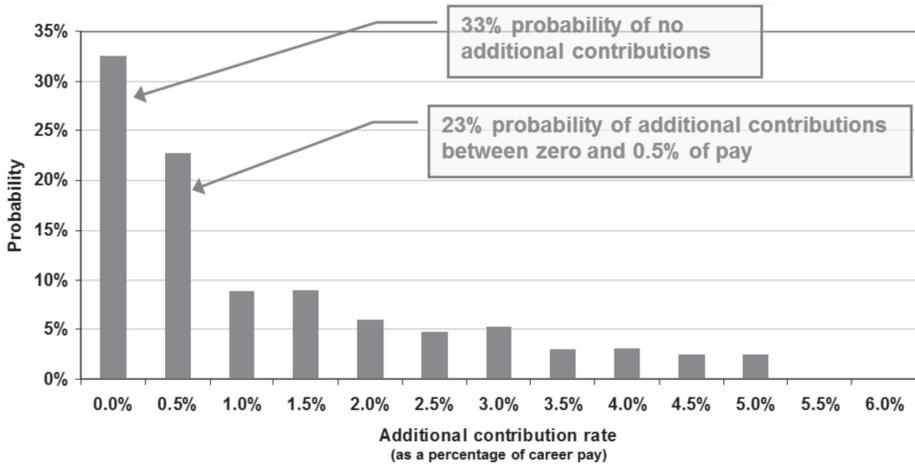
Shortfall probabilities (percent of simulated outcomes below targets):

Moderate (70% to 75%)	8.7%	12.7%	9.3%	3.9%	1.4%
Significant (<70%)	44.6%	16.4%	2.7%	2.1%	0.8%
Total shortfall prob.	53.3%	29.1%	12.0%	6.0%	2.2%

We can also use the simulation model to analyze the likely extent of additional contributions that may be triggered under the automatic adjustment provisions. The histogram in Chart 16 shows the probability of additional contributions for any cohort at specified levels (expressed as a percent of career pay). There is a 33 percent probability that no additional contributions will be triggered at all. The average additional contribution is 1.0 percent of covered pay (i.e., pay up to the pay cap). For the worst 10 percent of outcomes the average rate is 4.2 percent. Although this is a subjective judgment, I believe this level of cost risk is something that sponsors should be able to manage well—it is certainly much less than the cost risk from a typical defined-benefit pension plan.

Chart 16

Simulation Analysis: Range of Additional Contributions



5. Public Policy Issues

My own belief is that the federal government must take the lead role in a reform of the retirement system. The Tracker Plan program outlined in this article is designed to provide a strong Pillar 2 arrangement that can supplement Social Security in such a way that a large majority of workers can expect to maintain a reasonable standard of living through their retirement years. Numerous political choices must be made as part of any major reform effort, and the effectiveness of the final program will depend on these political choices. In this section I review some of the more important areas where public policy choices will be required.

5.1 Coverage

No decision will be more important to the aggregate impact of reform than the decision on how workers will become covered under the program. The current scheme of plans voluntarily sponsored by employers has left over half of the U.S. workforce without retirement plan coverage. The track record for individual IRA-type arrangements is that lower-paid workers do not participate in significant numbers. To have a real impact on increasing the retirement savings throughout our economy, I believe a muscular approach is needed. A full mandate that all workers participate might be overkill and would likely find lukewarm congressional support, but it can and should be considered as one option. Absent a full individual mandate, I believe the program requires that all employers automatically enroll new employees into a Pillar 2 program and make the needed payroll deductions. Employees could then have the option to decline participation or to participate at a rate lower than the regular contribution schedule. Nonparticipating workers could then be auto-enrolled again at certain ages. The prevailing environment should be that plans that do not attain at least 95 percent coverage of workers (age 30 and up) should institute special operational and communication efforts to raise their coverage levels.

5.2 Uniformity

I believe that when a program, like the Tracker Plan, is designed with very specific risk control objectives, then uniformity of provisions is critical for success. A wide range of choices may make sense for higher-income individuals, but lower- and middle-income workers need to have a simple framework for retirement savings that is the same from one employer to the next, where continuity of savings over the full career is a real necessity. All tracker funds should use the same basic asset allocation glide path, and any grouping of age cohorts (e.g., into three-year age groups) must be uniform from fund to fund. The regular contribution schedule and the automatic adjustment procedures should be uniform and based on a uniform target accumulation path so that the tracking error concept can carry from one plan to another. Uniformity of these features is likely to be resisted by the financial services industry, but I believe that innovative product design and choices can be preserved for supplemental plans that cover the higher paid workers who have the interest and required skills to utilize choice effectively.

5.3 Size of Benefits and Employer Cost

My design was based on a reasonable income replacement target of 75 percent of pay, and the resulting contribution schedule is that required to have a high confidence of successfully meeting the target. A lower contribution schedule would necessarily require some combination of changes in these factors:

- A lower replacement ratio target than the 75 percent that I used (even though recognition of medical costs might argue for a higher target, not a lower one)
- A higher retirement age target, such as age 66 or age 67
- An assumption of lower post-retirement benefit increases
- A lower pay cap, which would mean that median-level earners would not have full coverage
- A lower standard of risk control, which might then also accommodate more investment risk

The way that costs are split between employees and employers is also a public policy choice. The legal framework could allow some level of choice for the employer, but there should then be some arrangement of tax incentives so that employers are strongly encouraged to underwrite a significant share of the cost. There could also be rules that require some level of employer cost sharing before the employer could implement any form of tax-favored supplemental plan for their higher-paid employees.

Finally, the Tracker Plan concept could be implemented as a two part arrangement. For example, the Basic Tracker Plan might only cover pay up to a lower limit like \$25,000—and this is where incentives and penalties for cost sharing could be stronger. Then an Extended Tracker Plan could cover pay from say \$25,000 to \$75,000 with more employer flexibility on cost sharing.

A major advantage of working within a framework like the Tracker Plan is that it forces a real discipline and transparency on the process that connects the cost of the program with very specific objectives for the key features that determine benefit adequacy:

- The replacement ratio target at a selected retirement age,

- The degree of post-retirement inflation protection, and
- The extent of risk control, expressed in terms of a confidence goal for outcomes.

A wide range of choices is available, and each choice will vary in terms of cost and benefit adequacy—there is a direct link between these two features. As one example of a radically scaled-back Tracker Plan design, let us make these three changes from the design discussed in this paper:

- Shift our target retirement age from age 65 up to age 67,
- Eliminate any post-retirement increases in benefit levels, and
- Drop our confidence target for avoiding shortfall outcomes from 90 percent to 80 percent.

A Tracker Plan can be designed to meet these revised objectives with a contribution schedule of 5.2 percent of pay each year. This is a very dramatic reduction from the contribution schedule used for the basic design analyzed in this paper (which starts at 8 percent of pay, then increases to 16 percent of pay at age 33), but this reflects a very dramatic reduction in overall benefit adequacy. This particular scaled-back version of the Tracker Plan would be essentially equivalent to a defined-benefit pension plan that provides a benefit of 1 percent times final five-year average pay for each year of service, with a normal retirement age of 67, no early retirement subsidies, and no post-retirement cost-of-living-adjustment (COLA) provision.

The single most important principle in economics is “Nullum gratuitum prandium” (“There is no free lunch”... it just sounds classier in Latin)—and the Tracker Plan framework makes all the trade-offs very apparent. Section 7 explores these trade-offs in more detail.

5.4 Operational Framework

Many employers are either unable, or unwilling, to sponsor and administer a retirement plan for their employees. This is especially apparent among smaller employers, as the administrative and legal obligations are far from trivial. To ensure broad worker coverage, employers should be relieved of any need to sponsor their own plans. As stated earlier, the primary obligation for employers is to enroll their employees in a program, make the required payroll deductions for employee contributions, and transfer these contributions (plus any employer contributions) to the fund manager.

What is thus required are outside organizations to run the program in a professional and cost-effective way. I believe that reform efforts should include enabling legislation for the creation of large, regional not-for-profit organizations for this purpose. This is an idea promoted by others, including Keith Ambachtsheer. The objective of low expense levels for administration and investment activities is very important—and these kinds of organizations are the best way to set the standard. Some current organizations like the Federal Thrift Savings Plan and TIAA-CREF provide good models. Private for-profit organizations could offer products, but they should win their business with good management and not with high marketing costs. Large employers that want to sponsor their own plan should also be permitted to do that.

I also encourage reorganization of federal oversight and regulatory bodies with respect to retirement issues. A single cabinet-level position is needed with responsibility for Social Security, Medicare, and the oversight and regulation of all Pillar 2 and Pillar 3 arrangements. Included here would be a mechanism to set broad standards for all retirement administration organizations and to monitor their effectiveness.

5.5 Investment Framework

I have previously stated the importance of having all tracker funds operated with the same basic glide-path allocations and cohort groupings. Beyond this, the funds should have significant leeway for using all available investment vehicles that help them achieve the objective of earning a high real return, net of fees, over the appropriate time period for each tracker fund age cohort. The best current model would be large defined-benefit plans that:

- Utilize both outside managers who can add value, and in-house management when that can be done cost-effectively,
- Seek the lowest fees for the services and skills obtained,
- Carefully monitor all managers,
- Continuously research capital market opportunities,
- Have a well-organized governance structure, and
- Set long-term objectives, and determine the best policy to meet those objectives.

The biggest difference with defined-benefit investment operations is that the tracker fund objectives are much more specific in nature. There is a fixed time frame, and there are clearly stated risk control objectives. This should vastly improve the ability of fund managers to set policy and monitor progress.

The potential also exists, I believe, for large tracker funds to lead the way for the creation of newer products (or at least a deeper and more efficiently priced market for long-dated equity market options) centered on risk control (downside insurance). As the funds approach their maturity dates, they may be willing to pay a premium for downside insurance, and could quantitatively determine a reasonable level of premium for the desired level of protection. Other funds, further from their maturity date, could then judge whether selling that insurance to these mature funds and earning the premiums is a desirable activity that might enhance their own long-term return objectives. The premiums may be a combination of fixed dollar amounts, plus some degree of upside participation rights.

5.6 Supplemental Plans and Tax Incentives

The Tracker Plan is envisioned as a core Pillar 2 benefit. A Tracker Plan program with the features described in this paper, using a pay cap of around \$50,000 (2009 dollars), would ensure that half of the workforce had what they need for a secure retirement. Those who earn above the median level of pay would need supplemental plans for additional savings or benefits to reach the same level of income replacement—but even without any supplemental coverage the Tracker Plan would provide a substantial floor of retirement income for them as well.

Supplemental plans could take various forms. The most direct would be an Extended Tracker Plan, which would base contributions on all pay (up to some maximum similar to the current \$245,000 for qualified plans). These contributions could be consolidated into the same tracker fund account as the regular Tracker Plan contributions for simplicity of administration and investment. Other supplemental defined-contribution arrangements could be sponsored by the employer, or provided in the retail market to individuals, with much more flexibility on level of contributions (on pay over the Tracker Plan cap), employer match levels, and investment options. Employer-sponsored defined-benefit supplemental plans could also be designed to “wrap around” the expected benefits from the Tracker Plan.

Regulation of these supplemental arrangements could be accomplished by a simplified set of plan qualification standards—the uniform provisions in the Tracker Plan should eliminate the need for much of the current regulatory maze. I believe that one simple rule could be quite effective in this area, namely, that no employer contributions could flow into a supplemental arrangement until some specified level of cost sharing was reached in the regular Tracker Plan for that employer.

Currently tax revenue forgone because of tax-preferred retirement savings arrangements is about 1 percent of the gross domestic product (GDP)—the largest single “tax expenditure” item in the federal budget. Pension reform efforts should include a close examination of who benefits from these tax expenditures and the degree to which they further the broad national interest. Opportunities should exist for restructuring these tax benefits in ways that better support the goal of expanding retirement savings opportunities across the population. The tax treatment of supplemental plans may differ from the basic Pillar 2 program, and incentives may be focused on employers, especially small employers, to encourage a sufficient level of cost sharing in the Pillar 2 plans.

6. Comparison with Comparable Defined-Benefit Plan

One possible reaction to the Tracker Plan described in this paper is that the cost is too high, perhaps based on previous experience with traditional defined-benefit pension plans where the expected long-term cost often falls into a range of 5 percent to 10 percent of payroll for corporate plans (with no post-retirement COLAs), or 10 percent to 15 percent for public pension plans that include COLA provisions. However, the benefits provided by the Tracker Plan are substantially better than most traditional pension arrangements, so cost comparisons need to be carefully framed. Let me start by commenting on a few of the features that are part of the Tracker Plan cost levels used in this paper:

- The 75 percent replacement ratio target includes the age-65 Social Security benefit expected to be available 40 years from now, in 2049. That benefit for a median-level earner is 32 percent of final pay, which compares with a benefit of about 40 percent of final pay for a worker retiring in 2009 at age 65. The benefit needed to reach the 75 percent total replacement ratio target has increased from 35 percent to 43 percent of final pay, a 23 percent increase in the benefit level.
- The Tracker Plan is designed to provide post-retirement benefit increases of 2.5 percent per year to control exposure to inflation risk. Compared to a plan with no post-retirement increases, this adds about another 30 percent to the cost.
- The benefit payouts from the Tracker Plan in this paper reflect future mortality improvements expected over the next 40 years, which adds about another 8 percent to the cost. This cost is seldom fully reflected in current defined-benefit plan costs.

- The Tracker Plan provides full portability of benefits, which is not provided in most defined-benefit arrangements.

Next I would like to construct a more meaningful comparison, where benefits provided are comparable. The following cash balance pension plan would closely replicate both the accrual pattern and the final retirement benefit (at the median expected Tracker Plan benefit):

- Total pay-based credits to the cash balance account at the same rates as the schedule used in the Tracker Plan, starting at 8 percent of pay and increasing to 16 percent of pay by age 33,
- Employee contributions equal to half of these pay-based credits,
- Interest credits on the cash balance account equal to 7 percent each year,
- Payout at age-65 retirement of the full cash balance account, or using the account balance to purchase a risk-free annuity with 2.5 percent post-retirement increases, and
- Full and immediate vesting in the cash balance account.

Let us also assume that the sponsor adopts an investment policy of 50 percent equities and 50 percent bonds. In this case the expected net employer cost would be 4.9 percent, which is lower than the 8.5 percent for the Tracker Plan (assuming a 50/50 cost sharing for the regular contributions). However, if we look at only the outcomes in the worst decile, the cost for the cash balance plan increases to 17.9 percent, while the Tracker Plan increases only to 11.7 percent. At the second percentile outcome, the cash balance cost is 21.5 percent and the Tracker Plan cost is 12.0 percent.

If this degree of cost volatility is too much for the sponsor, then a more conservative investment policy is required. With an equity allocation of only 20 percent, the expected cash balance plan cost becomes 8.5 percent of pay, matching the Tracker Plan. Now the average cost for the worst decile is 14.2 percent of pay, and the cost at the second percentile outcome is 15.7 percent of pay.

Nullum gratuitum prandium.

7. Framework for Analysis and Comparison of Design Options

For any retirement system, two metrics are critical:

1. What is the cost?
2. What benefits are provided?

In the real world, financial risk factors (investment returns, inflation) create some level of uncertainty in either one, or both, of these metrics on a forward-looking basis. This means we need to deal with a distribution of possible outcomes, and we can capture the important features of this in a chart where projected benefits (expressed as a replacement ratio) are plotted against cost. The points which are plotted should reflect both expected (e.g., median) levels, as well as some measure of the range of uncertainty (e.g., the average value for top and bottom decile outcomes, which can be estimated using a

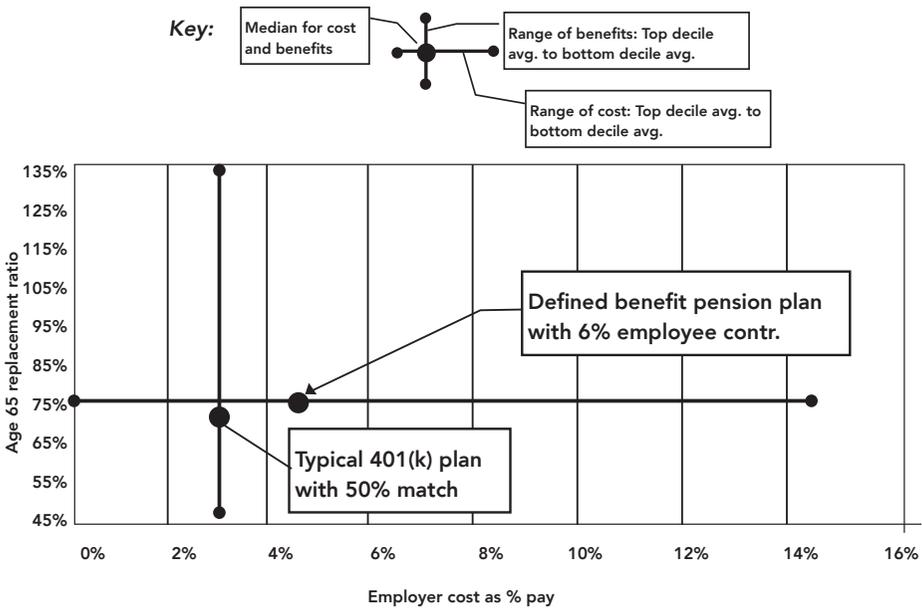
Monte Carlo simulation model). The range of uncertainty is the only way to quantify risk, and any comparison of alternative retirement system designs must incorporate a clear analysis of the risk to all stakeholders that is embedded within the design structure.

If we first look at traditional plans, we see that all of the uncertainty is forced into a single dimension. For a 401(k) plan all of the uncertainty emerges on the benefit metric, and with a traditional defined-benefit pension plan all of the uncertainty emerges on the cost metric. Chart 17 shows results for:

- The typical 401(k) plan described earlier (where the employer cost is fixed at 3 percent of pay to provide a 50 percent match on a 6 percent employee contribution), and
- A pension plan that targets a 75 percent replacement ratio at age 65 (inclusive of Social Security), includes a post-retirement COLA of 2.5 percent, and provides full and immediate vesting. In determining employer cost, we assume the sponsor uses a 50/50 asset allocation, and that employees contribute 6 percent of their own pay in order to participate.

Chart 17

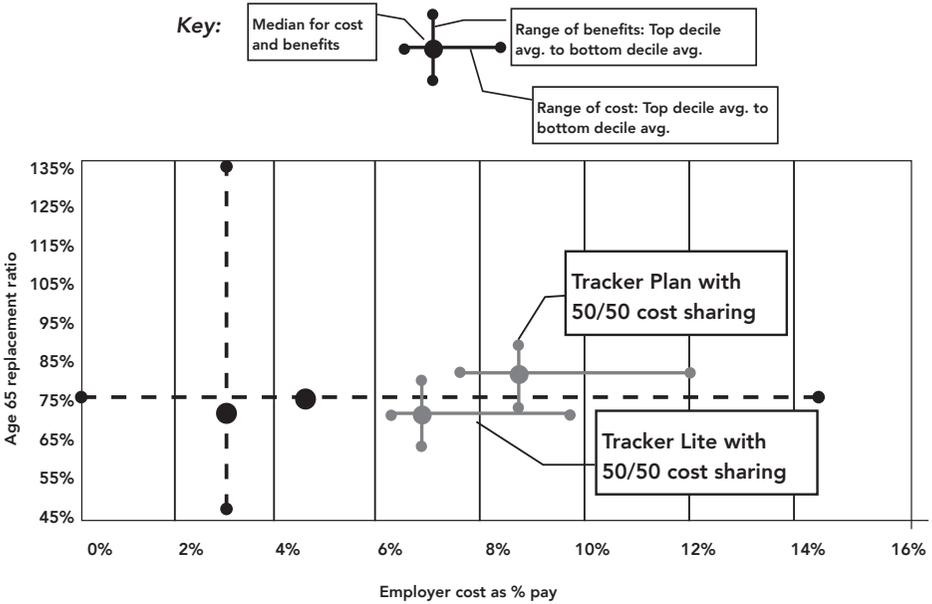
Traditional Plans in Benefit/Cost Framework



In contrast to these one-dimensional approaches, the Tracker Plan operates in two dimensions. The same will be true for any other plan that includes risk-sharing features. Chart 18 shows how the Tracker Plan, as described in this article, plots in this benefit/cost space. I also plot the location for the dramatically scaled-back Tracker Plan described in Section 5.4 (labeled as Tracker Lite).

Chart 18

Tracker Plans in Benefit/Cost Framework



These charts clearly convey most of the critical information required to make meaningful comparisons among competing options for pension reform. Each stakeholder naturally prefers to get good results without any risk, but the risk has to flow somewhere. By explicitly showing the risk to each stakeholder, the trade-offs become transparent. Only then can we have a clear dialogue for policy decisions.

Rowland M. Davis, FSA, is pension actuary, at RMD Pension Consulting in Chicago, Ill.

“The Tracker Plan: A Controlled Risk Defined-Contribution Retirement Program”

by Faisal Siddiqi

1. Overview

Rowland Davis first discusses the problem facing the U.S. retirement system. He feels that many workers are headed toward retirement with insufficient or no retirement savings. This will lead to dramatic reductions in living standards for future senior citizens and/or require significant increases in social security pensions. To avoid this and manage the risk inherent in the current retirement system, Davis proposes the Controlled Risk Defined-Contribution Retirement Program or the Tracker Plan.

Rowland Davis' Tracker Plan is designed to increase the level of retirement savings among all workers, expand coverage of retirement savings, and manage the risk in traditional defined-benefit (DB) and defined-contribution plans (DC). Davis proposes that the Tracker Plan be implemented as a mandatory (or auto-enrolled) DC plan with independent investment management so that all workers can have coverage and at an affordable level for all parties. It is intended to work hand in hand with the pension provided by U.S. Social Security.

The Tracker Plan is designed to share the risk between employers and employees with any ultimate financial risk falling to the employee like all DC arrangements since the employer risk is subject to a hard cap. The risk to the employee is managed through various plan features. The beauty behind the plan is that probability targets are assigned to measure the successful accumulation of retirement savings. The Tracker Plan, as its name implies, tracks an individual's retirement savings relative to what is required to successfully achieve a retirement savings target. Davis provides lots of sensitivity analysis to the assumptions he chooses to illustrate how the plan works and the historical back testing over multiple 40-year periods proves that it can work. The system is a comprehensive design with a well-designed investment approach and can easily be implemented on a large scale basis.

2. Key Elements of the System

From an individual participant's perspective, the plan works as follows:

- There is a single investment vehicle that gradually reduces risk over the course of a participant's career. The vehicle is similar to a target-date fund with the level of equity assets decreasing over time with the replacement of bonds and stable value funds.
- There is a standard contribution pattern to follow throughout a participant's career that is designed to accumulate the required target amount of retirement savings.
- Based on the risk analysis Davis has done, he recommends an employee contribution level starting at 4 percent and increasing to 8 percent with a 100 percent employer match. Contribution levels increase at age 30 by 2 percent reaching the 16 percent level in total by age 33.

- Participation will be mandatory or will be done on an auto-enrolment basis.
- Progress toward the target is monitored and adjustments are made based on tracking error. If experience is adverse, additional contributions are triggered, up to a maximum. If experience is favorable, then the investment risk is reduced to preserve the higher than expected retirement savings.

The risk of reaching one's retirement goals is measured using confidence intervals. Davis uses a 90 percent test to see that a participant will meet or exceed their goals and if there is a risk of not meeting the goal, Davis suggests changes that will not require the participant to work more than one additional year.

From an employer's perspective, the plan works as follows:

- The contributions participants make are subject to an earnings cap. This controls an employer's financial exposure. Davis suggests a cap of \$50,000 (or 130 percent of the Average Wage Index from two years prior) representing the median level of earnings for a 55 to 64 year old, and he further suggests this cap be indexed to average wage increases.
- If an employer wants to, they can set up a supplemental plan to cover earnings levels above the cap.
- The retirement savings target will be 75 percent of income at age 65, inclusive of Social Security. Davis assumes the Social Security benefit to be paid will be the one expected for 2049. Since that will cover 32 percent of income, the Tracker Plan is designed to provide 43 percent income replacement.
- Based on the 90 percent confidence interval, the Tracker Plan is designed to provide a benefit that will not be less than 38 percent of final pay.
- Davis determines that the size of the fund required at retirement to replace 43 percent of income is a fund equal to about 7.5 to 9 times pay. It depends on assumptions for inflation and retirement age.
- The Tracker Plan will annuitize benefits at age 65 with assumed post-retirement indexing of 2.5 percent per annum

The fund investments will work as follows:

- There will be three pools of investment funds: (a) a risk asset portfolio consisting of equities and other expected higher-income producing asset classes, (b) a fixed-income portfolio with holdings similar to Barclay's Aggregate Bond Index, and (c) a stable value fund invested in TIPS (Treasury inflation-protected securities).
- The funds have to operate to control risk and have low expenses.
- Based on a Monte Carlo analysis, Davis recommends that the risky portfolio start with 75 percent equities and decrease starting at age 35 gradually to 15 percent by age 60, and the bond portfolio start at 25 percent and eventually switch to the stable value fund to avoid sudden inflationary losses.

- Davis proposes one fund for those under age 35 (75/25 fund) and 10 additional funds for those aged 35 to 65 (using three-year cohort groupings).

There are automatic adjustments in the Tracker Plan to help keep accumulations on the desired path, as follows:

- Increasing contributions, if experience is unfavorable.
- Increasing allocation of assets to the bond portfolio, if experience is favorable.

3. Public Policy Issues

Davis feels strongly that the Tracker Plan will help address the critical issues facing Americans as they head toward retirement—issues of coverage, sufficient income, and risk management.

Coverage is the most important issue. The current scheme of voluntarily sponsored pension plans by employers is leaving many parts of society without adequate retirement income. Davis feels the strength of his proposal is having universal coverage so that everyone has something. He also feels that universal coverage will address the second issue of sufficient income. Since the Tracker Plan is designed to provide sufficient retirement income, its establishment will ensure this objective.

The next issue to consider is uniformity. A uniform plan will provide for simplicity of administration and communication.

There may also be concerns around the 75 percent replacement ratio objective and proposed level of employer and employee contributions. Davis discusses various alternatives to targeting a lower replacement ratio, assuming a higher normal retirement age versus the age 65 in his proposal, and assuming a lower level of post-retirement indexation. In the end if the Tracker Plan were to be implemented, there are many political choices that would have to be made but at least the impact of these choices would be apparent whether they impact coverage, cost, sufficiency of retirement income, risk management, or investment policy.

4. Pros and Cons of the Proposed Plan

Pros

- Mandatory and auto-enrollment forces broad labor force participation. This is key to address the coverage issue.
- Contributions at 8 percent from an employee's perspective may seem high initially, but they will help to ensure a secure retirement at least for participants up to the median earnings level. Again, this is key to avoiding an insecure retirement.
- Having funds invested in a set number of funds with appropriate risk profiles will minimize costs and help control risk. Again, this is a key to accumulating sufficient funds for retirement.
- The tracking error feature will help cohorts either preserve savings if results are good or help them achieve their targets via higher contributions if results are not good.

- The graph of where their retirement savings should be is very useful. The visual of percent of pay that needs to be accumulated will make the system easy to understand.
- The earnings cap will address the financial exposure for employers.
- Portability will be easy for participants.
- The uniformity of the plan is important to maintain simple communications and ultimately simpler administration of the plan.
- Because it is a DC plan, it will avoid having unfunded deficiencies and will help address one of the big issues with Social Security.
- In-service hardship withdrawals and loans can be allowed, though this would create leakage in the system.
- Forcing annuities to be purchased will address the longevity risk inherent in many DC plans today, so that is a good idea.
- The back testing through a very tumultuous 40-year period from 1970 to 2010 shows the Tracker Plan achieved and exceeded its 75 percent target and was not impacted by the poor equity returns in the 2000s.
- The back testing through 1940 to 1980 also achieved target results, but just barely. This shows the robustness of the Tracker Plan.
- As many retirees know, the indexing feature of the Tracker Plan is also very important. It helps to preserve purchasing power.

Cons

- I don't have any negatives to discuss for this proposed plan. It makes a lot of sense, and Davis has done so much sensitivity analysis that all the alternatives that one could come back with him on have been discussed, whether it be individuals to cover, level of contributions, assumptions, investment approach, public policy issues, administration, or communication.

5. Questions for the Author

- The political will to implement the Tracker Plan will be the biggest hurdle. How could this idea be implemented?
- It is interesting that the Canadian government is essentially implementing a basic DC pension plan for all its federal employees, though on a voluntary basis. The plan in Canada is called a Pooled Registered Pension Plan (PRPP). I would be interested to know what Mr. Davis has to say about this proposal relative to the Tracker Plan.

6. Conclusion

After having read Rowland Davis' paper, I find it as a great solution to an important problem facing society today—not just in the United States but in many countries. The Tracker Plan he proposes has a lot of merit to it for many stakeholders, and I can only hope that it is implemented in some shape or form. Thanks for a great contribution.

Faisal Siddiqi, FSA, FCIA, is principal and consulting actuary at Buck Consultants in Toronto, ON.

Author's Response to Comments by Faisal Siddiqi

By Rowland M. Davis

I greatly appreciate Faisal Siddiqi's discussion of my "Tracker Plan" paper. His overview and summary of the key elements are completely accurate, and I have no comments to add. I thank him for his generous comments in the pros and cons section. Mr. Siddiqi raises two interesting questions in section 5 that I will respond to:

1) *Implementation issues*: I completely agree that the political will for any significant pension reform is a major hurdle—perhaps insurmountable in the medium term. Fortunately, for the *Retirement 20/20* exercise we were encouraged to think broadly, and to propose the best solutions without compromising for the sake of political reality. With any new idea, gaining traction is a slow process. One area that may offer some hope is to implement some version of the Tracker Plan to cover a group of employees in a select situation. In the United States, many large public retirement plan systems are now considering significant reforms—and I believe the Tracker Plan concept could be a model for reform here.

2) *Comparison with Canadian PRPPs*: I am not expert on the new Canadian PRPP structure, but it seems to fall into the broad category often referred to as a "collective defined-contribution" (CDC) system. Some of these exist now in the Netherlands, and there have been some recent CDC-like proposals in the United States (Senator Harkin, the Center for American Progress, and the Pension Rights Center). I believe the Tracker Plan falls into this broad CDC category—but one of my goals was to have the full structure of the system defined so that it can operate without the need for future ad hoc decisions or adjustments. Some CDC arrangements offer intergenerational risk sharing (e.g., Dutch CDCs), and one area of research I am pursuing is to add an additional layer of intergenerational risk sharing to the Tracker Plan structure.

Affordable Retirement Income through Savings and Annuities

by Donald E. Fuerst

Abstract

This paper proposes a new system for accomplishing affordable retirement security.

Compulsory savings for all workers is combined with new transparent investment vehicles designed to promote competition based on expense levels, fund performance, and customer service. At least 50 percent of all accounts are invested in Treasury inflation-protected securities (TIPS) to preserve purchasing power. The balance of accounts can be invested more aggressively to provide growth. Employers may voluntarily supplement retirement savings. Pre-retirement distributions are restricted to disability, death, and limited hardship withdrawals and loans. All accounts are fully portable and 100 percent vested.

Upon retirement—generally at participant’s choice between ages 60 and 70—50 percent of the account must be annuitized in a participating variable annuity (PVA) backed by TIPS. All investment experience, expenses, and pooled longevity experience are passed to annuitants through periodic benefit adjustments. Annuities are priced uniformly based only on age at commencement, and longevity experience is shared among cohort groups through the creation of a federal Longevity Pooling Agency (LPA).

Pricing of annuities is based on nationwide cohort group mortality tables and the real interest rate implicit in TIPS. Pricing is expected to be approximately 20 percent below the price of current inflation-indexed annuities and almost 40 percent below common recommendations for self-annuitization.

The result is a lifetime income for all retirees at an affordable price that incorporates individual equity, inflation protection, and competitive financial markets.

Highlights

The United States faces serious challenges in financing the retirement of current and future generations. The traditional three tiers of retirement security—Social Security, employer-based pensions, and individual savings—appear unable to meet demands. Social Security financing is inadequate, private employer pension plans are disappearing, and individual savings—including employer contributions to defined-contribution (DC) plans—are insufficient.

This paper presents the author’s response to the Society of Actuaries’ call for new retirement system models to overcome these challenges. It proposes a new Tier 2 structure—an employment-based retirement system that provides a meaningful level of retirement income to all workers.

The paper:

- Assumes the current Tier 1 system (Social Security) remains in place, with changes to balance anticipated benefits and revenues. These changes would likely combine some reductions in the rate of benefit increases, some increases in the full retirement age, and some tax increases.
- Does not specifically address Tier 3—individual savings. Encouraging voluntary savings through the tax code and other methods would enhance the financial security of many workers, but the purpose here is not to design those motivations/vehicles.
- Does not address medical benefits—adequately financing Medicare and supplemental medical benefits in retirement remains a significant challenge. A robust Tier 2 will help mitigate but will not eliminate this issue.

The proposed structure strives to bridge the wide gulf between social insurance and voluntary savings, involving compromise and distinct differences from both Tiers 1 and 3, accomplished by:

- *Minimizing intergenerational subsidies.* Unlike Tier 1, the Tier 2 retirement system should promote equity among generations of workers, with each generation funding its own benefits.
- *Extending universal coverage.* The broadest possible coverage creates the greatest efficiencies and thus the lowest cost.
- *Maximizing use of the private sector.* Competition within the private sector produces value and innovation.
- *Calling on government entities only in areas the private sector cannot adequately address.* The government can effectively promote competition in the private sector by ensuring that all financial products are transparent and easy to compare.
- *Making retirement income uniformly available to all workers.* Tier 2 should benefit all workers without bias based on gender, marital status, ethnic status, health status, or the other characteristics that often affect commercial annuity markets.
- *Creating a mechanism to pool the longevity risk within cohort groups.* Longevity is a risk that individuals have difficulty managing. A new system needs to pool the longevity risk efficiently.

This mandatory retirement system offers a high degree of individual equity, inflation protection, and income replacement. An outline of how it works follows:

- Benefits are funded through contributions based on earned wages.
- A minimum required contribution can be made by the employee or employer. Employers are not obligated to contribute but must enroll all employees, withhold employee contributions, and transmit funds to a selected investment company.
- All participants are always 100 percent vested in their accounts, which are fully portable.
- There is no penalty for changing employers (although some employers may choose to contribute more than others).

- There is little intergenerational transfer and minimum taxpayer subsidy.
- Funds accumulate in individual accounts and are invested in TIPS and target date funds. Distributions before retirement are limited to disability benefits and death benefits, and perhaps some hardship withdrawals and loans.
- Income replacement is provided at a uniform price for all workers of the same age. Individuals receive the full experience of their invested funds and pool longevity experience with a cohort group.
- Retirement income is paid to individuals through mandatory partial annuitization into PVAs. These annuities guarantee income for a lifetime, with the amount varying each year based on actual investment, expense and mortality experience. Annuities are designed with an expectation that income keeps pace with inflation, but there's no guarantee.
- One government agency oversees the industry and facilitates the pooling of longevity experience on the broadest possible basis. The agency is fully funded by the companies and individuals participating in the system, with no taxpayer funds involved.

These elements and related points are detailed in the following sections.

The Need: Shortcomings of the Current System

The current Tier 1 is a social system intended to provide sufficient income for a modest, perhaps minimal, standard of living in retirement. Benefits are heavily weighted toward low-income workers. The system is not fully funded and involves intergenerational transfer of assets. While benefits are related to the taxes an individual pays, there is no intent to provide individual equity in the sense that everyone should get out at least what they put in.

Social Security is a social system that always has and will continue to provide disproportionate benefits to low-income workers. The current level of replacement income in Social Security is not adequate to sustain a comparable standard of living in retirement for most workers.

Social Security financing is precarious; the tax structure will not support the promised benefits beyond approximately 2040. Changes to benefits and taxes can make the system financially viable, but this is likely to produce some decline in the real value of replacement income—increasing the need for a robust Tier 2 system.

The existing system of some employment-based retirement plans and voluntary savings is inadequate and will not provide the additional income most retirees need to sustain a standard of living in retirement similar to that of their working years.

This employer-based system has multiple flaws:

- Defined-benefit (DB) plans are rapidly declining in coverage. Many lament this decline and suggest that only DB plans can provide secure lifetime income, but the reality is this: Employers don't want the volatile effects of these plans on their balance sheet, and they're voting with their feet. Coverage of DB plans has been diminishing since the mid-1980s, and the recent financial market crisis accelerated this decline.
- DC plans currently provide broad coverage, but still fail to cover many workers. Many small employers do not sponsor plans; even among employers that do, workers often choose not to participate or participate at very low levels.
- Benefits depend highly on investment elections—elections usually made by the participant rather than an investment professional. Many workers are befuddled by a wide range of choices and lack understanding about proper fund allocation.
- Most DC plans and many DB plans pay benefits at retirement as a lump sum rather than a lifetime income. This poses multiple challenges to the retiree, such as investing prudently and spending only enough to ensure the funds will last a lifetime. Those plans that do provide lifetime income seldom provide inflation protection.

A replacement for the current voluntary system needs to address these shortcomings. A new retirement system that supplements Social Security should:

- Provide broad coverage, including virtually the entire labor force.
- Reduce investment choices and ensure that part of each worker's retirement assets is in safe investments that can reasonably be expected to protect the individual from inflation's erosive effect.
- Deliver a lifetime income with a high probability of keeping up with inflation and sustaining a standard of living comparable to pre-retirement.

Attaining these goals will not be easy. It calls for substantial changes in the way we design the system. There will be controversy and objections—particularly from those with a vested interest in the current system.

This paper suggests a system for accumulating funds during one's career and paying out those funds over the worker's lifetime. Specifics help illustrate the system's operation—the individual's annual contribution, maximum covered wage, threshold for lump-sum distributions, percent of funds invested in default options, etc. In most cases the following sections describe a potential range for these factors. The actual specifics will result from many compromises, and will reflect the political process of evaluating conflicting interests. The new structure can work well within a wide range of these specifics, which will influence the ultimate benefits delivered to retirees.

The emphasis of this paper is on the system's basic structure, not the specific value of any certain element.

Two Phases, Two Challenges

Ensuring financial security throughout retirement involves two very different challenges:

- *The accumulation phase*—An individual needs to accrue enough wealth to provide adequate funds during retirement. How much is needed? How much must be saved and for how long? How should the funds be invested? The answers are not obvious, and employees often revise the plan to reach a specific goal many times over a career. Even with a good plan, uncommon discipline is needed to defend it against the other demands on financial resources.
- *The spend-down phase*—Accumulated funds are used to provide income during the nonworking years of retirement. Questions remain about how to invest, but another immediate question surfaces: How much can be withdrawn each year? The greatest challenge in this spend-down phase is to ensure the funds last the individual's full lifetime without excessive transfer to a subsequent generation.

Part 1—The Accumulation Phase

Changes in our retirement system over the last 30 years demonstrate a clear point: The path of least resistance lies in DC plans. While many argue the merits and efficiencies of DB (this author included), widespread coverage of workers in these plans seems unlikely in the future because of understandable employer rejection. This paper embraces the path of least resistance in adopting the DC approach to the accumulation phase, but differs significantly in the spend-down phase.

Yet a DC accumulation phase faces numerous challenges. Providing universal coverage, setting an appropriate contribution level, determining employer involvement, and selecting the right investments ... all are daunting tasks.

The proposed structure accumulates funds throughout the working years by establishing retirement savings accounts (RSAs) for all workers.

Individual Accounts

DC plans can also be called individual account (IA) plans, which puts more emphasis on their broader characteristics. The IA helps ensure equity to the individual and is fully transparent. IA plans track for each person:

- Contribution amounts,
- Investment income credited,
- Expenses charged to the account, and
- The benefit ultimately paid out to the retiree.

¹ Cash balance plans, a type of DB plan, establish a nominal account and credit contributions as well as nominal investment income, but the account is hypothetical—and they don't balance to trust assets.

By tracking all these amounts, the account shows individuals exactly what they get for their contributions. This is quite different from Social Security or DB plans, neither of which tracks investment income or expenses.¹ Although Social Security does maintain a record of the individual's earnings that are the basis for tax payments, benefits are not paid from this account.

The IA also helps participants appreciate the plan by reporting current account value with every statement. Most individuals have little idea about the value of their Social Security account or DB plans; IAs overcome this communication issue by periodically reporting a current value showing the changes since the previous report. The IA in an RSA can go further in communicating the benefit by also showing the monthly income the balance would provide at various potential retirement ages, i.e., ages 60, 65, and 70. Converting the current balance to a monthly income would be based on inflation-adjusted interest rates and a standard mortality table discussed later. These rates are likely to be quite stable and will show income in terms of current purchasing power.

The RSAs for all workers will be IA plans.

Universal Coverage

All workers need assurance of financial security when they reach an age where they can no longer work. This can happen only if participation is mandatory for the broadest class of workers possible.

Social Security coverage is broad now, but does not encompass many state and local government workers. This presents a constitutional challenge that must be overcome if we're to have a uniform, effective program. Regardless of how the current Social Security coverage issue is addressed, a new Tier 2 retirement system to supplement it should cover employees of every organization—large or small, public or private.

Social Security would be more effective, and many inequities would be resolved, if it were expanded to include all workers. Universal coverage has proven possible and effective in other countries and can surely be accomplished in the United States.

Universal coverage could be implemented through a participation mandate at the individual taxpayer level—with all workers required to be in an RSA. Employers would have to withhold the minimum required contribution from their wages and forward the funds to the worker's RSA. Employers could make the contribution on behalf of the employee so that wages are not reduced, and all contributions would be reported on the W-2 to demonstrate the minimum contribution had been made.

Compliance would be enforced through the tax-filing process. For example, if a self-employed individual didn't make the minimum required contribution, the tax due with Form 1040 would be increased by the necessary amount (plus a penalty to discourage such activity); the Treasury would then transfer the minimum contribution to the taxpayer's RSA.

Minimum Required Contributions

The minimum required contribution amount will be hotly debated. Ask any financial advisor how much you need to save for retirement and the answer is the same: "More!" This is perhaps an accurate response, but not very helpful. Nevertheless, the contribution needs to be large enough to defray

reasonable expenses and build a meaningful level of assets by retirement. Anything less than 3 percent of pay would likely mean excessive expenses relative to the amount contributed and would not provide a significant retirement income.

To maintain a standard of living in retirement consistent with the working years, many studies conclude 15 percent of pay or more is required throughout a career. This mandatory savings level is not likely to be politically attractive, however, and there's no need for a mandatory system to *fully* replace an individual's standard of living.

A politically acceptable minimum contribution level may be 5 percent to 10 percent of pay:

- At the low end, contributions would be large enough to make necessary expenses reasonable and would yield a meaningful benefit at retirement. A danger of selecting the low end is that many individuals will think they don't need to save more.
- At the high end, the accumulations would replace a significant part of pre-retirement income. A danger at the high end is that our labor market would be more expensive, which might affect the economy and future growth.

Transition rules might start the minimum required contribution at an even lower level, such as 3 percent, and increase it 1 percent per year until the ultimate rate is reached.

There is no need to give a tax shelter to contributions based on very large incomes, so compensation subject to the minimum percent contribution should be limited, similar to the way Social Security taxes are limited to pay below the Social Security Wage Base (SSWB). But the limit should be higher, to help all workers accrue enough for their retirement. A possible range for the maximum pay level subject to the minimum required contribution is at least twice the SSWB as a lower limit, and perhaps \$1 million as an upper limit. The current compensation limit in qualified plans is another benchmark.

Employee contributions to the RSA are made with pretax dollars and are always 100 percent vested.

Voluntary employee contributions in excess of the mandatory contribution might be allowed if that level is low. For example, if political compromises result in a system with a 4 percent of pay mandatory contribution, it would be reasonable to allow voluntary contributions of another 6 percent for a total of 10 percent. This would enable workers to benefit from the spend-down provisions of this proposal. On the other hand, if the mandatory contribution is 10 percent or more, voluntary contributions would probably be better left to Tier 3—a system designed exclusively for voluntary contributions.

Employer Contributions

Employers would be free to make the minimum required contribution for the employee or additional contributions to the employee's account. Some employers, particularly those that currently sponsor retirement plans, probably would want to contribute to the employee's account. There would be an upper limit, similar to the IRC §415 limit, but increased substantially to allow all workers to build sufficient funds. The maximum dollar contribution should be at least 10 percent of the maximum wage considered.

All employer contributions to the RSA are deductible to the employer and not currently taxable to the employee. All employer contributions are immediately vested.

Investment Companies

Broad competition among investment management firms should be encouraged for RSA funds. Banks, mutual funds, and other financial institutions could establish individual accounts but would first have to demonstrate compliance with minimum criteria. To be eligible to accept RSA contributions, a financial institution must:

- Segregate all funds in separate accounts not subject to the financial institution's creditors (similar to the way mutual funds are organized).
- Establish a governance process separate from the governance of the sponsoring institution (comparable to mutual fund trustees).
- Show all fund expenses and net fund returns in a fully transparent, standardized way for easy comparison among managers.
- Offer the required default funds.
- Be audited annually by an independent firm to confirm compliance with all requirements.

Fees would be allowed (but not required) for:

- Setting up an account,
- Quarterly maintenance (small flat dollar amount),
- Percentage of assets under management (could vary by fund), and
- Asset transfers (assessed when funds are transferred out).

These fees are the only income the investment companies receive; commissions, rebates, loads, or similar items are prohibited. For example, any rebate offered by a brokerage firm to the investment manager as an incentive to direct trading must be credited to the investment fund as an expense reduction.

Competition among financial institutions is enhanced by standardized reporting; firms can distinguish themselves by keeping expenses low and providing excellent service.

Employers would be able to select one or more financial institutions to accept the contributions of all employees. However, to encourage competition, that institution must allow the participant one feeless transfer per calendar year to another financial institution. Individuals can establish an RSA with any qualified financial institution, but their payroll deductions would first go to the one selected by the employer.

Investment Funds

Recent investment market volatility demonstrates the consequences of substantial risk to retirement funds. While volatile investments may produce superior returns over some long periods, that's little solace to someone retiring when markets are plummeting. Our current system burdens every individual with the

responsibility of determining appropriate asset allocation; many are woefully unprepared. Attempts to provide investment education, while helpful, will never give every American adequate skills.

Retirement assets should be invested with their specific purpose in mind. Each year the worker contributes a portion of annual pay; the funds are intended to replace part of the individual's purchasing power and to maintain it throughout the retirement years. This calls for keeping pace with inflation.

TIPS are the primary investment that can achieve this goal with certainty and maintain a retiree's purchasing power.

In the proposed structure, every financial institution that invests RSA funds must establish a TIPS fund as the required investment for a portion of the account. As with other parameters, the required level will be subject to much debate, but 50 percent is suggested.

A risk-averse participant can choose to invest more in the TIPS fund. Other participants willing to incur additional risk for the opportunity of greater gains could invest the remaining 50 percent of their account in target date funds (also known as life-cycle or age-rated funds). These funds should have narrow ranges of allowable asset allocation bands to which the financial institutions must adhere. Based on age or target year, the narrow bands:

- Help in comparing the performance reports of various institutions, and
- Produce meaningful competition for investment results in addition to expense levels and participant service.

Some may criticize this mandatory investment in conservative funds, but it is consistent with the funds' purpose. Tier 2 is a mandatory system intended to ensure a reasonable level of purchasing power in retirement for everyone beyond the minimal levels provided by Social Security. Tier 3, a purely voluntary system of encouraging further savings, is the place for risky investments.

This substantial investment in TIPS would create an increased domestic demand for U.S. government securities. As the system matured, the demand might exceed the supply of government securities, although that day is likely to be many years in the future. Should this occur, investment in other high-quality fixed-income securities could be allowed.

All income earned by the RSA is tax sheltered. Income is not taxed while in the account, but RSA distributions are generally taxable income.

Pre-retirement Distributions

Withdrawals would not be permitted from the RSA before retirement age except for death or disability and limited amounts for hardships or loans.

At death before retirement age, 100 percent of the RSA would pass to the spouse's RSA if married, or directly to the other designated beneficiary if not married or if a spouse waiver was signed (similar to ERISA rules). Death transfers to RSAs would not be taxable. Death transfers to other designated beneficiaries would be fully taxable.

At disability (qualified by Social Security), periodic distributions would be permitted, with the maximum a function of taxable income (subject to the eligible compensation limit) before disability. For example, the maximum distribution might be an amount that, when combined with Social Security, would equal 60 percent of taxable income before disability. Disability distributions would be taxable income. Lump-sum distributions would not be allowed.

RSAs would be permitted to make periodic distributions to purchase disability insurance. Several types of disability coverage might develop in the marketplace. For example, coverage might provide periodic income benefits to the individual, in which case additional withdrawals from the RSA would not be required. Alternatively, the disability benefit might provide continued contributions to the RSA account during the period of disability.

Some current qualified retirement plans allow hardship withdrawals. Those supporting hardship withdrawals argue that the funds belong to the individual, and severe financial hardships that cannot be met by other sources should be a reason to allow distributions. On the other hand, these withdrawals undermine the individual's future financial security. Hardship withdrawals, if allowed, should be limited to relatively small amounts—similar to current loan restrictions on qualified plans.

Current qualified plans also allow loans up to \$50,000 and require repayment. But loans often result in accumulating less for retirement when participants lower their contribution rate to make loan repayment easier or terminate employment and fail to repay the loan.

Loans from an RSA can be accomplished by requiring repayment without any offsetting reduction in the minimum required payment. Repayment must be in addition to the minimum required contribution and, if employment is changed, must continue with the next employer. New employers would have to withhold the loan payment and remit to the appropriate financial institution at the employee's request. A significant tax penalty would result if the employee defaults by not informing the new employer about the loan.

Loan payments would be deferred for any period when the individual receives unemployment compensation.

RSAs would be subject to division upon the dissolution of a marriage. Part of the RSA could be transferred to the RSA of the spouse pursuant to a domestic relations order. Standards similar to those of current qualified domestic relations orders would be established.

Retirement Age

The RSA is an individual account that holds investments made by the employee and/or employer. The employee owns the funds and should reap the full benefit. The employee also should be able to decide when to retire—within the constraints of a minimum and maximum. Little is gained by encouraging or discouraging retirement at any particular age. Some will choose to retire early, and others will choose to continue working. Funds accumulated in the RSA should be available without penalty and without incentive to retire at a certain age:

- A minimum retirement age prevents early withdrawals for purposes other than retirement. Current tax law allows distributions from retirement accounts as early as age 55 if made as lifetime annuities or age 59½ otherwise. Earlier withdrawals are subject to tax penalties. Social Security sets 62 as the earliest retirement age.

- A maximum retirement age requires the start of retirement benefits to avoid an indefinite tax deferral. The tax shelter was created to provide retirement income, not pass wealth to another generation. The current qualified plan rules requiring distributions to begin at age 70½ accomplish this purpose. Social Security does not have a maximum retirement age, but essentially imposes one by eliminating benefit increases at age 70.

Ages suggested by the current system, 59½ and 70½, seem adequate, but 60 and 70 would be simpler, and are used in later examples.

A worker could choose to keep working past the maximum retirement age even if receiving RSA distributions. RSA contributions after the maximum age would not be required, but could be continued voluntarily.

These details can be debated endlessly but do not affect the proposed basic structure. The accumulation phase structure is a compulsory IA plan substantially invested in inflation-indexed securities. Funds are generally not available until retirement.

Part 2—The Spend-Down Phase

A worker who participates in the RSA for a full career would accumulate enough at retirement to replace a substantial portion of pre-retirement income. But considerable challenges remain.

Broad Longevity Risk Sharing

Perhaps the most perplexing difficulty a retiree faces is how to manage funds to last a lifetime. The average life expectancy of a healthy age-65 retiree is about 20 years, but some die unexpectedly only months after retiring, while others live 30, even 40 years or more in retirement.

Financial advisors give a common rule of thumb for how much to withdraw the first year from total accumulated funds: 4 percent. This implies that you need to accumulate 25 times the amount of your first-year expenses. Yet you can purchase a fully guaranteed inflation-protected annuity for less than 20 times the annual amount. How can an insurance company provide this guarantee for 20 percent less than the financial advisor's guideline?

Insurers effectively pool the longevity risk for those who purchase annuities. This risk pooling enables them to provide a lifetime income for less than the cost of providing a fixed monthly payment for the retiree's life expectancy. Perhaps it's not intuitive, but pooling this risk actually creates value.²

Pooling the longevity risk for retirees:

- *Enables all retirees to be confident they'll have an income for their entire life.* There is no risk of running out of funds.
- *Creates large savings on a macro level.* A retiree with an average life expectancy of 20 years who accumulates enough to last 20 years has about a 50 percent chance of outliving those funds. To have

² A rudimentary formula proven by all actuarial students demonstrates that the cost of a life annuity is less than the cost of an annuity certain over the individual's life expectancy for any interest rate greater than zero.

enough to last 30 years, that retiree would need 20 percent to 30 percent more—depending on the investment return—and still could outlive the 30-year span.

If all retirees saved 20 percent to 30 percent more than needed for average life expectancy, there would be enormous oversavings for retirement. Most of the excess funds would be transferred to subsequent generations.

- *Has limitations.* It's most effective when the risk is pooled over a large number of annuitants and when there's no anti-selection. Anti-selection—one of the factors contributing to the relative expense of annuities—can be illustrated by two individuals about to retire who are considering the purchase of an annuity. Assume the first is healthy, fit, never smoked, exercises regularly, and has parents and grandparents who lived to be 90. The second is overweight, smokes, never exercises, and has a family history of heart disease. Who is more likely to buy the annuity? Of course it is the healthy person. Insurance companies recognize this, and base their longevity projections on generally healthy individuals who are more likely to live longer than the “average person.” *In other words, one reason annuity rates are high is because only those who expect to live many years purchase annuities.*

Mandatory Annuitization

Annuity rates would be lower if everyone bought annuities, and this brings us to another mandatory feature of the Tier 2 retirement system: RSAs must be partially annuitized at retirement. Requiring all retirees to purchase an annuity with at least part of their RSA not only would greatly reduce anti-selection bias, but also would ensure that each retiree:

- Can pay the lowest possible premium, and
- Has a lifetime income regardless of low investment returns or other calamities.

Annuity conversions could start as early as retirement age 60. Annuitization could also be deferred, but not beyond age 70—when a participant must annuitize the minimum required amount.

The minimum annuitization might be 50 percent of the account, with additional amounts:

- Voluntarily annuitized,
- Withdrawn as a lump sum, or
- Withdrawn as periodic distributions, but not less than under the current minimum distribution rules of current qualified plans.

Non-annuity withdrawals could be made only after minimum annuitization is complete.

Requiring all retirees to purchase annuities seems to compromise the objective of individual equity. The healthy annuitant who gets a lower premium would be delighted, but what about the unhealthy retiree who doesn't expect to live as long, or even the healthy retiree who dies unexpectedly soon after retirement? These people do not seem to get the full benefit of funds they built up during their working years.

This dilemma can be addressed by making a cash refund feature a part of all annuities, providing a special benefit that may be payable at the annuitant's death. If the total paid to the annuitant is less than the premium paid for the annuity, a death benefit would be paid equal to the shortfall. In the extreme example, if a retiree dies after purchasing an annuity but before the first monthly benefit is paid, the entire premium would be paid as a death benefit to the beneficiary.

Although mandatory annuitization would substantially reduce anti-selection, it would not be eliminated. Mortality experience studies indicate a correlation between longevity and wealth; individuals with greater wealth have access to better health care and other factors linked with longer life span. Even if annuitization is mandatory, longevity experience would likely be skewed toward those with larger account balances and those who voluntarily elect to annuitize more than the minimum requirement. This simply indicates that experience will never exactly follow the mortality tables—and that additional factors are needed to help stabilize any system.

Guarantees and Risk

Everyone wants a fully guaranteed retirement benefit. Unfortunately, guarantees are expensive. Fully guaranteed annuities are available in the insurance market, but disdained by many, at least partially because of the expense.

An insurance company that promises a guaranteed annual income for life protects the annuitant against at least three risks and charges the annuitant for this risk transfer:

- *Longevity risk*—Insurers expect to pool longevity risk among a large number of annuitants, but recognize that the annuitant is likely to be healthy and live longer than the average individual. To compensate, they base the premium on a mortality table that expects greater longevity and add margins to protect against the risk.
- *Investment risk*—Insurers intend to invest the premium and use investment income to pay part of the annuitant's periodic benefit. They must estimate the return expected on these investments. If they intend to make a profit on the annuity, they must estimate—not overestimate—this return very carefully. They generally invest conservatively, in high-quality fixed-income investments with predictable returns.
- *Expense risk*—Insurers guarantee an expense level for the annuitant's lifetime. They must estimate the cost they incur for many years in the future—again, conservatively, if they expect to make a reasonable profit on the transaction. There's no going back to ask for additional premium later.

These pressures for the insurance company to add margins in order to protect profitability are partially offset by a competitive market that places downward pressure on annuity premiums. But the prospective annuitant wants assurance that the insurer can make payments in the future—and generally is willing to pay more for that assurance. In addition, state insurance regulators require all insurers to meet certain requirements, including adequate reserves, so that payments will be made as promised.

These guarantees not only add to the cost of providing an annuity, but also mean there will be winners and losers in these transactions. Consider an annuity with a premium that implies a 4 percent investment return over the annuitant's expected lifetime. Even if the insurer invests the premium in very high-quality fixed-income securities (perhaps U.S. Treasuries) with an expected 4 percent return, the actual return is highly likely to differ. If it's a little more, the insurer profits; if it's less, the profit is

reduced, possibly eliminated. The longevity risk and expense risk involve similar potential winners and losers. The insurers must add margins to protect against these possible losses; otherwise they might fail and the annuitant, or the state insurance guarantee fund, will suffer.

Social Security guarantees a fixed annual income with cost-of-living increases. Its price is borne by future taxpayers. If retirees actually live longer than Social Security actuaries project, or if inflation is greater than expected, future taxpayers have to pay more, or the guarantee might be broken.

Guarantees seem reasonable in a social insurance system that involves intergenerational subsidies. But in a mandatory supplemental retirement system that strives to produce equity and eliminate intergenerational subsidies, guarantees are very expensive. Minimizing guarantees may enable the system to provide better benefits at a lower cost to most participants.

The Variable Annuity

A variable annuity (VA) is simply a lifetime income benefit where investment experience is passed on to the annuitant rather than guaranteed. In a VA, the exact amount of each periodic benefit changes, depending on the overall experience of the funds backing the annuity. Let's look at a simple example.

Assume you have \$100,000 to cover certain expenses over the next five years (the example can be expanded to longer periods or lifetimes, but a short period helps keep it clear). If the money is deposited in a non-interest-bearing account, you could withdraw \$20,000 a year for five years.

However, if you anticipate investing the funds and earning a return, you may be able to withdraw more. For example, if you expect to earn 4 percent (the assumed investment return or AIR), you could withdraw almost \$21,600 a year. At the start of the first year, you withdraw \$21,600, leaving about \$78,400 in the fund. If it earns 4 percent during the year you would have \$81,537 at year-end. The following table shows exact amounts.

Table 1. Assumed Earnings at 4 Percent

Year	Balance at Beginning of Year	Withdrawal	Balance after Withdrawal	Investment Earnings	Balance at End of Year
1	\$100,000.00	\$(21,598.76)	\$78,401.24	\$3,136.05	\$81,537.29
2	81,537.29	(21,598.76)	59,938.53	2,397.54	62,336.07
3	62,336.07	(21,598.76)	40,737.31	1,629.49	42,366.80
4	42,366.80	(21,598.76)	20,768.04	830.72	21,598.76
5	21,598.76	(21,598.76)	0.00	-	-

At the start of the fifth year, you have exactly enough to make the final withdrawal. But what happens if you don't earn exactly 4 percent each year? Suppose you underestimated, or interest rates simply rise and you actually earn 5 percent each year. As the next table shows, you would have money left over at the end of five years.

Table 2. Actual Earnings at 5 Percent

Year	Balance at Beginning of Year	Withdrawal	Balance after Withdrawal	Investment Earnings	Balance at End of Year
1	\$100,000.00	\$(21,598.76)	\$78,401.24	\$3,920.06	\$82,321.30
2	82,321.30	(21,598.76)	60,722.54	3,036.13	63,758.67
3	63,758.67	(21,598.76)	42,159.91	2,108.00	44,267.91
4	44,267.91	(21,598.76)	22,669.15	1,133.46	23,802.61
5	23,802.61	(21,598.76)	2,203.85	110.19	2,314.04

The opposite could happen also. You might earn less than 4 percent and not have enough money for your last withdrawal. Is there a way to adjust withdrawals to reflect actual earnings? There is, as Table 3 shows, assuming a constant return of 5 percent.³

Table 3. Earnings at 5 Percent—Adjusted Withdrawal

Year	Balance at Beginning of Year	Withdrawal	Balance after Withdrawal	Investment Earnings	Balance at End of Year
1	\$100,000.00	\$(21,598.76)	\$78,401.24	\$3,920.06	\$82,321.30
2	82,321.30	(21,806.44)	60,514.86	3,025.74	63,540.60
3	63,540.60	(22,016.12)	41,524.48	2,076.22	43,600.70
4	43,600.70	(22,227.81)	21,372.89	1,068.64	22,441.53
5	22,441.53	(22,441.53)	0.00	-	-

In this case the withdrawals increase each year as you continually earn more than the assumed 4 percent. If you knew with certainty that you were going to earn 5 percent each year, you could increase each payment to \$21,997.60, but at the beginning, 4 percent was your best estimate of your expected return.

A similar adjustment will work when the amount of investment earnings changes every year, as Table 4 shows.

Table 4. Variable Earnings—Adjusted Withdrawal

Year	Balance at Beginning of Year	Withdrawal	Balance after Withdrawal	Actual Rate of Return	Investment Earnings	Balance at End of Year
1	\$100,000.00	\$(21,598.76)	\$78,401.24	5%	\$3,920.06	\$81,537.29
2	82,321.30	(21,806.44)	60,514.86	2%	1,210.30	61,725.16
3	61,725.16	(21,387.09)	40,338.07	8%	3,227.05	43,565.12
4	43,565.12	(22,209.67)	21,355.45	3%	640.66	21,996.11
5	21,996.11	(21,996.11)	0.00		-	-

³ The formula to determine the adjusted withdrawal is: Adjusted Withdrawal = Previous Withdrawal × (1 + AR)/(1 + AIR) where AR is Actual Return and AIR is Assumed Investment Return.

Some find an alternative way of thinking about VAs easier to understand. The initial deposit of \$100,000 could be thought of as buying annuity units (similar to mutual fund shares). Units for a five-year certain annuity at 4 percent AIR would have a price of \$4.629895.⁴ Each unit would make an initial payment of \$1.00 and subsequent payments would be adjusted based on the actual return.⁵ Our initial fund of \$100,000 would buy 21,598.76 units. Table 5 shows how the unit value calculation produces the same result.

Table 5. Variable Earnings—Annuity Units

Year	Annuity Unit Payment Value	Adjusted Withdrawal	Balance after Withdrawal	Actual Rate of Return	Investment Earnings	Balance at End of Year
1	\$1.000000	\$(21,598.76)	\$78,401.24	5%	\$3,920.06	\$81,537.29
2	1.009615	(21,806.44)	60,514.86	2%	1,210.30	61,725.16
3	0.990199	(21,387.09)	40,338.07	8%	3,227.05	43,565.12
4	1.028284	(22,209.67)	21,355.45	3%	640.66	21,996.11
5	1.018397	(21,996.11)	0.00		-	-

A VA that pays a lifetime income works in a similar manner:

- The payment is adjusted periodically (usually once per year, but it could be more frequent), based on the actual return on investments backing the annuity.
- With a VA the annuitant gets the full benefit of all investment earnings, but also bears the risk that the investments might not earn as much as expected. In the example above, in year 3, the amount withdrawn is actually less than the year 1 withdrawal, but in all other years the withdrawal is greater.
- Benefits continue for a lifetime, not just the five years in the above example.

The AIR is an important component of the VA. A high AIR will produce a larger initial payment, but make it more difficult to exceed the assumed earnings and have an increasing annuity. A low AIR results in lower initial payments, but a greater likelihood of payments increasing in the future.

Immediate VAs are available in the insurance market today, providing purchasers a means to retain the risks and rewards of investments, while transferring longevity risk to the insurance company. Unfortunately, many of these products have very high expenses and are not as transparent as the system proposed for a new Tier 2.

Participating Variable Annuity

The term “participating annuity” has generally been used to describe an annuity that shares with the participant some of the insurer’s risks and/or rewards. Some participating annuities share excess investment returns over a certain amount; others share longevity gains above a threshold level.

⁴ A compound interest function: $(1-v^5)/(1-v)$.

⁵ The adjustment in payment value is:

New Payment Value = Old Payment Value $\times (1 + AR)/(1 + AIR)$ where AR is Actual Return and AIR is Assumed Investment Return, in this case 4 percent.

When combined with a VA, the term “participating variable annuity (PVA)” means an annuity that passes actual investment experience, actual expenses and actual longevity experience to the annuitant through periodic benefit adjustments.

Creating such annuities makes it possible to provide lifetime income to large groups without incurring the extra cost of guarantees and without any potential subsidy from outside the group. PVAs are not generally available in the insurance market today.

A structure must be created to provide PVAs with longevity risk pooling on the widest possible basis.

To create such contracts and to pool longevity experience on the widest possible level, a new structure is needed. This structure will entail a new type of annuity company and a government entity to facilitate longevity pooling, as described below.

Federally Chartered Annuity Companies

Private industry should be the site of this new structure, not the government. Private industry provides the best means of producing competitive products, with the government’s role limited to enabling risk sharing on the widest possible basis and ensuring that competition among vendors is based on the proper factors.

A new financial institution could be created and regulated by the federal government. These organizations, federally chartered annuity companies (FCACs), would provide the investment funds and administrative capability to deliver PVAs consistently throughout the country. The FCAC might be affiliated with the financial institution that accumulated the RSA funds, but could be entirely different. There probably would be far fewer FCACs than financial institutions that accumulated RSA funds.

For the widest possible longevity pooling and to avoid issues regarding selection of longevity risk, all FCACs should be required to base annuity premiums on the same mortality table and the same AIR. Premiums would depend only on age. This means that two people of the same age would pay the same premium rate for an annuity—regardless of gender, race, health, or any other factor.

Since the annuity’s initial price would be the same for all companies, competition among FCACs would be based on service levels, expense ratios, and their investment fund performance.

Longevity Differences

Longevity experience is not the same for all Americans; in fact, there is much variability based on several factors, the most obvious being gender. Women live longer than men—about four to five years longer by most measurements. But many other factors influence longevity including race, health status, marital status, and personal health habits. Some actuaries even measure longevity experience based on postal codes.

Charging the same premium for all individuals of the same age would be a recipe for disaster. Healthy retirees with long life expectations would flock to buy these annuities, but they would be shunned by the unhealthy and those with shorter life expectations. An insurer that charged the same premiums for males and females would attract mostly females to their product. This pricing structure would collapse in a free and competitive market.

The same rate for all individuals is not a market-driven pricing policy. This rate structure would be socially driven—a pricing structure intended to accomplish a specific purpose: making longevity protection available to all Americans at a reasonable price.

Mandatory annuitization would help limit the selection issue, but random differences between the annuitant groups for various companies would sink some firms and produce windfall profits for others. A method of pooling longevity experience on a large scale needs to be created. But first, here are a few more details on the FCACs and annuities.

More on FCACs and Annuity Structure

All annuities issued by the FCACs would be PVAs. Annuity purchase rates would be based on a mortality table established by the federal agency that regulates the FCACs. The AIR, or hurdle rate, used for annuity premium rates would also be determined by the federal agency, based on the real interest rate implicit in TIPS. The AIR and the mortality table could be periodically revised by the regulatory agency.

The mortality table used for the annuity premium would be a broad-based cohort table representative of longevity experience (and projected experience) for the entire United States. One cohort table would be used for all retirees born within a certain time frame (perhaps as little as one year or as many as 10); the only variable would be age at commencement. The table would not distinguish based on gender, race, health status, or any variable other than age.

The development of this table is beyond the scope of this paper, but a simple illustration can estimate pricing. If we use 2 percent interest to approximate the real return on TIPS and the Social Security cohort life table for 1950 (age 60 in 2010), and then simply average male and female rates to approximate a unisex rate, the price for each \$1 of annual income at age 65 as a PVA would be \$15.20. This compares to \$18 to \$20 for an inflation-indexed commercial annuity today or to the \$25 of accumulation typically recommended by financial advisors.⁶

Similar to the accumulation phase, a retiree would be required to invest 100 percent of the minimum required annuity funds in the TIPS fund. Any additional annuity the individual elected to purchase could be invested in the TIPS fund, a target fund, or any other fund the FCAC offers. Other funds would have requirements similar to those for qualified funds today.

Additional details follow:

- The FCAC would pay annuities from each selected fund (only the TIPS fund if no voluntary annuitization) and indicate to the retiree how much was being disbursed from each annuity fund.
- Annuities would be adjusted once per year based on the investment return of each annuity fund.⁷ The investment return would be determined for each fund. Fully transparent investment expenses and administrative expenses would be deducted from the investment return; the net return would be compared to the AIR. If actual return exceeded AIR, next year's monthly payments would

⁶ These annuity rates are based on straight life annuities. Actual annuities might include a cash refund feature, as discussed earlier, and a joint and survivor provision for married retirees.

⁷ Annual adjustment is common for existing qualified variable benefit plans. Some insurance companies offer monthly adjustment of variable annuities, which would be a desirable enhancement to lessen the risk exposure for all entities.

increase to reflect the gain; if the return was less than AIR, next year's monthly payments would decrease to reflect the loss.⁸

- Annuities invested in the TIPS fund would be expected to increase each year by approximately the rate of inflation, although this is not guaranteed and deviations would certainly take place.
- Annuities invested in other funds could increase or decrease based on investment performance. Because the funds would generally be expected to experience returns greater than AIR (based on the real return implicit in TIPS), annuities would generally increase, but this also is not a guarantee.
- Annuity payments would be taxable as ordinary income to the recipient, but subject to a 10 percent exclusion from taxable income. This exclusion would make the mandatory annuitization more palatable to the individual and encourage additional annuitization beyond the minimum required amount. This tax subsidy is the only aspect of the proposal that involves some intergenerational cost. It is relatively small and should prove beneficial in gaining acceptance for the mandatory annuitization.
- At a married retiree's death, the annuity would be continued to the spouse (contingent beneficiary) in the selected percent (50 percent, 75 percent, or 100 percent) if the retiree had elected a joint and survivor annuity.
- At a single retiree's or contingent beneficiary's death, a lump sum would go to the retiree's designated beneficiary if total payments to the retiree and contingent beneficiary were less than the premium paid for the annuity. The lump-sum amount would be the premium paid less all payments previously made to the retiree and contingent beneficiary (no adjustment for investment income/loss). If total payments to the retiree and contingent beneficiary exceeded the premium paid, no death benefit would be payable and all payments would cease.
- All FCACs would compete on the basis of investment returns, expenses, and service to investors. Mortality experience would not affect company performance or profitability.
- Competition among FCACs could be enhanced by allowing retirees to transfer to a competing FCAC periodically, perhaps once every three or five years, so they're not locked into one company for their lifetime. If a company's funds perform poorly, their expenses prove higher than other companies, or their service is unsatisfactory, the retiree could transfer to a competing FCAC. Upon a transfer, the original FCAC would transfer to the successor FCAC the reserve, calculated on the mortality table and interest rate at the time of transfer.

Pooling Longevity Experience through a New Federal Agency

A mechanism must be created to pool mortality experience over all companies offering these annuities to sustain the single pricing structure and ability to transfer funds periodically. This mechanism would not evolve naturally in the private sector; government involvement is essential to provide the broadest possible longevity pooling.

⁸ The formula for adjustment is:

New Benefit = Old Benefit × (1 + AR)/(1 + AIR) where AR is Actual Return and AIR is Assumed Investment Return used to determine the annuity premium

This could be accomplished by a new federal agency—the Longevity Pooling Agency (LPA). The LPA would be supported entirely by the companies it oversees (the FCACs) and RSA participants, with no taxpayer funds involved. In this sense it would be similar to the Pension Benefit Guaranty Corporation.

As the government entity overseeing the annuitization of all RSA balances, the LPA would:

- Issue charters to annuity companies that comply with all requirements for an FCAC.
- Promulgate the mortality table and assumed interest rate used for the standard pricing of annuities by all FCACs.
- Promulgate adjustments to the mortality table for determining required reserves and the annual mortality charges.
- Audit or oversee the audit of all FCACs, particularly with respect to the periodic determination of required reserves.
- Collect funds from FCACs with excess reserves and distribute funds to FCACs with insufficient reserves. This redistribution of reserves may be annual, but biennial or triennial might be possible and would mean lower expenses.
- Enforce penalties for misstatement of reserves.

Each FCAC would calculate the required reserves for its block of annuity business, based on the mortality table and interest rate promulgated by the LPA. If actual reserves exceeded the required amount, the company would remit the excess to the LPA; if actual reserves were less than the required amount, the company would request additional funds from the LPA. Upon audit and approval, the LPA would transfer funds to the FCAC.

Since all annuities would be participating VAs, only mortality experience would cause a company to have a surplus or deficit with respect to the required reserves. Any investment gains or losses with respect to the AIR would be reflected in adjustments to the underlying annuity. All expenses—both investment-related and administrative—would be charged against the annuities and fully transparent to the annuitant. So the only reason a company might experience a deficit would be that their annuitants lived longer than the mortality table would expect.

Additional details follow:

- The aggregate experience of all FCACs should approximate the experience expected by the mortality table, but this is not guaranteed; there would almost always be deviations. To prevent them from undermining the system, the table must be constructed conservatively, with a mechanism for continual adjustment to reflect actual experience as it emerges.
- The LPA would establish the mortality table on the basis of the broadest possible experience throughout the country. The table should be a cohort table—that is, it must reflect that the longevity expectations differ based on year of birth. The life expectancy for a 65-year-old born in 1940 is different from that of a 65-year-old born in 1960.

- The primary method of adjusting reserves would be an annual mortality charge assessed against all annuities as a number of basis points against the return on invested funds. This serves two main purposes by providing:
 - Operating funds to the LPA, and
 - A means for the LPA to adjust annuities based on actual longevity experience.

For example, assume the mortality charge is initially established as 30 basis points for all annuitants. In subsequent years the LPA determines that annuitants born in 1945 through 1949 are living longer than expected, but annuitants born in 1950 through 1954 are dying sooner than expected. Overall reserves of the system could be kept in balance and intergenerational subsidies avoided by increasing the annual mortality charge for annuitants born in 1945 through 1949 and decreasing the annual mortality charge for annuitants born in 1950 through 1954.

The LPA would receive its funding from three sources:

- *The annual mortality charge assessed against all annuity payments.* The amount would be collected by the FCAC and remitted to the LPA. With respect to the retiree's annuity, the mortality charge would be treated as an administrative expense and netted against the investment return of the PVA. The amount might initially be 30 basis points, subsequently adjusted based on actual experience.
- *An annual mortality charge assessed against all RSA account balances.* This charge should be minimal, perhaps 5 basis points or less. This charge is designed to help finance the LPA, which will benefit all participants.
- *An assessment against any non-annuity distribution from an RSA.* This would include death benefits, whether paid directly to a beneficiary or transferred to their RSA account, and lump-sum or periodic nonannuity distributions to participants. The assessment proposed is 30 basis points, comparable to the annual charge on annuities. This might also be adjusted subsequently based on the LPA's financial needs.

Funding the LPA by charges to FCACs and participants and keeping all funding independent of taxpayer money would help ensure that each generation of workers accrues its own benefits without intergenerational transfers.

Making It Work

The proposed structure aims to meet both accumulation and spend-down phase challenges in providing a meaningful retirement income to all workers.

The accumulation phase could be adopted gradually and without major structural changes. The mandatory contribution could be phased in over several years to ease any jolt to the economy and labor cost structure. With a few years of advance planning, employers could modify and gradually phase out existing employee retirement plans. Existing DB plans could be maintained for current members, but new employees would be covered by RSAs. Employers would be permitted to reduce future accruals for current members to reflect the value of any employer contribution to the RSA.

Structural changes for the spend-down phase would take longer to accomplish. The creation of FCACs would greatly simplify the regulation of annuity companies. State regulation of insurance companies (including non-RSA annuities) would continue, but all annuities purchased by RSAs would be subject to federal regulation and standard throughout the country.

The LPA would be established in advance and would set the requirements and charter process for FCACs. This would likely take several years. Initial funding of the LPA would be challenging because the sources of revenue proposed would not be significant until annuities were being paid to retirees from the FCACs. Temporary funding through loans from general revenues might be necessary, with the loans to be repaid when annuity payments become substantial.

The audit and supervisory role should be exceptionally strong. FCACs could be tempted to overstate required reserves in order to qualify for additional funds. Stringent audit requirements and substantial penalties for misstatement of reserves could mitigate this risk.

As the system matures, the investment in TIPS would become very large. Other types of fixed-income securities might be considered for the RSA and FCAC investment funds if necessary to maintain market equilibrium.

The basic model of compulsory savings and annuity payout with pooled longevity could be implemented on other than a national model. Statewide or regional plans covering most or all workers could apply these concepts, but the efficiencies would not be as great as in a national system.

Taxation Summary

Various tax aspects of Tier 2 have been mentioned throughout this paper; they are summarized below:

Contributions to an RSA by an individual or an employer would not be taxable income to the employee at the time of contribution. All such contributions by the employer would be deductible from taxable income. All income earned by the RSA would be sheltered from taxation. Any lump sum or periodic distribution from the RSA would be taxable income, including a disability payment or hardship withdrawal (if allowed). Default on a loan repayment would result in taxable income and a tax penalty (perhaps greater than the current 10 percent to further discourage default). A spouse's transfer to the RSA at the participant's death would not be taxable. Transfer to a beneficiary at the participant's death would be taxable.

Conversion of an RSA account balance to an annuity would not be a taxable event. All income earned by annuity funds within an FCAC would be sheltered from taxation. Annuity payments from an FCAC would be taxable, but subject to a 10 percent exclusion from taxable income. This additional tax benefit would enhance the annuity benefit and encourage more voluntary conversions to annuities. Death benefits resulting from the cash refund feature of the annuity would be taxable.

A Look at the Future

After a gradual transition period, a robust Tier 2 system will produce many benefits for the economy. Labor costs will quickly adjust to the new structure, and all workers will take part in building a secure financial future. Substantial new domestic demand will be created for government securities. Financial

institutions will compete aggressively to be the RSA vendor of choice, and the competition will be focused on expenses, fund performance, and customer service.

Employers will experience lower costs in administering benefit plans. RSA costs will be limited to selecting an RSA provider, enrolling participants, and transmitting funds. The high cost of administering ERISA retirement plans will fade into the past. Financial statement volatility affecting both the income statement and the balance sheet will be a distant memory. Fiduciary responsibilities and the risk of litigation no longer will be employer concerns.

The greatest additional benefits will be experienced by future retirees. Imagine looking forward to retirement with the knowledge that:

- In addition to an adequately financed and secure Social Security benefit, you will have an additional substantial lifetime income that is highly likely to keep pace with inflation.
- You will have the flexibility to invest part of retirement funds for growth, with the security that at least half of your supplemental income is backed by government securities.

Poverty among the elderly will be reduced, and welfare costs will likely decrease. The additional income for retirees will increase discretionary income, making retirees an important component of strong consumer spending driving our economy.

Investing in our future through compulsory savings and ensuring lifetime income for all retirees at a reasonable price is an investment we cannot afford to miss.

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Glossary of Acronyms

AIR—Assumed Investment Return

AR – Actual Return

FCAC – Federally Chartered Annuity Company

IA – Individual Account

LPA – Longevity Pooling Agency

PVA – Participating Variable Annuity

RSA – Retirement Savings Account

TIPS – Treasury Inflation-Protected Securities

VA – Variable Annuity

“Affordable Retirement Income through Savings and Annuities”

By Charlene Moriarty

The Fuerst model scored high points among the judging panel, based on the measurement criteria used. I, for one, find it to be a very elegant private sector solution to many of the pitfalls of the current Tier II retirement system in North America today.

The exodus from DB to DC plans continues unabated. As industry professionals, we are all too aware of the implications of this phenomenon: transfer of investment and longevity risk to stakeholders who are least equipped to assume such risks. These transfers have taken place because employers are themselves no longer willing or able to carry the investment and longevity risks associated with DB Plans. In a DC plan however, employers face a new type of risk, as do their employees: the risk that employees won't have enough money to retire on, because of either poor investment decisions or bad luck or both. As a fiduciary, the employer must ensure that the investment choices adequately meet the needs of employees and that they are receiving enough information and education to make informed decisions.

The Fuerst model is essentially a DC model, with these major pitfalls removed or at least mitigated.

With the Fuerst model the employer is relieved of the fiduciary burden of plan sponsorship. The employer's role is relegated to that of a conduit, providing the mechanism for payroll deductions and remittances to the member's individual account.

For the employee, it mitigates much of the investment risk by requiring investment of a significant portion of the funds (50 percent is suggested) in government-indexed linked securities. Target date funds would also be available for a portion of the contributions. The net effect is that there is very little room for members to be adversely affected by poor investment decisions. And investment in TIPS ensures that the growth in the funds at least keeps pace with inflation.

The most valuable and innovative feature of the Fuerst model in my view is its proposed approach for handling the spend-down phase. One of the largest pitfalls of a traditional DC plan for employees is that it continues to expose individuals to both longevity and investment risk, at a time when they are potentially most vulnerable. Broadly speaking, the two choices available with DC money are to continue to invest it and draw down the balance over the remainder of the individual's lifetime, or to purchase an annuity that guarantees a fixed income for the annuitant's lifetime. Either option utilizes funds very inefficiently. With the former option, a retiree must be overly conservative in the amounts withdrawn each year, to ensure he will not outlive his retirement income. With the latter option, the cost of annuity guarantees in today's market is very expensive. It's expensive primarily because an insurance company takes on at least three types of risk in exchange for a guaranteed annual income and charges the annuitant for these risks: longevity risk, investment risk, and expense risk. Although the longevity risk is pooled among a large number of annuitants, insurance companies recognize that only the healthy are likely to elect annuity options and therefore price the annuities accordingly. The investment risk is covered through conservative investments and choice of assumptions. The expense risk is covered through conservatively estimating the administrative expenses over the length of the contract.

The Fuerst model essentially accepts the notion that income guarantees are at best expensive and at worst illusory. The proposed system of participating variable annuities (PVAs) makes annuities affordable first of all by removing the guarantee and replacing it with a reasonable assurance of a fairly steady lifetime income in retirement. Although the investment risk is passed on to the annuitant, it is kept to a minimum, since companies issuing the annuity contracts must invest the proceeds in index-linked securities (at least for the mandatory annuitization portion). Since 50 percent of the member's individual account must be used to purchase a PVA, this mandatory feature allows for a much more efficient pooling of longevity risk by reducing the degree of anti-selection inherent in a voluntary system.

To ensure efficient pooling of mortality risk, a mechanism would be created to pool mortality experience of all companies issuing PVAs. Clearly some government involvement is required for this annuitization solution to work. Fuerst recognizes this and proposes the creation of a government agency—the Longevity Pooling Agency—whose primary role would be to license and regulate the financial institutions issuing PVAs, as well as setting the mortality tables and interest rate to be used for the standard pricing of annuities.

Challenges of the Fuerst Model

Clearly the Fuerst model would work best as a mandatory system. The mandatory nature would ensure a quick buildup of the economies of scale and would be most effective in reducing anti-selection when annuitizing. It also serves to enforce some coverage for the self-employed and employees of organizations who do not currently sponsor any type of pension or retirement savings plan.

Implementation would present some challenges, particularly in setting up the government agency to regulate and monitor the financial institutions licensed to administer these plans and issue PVAs, and to set the mortality tables and hurdle rates. But I believe that if the political will were there, these challenges would not be insurmountable. The market infrastructure is already largely in place.

It is interesting to note that the Canadian federal government recently promulgated the Pooled Registered Pension Plans (PRPP) Act, which seems to parallel the Fuerst model, at least in the accumulation phase. Under this new legislation a PRPP will be a DC plan administered by a third party—a financial institution authorized by the federal government to administer such a plan. As in the Fuerst model, the employer is relieved of the fiduciary burden of plan sponsorship. But this is where the similarities end. In all other respects, the PRPP is a traditional DC plan with the plan members still bearing all the investment and longevity risk, and no special plan features to mitigate those risks.

The biggest challenge of the Fuerst model is finding the political will to implement features that are bound to be unpopular among some groups. Mandatory participation, restrictions on investment choices, forced annuitization are bound to elicit strong objections from citizens at different ends of the wealth spectrum: from the rich who want control over their own money, from the poorer folk who may feel the financial strain of forced participation, and from middle class families who might prefer using the money toward paying off a mortgage or saving for their children's education.

But if a government's goal in implementing a retirement system is to increase pension coverage among the poorly covered sectors of society, then some individual choice must be sacrificed in the interests of the public good. If a government is concerned about economic and social impact of poverty in retirement because of the poor savings choices made by its citizens, then it behooves them to implement a retirement system that protects all its citizens (at least to some degree) against the potential consequences

retirement savings losses and poor retirement planning. As more and more citizens rely on retirement income from DC pension and retirement savings plans, these issues will become increasingly critical for governments to deal with. Canada's PRPP remains a voluntary system; hence the goal of increased pension coverage is not likely to be achieved. And it does not provide participants with any protection against longevity or investment risk. In Canada, significant attention has been paid to the fall in pension coverage. Since 2006 there have been numerous commissions, public consultations, and research working groups launched at both the provincial and federal levels to assess the current state of the Canadian retirement system and develop recommendations for improving and increasing pension plan coverage where necessary. It's distressing to find that, at the end of the day, the Canadian government couldn't come up with something more imaginative than a basic voluntary DC plan design, with no attempt to address some of its major flaws.

Picking the minimum required contribution rate would present a challenge. Too high a contribution rate would place an undue burden on the lower paid and would be politically unpopular, and too low a contribution rate would render the system expensive and ineffective. Fuerst suggests an acceptable minimum to be in the range of 5 percent to 10 percent of pay. In Canada, integration with the Canada/Quebec Pension Plan contributions would make sense. Someone who has earned the Year's Maximum Pensionable Earnings (YMPE)¹ throughout his working life will have about 36 percent of his final earnings before retirement covered under Canada's government programs. For someone earning double the average wage, this replacement ratio drops to about 18 percent. Using conservative assumptions similar to those employed by Fuerst, over a 35-year working career, a minimum required contribution rate of 4 percent on earnings up to the YMPE and 8 percent on earnings in excess of the YMPE can be expected to generate replacement ratios (taking into account government programs) of close to 50 percent for the average wage earner and about 36 percent for someone earning double the average wage. Striking the right contribution rate depends on what the goals should be for a mandatory Tier II retirement system. The 4 percent/8 percent structure illustrated above provides meaningful retirement income protection; however, it does not (nor should it) eliminate the necessity for personal savings or voluntary retirement plans to maintain one's standard of living in retirement.

Could the Fuerst Model work under a voluntary retirement system? Certainly, economies of scale are necessary to make this system work effectively. However, perhaps the model for the spend-down phase can be made to work under the current voluntary system. In Canada, assets in DC pension plans alone amount to about \$41 billion,² covering almost one million participants. It used to be that members retiring from a DC pension plan were required to purchase annuities with their DC funds by the time they reached the age of 80. This requirement was eventually removed in all provincial jurisdictions. Today, members retiring from DC plans have the option to annuitize or to transfer their funds to an individual retirement vehicle with legislated maximum annual withdrawal limits. Most choose the latter option. If forced annuitization on retirement was legislated for at least a portion of a member's DC funds, then this may eventually provide the economies of scale needed to make PVA's an effective and affordable alternative.

The final challenge facing the Fuerst Model that I think is worth discussion is the potential shortage of supply of inflation-protected securities to cover the increasing demand as the system matures. What

¹ These are the maximum earnings upon which Canada/Quebec Pension Plan contributions and benefits are based. The YMPE approximates the average wage in Canada is set at \$50,100 for 2012.

² Statistics Canada 2010. These figures are for pure DC plans. They do not include DC assets and membership within registered pension plans that have both a DB and a DC provision. As such, they underestimate the total amount of DC assets and membership within the registered pension plan framework in Canada.

impact would such shortage have on real rates of return and hence the affordability of PVAs? Fuerst mentions this possibility in his paper and suggests that, should this occur, other high-quality fixed-income securities could be allowed. But what if there becomes a shortage of high-quality debt generally? The potential shortfall in the supply of suitable fixed-income securities to cover the demands created by this type of mandatory retirement system is, in my view, an important issue to consider. What would be the macroeconomic implications of such a significant increase in the demand for high-quality fixed-income investments, and how would this affect the supply of equity capital? Should markets and society be concerned about this? These issues highlight one of the key macro-economic advantages of DB plans that receives very little attention. The assets backing DB pension plans are a major source of equity capital to both business and government. Because of their long-term investment horizon, they are a prime source of long-term investment capital for large projects that can be used to support a country's future production capacity. By transferring investment risk from individuals to collectives, they also help achieve a more efficient allocation of savings. In my opinion, this speaks to a significant weakness of a DC type of design for a mandatory Tier II retirement system when compared to a DB type of design. DB plans are simply more financially efficient at pooling risk and deploying capital. Macroeconomic factors such as these need to be taken into account in the design of a retirement system.

The strength of the Fuerst model, when measured against some of the *Retirement 20/20* criteria for a model retirement system, is that it does a good job of aligning stakeholder roles with their skills. The markets play a significant role in hedging and pooling risks; the regulators (as society's agents) provide the oversight necessary to ensure legal compliance, transparency, and standardization. Employers are relieved of the burden of plan sponsorship and can therefore focus more on their core business. And, last but not least, employees are provided with reasonable assurance of retirement income protection. Given the inexorable move toward DC plans in North America there is dire need for alternatives to the current options available to retirees. The Fuerst Model, in this regard, presents an alternative well worth considering.

Charlene Moriarty, FSA, FCIA, is a principal in the Toronto retirement practice of Morneau Shepell. The opinions expressed here are her own and do not reflect those of her employer, the Canadian Institute of Actuaries, or the Society of Actuaries.

Author's Response to Comments by Charlene Moriarty

by Donald E. Fuerst

I would like to thank Charlene Moriarty for her kind comments and for the intriguing comparison to the Canadian pension system.

Moriarty correctly classifies the model as essentially defined-contribution. My thinking has evolved gradually to believe the generally level accrual pattern of defined-contribution plans provides equity and portability that the defined-benefit system lacks. Cash balance plans have provided a laudable step in this direction, but still suffer with several of the issues that corporate America has with defined-benefit plans, particularly the affect on the balance sheet and earnings statement.

Moriarty also correctly notes that the model differs greatly from current DC plans by relieving the sponsor of most fiduciary requirements, requiring mandatory contributions, and mandatory investment in inflation-indexed securities. Could such changes actually be implemented? She observes "if the political will were there, these challenges would not be insurmountable." Frankly, I am less optimistic and doubt that such widespread mandates could ever be implemented in the United States.

Despite this pessimism, there is much that can be learned from the model. The traditional fixed annuities that sometimes seem the only way to provide longevity protection for DC plan participants are expensive and provide long-term investment guarantees that I doubt are beneficial to most retirees. Low-cost immediate variable annuities are available in today's market and can be backed by a wide variety of mutual funds, including conservative fixed investment funds. These contracts provide longevity protection without investment guarantees, thus reducing the need for larger margins to protect the provider against adverse investments.

The substantial cost advantage of widespread longevity pooling is lost in a purely voluntary system. The broad mandates of the model are unlikely to be attained, but smaller versions are possible. Moriarty discusses some variations of this in the Canadian system. In the United States, the best opportunity might be encouraging plan sponsors to make a portion of the employer provided contribution account available only as a fixed or variable annuity. This would enable group contracts to reduce adverse selection risk and improve the pricing and attractiveness of the annuities.

The Total Career Benchmark Model: A Pension Model for *Retirement 20/20*

Thomas J. Walker

Abstract

The Total Career Benchmark (TCB) model in this paper, consistent with *Retirement 20/20* principles, focuses on reconstructing and maintaining a consistent and reasonable sharing of risks and rewards among the four stakeholders: individuals, society, employers, and the markets. The model takes advantage of modern technology for the necessary tools. This is done by establishing a series of benchmarks used to define tax shelter limits and target pensions and other items like accrued benefits to date. The key benchmark in the TCB model (which is referred to as the Annual Service Factor) links “Tier I” to “Tier II.” The Annual Service Factor is at the root of a system that includes a simplified and predictable “lifetime” component and a very flexible “personal” component for each individual. The “lifetime component” is the insurance aspect, whereas the “personal” component enables individuals to tailor retirement benefits to their own personal needs. Implicit within each of these components is the critical “investment risk” for the contribution streams to cover the “lifetime risk” and the “demographic risk.” Individuals and employers will look to the markets as a vehicle to which the “lifetime risk” and a portion of the “investment risk” can be transferred. The necessity for society to monitor will still be present but will be greatly simplified by the TCB model. The self-adjusting, consistent benchmarks under the TCB model mean that all four of the stakeholders will speak the same language. Individuals and employers can easily compare what they have to what they need—and even more importantly can determine how to accrue what is needed. This is done by transferring the skills of the expert staff within the retirement industry away from time wasted on the ever-increasing stack of bureaucratic requirements. Instead the talent of these people will shift to developing creative risk management solutions, within an effective and sustainable system, through the use of advanced technology. In the end, under the TCB model, each employee has the equivalent of an individual defined-benefit pension plan with adjustment features available to reflect both personal and market changes. An individual’s ability to tax shelter income over a career will be unaffected by the design of any employer pension plan. All funds allocated to an individual remain the individual’s and are not used to subsidize another person—except for the inherent risk sharing of an annuity.

Executive Summary of the Total Career Benchmark Model¹

The *Retirement 20/20 (R20/20)* process (*Retirement 20/20 Accomplishments to Date*) recognizes the necessity to go back to first principles and to develop a system that achieves the underlying goals of retirement savings from the perspectives of all of the stakeholders. The direct stakeholders are employees, employers, and society in general—through the government. All three of these groups, employees, employers, and society—hereafter referred to as the threesome, are very much in need of a predictable, understandable and sustainable retirement system. The indirect stakeholder is the market, which has a critical role to play in order to guarantee that the threesome is able to achieve the underlying goals of an effective retirement system.

¹ Thanks to Tian-Teck Go, FSA, FCIA; William Solomon, FSA, FCIA; and Paul M. Winokur, FSA, FCIA, MAAA, for reviewing drafts of this paper. The author alone is responsible for any errors or omissions in the paper.

The Total Career Benchmark (TCB) model, developed in this paper, with a focus on Canada and the province of Ontario, is based on the fundamental goals that I previously described in an earlier paper (Walker, 2008). Although that paper was not directly in response to *R20/20*, the proposals in it were closely in line with the principles of *R20/20* (*Retirement 20/20* Archive).

In this summary of the TCB model I will focus on the main instruments that are being used and how they work together to ensure proper allocation of risk, governance and administration. The transparency under the TCB model will greatly assist in the transition from the current system. The TCB model will lower employer, and employee, cost and risk while at the same time increasing employee understanding, increasing employee appreciation of benefits, and increasing employee acceptance of responsibility for their portion of the risk. The model also focuses on making sure that the income replacement ratio at retirement is consistent with societal goals for those with lower income levels. The only way these seemingly divergent goals can be attained simultaneously is by simplifying both the environment and the benefits. Lower employer risk does not have to mean higher employee risk. Lower employer administrative and governance costs as plan sponsors will help to make higher employee benefits possible—particularly for small to mid-size companies and the self-employed.

The cost savings under TCB will not be as a result of removing funds from the intended purpose of providing retirement income but will instead be from a combination of:

1. The removal of the necessity for a significant portion of the bureaucracy that binds the current Canadian retirement system and many other nations' retirement systems.
2. Taking advantage of current technology to implement consistent, standardized, and sophisticated processes that increase understanding and spread risk on a national basis.

An employer or an individual deferring the same percentage of income as they do now for retirement purposes will actually receive a much higher proportion of that deferral as “retirement income” under the TCB model. TCB should effectively provide each employee with the equivalent of an individual, personalized, defined-benefit (DB) pension plan by combining an insurance foundation built upon a “Lifetime Account” and a personal needs component funded through a “Personal Account.” From an employer perspective, the TCB model permits the provision of DB-type benefits using “defined contributions.” A key element implicit within TCB is that all individuals, including those who are self-employed or who are not part of an employer-sponsored plan, will have access to some of the risk management mechanisms that are now available only to members of large DB plans.

The new TCB system will be such that weaknesses inherent in the current system are not grandfathered but are eliminated in a smooth transition to the new system. The transition process to the TCB model will be by evolution with some initial overlap. The strengths of the current system will stay, but in a manner under which risks and opportunities are much more fairly apportioned to every working Canadian. The manner in which TCB can change, or integrate with, the entire retirement scenario in Canada, including employer-sponsored DB and/or defined-contribution (DC) plans, individual tax-sheltered retirement savings (RRSPs), and public mechanisms like the Canada Pension Plan (CPP) and Old Age Security (OAS), will be discussed.

It is also critical when reviewing changes as fundamental as the TCB model that we consider the very different electronic tools that are now available to individuals, as well as their skill and propensity to use them, compared to even 15 years ago. An analogy that I have frequently used in presentations about my

total career benchmark idea has been that it is time for the pension iPod. Many of the fixes proposed for our current pension system are the equivalent of trying to squeeze extra songs onto an old LP. The TCB model is the pension equivalent of being able to have multiple personal playlists along with a huge number of songs and other features on your “record player.”

The use of the CPP to determine the benchmarks for TCB provides an effective basis for the integration of Tier I and Tier II. It should be noted that in Canada the common terminology is to refer to three “Pillars,” where Pillar 1 is totally government-funded benefits such as OAS and the Guaranteed Income Supplement (GIS), Pillar 2 is the CPP/Quebec Pension Plan (QPP), which requires contributions, and Pillar 3 includes employer-sponsored registered plans as well as individual RRSPPs. In this paper Pillar 1 plus Pillar 2 equals Tier I and Pillar 3 equals Tier II. I use the Tier I and Tier II terminology for consistency with *R20/20* terminology. It is also assumed that the current Tier I benefits will remain in place in Canada when the TCB model is implemented.

The TCB model is built on a solid foundation of “benchmarks” that work together to enable country-wide risk sharing of the “lifetime risk,” while minimizing demographic and cohort risk, and even risk sharing of unpredictable items like a market crash. At the same time these “benchmarks” enable the use of optional benefits for idiosyncratic risks and bring much better transparency to the overall retirement system. In the current pension system the term “plan sponsor” implicitly also includes the roles of “plan governor” and “plan guarantor.” Under the TCB model the “plan sponsor” role will only include the responsibility to “champion” and to help “pay for” plan benefits. The “guarantor” and “governor” responsibilities will transfer to the regimes that actually provide the plan’s lifetime benefits.

The simplest benchmark that will be used is the Canadian Retirement Age. This is defined as the normal retirement age for the CPP, which is currently 65. Another CPP item, upon which some other benchmarks are based, is the Yearly Maximum Pensionable Earnings (YMPE, which is \$47,200 in 2010). Under the CPP the YMPE is used both to calculate annual contribution limits and annual benefit amounts, and grows in step with the Average Industrial Wage (AIW). The YMPE will be used in a similar manner within the TCB model providing a direct link to Tier I benefits. The YMPE can, in my opinion, be viewed as an annual rounded version of the AIW in Canada.

The defining benchmark under the TCB model is the Annual Service Factor (ASF), which restates every individual’s annual income as a multiple of the YMPE (e.g., an individual with 2010 income of \$59,000 gets an Annual Service Factor of 1.25, calculated as \$59,000 divided by \$47,200). This benchmark means that at any time an individual will know his accumulated ASFs to date, and average ASF to date and can easily project future ASFs. By using the ASF as the base, all past and future earnings are stated in current year dollars. Under the TCB model ASFs are accrued during three separate phases—the Phase-In Period, the Pension Accrual Period, and the Phase-Out Period. The basic target pension amounts under TCB are based on the Pension Accrual Period. ASFs accrued during the other two phases, together with the portion of any ASF that causes an annual tax limit to be exceeded before the career tax limit has been hit, are used to provide the necessary adjustment mechanisms to recognize the different career patterns that individuals experience.

The next critical benchmark is the Pension Unit. One Pension Unit is defined to provide an annual lifetime pension income beginning at the Canadian Retirement Age and continuing on a life-only basis. At any given time before the Canadian Retirement Age the target deferred pension payable by 1 Pension Unit is equal to the YMPE for that year divided by 1,000 (e.g., in 2010 one Pension Unit would provide a deferred annual retirement income equal to \$47.20 beginning at the Canadian

Retirement Age). Prior to the Canadian Retirement Age the Pension Unit grows in step with the YMPE (e.g., a Pension Unit earned in 2002 when the YMPE was \$39,100 will have grown from \$39.10 in 2002 to \$47.20 in 2010). After the Canadian Retirement Age the Pension Unit is indexed at the same rate as CPP retirement pensions.

Under TCB the annual income tax contribution limits will be established by setting the annual target number of Pension Units at 20 times the individual's Annual Service Factor (which equals 2 percent of earned income for that year) to an annual maximum of 60 Pension Units. The career target pension limits will be based on a maximum Pension Unit accrual limit during the Pension Accrual Period combined with top-ups by using ASFs from the Phase-In Period. The career target units will take into account projected Pension Units from both the CPP and OAS. It will be much easier for an individual to focus on a target of 1,000 Pension Units than on a dollar amount that is constantly changing. When the target unit amount goes up significantly it will be as a result of a salary increase much in excess of the national average. That type of increase occurs more frequently, and has more impact on projected career average, in the early part of a career.

Benchmark worth factors will also be established, and reported to all, that consistently show the value of a Pension Unit both as a cost to an employer and as a cost to an individual. The benchmark worth factors will consistently show how much one Pension Unit is worth and/or how much it would cost to purchase one Pension Unit, at any given age by either employer or employee. The worth factors do not represent the actual cost to either the employer or the individual but instead give them a basis for assessing their provider's costs compared to others (e.g., if for an individual of a certain age the benchmark worth factor is \$255, then 10 Pension Units are worth \$2,550). It is important to note that the "purchase" of a Pension Unit is intended to fully "fund" the promised deferred annuity. The funding levels will recognize (within each Age-Specific Plan [ASP] as described below) the anticipated values of both future contributions and future liabilities.

The standardization of Pension Units enables a very broad spreading of risk. A unique aspect of a "Pension Unit" is that the annuity payout of each unit begins at the Canadian Retirement Age regardless of whether or not the individual has actually retired. Any portion of the Lifetime Account used for early retirement, before the Canadian Retirement Age, will be by "cashing in" existing Pension Units rather than by receiving annuity payments. An election not to receive a pension until after the Canadian Retirement Age will result in an increase in the number of Pension Units rather than an increase in the pension amount per unit. This is necessary to maintain the consistency and meaning of the Pension Unit amounts and values as benchmarks. It also makes a flow of Pension Units from Lifetime Account to Personal Account and vice versa, until career limits are hit, easier.

There is a lack of transparency in the current rules for establishing tax shelter limits in Canada. Most people, especially those who are not members of DB plans, believe that no Canadian can tax shelter deferred retirement savings at a rate greater than 18 percent of annual income. This is not the case. It should be noted that in setting the contribution levels that I have developed for my TCB examples, I have used, as a career base, the current limit (27 percent of annual income and even more in some cases) available to any member of a DB plan (*Registered Plans Directorate Newsletter*, no. 96-3, Nov. 25, 1996), which requires employee contributions or which permits voluntary employee contributions. Therefore the TCB model does not include a direct increase in the tax-sheltered contributions limits currently available. Instead the TCB model rearranges the total career limits in a manner that gives all individuals the same access, regardless of the plan design used by their employer.

By changing the structure for tax sheltering deferred retirement income it will be possible to address the tensions between “investment and insurance, choice and default” as have been identified in the *R20/20* initiative to date (Kessler 2009). Under TCB each individual, regardless of whether they are a member of an employer-sponsored plan, will have a Retirement Account that has two separate components—a Lifetime Account and a Personal Account. The Lifetime Account covers the “lifetime risk” and will include all employer contributions and all “required” employee contributions to a sponsored plan. As long as an individual has not exceeded annual or career limits, the individual can, at any time, voluntarily contribute to the Lifetime Account and/or to the Personal Account. The Personal Account funds all “ancillary benefits” such as survivor benefits, early retirement benefits, upgrades from career average to “best five” earnings, etc. It will also be possible to transfer funds from one account to the other, under certain criteria, without affecting the total Retirement Account contribution limit.

Standardizing the lifetime component, as is done under the TCB model, will make it possible to establish a series of what I will refer to as “Approved Annuitization Funds” and “Age-Specific Plans.” The Approved Annuitization Funds (AAFs) will deal directly with the plan sponsor, or individual, with respect to the purchase of Pension Units, cash contributions, and the transfer of risk. Once a transfer of cash from a plan sponsor, or an individual, has been made to an AAF, the AAF then tracks assets and liabilities not by sponsor but rather by ASPs. This is because at the instant the AAF receives the cash transfer the obligation of the AAF is to provide annuity benefits to an ASP for each individual of a particular age. The AAF has become the insurer for the ASP that will receive annuity benefits from the AAF and distribute them to individuals after the Canadian Retirement Age.

The “real” pension plans under the TCB model are the ASPs. The AAFs and the ASPs are the “plan governors” and “plan guarantors.” An individual who changes jobs remains within the same ASP and does not suffer a loss of pension value. All individual data are transferred to the ASPs, which will then pass the data on to the Centralized Retirement Account System. Legislation will establish the rules for AAFs, ASPs, and the Centralized Retirement Account System. The Centralized Retirement Account System will be a national government unit since it is tracking individual tax information. The AAFs and ASPs will overlap with each other and will be mostly private sector but with some public sector participation.

Under TCB the proposal is that the largest pension plans, especially the large public sector plans that have very large pools of funds and employ many pension and investment experts, be permitted to annuitize benefits for smaller plan sponsors and possibly even for individuals by being designated as AAFs. Other financial institutions in the market, like insurers and banks, could also provide AAFs. ASPs will be national from a risk-sharing perspective but could be based in different provinces.

The existence of AAFs and ASPs means that an employer has fully met all pension obligations once the employer pays for the Pension Units promised to each employee under any employer-sponsored plan. The employer can, and in most instances should, set up a DB-type plan in which a promise is made to provide a specific number of Pension Units equal to a multiple of the ASF for each employee during the year. As will be shown in this paper, variations in plan design can be quite flexible. Therefore, from an employer point of view, a DB plan effectively becomes a DC plan.

Once annuity payments begin, the ASPs will, over time, be systematically combined with each other until the final transfer to the ultimate TOP plan, which will be established in a manner that includes the portion of the population at the upper level of their life expectancy to the end of their lifetime. This transfer process will provide a moving risk-averaging basis for the ASPs that will assist in spreading the “lifetime risk” and will also avoid the “tontine” effect within any ASPs.

In contrast to current DB plans, the role of the AAFs is to act as the “insurers” for the ASPs. Therefore the funding methods and asset allocation will be different than for current pension plans. It is important to stress that the ASPs will have their own investment policies, which DB plans do now, based on assets, liabilities, and future cash flow. This will have a major impact on the allocation of investment income within an AAF. An AAF will establish its own investment policy based on the number of Pension Units it holds from each ASP. AAFs can trade Pension Units with each other to properly balance their assets, liabilities, and investment portfolio. For an ASP the date at which annuity payments will begin is known, and it is also known that any “new” liabilities will be funded as they are accepted. There will be a need for a “participation” component and some reserving as the funds mature. Even though the funds come to the AAFs from the plan sponsors and/or individuals, the actual “group insurance” clients are the ASPs.

It may be helpful both to review the Glossary and to read the Example of Company Communication to Employees in Appendix A1 as an additional preface.

The actual level and value of some benchmarks included in the paper are for illustrative purposes only. The actual values to be used will require further research and study beyond the scope of the paper.

1. Designing and Building the Total Career Benchmark Model

In this section I will discuss the factors that were considered in determining how to allocate risks, roles, and governance responsibilities in both the design and building of the TCB model. The following four sections will then discuss the design and building of the specific components for each of the stakeholders.

In discussing the design the components will be analyzed in a general way that is applicable to any society. In building the model the design and structure will be adjusted to fit the current Canadian system in the province of Ontario with specific identification of the strengths that are built on and the weaknesses that are removed under the TCB model. The new system must be such that weaknesses inherent in the current system are not grandfathered but are eliminated in a smooth transition to the new system.

1.1 Designing the Total Career Benchmark Model

Under the TCB model the role of stakeholders will be dramatically different than under the current model. In designing the TCB model it is critical to define both the role, and the tools necessary to fulfill the role, for each of the direct stakeholders in the threesome (individuals, society, and employers) as well as for the indirect stakeholder—the markets. The ultimate goals of the threesome—providing adequate retirement benefits, with appropriate sharing of risks and rewards, to each individual in society by using a combination of Tier I and Tier II—will, of course, require help from the markets. For the TCB model it was necessary to use a “retrospective” approach to achieve the desired goals by first identifying the critical needs and roles for the individual component. Once those needs and roles have been identified we then consider needs and roles for the societal components, then for the employer components, and finally for the market components. Society, employers, and the market will all have a shared responsibility to provide education for individuals in a manner that ensures that they all will have the ability to compare and assess retirement vehicles at least as efficiently as they can now determine which house is the best fit for their family.

Reallocation and reduction of risk has been a priority in designing the TCB model. The major risk in retirement planning is the “lifetime risk.” Everyone is more and more aware of the risk of outliving their retirement savings. At the same time, as life expectancy is increasing, there is a trend away from DB plans. The “lifetime risk” is one for which a ready solution is available—annuities. Annuities, or a modernized variation, should, once again, be required on any plan that receives a tax shelter. About two-thirds of the total accumulated retirement savings over a career must be allocated to the “lifetime risk.” The DB design and regulation under TCB should be such that the accumulated benefit for a particular period of service, and a prescribed normal retirement age, is consistent for all employees regardless of gender, marital status, job changes, career income pattern, or target retirement age.

The second major risk is the demographic risk. Demographic risk has had a large impact on many plans with generous “ancillary benefits” such as unreduced early retirement. Traditional DB designs are such that there are frequently situations in which one category of members effectively subsidizes another: younger subsidizes older, short service subsidizes long service, normal retirement subsidizes early retirement, and single subsidizes married. Most of these “hidden subsidies” are a function of the plan design and contribute to the lack of transparency inherent within the current system. They also have been a huge factor in the trend away from DB plans. In the design of the TCB model an attempt is made to remove both the “unfairness” faced by some plan members and the “demographic risk” faced by employers as plan sponsors. If these aspects are not removed there will never be a resurrection of DB plans.

We can largely separate demographic risk from the “lifetime risk” by recognizing that much of the demographic risk is within the control of the employee rather than the employer. A portion of the demographic risk can, and should be, characterized as “personal circumstances risk” or in *R20/20* terminology “idiosyncratic risk.” The decision to marry, the decision to change jobs, and the decision to retire early are all aspects that are, to varying degrees, much more within the control of the employee than the employer. The employee has more ability to plan for personal factors than does the employer. This was considered in the design of the TCB model. The “cohort” portion of demographic risk, which can have much more impact on the employer, is also directly factored into the TCB model design.

Under the TCB model the “plan sponsor” role will be more narrowly defined to include only the responsibility to “champion” and to help “pay for” plan benefits. The “guarantor” and “governor” responsibilities, which are currently implicit within the term “sponsor” in the current system, will be split out and assigned to “plan governors” who will have the responsibility to manage all plan assets, liabilities, and risks.

1.2 Building the Total Career Benchmark Model

From an individual’s, and a societal, point of view, DB plans are the best tool for providing adequate pensions because of the strong insurance aspect. In building the TCB model it is recognized that the insurance aspect must be stressed, but the “insurer” must be strong. I have always found it very ironic that a small private sector company sponsoring a DB plan is not required to fund for annuity promises to the same extent as a large, well-capitalized insurer. The TCB model focuses on building strong “insurers” and providing the tools to all employers, whether big or small, to pay a reasonable price for the “insurance” without being the “insurer.”

Currently the very best pensions are enjoyed by employees of large private sector companies and by public sector employees. The two most positive characteristics of the very best pension plans are the following: 1) the income replacement ratio at retirement, for employees with long service, is generally adequate, inflation-protected, and guaranteed for life; and 2) employees are required to make significant contributions, often equal to the employer contributions. As a result members appropriately share in both the risks and rewards of the plan's performance. These two characteristics go a long way toward minimizing the "risk asymmetry" between plan members and plan sponsors that has occurred in many DB plans. These are strengths to be built on.

Members of the very best pension plans, which are all DB plans, benefit from the ability to tax shelter a much higher proportion of income (by at least one-half as a percentage of income) than do members of DC plans or individuals with no employer-sponsored pension plan. The higher tax shelter limits are primarily as a result of the current system failing to explicitly place a value on ancillary benefits (*Registered Plans Directorate Newsletter, no. 96-3, Nov. 25, 1996*), except when a member of the unrepresented group (discussed below) leaves a plan. The ability to have at least an extra 9 percent to tax shelter ancillary benefits, some of which are absolutely needed (e.g., indexing of benefits before and after retirement, spousal survivor benefits), as well as some desirable ancillary benefits (e.g., the use of final average earnings, unreduced early retirement pensions) is another strength of the current Canadian DB system to build on.

It is very important to note that the inability to directly tax shelter for such ancillary benefits except in a DB plan is an aspect of the Canadian tax system that is very non-transparent to most Canadians—including many with a high level of financial knowledge. The majority of private sector employees currently do not have full access to the available tax shelter room under the Canadian Income Tax Act due to factors beyond their control but within the control of their employer. Many employers have to control risks and costs by opting for a DC plan or a group RRSP or no plan at all rather than a DB plan. Other employers may be in a position to sponsor a DB plan but opt to make it non-contributory for employees for administrative simplicity. Ironically both employers and employees are likely to view the absence of employee contributions as a generous feature. In making these decisions the employers are not attempting to limit their employee's ability to tax shelter funds but they are! In most cases, neither the employer nor the employee recognizes this nontransparent aspect of the Canadian tax system. These decisions by the employer (i.e., to sponsor anything other than a DB plan requiring employee contributions) reduces the employee's ability to tax shelter "deferred income" by at least one-third. This unfairness aspect with respect to ancillary benefits for plans other than DB ones is a weakness that must be removed from the current system. This weakness is removed under the TCB model since the amount of deferred income that an individual can tax shelter over a career is totally independent of plan design.

Another weakness of the current system is the inability to recognize and adjust for the significant difference that occurs among individuals with respect to career income patterns—including job changes. This weakness can be alleviated by at least aligning the ability to tax shelter income with the necessity to pay income tax as in done under the TCB model.

At present in the Canadian System there is one very large group of employees who are totally unrepresented by any advocacy group. The unrepresented employee group consists of those who have been members of DB plans and then terminate employment, or die, before becoming eligible to receive a pension. This group also includes employees who opt not to take advantage of subsidized early retirement. This group is unrepresented primarily because most employees don't realize that they have been, or likely will be, part of this unrepresented group at least once during their career. The most

frequent job changes are also most likely to occur in the early stages of a career and/or when income is low. This is a weakness that must be eliminated.

One of the key strengths of the TCB model is the portability that it provides to employees who change jobs.

2. Designing and Building the Individual Components of the TCB Model

2.1 Designing the Individual Components

The role of the individual will vary significantly from one individual to another. Some employees will want their employer, society, and the markets to accept full responsibility for their retirement plan. These employees will still have to make contributions to the pension plan and accept at least a basic level of responsibility for monitoring where they are at any given time. Many employees will want to play an active role in the retirement planning process with help from their employers and/or financial advisers. There will also be a significant portion of employees, likely a higher proportion than we have now, who will want to use the modern tools available to them to personally control the retirement process for themselves and their family.

As TCB evolves, employee knowledge of the basic structure and terminology will increase significantly, and all employees, regardless of the type of plan they are in, will be speaking the same language. They should also not have to learn a new language every time they change jobs. They will also become aware that a regular review of their retirement funding status is necessary.

The individual's role is to actively participate in the process of saving for retirement. In order to meet the goals of the TCB model both mandatory and voluntary contributions will be required from both employees and employers. Employee contributions could be nonmandatory on the portion of income up to the AIW and/or until employer contributions reach a certain level. A very key element of TCB will be to provide employees with clear, self-adjusting, consistent benchmarks. The consistent terminology and structure of TCB must be such that at any given time each employee will have some sense of where they are on the path to retirement and will be able to map out the remaining directions. Part of the responsibilities of each of the other stakeholders will be to provide education and information to an employee that is consistent with both the individuals' needs and desires to understand and control the process throughout their career. Employees who do not have the desire or the expertise to control their own retirement fund accumulation should be able to transfer that responsibility to qualified financial advisers, including actuaries, within the market.

There is a tendency, which I have observed many times over my career, for an individual to place a much greater value on a "lump sum" compared to a "lifetime annuity" that actually has an equal or even greater value. The tools provided under the TCB model must assist employees to more accurately understand the relative value, and the risks involved, when deciding between a "lump sum" and the "lifetime annuity." Benefits under the TCB model are designed to be built on a strong foundation provided by the "insurance portion" funded through the Lifetime Account. The strength of this foundation enables optional benefits and risk management to be provided by a lump-sum amount accumulated in the Personal Account.

The individual components must be designed to reflect the variations that occur both from individual to individual and over any one individual's life cycle. One of the constant issues that have been

identified as an underlying weakness in the current systems is the lack of understanding by employees. In the design of the TCB model the focus is on providing tools to individuals that help them to understand the basic fact that the receipt of the income you earn while working must be spread out over an entire lifetime. In any one year a portion of earned income must be deferred to provide retirement income. The portion required to fund Tier II retirement benefits increases both with age and with income. The TCB model must be a collection of tools that, at any given time, enables an individual to visualize where they are, where they need to be, and how to get there.

The tools provided to assist in understanding under the TCB model design will also help to motivate individuals to fulfill their own portion of the responsibility to fund for retirement. The TCB tools must be understandable to the individual and must not vary in meaning, but only in value, from year to year. In the designing of the TCB model the individual tools are collected into an electronic toolbox called the “Retirement Account.” The toolbox itself is divided into two sections: the “Lifetime Account” and the “Personal Account.” Communications experts will be able to rename and display the tools more effectively than the technical terminology used in this paper.

The Lifetime Account is the biggest section of the toolbox and includes the measuring tools necessary for individuals to assess where they are with respect to the lifetime (i.e., insurance) component of their Retirement Account. The tools in the Lifetime Account section of the toolbox must be such that they include benchmarks for annual earned income, career income, tax shelter limits, accrued pension benefits, etc. The design of TCB includes the following tools for this purpose: Service Factors, Worth Factors, and Pension Units.

The Personal Account section of the toolbox includes the measuring tools necessary for individuals to assess where they are with respect to the personal (i.e., optional) component of their Retirement Account. The tools used for the Lifetime Account section of the toolbox are also used for the Personal Account section. Several additional tools will be required for efficient use of the Personal Account, such as the optional ability for couples to assess spousal Retirement Accounts together to provide the “family version” using each of the Lifetime Account tools. During the phase-in to full retirement another necessary tool will be the ability to transfer one spouse’s accrued Pension Units to the other spouse’s Lifetime Account (on an actuarially equivalent basis). This will greatly assist families in providing appropriate levels of spousal survival benefits.

2.2 Building the Individual Tools

Most of the TCB tools are “individual” in nature. Building the individual tools requires links between Tier I and Tier II (or in Canadian lingo a link of Pillars 1 and 2 with Pillar 3). The CPP forms the base for the primary benchmarks. The link to the CPP is intended to achieve three major goals:

- Government benefits such as CPP (which moves in tandem with the AIW) and OAS can be directly included in the benchmarking process.
- The CPP administration process can be used to establish a central source for all tax shelter records.
- The methodology used by the CPP to track member records can be easily expanded to cover

private sector plans in a manner that will permit the private sector to move in tandem with the CPP as the market changes (a specific example of CPP methodology is in the Appendices).

The links to the CPP are driven by four key items:

- The YMPE
- The CPP normal retirement age (which is now age 65)
- The maximum CPP contributory period (currently from age 18 to age 70)
- Post-retirement indexing.

In the remainder of this paper the normal retirement age under the CPP will be referred to as the *Canadian Retirement Age*. There are some unique aspects to the CPP methodology used to track member records. The key feature that will be used in the design of TCB is a simple method used to track year-by-year contributions and pensionable earnings. The Annual Service Factors under the TCB model are calculated using the same methodology as is used by the CPP. By linking to CPP it is possible to simplify the overall administration under the TCB model. The model also provides the mechanism to make any future changes needed in such areas as the Canadian Retirement Age as life expectancy and career patterns continue to evolve.

From the time that an individual is required to make contributions to the CPP the following factors and benchmarks are calculated and available online as part of the Retirement Account toolbox. *A “Flowing Example” based on an individual named Sam begins in this section. Please note that in this Flowing Example the actual calculations are shown. **Sam does not have to do the calculations but simply uses the “tools” in the Retirement Account.** The Flowing Example flows forward throughout the remainder of this paper. It is assumed in the Flowing Example that we are at the end of 2010 and that the YMPE is \$47,200. Information in the Flowing Example is based on one sample set of individual data (which can be found in the Appendices):*

1. The **Annual Service Factor (ASF)** is the earnings to date in a calendar year divided by the YMPE. Implicit within the ASF is pre-retirement indexing in accordance with the YMPE, which is indexed in accordance with the AIW.

Flowing Example 1: Sam’s earnings of \$70,800 in 2010 resulted in an ASF equal to 1.5000 (\$70,800 divided by \$47,200).

Under TCB the ASF (consistent with that used under CPP) will be calculated throughout the CPP contributory period, which could be as long as 52 years—age 18 to age 70. The CPP currently includes a 15 percent dropout period for years when the service factor is low (as well as some other dropouts). The impact of this dropout is to increase the CPP retirement benefit that an individual receives. An increase in the dropout period, up to 17 percent by 2014, has been accepted (*Proposed Changes to the Canada Pension Plan 2009*). Under TCB, there will not be a dropout period for low-income years. Instead the structure will be set up to recognize and adjust for the varying career patterns that affect almost everyone by using an opposite approach under which the income during the Phase-In and Phase-Out Periods, which is likely to be low, can be added to income during the Pension Accrual Period. To adjust for career pattern differences, and ancillary benefits to be funded from the Personal

Account, requires some more Individual tools. These tools will assist in properly allocating funds throughout a career into the Lifetime Account and the Personal Account.

2. The **Phase-In Period** is any year beginning with the year an individual turns 18 up to the year an individual turns 30. The Phase-In Period tool is included for several reasons. First, it is to recognize the fact that many individuals are still continuing their education during this period and have not yet started full-time employment. One also tends to have very frequent job changes over this life phase and lower income levels. Another important reason for this tool is to make sure that when an ASP starts to accumulate Pension Units (Tool 9 defined below) for a particular age, there will be an immediate significant flow of funds into the plan since most individuals will have started their career. During this period an individual can still receive employer contributions to the Lifetime Account based on ASFs, and will still be part of an ASP. However, the funds cannot be converted to Pension Units until the individual starts to use the next tool shown below—the Pension Accrual Period. Effectively the total income during this 12-year period can be added together and carried forward into the Pension Accrual Period to augment career average earnings subject to career limits.

Flowing Example 2: Sam had ASFs totalling 6.4600 during the Phase-In Period.

3. The **Pension Accrual Period** begins with the year an individual turns 30 and ends with the year the individual turns age 65—the Canadian Retirement Age. The Pension Accrual Period covers what for most individuals is the period during which a very high proportion of total career income is attained. The actual accrual of Pension Units does not begin until the individual enters the Pension Accrual Period. Annual and career maximum Pension Unit accrual limits are applied during this period. The annual limits are based on the current year's ASF and will be applicable each year. The career limits are based on the “best 5” consecutive ASFs during the Pension Accrual Period and the number of years in the CPP contributory period to date to a maximum of 40 for consistency with the CPP. The Pension Accrual Period will be the basis for the Target Career Average Pension defined below. ASFs accrued during the Phase-In Period can be carried forward into the Pension Accrual Period in a manner that assists in offsetting low-income years or career gaps.

Flowing Example 3: Currently Sam has ASFs during the Pension Accrual Period totalling 20.8800.

4. The **Phase-Out Period** begins with the year an individual turns 65—the Canadian Retirement Age—and ends with the year the individual turns 70. The Phase-Out Period tool is also included for several reasons. First, it is to recognize that more and more individuals choose to work beyond normal retirement age and/or choose to phase into retirement. As noted in the definition of a Pension Unit, the annuity payout of each unit begins at the Canadian Retirement Age regardless of whether or not the individual has actually retired. Any portion of the Lifetime Account used for early retirement, before the Canadian Retirement Age, will be by “cashing in” existing Pension Units rather than receiving annuity payments. An election not to receive a pension until after the Canadian Retirement Age, in the Phase-Out Period, will result in an increase in the number of Pension Units rather than an increase in the pension amount per unit. This is necessary to maintain the consistency and meaning of the Pension Unit amounts and values as benchmarks. This Pension Unit feature also enables individuals to watch “actuarial equivalence” as it happens. ASFs accrued during the Phase-Out Period can still be used to buy new Pension Units unless and until the career maximum limit has been reached.

You will note that Tools 2, 3, and 4 cover the total CPP contributory period.

5. The **Career Service Factor** (CSF) is the sum of ASFs to date.

Flowing Example 4: Sam's CSF of 27.3400 (6.4600 plus 20.8800) in 2010 means that career earnings to date, in 2010 dollars, are \$1,290,448 (27.3400 times the YMPE of \$47,200).

6. The **Designated Service Factor** (DSF) is the sum of ASFs accrued during the Pension Accrual Period plus any ASFs from the Phase-In Period that have been converted to Pension Units.

Flowing Example 5: Sam's DSF is 20.8800 in 2010 since none of Sam's ASFs of 6.4600 from the Phase-In Period have been converted to Pension Units. The portion of Sam's career earnings to date during the Pension Accrual Period is equal to \$985,536 in 2010 dollars.

7. The **Future Service Factor** (FSF) is a projection of future Annual Service Factors to the Canadian Retirement Age. The default value of the FSF assumes that the most recent ASF remains level until the Canadian Retirement Age.

Flowing Example 6: If the most recent ASF is 1.5000 and 19 years remain until the Canadian Retirement Age, the default FSF is 28.5000 (1.5000 times 19). Future career earnings, in 2010 dollars, are projected to be \$1,345,200 (28.5000 times the YMPE of \$47,200). On an earnings level Sam is about halfway through the career phase. Sam's projected DSF is currently 49.3800 (20.8800 plus 28.5000).

8. The **Retirement Service Factor** (RSF) equals the CSF plus the FSF. The RSF represents the total career earnings at the Canadian Retirement Age.

Flowing Example 7: Sam's projected RSF is 55.8400 (a CSF of 27.3400 plus an FSF of 28.5000).

9. A **Pension Unit** is defined to provide an annual pension amount equal to the current YMPE divided by 1,000 payable beginning the month following attainment of the Canadian Retirement Age. Annuity payments begin at this time regardless of whether or not the individual has actually retired (explained below). As with the service factors, Pension Units are in current dollars. A Pension Unit is assumed to increase annually with the YMPE until the Canadian Retirement Age and to increase thereafter in accordance with the annual increase in CPP pensions using the CPP Pension Index. A unique aspect of a "Pension Unit" is that the annuity payout of each unit is from an ASP. Any adjustments necessary to a Personal Account as a result of market meltdowns, changes in Canadian Retirement Age, etc., will be by adjusting the number of Pension Units rather than the defined benefit provided by a Pension Unit.

Flowing Example 8: In 2010 one Pension Unit provides an annual pension amount of \$47.20 calculated as the YMPE of \$47,200 divided by 1,000.

10. The benchmark **Lifetime Worth Factor** is a present value factor, expressed as an integer dollar value, calculated based on the individual's age in years and months to provide one Pension Unit. The factors will be released to the media on a regular periodic basis and will always be available to the employee as part of the employee's online Retirement Account data. Worth Factors for early retirement ages prior to normal retirement age will also be available. Each year the individual can

monitor the increased benefit amount provided by each Pension Unit, the increase in value of each unit, the total accrued units to date, and the units per year needed to reach the target pension.

Flowing Example 9: Sam has a Lifetime Worth Factor of \$382 at the end of 2010 meaning the 18 Pension Units accrued by Sam in 2010 are worth \$6,876 calculated as \$382 times 18. At any time the value of the accrued Lifetime Pension equals the Lifetime Worth Factor times the Number of Pension Units in the Lifetime Account.

11. The **Target Career Average Pension Units** for an individual are equal to 20 times the projected DSF. This includes all ASFs accrued during the Pension Accrual Period plus any ASFs carried forward from the Phase-In Period that have already been used to purchase Pension Units, plus the FSFs. This equates to a 70 percent best “35 Years” career average based on the individual’s average “topped up” earnings during the Pension Accrual Period. When assessing the individual’s status relative to the target, Pension Units projected to be provided by both the CPP and the OAS are included. The variation in the methodology used for annual and career limits provides the means to adjust for differences in career earnings patterns, particularly for very low earnings years early in a career and/or participation gaps for other personal reasons such as raising a family. The Target Career Average Pension Units is another TCB “benchmark,” which represents the “wide-ranging” income replacement goals of individuals. The tools within the Retirement Account toolbox allow an individual or family to vary their Target Pension Units to meet their personal goals.

Flowing Example 10: Sam’s projected Target Career Average Pension Units based on the 49,380 ASFs accrued during the Pension Accrual Period, as calculated above, are 988 (20 times 49,380). Based on Sam’s projected RSF, about 366 of the Target Pension Units will be available, in total, from the CPP and the OAS. This means that about 622 Pension Units (988 minus 366) will be needed in Sam’s Lifetime Account by the Canadian Retirement Age. The projected Pension Units in Sam’s Lifetime Account based on his current employer’s plan are 580. Sam will need to add an additional 42 units (622 minus 580) to reach the target by the Canadian Retirement Age.

12. The **Target Career Average Pension** is equal to the Target Career Average Pension Units times One Pension Unit Amount.

Flowing Example 11: Sam’s projected target pension amount based on 988 Pension Units is \$46,634 (988 times \$47.20) in 2010 dollars.

The individual TCB tools described so far are primarily used in the Lifetime Account portion of the TCB toolbox. The Personal Account portion of the toolbox is designed to cover the personal portion of “demographic risk” that evolves and tends to decrease over an employee’s career. A critical personal component of “demographic risk” is the variation which occurs in the timing of career income. This timing variation is handled by the combined tools in the Lifetime Account and the Personal Account.

Flowing Example 12: Sam’s ASF increased from 1.4100 in 2009 to 1.5000 in 2010 as a result of a promotion. Sam’s Target Career Average Pension is based on a career average ASF of 1.4109 (49,380 divided by 35). Sam’s projected “best 5” factor is currently 1.5000. Sam upgrades the Target Pension Units to 1,050 (1.5000 times 20 times 35) to be more consistent with current earnings. To meet this upgraded target, compared to the target in Example 10, Sam will need an additional 62 (1,050 minus 988) Pension Units. To meet this revised personal target Sam needs a total of about 104 additional Pension Units (62 plus the 42 from Example 10, or 1,050 minus 366 minus 580 if calculated directly). Sam has a choice as to whether to buy some Pension Units immediately using the cash balance in the Lifetime Account or by transferring in

some funds from the Personal Account. Another option under Sam's employer plan is to simply buy the extra Pension Units each year by payroll deduction.

Under TCB the Personal Account can be used to maintain fairness from one employee to another in contrast to the current situation under many DB plans (e.g., a person deciding not to retire early does not lose the “value” of a subsidized early retirement benefit [Schirle 2008] but instead maintains the funds in the Personal Account to use for other personal needs or desires at a future date). Under the TCB model an individual whose income stays relatively level as a multiple of the YMPE will usually not have to top up to “best 5” average earnings.

The Personal Account should be used first to supplement any employer-provided pensions up to the target Career Average Pension. The remaining funds can then be used to recognize personal differences such as retirement age, single vs. married, etc. The personal risk component should be the component that provides the most flexibility, particularly in the years when an employee's retirement is far off in the future. The risk and cost of early retirement is gone by normal retirement age. It is also important to recognize the very significant changes in family income structure as more and more families have two-income earners. The ability to split pension benefits after retirement in Canada and the new Tax-Free Savings Accounts (TFSAs) also substantially change the planning as retirement approaches. Individuals who are not married at retirement may want, and need, a larger proportion of their funds at retirement left in the Personal Account, particularly if they are in poor health.

Whether you are measuring DB benefits or DC benefits, the TCB model will provide a comparison scale. Over time the terminology will evolve and will become everyday lingo for all. Behind the scenes, like with the Richter scale, the process to develop the ongoing measures will be extremely complex as well as reflective of the current markets and demography. Actuarial and investment risk management expertise will be needed to develop the factors. Over time the current terminology (e.g., DB, DC, RRSP, etc.) will be replaced with new terms like Lifetime Account, Personal Account, Annual Service Factors, Pension Units, etc. In Canada we have “loonies and toonies.” Who knows what a Pension Unit will be called (a punie?) if it ever becomes retirement “currency”?

It is important to stress that the actual level and value of the benchmarks (other than the YMPE) included in this paper are for illustrative purposes only. The actual values to be used will require further research and study beyond the scope of this paper.

3. Designing and Building the Societal Components of the TCB Model

3.1 Designing the Societal Components

No society can build an ongoing, effective, self-adjusting retirement system without building the primary tools at the government level. The role of society must be to provide a mechanism and overall governance structure that works in a transparent and fair manner. Most societies already have some Tier I tools in place to provide a basic foundation upon which to build a Tier II system. Unfortunately as time goes on the underlying rules for the Tier II systems have built one layer of bureaucracy on top of another and have dramatically reduced the effectiveness of Tier II products. The typical plan document required for a DB plan is often 50 or more pages in addition to investment and governance documents. Just as with our computers, it is necessary to move up to a more current version or, at the very least, reboot on a regular basis.

The first role of society under the TCB model will be to establish a system that provides fairness to all individuals. The ability to tax shelter deferred income until retirement must integrate Tier I with Tier II and should provide neutrality of value over a career rather than just annually. Further, the system should make sure that any portion of Tier I benefits that are intended for those in need cannot be “claimed” by those who are not in need through nontransparent means.

Society in general, rather than a specific pension plan sponsor, must control how much tax-sheltered funding is available to an individual. The first societal TCB design tool required will therefore be Restructured Tax Shelter Limits, under which there is neutrality throughout a career rather than by age. This will permit a higher percentage of earnings to be contributed to a tax-sheltered fund as an employee ages. This is consistent with both the cost of a lifetime benefit and with the ability to set aside funds for retirement. Another benefit of this pattern will be an increased understanding on the part of employees that the value and cost of their pension increase as they age.

The TCB model design establishes tax limits and plan designs in a manner such that the ability to tax shelter funds for retirement is independent of the plan provided by any given employer but is rather specific to the individual’s earnings over their career and directly linked to a nation’s AIW through a Tier I component. The plan design under TCB is such that no one employee subsidizes any other employee—there is neutrality in value.

The critical societal need is to provide adequate retirement income to all individuals in a manner that shares risks and rewards. The societal components of any retirement system design must recognize both current and future generations. In any system the design must include a link of Tier I benefits to Tier II benefits. It is also critical that the design include a reasonable sharing of risk throughout society when a major crisis occurs. Further, under the TCB model, Tier I benefits are directly reflected in setting overall tax shelter limits.

The second, equally important, role of society is the effective governance and risk management of pension funds. Under the TCB model the highest level of governance and risk management will, of course, be at the government level. However, a key part of the TCB model will be to set up a mechanism under which the governance and risk management of specific pension funds are largely transferred to the market—but at a level where these roles are fulfilled by professionals. In designing the TCB model a key consideration was to simplify the system in a manner that reduced the need for much of the current governance that exists by properly redefining roles and by dramatically reducing both the number and types of plans that need governance.

The second TCB societal design tool necessary to help government fulfill its key roles is the Centralized Retirement Account System. This system will track the data contained in the individual’s electronic toolbox called the “Retirement Account” containing the “Lifetime Account” and the “Personal Account.” Deferred compensation for an individual represents deferred taxes for a government. The fundamental individual benchmarks under the TCB model were designed to include items that are automatically included on tax filings. From the first time that an individual files a tax return there will be a Retirement Account. All funds in an individual’s Retirement Account are “deferred income.”

The existence of the Personal Account, together with the underlying fairness of the TCB model, should remove the need for much of the existing legislation (e.g., employers do not have any responsibility at all for items like “spousal survivor benefits”). Society will have a very critical role in working jointly

with the markets to set up the system under which individual Retirement Accounts are administered and tracked.

In designing the TCB model it was obvious to me, and to virtually everyone else with any knowledge of the current retirement systems, that for an individual or a small employer to have any hope of meeting the objectives of *R20/20* there must be access to a large “pension fund” (Ambachtsheer 2008). As part of its role society must provide the tools that give this access. Rather than having complex legislation for employer-sponsored pension plans, it will be the responsibility of government to set up modern legislation for the third and fourth required societal tools: AAFs and ASPs that are accessible to all individuals.

Under the TCB model the AAFs are designed to “sell” Pension Units to plan sponsors and/or individuals. The units sold are then reported to, and tracked by, an ASP. The ASP is effectively the “real” pension plan and is responsible for monitoring all members, all assets and all liabilities. AAFs can hold units for many ASPs and for many different plan sponsors. The AAFs that hold almost all of the actual assets and liabilities are likely to be primarily private sector. The ASPs may be either public or private (e.g., an AAF may also be primarily responsible for one or more ASPs).

The TCB model design uses ASPs to share risk and to maintain intergenerational equity. There are enough employees born in the same year—or even the same year and month—to permit a national Age-Specific Pension Plan. The “Age-Specific Plans” and “Approved Annuitization Funds” will help to fulfill both the governance and risk management role of society. An anomaly of the current DB systems is that the wealth transfer inherent in the systems is usually from the lower income to the higher income (e.g., a worker has to change jobs, creating an “actuarial” gain for a DB plan, which helps to fund early retirement for someone who can afford it). The TCB model removes this anomaly.

3.2 Building Society’s Tools

The most important single tool that society must provide to achieve the goal of adequate retirement income is the ability for an individual to defer income on a tax-sheltered basis in a fair manner over a total career. The transparency provided by the TCB design will also help to guarantee that any Tier I benefits—such as the Guaranteed Income Supplement (GIS) in Canada—that are intended to benefit those individuals who, because of circumstances beyond their control, need societal help, will always be used for the intended purpose.

Major changes to the Canadian tax shelter limits occurred in 1990, which dramatically increased the level of fairness among DB plans, DC plans, and RRSPs. This change came at a time when there were many more DB plans than there are now. Changes have occurred in overall limits since 1990. The tax limits include a percentage limit, currently 18 percent, and a maximum earnings level to which the percentage can be applied.

There is still considerable unfairness under Canada’s current tax rules since it is possible for a member of a DB plan to tax shelter up to 27 percent of annual earned income, or even more in some situations because “ancillary benefits are disregarded in computing pension adjustments (PAs) and past service pension adjustments (PSPAs)” (*Registered Plans Directorate Newsletter*, no. 96-3, Nov. 25, 1996). A “Flexible” DB plan is permitted to allow members to tax shelter an additional 9 percent of earnings through voluntary contributions to the plan—which must be used upon termination or retirement to purchase ancillary benefits. I am using the “Flexible” plan example simply because it is the most

transparent unfairness component in Canada when comparing DB to DC. This additional amount is not considered when calculating the member's "PA" and is therefore over and above the "18 percent of earnings" limit that applies to DC plans and RRSPs. In simple terms the "PA" (Pension Adjustment) is the "value" placed on a DB benefit for tax shelter purposes and does not vary by age. The "PA" is equal to 9 times the benefit accrued in a year (minus an arbitrary \$600 which gives a little more tax shelter room to DB members), ignoring any increase as a result of indexing or increases in final average earnings. The "PA" overstates the value for younger members and understates the value for older members. If a member leaves a DB plan before the transfer value of his accrued pension exceeds his accumulated "PAs," he receives a PAR (Pension Adjustment Reversal) to restore some tax room.

I stress that a simple increase in the tax shelter limits from 18 percent to 27 percent for DC plans and RRSPs would not achieve society's goal to provide adequate tax-sheltered retirement income for the highest possible proportion of the population. The TCB model recognizes the necessity to guarantee that the readjustment in tax shelter limits is focused on making sure that the "insurance" aspect is met as is the case now when an individual is a member of a good DB plan. It is critical that the "fairness" aspect also be recognized since under the current system the DB plans do take advantage of the "unrepresented group" and intergenerational transfers. None of the solutions I have seen suggested to date fully recognize that the reason that the best DB plans work is because there is the nontransparent ability to both tax shelter a higher proportion of income and to indirectly transfer value from one plan member to another.

Once again I note that under the TCB model tax shelter limits are provided on a personal basis and are not a function of plan design. This is consistent with the philosophy expressed in my prior paper (Walker 2008) and also an important factor addressed in a paper (Pierlot 2008) that analyzes the unfairness in the Canadian system for tax sheltering retirement funds in some detail. Under the TCB model I have not adjusted the limits to match the maximum possible tax shelter percentage that is currently available, and largely nontransparent, in the richest DB plans. Instead the tax shelter limits under the TCB examples (which are for illustrative purposes only) are set to be slightly less, on a simple average basis, over the CPP contributory period than the current "27 percent" per year that is now available under DB plans permitting "Flexible" contributions.

If we look at only the Pension Accrual Period, or consider late entrants to the workforce (e.g., immigrants), about two-thirds of the illustrative TCB model contribution limits goes to the Lifetime Account and about one-third to the Personal Account. This is consistent with the requirements under current "Flexible" plans since the Personal Account under the TCB model is to be used for "ancillary benefits."

Under the TCB model examples, the Lifetime Account Contribution Limits during the Pension Accrual Period are split into five-year age groupings. The groupings are such that the limit at the upper end of the grouping includes a small margin for the estimated cost of a "20-Unit Plan" for that age. Over a career the maximum pension that can be accrued under the TCB model, at the Canadian Retirement Age, is comparable to the maximum pension currently available under some of the very best DB plans. A more detailed discussion of the illustrative TCB limits used in the examples, to the current limits, is included in the Appendices of this paper.

An important feature of tax limits under the TCB model is that they will be expressed as a percentage that is multiplied by the ASF and then by the YMPE. This enables the carryforward of unused contribution room on a basis that is indexed in accordance with the AIW.

Flowing Example 13: Sam's total annual Retirement Account tax shelter limit in 2010 is 42 percent of the

YMPE (28 percent times the ASF of 1.5). If the combined employer and employee contributions to Sam's Retirement Account in 2010 equal 22 percent of the YMPE, Sam gets to carry forward unused contribution room equal to 20 percent of the YMPE (42 percent minus 22 percent).

This feature is currently implicitly available to DB plan members (i.e., by using final average earnings or upgrading benefits in a career average or unit credit plan) but not to other individuals. Further, if government is concerned that people will defer their contributions until they can claim a deduction at their highest tax rate, the structure of the TCB model provides the solution. It would be easy to give tax credits based on the carryforward room at the same rate as if the “carried forward” ASF had been accrued during the year the room is used.

For employees whose employer sponsors a plan, whether DB or DC, the TCB model would include a legislated requirement that all employer contributions be converted to Pension Units (i.e., annuitized) prior to the Canadian Retirement Age. This requirement is consistent with the employer's purpose for providing retirement benefits. Further such a requirement reduces risk for both employees and employers. For employees who do not have the benefit of an employer-sponsored pension, annuitization of a defined amount, which varies as a career progresses, will be required. The amount would be calculated to provide a Mandated Income Replacement Ratio (including government benefits such as CPP and OAS). The income replacement ratio, and the income it is applied to, would reflect the year-by-year tax-sheltered limits up to the date of retirement. The TCB model is designed to encourage individuals to recognize the “insurance” value of Pension Units.

Government will also be required to develop the mechanisms necessary to enable the establishment and governance of the following important societal tools for TCB:

- The Centralized Retirement Account System
- The Approved Annuitization Funds
- The Age-Specific Plans.

4. Designing and Building the Employer Components of the TCB Model

4.1 Designing the Employer Components

The role of the employer changes the most of any of the stakeholders under the TCB model. The employer may still have a “retirement plan,” but the employer is no longer the “insurer of the plan” but rather is a “contributor” to the plan. When considering the role of the employer it is again important to emphasize that employer pension contributions will be regarded, and defined, as deferred compensation. It will be stressed to employees that their compensation includes both an “immediate” and a “lifetime deferred” component. The design of any effective system must recognize this and also recognize that an employer's immediate obligation is met once the deferred income has been transferred to the employee. The deferred component is not immediately taxable to the employee but is an immediate tax deduction for the employer.

The role of employers will primarily be to provide annual contributions to the employee's Lifetime Account. An equally important part of the employer's role will be to provide education to the employees with respect to their retirement plans.

An employer's role in a retirement system must be consistent with both societal goals and the employer's business goals. The TCB model design recognizes this. In designing the TCB model, making sure that an employer is no longer faced with a choice about taking on the huge risks, costs, and complexities of the current DB plans or the governance and administrative requirements of other plan types, or no plan at all, was an important consideration. Instead the employer sees the ability to "design" and sponsor a plan that is consistent with the company goals and financial situation. However, the transparency of the TCB design is such that although the employer does not have to worry about increasing liabilities for past "promises," employers will know that in order to attract and retain the employees they need they must highlight and promote the value of their own pension plans. Although the employer will still be considered to be a plan "sponsor" under the TCB model, the sponsorship risks, both to the employer and the employee, will plummet.

As noted above, the role of employers will primarily be to provide annual contributions to the employee's Lifetime Account. Better pension benefits provided by an employer will receive the same recognition from an employee, or a prospective employee, as higher immediate income does. An employer-sponsored plan can, and should, require some level of employee contributions to the Lifetime Account. It should be stressed that under the TCB model self-employed individuals will also be considered to be "employers."

Under this stakeholder category it is important to include trade unions even though they are not technically the "employer" of their members. Trade unions are frequently the "sponsors" of multi-employer pension plans. Under the TCB model design, unions could still be the sponsors of such plans, with funding from employers and/or employees. However, just as with employers, the unions would no longer be responsible for taking on the risks and costs associated with the current pension system but would be working with, and for, the "contributors" to the plan.

Once again I emphasize that the TCB design is intended to make it possible for both employers and employees to consider the employer funding of both immediate compensation and deferred retirement compensation to be the employee's total "employment compensation." One of the creative features that could be available would be to have an option that a bigger proportion of the total "employment compensation" could voluntarily be deferred.

4.2 Building the Employer's Tools

The employer's tools will generally be available from the market. However, the employer must "sharpen" the tools for effective use. Even if TCB legislation does not require that an employer provides a pension plan, it will be necessary for most employers to do so as the TCB process matures. It is absolutely necessary that one of the rules under the TCB model be that all employer-sponsored plans provide funding for the same basic benefit—the "Pension Unit." The funding methods used for an employer plan could be flexible and designed to provide Pension Units as a direct multiple of the ASF (a DB-type design) or funding the Lifetime Account as a percentage of income (a DC-type design). The most effective design would likely be a "hybrid." An employer who does not sponsor a plan, or sponsors a plan that does not fully meet the target pension amounts, should try to provide access to an AAF for employees who wish to acquire additional Pension Units for their Lifetime Account.

The richest plan would be a "20-Unit Plan" under which each member receives a number of Pension Units equal to 20 times the Annual Service Factor (ASF). This would equate to a 2 percent DB plan. It is most likely that a plan this rich would be offered only by an individual who is self-employed, as is the

case now with IPPs (Individual Pension Plans in Canada). At the next level, if the employer wanted to duplicate a current “rich” plan that provides benefits of 1.4 percent up to the YMPE, and 2 percent over the YMPE, a “14 plus 6” plan could be provided. Under such a plan the number of Pension Units that a member would receive would be 14 times the ASF plus 6 times the portion of the ASF greater than 1. The best design would likely be a Target Number of Units as a direct multiple of the ASF. Under this design the employer would contribute a level percentage of income within each five-year age grouping. There would be an immediate conversion to units up to the target each year. Any excess contributions would remain in the Lifetime Account as a cash balance. In years where the level contribution is insufficient to fund the units the cash balance is used to top it up.

Another option to the employer would be a “hybrid” plan—for example, a plan that provides all employees with a “10 Unit” plan during the Pension-Accrual Period plus a DC component under which the employer matches the CPP contribution rate on the total ASF during the Phase-In Period and on the portion of the ASF greater than 1 (i.e., income above the YMPE) after the Phase-In Period. Both the “14 plus 6” plan and the “hybrid” plan then integrate directly with the CPP. The “14 plus 6” plan would provide an Income Replacement Ratio of just over 70 percent for a member whose income was at the maximum of three times the YMPE throughout DPAP when CPP and OAS are factored in. A “14 plus 6” plan will almost always hit or exceed the target pensions.

Employee contributions could be required or voluntary under any plan design. An option that many smaller employers should consider would be to provide full funding for a “10-Unit Plan,” which, when CPP and OAS are included, provides a greater than 70 percent career average income replacement ratio for those whose income is equal to or less than the YMPE (i.e., an average ASF less than or equal to 1). In order to meet their target pension there could then be an option for higher income employees to purchase additional Units by payroll deduction. The 10 Unit plan would provide a career average income replacement ratio of 35 percent, excluding CPP and OAS.

Flowing Example 14: Sam is a member of a “10 and 6” plan. The 18 Pension Units accrued during 2010 were calculated as 10 times the 2010 ASF of 1.500 plus 6 times 0.5000 (the portion of the ASF greater than 1). The 18 Pension Units accrued in 2010 will provide a deferred annual indexed pension amount of \$849.60 (18 times \$47.20 in 2010 dollars) beginning at the Canadian Retirement Age. At the end of 2009 Sam had accrued 220 Pension Units under the employer’s plan. As of Jan. 1, 2010, the total deferred benefit from these accrued Pension Units increased from \$10,186 (220 times the 2009 Pension Unit amount of \$46.30) to \$10,384 (220 times the 2010 Pension Unit amount of \$47.20).

The grouping of employees within an AAF will be by age rather than by employer. If over time the average age of an employer’s staff, weighted by compensation, increases significantly, the employer can pursue many options to reduce cost and can include the employees in the solution. An older workforce would likely be amenable to allocating a greater portion of its compensation to pension benefits. If the employer does find it necessary to reduce DB benefits, only future benefits are affected. Employees would then have additional contribution room available. A more positive scenario would be to make the pension plan richer to attract new employees and to retain current employees.

The employer will need to build some educational tools specific to its plan (see Example in Appendices). Also the plan design and the educational material should try to show the benefit of “the creative feature” previously mentioned under which an employee can voluntarily opt to defer a bigger proportion of total “employment compensation” until retirement. As the TCB model matures, the bench-

marks, and regular reporting to employees, will make them more and more aware of the value, and the necessity, to increase the number of Pension Units they hold.

Each of the employer plans that have been discussed in this section are still effectively “DC” plans for the employer from a risk point of view. The employer plans are either directly purchasing on a DB basis, or making available on a DC basis, Pension Units to be deposited into the Lifetime Account and ASP of each employee. The overall contributions of the employer providing a “DB”- or “hybrid”-type plan will vary but only based on the age groupings and incomes of their current employees. The liabilities of the employer will not grow as their workforce grows older and retires. The employer plan will not suffer from an “actuarial loss” if many employees retire early; nor will the employer plan benefit from an “actuarial gain” when some employees move to another employer. When considering variations in plan design, the employer should still consult pension experts to project costs based on their employee demographics by age and compensation. From a Plan Sponsor perspective, virtually any plan design now used, except for those highly dependent on cross-member subsidization, is possible under the TCB model.

5. Designing and Building the Market Components of the TCB Model

5.1 Designing the Market Components

The market will have a very important role in helping to guarantee the success of both the TCB model in general and in assisting individuals to meet their retirement objectives.

The role of the markets is to provide the vehicles by which the other three stakeholders can manage both the investment risk and the insurance risk. The market will be required to develop innovative products that are specific to the needs of the threesome. The market will be paid for its products by the other three stakeholders. A particularly important role for professionals in the market will be to provide advice to both employers and employees.

The TCB design focuses on the market for two defining portions of the model: the use of modern technology and the ability to share risk nationally rather than by employer. Another important underlying principle that I think should be built into communications about tax-sheltered “deferred compensation” under the TCB design is that it forms the base for all retirement income and should always be analyzed as the “first layer” of income received by a retiree. You do not build your estate from the capital within your “deferred income accounts” but rather from the actual retirement income as it is received. Post-retirement income from other sources gets added to the “first layer” of income from “deferred compensation.” For example, in applying the career limits under the TCB model, the “claw back” of OAS benefits is based strictly on Tier I and Tier II income.

There are almost no currently active employees who are uncomfortable with using a computer and other even more modern tools. The pension system that we now have was founded long before personal computers. The TCB design anticipates individuals being as comfortable reviewing their pension needs online as they are “chatting” online and “texting” from the beach. A key aspect of the TCB model design is that the online system will be standard on a national level, which over time will greatly increase societal understanding of retirement planning.

The Centralized Retirement Account System, the AAFs and the ASPs will be possible because of new innovative products that will come from the market. These products will include both educational materials and products designed to meet personal needs at retirement.

The TCB model design also anticipates that the market can provide the insurance products needed for disability, and other similar types of risks, by including deferred retirement compensation as part of “employment compensation.” The market should also provide a mechanism so that an individual who is employed by an employer that does not sponsor a plan can access an AAF and either purchase Pension Units or make contributions to the Lifetime Account.

An AAF is intended to be very large and to have the investment and risk management expertise to accept multiple transfers of pension liabilities from multiple employer sponsors through the payment of monthly contributions that are specific by employee. It is important to stress that large pension funds that become AAFs are not accepting new members into “their plan” but are instead becoming insurers for the ASPs. Using modern tools on a daily basis, these contributions and liabilities are sorted into Age-Specific groupings and reported to the ASPs, which are the overall plan “governors.” A key market tool will be a mechanism by which the AAFs can trade Age-Specific Pension Units with each other to keep their own pension assets and liabilities structured in a manner consistent with their investment policies and the investment policies of the ASPs. This will also help to manage cohort risk.

The ASPs envisioned under the TCB model are somewhat the opposite of the attempted “pay as you go” philosophy that is part of the current DB structure. The “old” way requires constant new entrants to fund the plan and is subject to huge demographic risk, as we have seen. Once the ratio of retirees to active employees changes dramatically many DB plans are in huge trouble. At first glance many will think that ASPs have a built-in guaranteed failure since at some point every person of the same age will be retired. That is not the case. Under the TCB model design the ASPs, in concert with the AAFs, provide a mechanism whereby private sector employers and employees can have the same “cohort” demographic risk as is present within a Tier I plan. Although this is a strange way to explain it, I view the ASPs as building an individual annuity under which the individual dies “a little bit at a time” rather than all at once. This, together with other aspects of the TCB model, will also enable the ASPs to include adjustment mechanisms and creative investment vehicles that would not be available to most of society currently.

5.2 Building the Market’s Tools

By standardizing the Lifetime Component it is possible for the market to establish a series of AAFs. Some of these AAFs may also be approved by government to be the “governors” for some ASPs. As previously noted, AAFs could be provided by insurers, banks, other financial institutions or even other large DB pension plans, which could accept new “Age-Specific” annuitants both to spread risk and to provide income. With the centralized administration proposed for the TCB model the annuitization process will be one in which the annuity payments flow to a central distributor for the ASP and then to the annuitant. It should be noted that, of course, there will be a new ASP each year. The organizations governing the ASPs, which are actually owned by the members, can be governing several such plans at a time. It was previously mentioned that some AAFs could also govern some ASPs.

Following the TCB goal to take maximum advantage of current technology will enable the market to have very sophisticated processes and complexities behind the scenes while at the same time producing

a “product” that is readily understood, and easy to implement, by its users. The market, together with society and employers, must use existing and evolving technology to develop the standard communication networks necessary for the proper integration of all four stakeholders into the TCB structure of Centralized Retirement Accounts, AAFs and ASPs.

The market will also have both the opportunity and the necessity to develop innovative products to help educate employees and employers, to assist employees in the effective use of the funds in the Personal Account, and to develop other sophisticated products that take maximum advantage of current technology.

Under TCB the Lifetime Accounts, and the annuitization process, are standardized. However, the Personal Accounts are not standardized and provide individuals with the ability to tailor the use of their Personal Accounts specific to their wants and needs. This feature of TCB should strengthen the overall process and play to the strengths of the market.

The primary new market instruments that will be required under TCB are group annuity products that will vary only by year and month of birth. The TCB standardization will make annuitization much cheaper and more available for low-income people and will make small top-ups an option for everyone. The premiums charged at younger ages should include a small “participation” or “variable rate” portion that phases out as the Canadian Retirement Age approaches. This will enable some additional risk management and will also help to minimize the bounces in the cost of Pension Units.

An additional feature of the new market instruments will be the manner in which ancillary benefits, such as spousal survivor benefits, are handled during the payout phase. There could be an innovative insurance product developed when a member elects to buy spousal survivor benefits using funds from the Personal Account or by reducing the number of Pension Units in the Lifetime Account. Ideally such a product would permit ASPs to continue to pay out units as “life only.” The insurer would be paid when the election was made. If the member predeceases the spouse, then the insurer pays the lump-sum amount necessary to purchase the required number of Pension Units from the spouse’s ASP.

Disability coverage under the TCB model should be constructed like the current group and individual disability products. The ASPs would not directly provide disability insurance but instead would permit the continued accrual of Pension Units by payments from the disability insurer, which develops an innovative product that includes deferred retirement compensation as part of “employment compensation” for determining disability benefit levels.

6. The Stakeholders’ Vision of TCB at Work

As previously stated, the primary goal of the TCB model is to bring fairness, consistency, and understanding to the Canadian Retirement System. In this section I will outline what I believe will be the stakeholders’ vision of the TCB model after it has been introduced and has become the primary system. It is important to realize that despite the fact that our current system appears to have become old and outdated, it is still relatively new to society. In fact, there are still Canadian retirees, collecting DB pension benefits, who had already been born when employer pension contributions first became tax-deductible in Canada. When we look at the manner in which other societal tools, which also were created during the 20th century, have changed over the same time period, it is critical that we envision a retirement system that is obviously modern and designed to mature through flexible updates rather than changes necessitating “grandfathering,” “greatgrandfathering,” etc.

As previously noted, one of the constant issues that has been identified as an underlying weakness in the current system is the lack of understanding by employees. This is not surprising since even many people who are directly involved with pension plans are sometimes not aware of critical issues that do not impact directly on the plans they work with—due to the lack of transparency within our current system. Under the TCB model everything will be available to review and to understand. There will not be significant differences in plan design from one employer to another. The main difference in design will be by employee rather than by employer. The employee will be obligated to defer income into the Lifetime Account. At the same time the employee will have the option to contribute to a Personal Account. The Lifetime Account will be very easy to understand and will be tracked regularly and communicated to the employee. The options available under the Personal Account will be more complex, but they will be directly related to the employee's personal choices and needs.

6.1 What Does Society See?

When discussing society we must recognize both current and future generations. At present the percentage of income that can be sheltered is independent of age. This causes distortions both in motivation to contribute and in pension benefit costs. As discussed in the Design section, the tax shelter limits under TCB will be by age groupings, stated as Pension Units, and designed to give equality over a career. Not only do these limits give equality over a career but they also recognize lifestyle changes and goals as an individual moves from one life stage to the next. Under the TCB model the tax limits will be such that intergenerational fairness will be visible to both politicians and bureaucrats. Any cost or benefit shifting from one age group to another will be within the same demographic group. No longer will a 35-year-old pay more so that a 55-year-old can pay less, or so that a 70-year-old can receive more. Instead under TCB an individual who pays too much at age 35 will benefit from either a lower cost or a greater benefit in future years.

The direct TCB link to the CPP, and the indirect link to the OAS, means that any necessary changes to such Tier I benefits automatically shift to all tax-sheltered retirement plans. As an example, consider that in this paper I have referred to age 65 (which is the current “normal retirement age” for both the CPP and the OAS) as the Canadian Retirement Age. The government can therefore establish demographic benchmarks for changing the Canadian Retirement Age automatically as society changes rather than face a political crisis. If the Canadian Retirement Age changes, the number of Pension Units in each Retirement Account will also change. Further, because of the TCB structure, the timing of such potential changes can be tracked and, again, will not result in any intergenerational transfer.

Society in general will place a much greater value on the Tier I benefits provided by CPP and OAS due to the benchmarking provided under the TCB model. The monitoring of both Tier I and Tier II benefits by using TCB Pension Units will be easy and consistent.

As TCB matures, the governments, both federal and provincial, will see a significant reduction in the number of pension plans that have to be monitored for any governance reason. Ultimately the monitoring will be of only the AAFs and the ASPs. A portion of each ASP will be part of several AAFs. Both the AAFs and the ASPs can, and likely will, have separate provincial components. However, the risk-sharing basis will be national.

In a broad sense personal (or “demographic”) rules, such as the requirement for spousal survivor benefits, will not come into play until a triggering event such as retirement, death, or a marriage breakdown actually occurs. The pre-retirement death benefit will be equal to the value of units and cash

accumulated in the Lifetime Account until an individual is eligible for early retirement. Under the TCB model until one of these triggering events occurs there is no need for society to monitor or impose conditions on any of the other three stakeholders.

In discussing society as a stakeholder I consider it necessary to also include the media. The development of consistent benchmarking, and regular communication of benchmark updates, in a manner that brings consistency and understanding to our retirement system has been a goal of mine for almost 10 years. I am confident that if the TCB model is introduced, the media will monitor, report, and comment on the major benchmarks regularly. This will assist in making the system viable and in alerting employers and employees of potential automatic adjustments that may occur. Due to the standardization of Pension Units, etc., the TCB model will also make it possible to add preliminary “lifetime income” education to a high school curriculum.

The governments will of course see the need for monitoring of the TCB system. At the highest level there will be a Centralized Retirement Account System. This will be established at a national level with provincial components. Standardized reporting of transactions will come from all AAFs and financial institutions offering Personal Accounts. The next level of governance will be for the AAFs and the ASPs. However, the monitoring of each AAF and ASP will be by the provincial or federal pension authorities. At maturity of the TCB model there will be fewer than 1,000 ASPs (if we ultimately use both year and month of birth to set up a plan) and even fewer during the Phase-In Period (if only year of birth is used).

6.2 What Do Employers See?

The TCB model totally changes the pension options available to employers. The employer is no longer faced with a choice about taking on the huge risks, costs, and complexities of the current DB plans or the governance and administrative requirements of other plan types or no plan at all. Instead the employer sees the ability to “design” and sponsor a plan that is consistent with the company goals and financial situation. The plan design is primarily built on quantity, but some extra quality can be built into the plan. Once the employer has selected the plan design the administration of it will be extremely easy. The plan design can be completed with help from professionals (i.e., actuaries) and the market.

The benefits provided to each employee will be by payroll deduction. Once the payroll deduction has been made the employer’s financial obligation to the employee is up-to-date since the TCB model recognizes that pension contributions are “deferred compensation.”

Once the employer has implemented a plan, the employer will have an obligation to assist in the education of employees about the employer’s own plan and retirement planning in general. The TCB model is such that the tools for such training will be readily available. The companies’ human resources professionals will all be very familiar with the TCB benchmarks such as the Annual Service Factors and Pension Units. If the employer so chooses, tools would be available through the market to track the history of the Pension Units, which the company has provided for any and all employees. By tracking such data the employer can appropriately receive proper credit for the value of all Pension Units provided.

Under the TCB model self-employed individuals will be considered to be “employers.” The “carryforward” aspect of the career contribution limits will also assist small businesses as they move to maturity. In addition, the income “bounces” that frequently occur for the self-employed or small businesses also benefit from the “carryforward aspect.”

Under the TCB model an employer who provides a DB plan will very clearly be recognized as providing “deferred compensation” rather than a “reward for long service.” This will also remove the asymmetry that currently exists when, in certain circumstances, plan members are sometimes found to have a right to plan surplus but no responsibility for funding plan deficits.

As previously stated, it is important to include trade unions in this stakeholder category even though they are not technically the “employer” of their members. Trade unions are frequently the “sponsors” of multi-employer pension plans. Under the TCB model unions could still be sponsors of such plans, with funding from employers and/or employees. However, as with employers they can “design” the plan, based on the union goals, but again the plan design will be built primarily on “quantity.” The quality that the union can provide will be in the education of members as to the benefits that they have accrued. As with employers, the union does not have to accept the huge governance risks that they now face under certain plan designs. In particular, union plan trustees would be working on making sure that current union members benefit from current plan design. They will know that past Pension Units accrued by current plan members and past plan members are safe, in a manner consistent with society as a whole.

It is important to note again that once an individual leaves any particular plan sponsor, whether by termination, death, or retirement, the plan sponsor has no further responsibility or risk with respect to accrued benefits.

6.3 What Do Individuals See?

For all individuals, whether active or retired, the most important thing that they will see under TCB is the online details of their Retirement Account. Under the current system some employees who are members of very large DB pension plans do have online access to their personal pension information. Many other individuals have no such access. Under TCB the online access will be standard for everyone and will include detailed information about the individual’s Retirement Account including the breakdown between the Lifetime Account and the Personal Account. In addition to accessing their own Retirement Account an individual can access the current status of their own ASP. Following are some of the TCB Visions available in various career phases.

The use of Pension Units, rather than a percentage benefit, will assist in employee understanding. Each year the number of accrued Pension Units should increase, the number needed to reach the retirement target should decrease, the value per unit will increase, and the annual pension amount per unit will also increase. Instead of trying to think in dollars 25 years in the future, the individual can, and will, easily monitor and understand the growth in number and value provided contained within his basket of Pension Units. To the individual the Pension Units will appear to be like “shares” held as part of a long-term investment and should help to make annuitization more attractive.

6.3.1 Before Retirement

The default values will be in current-year dollars. There will be a projection of future ASFs to the Canadian Retirement Age as well as an indicator of how many additional units will be needed to meet the target pension goals. The individual will be able to easily try different projection scenarios but in contrast to most calculators now will not have to put in assumptions about interest rates and inflation but only about changes in job status such as a promotion.

The individual's historical data will also be available in current-year dollars. However, if the individual wants to see where he was 10 years ago, in dollars of that year, only the "Display Year" entry has to be changed. Future projections are always in the dollars of the current calendar year.

The individual benchmarks will also be shown and will include:

- The current annual pension amount provided by one Pension Unit at the Canadian Retirement Age
- A benchmark worth factor for the individual's ASP, which indicates how much the purchase of one Pension Unit is expected to cost the "average plan sponsor"
- A second benchmark worth factor for the individual's ASP, which indicates how much the purchase of one Pension Unit is expected to cost an "individual."

Included in the data displayed will be a record of the individual's current Lifetime Account tax shelter room available as well as the availability of any carryforwards from the Phase-In Period, or from lower income years.

The employee's Lifetime Account does not include only the accrued Pension Units but may also include a cash amount that may be part of a DC contribution, a cash participation dividend, or a carryforward from the Phase-In Period. The best thing that the employee sees is the growing value and need for Pension Units as retirement nears. The employees will realize that the Pension Units are their "Income Shares" for the future and that they need more to reach their target.

The Personal Account balance and current Personal Account tax shelter room available will also be shown. The Personal Account funds can also be used for some special programs currently available to those with RRSPs such as the Home Buyer's Plan and the Lifelong Learning Plan. The individual's Retirement Account will also track the status of these plans. It should be emphasized that the individual's contributions to the Personal Account are independent of the employer and may be held by any eligible financial institution. Deposits and balances must regularly be reported electronically to the Centralized Retirement Account System.

The online account will also include tools that use the employee's career data to display charts, ratios, and numbers that show the relative value in current dollars of the employee's career earnings to date, the employee's future career earnings to Canadian Retirement Age, and the employee's Lifetime and Personal Accounts. These visuals will help the employees to picture their pension and know where they are.

The Personal Account is intended to be available for "Demographic" or personal circumstances risks such as early retirement, spousal survivor benefits, post-retirement health care, etc.

A feature that will also be available online, subject to approval by both spouses, would be joint access to both accounts to do projections and assess the family position in retirement planning.

6.3.2 During Early or Phased Retirement

All information available to employees who are not yet phasing into retirement is also available to those who have elected early or phased retirement. It is important to again note that under TCB any

payments made from the Lifetime Account before the Canadian Retirement Age represent a cashing in of Pension Units rather than an annuity. The online Retirement Account information would indicate the maximum withdrawal amount available until the Canadian Retirement Age based on the required lock-in provisions to meet the minimum at Canadian Retirement Age. Early retirement withdrawals can be made directly from the Personal Account, or the individual could elect to purchase a term-certain annuity to the Canadian Retirement Age using Personal Account funds.

During phased retirement an employee will still be receiving ASFs and will be eligible for additional Pension Units through an employer plan or by direct purchase.

Individuals who continue to work after reaching the Canadian Retirement Age have now entered the “double flow” retirement phase. The ASPs begin annuity payouts automatically at Canadian Retirement Age. Individuals who do not want to begin receiving their lifetime pension have two options. The first is to have the payments go directly into their Personal Account to continue deferring taxes. The second is to automatically purchase more Pension Units within the Lifetime Account with the annuity payments. Both options will, of course, be subject to the tax shelter limits for each account.

During the phased retirement period after the Canadian Retirement Age, the individual can also accrue ASFs and will be eligible for additional Pension Units through an employer plan or by direct purchase. The online Retirement Account will track and report regularly all components of the phased retirement.

6.3.3 After Total Retirement

After total retirement the online Retirement Account will track the Lifetime annuity payments received and any value changes as a result of indexing or corrective adjustments. Further, the Personal Account will also be tracked.

As the retiree ages the particular ASP to which he belongs will change over time. Such changes will be tracked, and the anticipated date of the next Age-Specific change will be shown. At any time the retiree, or the retiree’s representative, can determine the history of payments received by the retiree from the Lifetime Account and the Personal Account and from both CPP and OAS.

6.4 What Does the Market See?

There will be many levels to the market. Initially the IT market, actuaries, pension consultants, and lawyers will be extremely busy setting up the TCB structure.

The financial sector will be extremely active in developing new innovative products for AAFs and employers. These products will include both educational materials and products designed to meet personal needs at retirement. The pension regulators will require spousal survivor benefits. Under TCB spousal benefits will be a form of insurance with the cost borne by the individual family. As one spouse, or the other, approaches Canadian Retirement Age, product help and advice may be needed. Insurance companies will be needed to provide special products to the AAFs and the ASPs.

A key need from the market will be disability insurance. This will not be built into the TCB Pension Units. However, plan sponsors could provide disability benefits as part of their own group disability coverage, and insurers could make such products available on an individual basis, in a manner such that the purchase of Pension Units could continue during a period of disability. In developing the TCB structure ASFs could be

defined to continue at the same level as they were at the time the disability commenced, which would permit either the plan sponsor or the individual to purchase Pension Units during a period of disability.

What does an AAF see? As previously discussed, AAFs can take many forms. First, the AAF sees the market for its annuity product. Different AAFs will aim for different parts of the market. Once an AAF has obtained a client it will see a regular inflow of assets and liabilities. The AAF will have provided its table of annuity costs for each Age-Specific group to the plan sponsor in a manner that can be used by the plan sponsor's payroll administrator. After each payroll activity the AAF will receive funds for ASPs based on the plan sponsor's plan design. The AAF will then allocate the funds to each Age-Specific account. For some plan designs all funds will immediately be converted to Pension Units. For these plans funds will stop flowing to the AAF for a given individual if an annual plan maximum has been reached. For other plan designs (e.g., target plans), funds may continue to flow to the AAF for an individual after the annual plan maximum has been reached and will be held in the individual's Lifetime Account as cash. The AAF is responsible for tracking all benefit accruals while an individual is a member of the sponsor's plan.

What does an ASP see? The ASP is a central administrator and governor. The ASP tracks all data for the specific age Lifetime Accounts of all individuals. The ASP also knows which AAF holds all of the Pension Units and the cash balance for each individual. If a member leaves a particular plan any cash balance remains in the AAF and can be converted to Pension Units at any time. The member would make such a request through the ASPs.

Actuaries are part of the market and would have a major role to play within AAFs and ASPs and directly with plan sponsors and individuals. Financial Planners and Financial Advisors will have a critical role to play both in providing educational services regarding TCB and in assisting individuals in planning for retirement. The investment risk for the lifetime component is with the AAFs. However, the Personal Account can accumulate funds based on the individual's ability and propensity to accept or avoid risk. The "lifetime risk" will be covered by annuities so the Personal Account can be more flexible although it is likely that a portion of the personal account could also be annuitized upon retirement with the purchase of optional ancillary benefits.

In the long term a portion of the market (i.e., lawyers and accountants) may not be thrilled with the TCB model as pension auditing and litigation will decline massively.

7. Analysis of How the TCB Model Works

In this section I will analyze the structure of the TCB model and include some direct comparisons to the current system in Canada.

7.1 What Are the Stakeholders' Roles?

The roles of the stakeholders have already been discussed in the Designing the TCB Model sections of this paper. In this section I just want to comment on some potential changes in the meaning of some words if and when the TCB model ever comes into being. In particular the phrase "Plan Sponsor" can be ambiguous under the TCB model. The employer can be a Plan Sponsor under TCB, but the roles and responsibilities will be much different than for a current "Plan Sponsor."

The primary sponsor of a plan under TCB is the employer. However, under TCB the plan structure is such that any self-employed individual or an individual who is not covered by an employer plan can access their ASP using one of the market's AAFs.

The sponsorship of a plan is dramatically different under the TCB model. Plans will continue to be sponsored by employers, but the governance and investment risk will be transferred to the AAFs and ASPs. The employees, trustees, and board members will all be pension experts. The ASPs also participate in society's monitoring and governance of the AAFs and vice versa.

Under TCB the ASPs are the real plans that have the responsibilities, other than funding, that current DB plan sponsors have. Also the AAFs are going to be coordinating with both "employer-sponsored plans" and the ASPs. In this section I will also discuss the role of the AAFs, the ASPs, and the Centralized Retirement Account System.

7.1.1 Role of the Approved Annuitization Funds

The AAFs will deal directly with the plan sponsor, and/or individual, with respect to the purchase of Pension Units, cash contributions, and the transfer of risk. Once a transfer of cash from a plan sponsor, or an individual, has been made to an AAF, the AAF then tracks assets and liabilities, not by sponsor, but rather by ASPs. For the plan sponsor or individual the AAF will track administrative records of contributions and the purchase of Pension Units. The plan governance obligation moves to the AAF, which transfers all individual data both to the Centralized Retirement Account System and to the ASPs. From an administrative point of view an employee account with an AAF could operate much like trading does on the stock markets. An individual who changes jobs remains within the same ASP and does not suffer a loss of pension value.

For the AAFs, even though the funds come from the plan sponsors and/or individuals, the actual "group insurance" clients are the ASPs. There will be a need for a "participation" component and some reserving as for the liabilities of each ASP. Some AAFs could also serve as ASPs.

7.1.2 Role of the Age-Specific Plans

The ASPs are the actual plan "governors." They track all assets and liabilities for their member owners and monitor all trading of Pension Units among the AAFs. The vast majority of the ASPs' assets will be held and invested by the AAFs. Each ASP will be required to follow mandated investment, risk management, and governance policies that must also be followed by the AAFs. Certain AAFs may also be "governors" for some ASPs. Both the AAFs and the ASPs can, and likely will, have separate provincial components. However, the risk-sharing basis will be national. The ASPs ultimately will manage the payout of the lifetime annuities. Until the Canadian Retirement Age there will likely be one ASP for each year of birth. As TCB matures it may be possible to have an ASP for each month and year of birth. After the Canadian Retirement Age, the ASPs will merge over time. Any one ASP ultimately "dies" except for the final TOP plan.

For example, the ASPs might stay as one-year plans through about age 75, at which point they move into the Age 76–Age 80 plan, then to the Age 81–Age 85 plan, then to the Age 86–Age 94 plan, and finally to the TOP plan at age 95. The actual process of moving from one ASP to the next would require significant risk

and investment monitoring so that the transfer of liabilities and assets from one to the other maintains the number of units for each member. Please note that this example is strictly to illustrate the process and no testing has been done for the age groupings shown. This process is to allow for ongoing sharing of the “lifetime risk” and to provide the adjustment mechanisms that will be needed to sustain the system. Also, in the actual implementation of the TCB model the more effective labeling of the ASPs might be “Birth Year Plans” (e.g., the 1965 plan).

7.1.3 Role of the Centralized Retirement Account System

The role of the Centralized Retirement Account System will basically be to track all individual data for the individual Retirement Accounts and to provide the online information system. The Centralized Retirement Account System may have to be a government unit to protect the privacy of individuals’ tax information. However, the technology part could likely still be private sector. At present it is my understanding that the Canada Pension Plan database includes historical individual earnings data back to the start of the CPP. This would include total pensionable earnings, not just the portion eligible for CPP. This would assist in the transition to the TCB model.

Also the Centralized Retirement Account System would alert the AAFs and ASPs when an individual is approaching either an annual or a career contribution limit. Again, with the TCB process modern technology will permit this to be an automated process.

7.2 Governance and Risk Management

7.2.1 Individual Risk and Governance Responsibilities

An employee will have some governance responsibilities to monitor the status of the Lifetime Account. The employer and the market will provide the tools under TCB for an individual employee to manage, and/or effectively avoid, the “lifetime risk.” An employee without the benefit of an employer-sponsored plan will also have to make regular contributions to the Lifetime Account and faces the risk of inadequate retirement income. This type of employee should become much rarer under the TCB model as it matures. The necessity and the ability for an individual to monitor where they are relative to retirement risk is a critical element within TCB as employees “picture their pension,” and this will help in minimizing the risk of inadequate retirement income.

The individual will be responsible for the governance of the Personal Account. The investment risk in the Personal Account is with the employee. The market will be providing innovative products, and will include professional advisors, to whom the individual may be able to transfer a portion of both governance and risk. It is very important to note that the Personal Account is the primary “choice” component in the TCB model, although there will be some choice also with respect to the Lifetime Account.

Individuals will also be exposed to the general risks facing all societies, but a significant portion of this risk will be shared nationally under the TCB model.

7.2.2 Employer Risk and Governance Responsibilities

The proper governance of pension plans has very high priority in Canada. This has led to a situation that places both additional administrative costs and direct fiduciary responsibilities and risk on the plan

sponsor. The governance requirements also place significant fiduciary responsibilities and risks on the trustees of a pension plan. In many cases the trustees are not pension and/or investment experts. Under the TCB model, the governance responsibilities for determining the funding levels and investment policies will not be directly with the plan sponsor but will instead be with the AAFs and ASPs.

The demographic risks accepted by private sector DB plan sponsors have really come to the forefront over the last couple of decades. This has led even very large, new, modern companies to avoid the traditional DB design. The major demographic risk is, of course, the aging of the workforce and an increased ratio of retirees to active workers. This major risk is handled under the TCB model by using Age-Specific groups during both the pre-retirement and the post-retirement phase.

Compared to the current system, employers, under TCB, will have a significant reduction in the fiduciary and governance risks. There will also be less financial risk due to a significant reduction in the volatility of contributions and in administration costs. Currently employers have a “pension governance” responsibility. Under TCB “pension governance” responsibility for an employer will be part of “employee compensation governance.” The primary risk facing employers will be the necessity to design a TCB “employer-sponsored plan” and to make annual contributions to their employees’ Lifetime Accounts. From an employer point of view, if there is a significant change in the demographics of the active workforce, under TCB it will be easy to adjust the level of benefits—or to adjust a portion of the total compensation allocated to retirement planning.

As with single-employer plans, the governance role in multi-employer or jointly sponsored plans can also now be focused on the deferral of an appropriate proportion of total compensation to retirement benefits. The structure of the TCB model will make it much easier for pension plan sponsors and plan trustees to determine the implications of any adjustments to their plans as the impact will be immediate. The “deferred” component of pension risk is no longer with the plan sponsor.

7.2.3 Society’s Risks and Governance Responsibilities

Society’s primary risk under TCB is that the combined accumulation of funds by employers and employees will be inadequate to fund pension benefits over a lifetime and result in increased government costs for certain Tier I benefits. The “optional” portion of this risk can be reduced a lot by requiring some basic sponsored plans. The “lifetime risk” can largely be eliminated by regularly monitoring the changing life expectancy of society, since under TCB the Pension Units for both Tiers I and II will all be scheduled to begin payouts at the Canadian Retirement Age.

The only explicit intergenerational transfer under the TCB model occurs at the very end of a lifetime and reflects only mortality improvements between two “touching” generations. The TCB model effectively groups all individuals with the same year of birth into one pension plan. By using some of the principles that were previously used for “participating insurance,” any value transfer from young to old, or vice versa, is within the same group under the TCB model and simply represents funding timing rather than an actual cost transfer.

Under TCB there is implicit protection against significant demographic shifts since benefits are not allocated by employer or by location but by year of birth. Post-retirement, the TCB model combines groups over time until the TOP group is reached. The TOP group is the group that represents those approaching the end of life (e.g., possibly the 95th to the 100th percentile based on the then-current

population mortality). The existence of the ASPs, and the participation of AAFs, will assist in developing effective and creative investment policies with assets allocated based on the current status of the plan. As a result, under any major market collapse each ASP can adjust benefits or costs in a non-destructive manner. All other post-retirement groups merge over time into more “mature” groups. As a group matures, both its assets and liabilities transfer to the more mature group. TOP is the ultimate group and has an ongoing flow of funds in and avoids the possibility of a hidden tontine. This post-retirement flow from one cohort to another should help to offset any systematic longevity risk inherent within any one cohort. As with the Canadian Retirement Age, regular monitoring, and complex, actuarial and investment monitoring of the post-retirement Age-Specific groups will help to control big bounces and maintain equity.

Society will have the overall responsibility for providing the rules and governance structure for the AAFs and ASPs, which will have to be extensive and complete. The number of plans requiring monitoring, once TCB matures, will only be a small fraction of the current number but will cover the total workforce.

7.2.4 The Market’s Risk and Governance Responsibilities

The governance requirements of the AAFs and ASPs will be significant. However, they will be of a significant size and will be able to have a trustee board consisting of pension experts. The primary focus of both AAF staff and trustees will be on the proper risk management and delivery of the pension promises made by the AAF in delivering their products. All contributions to Lifetime Accounts will go directly to an AAF, and indirectly to an ASP. The market, through the AAFs and ASPs, becomes the “plan governors” under the TCB model. The markets then accept the “lifetime risk” and the inherent investment risk included with said funding. All responsibility for asset and liability management transfers to the AAFs and ASPs. The societal components of plan risk sharing, and effective governance sharing, built into the TCB tools, through both the accumulation phase and the payout phase, will mean that any individual AAF or ASP can manage risk effectively. The design of the products under TCB will include some mechanisms that will automatically self-correct, and the AAFs and ASPs will both have professional staff and trustees. The ability to reallocate demographic and investment risk by trading Pension Units will be one of the risk management tools available to the market.

The market, through vehicles other than the AAFs and ASPs, will also be expected, and motivated, to accept some additional “insurance” risk by providing other innovative products when an individual is phasing into retirement and needs access to certain ancillary benefits by using funds from the Personal Account. Disability coverage under the TCB model will be constructed like the current group and individual disability products, and this will also involve a risk transfer to the market.

7.2.5 Demographics and Cohorts

One of the main advantages that large public sector plans have is the ability to manage demographic risk. A public sector plan is much less exposed to the insolvency risk facing many private sector plans. As discussed in several sections of this paper, the TCB model is designed to minimize demographic and cohort risk through the use of the AAFs and ASPs. Effectively, under the TCB model, each employee’s pension benefits are only affected by demographic and cohort risk on a “national” level. The link to the Tier I CPP permits this but in a manner that does *not* require a direct expansion of Tier I benefits. I

actually believe that the TCB model will reduce the need for non-funded Tier I benefits like the Guaranteed Income Supplement (GIS).

7.2.6 What Happens during Extreme Events?

No system can totally protect from major disasters such as the market meltdown that we recently experienced. The demographic and cohort risk under the TCB model is much less under an extreme event due to the recommended AAFs' and ASPs' structure under the TCB model. The risk of an extreme event affecting members of either a particular AAF or an ASP due to plan members all being in the same location, or in the same industry, will be significantly reduced.

It is also possible under the TCB model to give the same ability to recover from an extreme event to all individuals in a manner that means the downturn risk is shared by society as a whole. This can be done by reducing the number of Pension Units and by doing so providing the necessary tax shelter room to recover. There has been a huge amount of press coverage in Canada about the fact that large DB plans have mechanisms available to them that will enable the plan sponsor, and indirectly plan members, to tax shelter the additional funding needed to make up for plan deficits. In both Canada and the United States, the auto sector received huge government bailouts using taxpayer money partly because of pension funding issues. Even more significantly, in Canada, many taxpayers are very upset that they must fund, through their taxes, the recovery of some of the richest public sector plans. There is no ability within the current system for a member of a DC plan, or an RRSP, to contribute additional amounts as a result of the market meltdown.

Under the TCB model all of the benchmarks are made to the CPP. The manner in which this link is used for determining and applying the annual and career tax shelter limits will provide all individuals with the same right and ability to make up for market downturns by providing additional tax-sheltered funding. It should be noted that the employer, as plan sponsor, would not have an obligation to fund the deficit—but would also have the right to fund the deficit.

7.2.7 Is There a Moral Hazard Risk?

There will always be some aspect of a moral hazard risk in any structure involving money. The transparency provided by the TCB model benchmarks should minimize such risk by providing constant comparisons. Furthermore the governance structure of the AAFs and ASPs should help to reduce such risk. If a “moral hazard” incident occurs, the risk sharing under the TCB model will alleviate the impact on any one person or cohort. Even if an individual's employer has always dealt with the same AAF, the individual's risk is not solely with that AAF but rather it is spread over all AAFs that hold any units of the member's own ASP.

7.3 Funding and Administration

The simplification for both funding and administration has already been somewhat discussed in the “Design” and “Building” sections of this paper. It is important to emphasize, over and over, the administrative simplification that an employer would have under TCB, whether sponsoring a DB plan or a DC plan or a hybrid. All the employer has to track is the actual purchase of DB benefits from an AAF or the actual DC contributions to such a fund.

The administration of current DC plans and group RRSPs is relatively easy until the governance requirements are considered. The administration and reporting requirements of DB plans are a totally different story. The history of DB plans, most especially the grandfathering of past benefits prior to a plan change or company merger, has created a situation where even a current plan sponsor requires a super complex administrative system. The reporting requirements take a huge amount of resources.

Under the TCB model the administrative responsibility will dramatically reduce. The most significant portion of the administrative responsibility will be handled by payroll deductions. Under TCB the employer will still have a responsibility to educate employees about their pension. However, the employer will not have to develop its own plan website to provide employees with the “calculator,” etc., because a centralized site will be available. Also the terminology of TCB is standard, which means that the employer will not have to develop educational material from scratch. An employer who offers a particularly rich plan will have the ability to produce plan materials. This material can easily demonstrate to employees the extra value that they are receiving.

The funding of benefits will be shared by employers and employees. All employer contributions will go to the Lifetime Account. Ideally the employer should fully fund a base benefit that would help to guarantee an adequate income replacement ratio, including CPP and OAS benefits, on earnings up to the YMPE. Above this base benefit employee contributions should be required. Since the employee will be the primary funder for the Personal Account, the employer should fund about two-thirds of the Lifetime Account contributions on an employer-sponsored plan. Again it is important to note that individuals can make voluntary contributions to the Lifetime Account and also that transfers can be made from the Personal Account to the Lifetime Account as long as the annual and/or career limits have not been exceeded.

7.4 Investments

Investments within the Lifetime Account will be handled by AAFs and overseen by the Age-Specific funds both during the accumulation and the payout phase. Responsibility for the handling of these funds will be transferred to the market, through the AAFs and ASPs, by employers and employees. On a portion of the Lifetime Account the individual can still decide if and when to annuitize cash balances.

A major necessary part of the investment policy for AAFs and ASPs will be to develop a reasonable system for directly allocating total AAF investment income to each ASP consistent with that ASP's current assets and liabilities. Once again I mention that the ability of the AAFs to trade Pension Units with each other should help in this process.

Currently, under DC plans and RRSPs, the entire investment responsibility is with the individual. In building the basic “insurance” foundation under TCB by using the Lifetime Account, it is critical that investment expertise, including the ability to react to market changes in an effective manner, be a priority. The large asset base for the AAFs and the ASPs, combined with their investment expertise, will benefit all individuals by following a “dynamic risk glide path” (Tretikova and Yamada 2009) rather than the “predetermined glide path” that most individuals have a propensity to follow.

The employee has responsibility for investments within the Personal Account. This responsibility should most often be transferred to the market by the employee. However, some employees have both the desire and the skill to handle their own investments. If this is done strictly within their Personal Account the employee assumes both the risks and rewards of making proper investments. Under TCB society will be largely protected by the existence of the Lifetime Account, which provides the foundation for retirement benefits. I have always viewed the “annuity” component of my own “deferred compensation” as risk diversification.

8. The Transition to TCB

The transition process to the TCB model is likely to be most effective by evolution with some initial overlap.

8.1 Potential Transition Issues and Obstacles

As with any fundamental change there will be major transition issues. However, the process can be extended over a period of time such that allowance can be made for individuals and/or plan sponsors who do not want to move immediately. A key element upon implementation must be that all “new” plans follow TCB. Further, for any plans that are grandfathered under the old system, none of the “significant” positive benefits under TCB can be added (e.g., the higher tax limits at older ages).

The transition issues will include how to handle current plans that wish to stay in place after the TCB model is introduced. Younger members of such plans, as well as older members who have decided not to take early retirement, are quite likely to want to use the new TCB model immediately.

A major obstacle is the impact of current legislation on existing plans. This will be discussed below under “Transition from Current Plans.”

8.2 Legislative Changes

The regulatory framework for TCB will be driven first of all by a fundamental shift in the national government’s rules for tax sheltering retirement savings. It is absolutely necessary that one of the rules for TCB must be that all employer-sponsored plans provide funding for the same basic benefit—the Pension Unit by using the AAFs.

Current provincial legislation would apply only through the transition period to TCB. New provincial and national legislation would not focus on the plan design as it currently does but would instead focus on the required level of contributions from both employers and employees as a career progresses. Items such as spousal survivor benefits would not be a function of plan design but instead would be mandated to apply at the point when the Personal Account is used to supplement the Lifetime Account beginning at the age when the individual is eligible for early retirement.

The key annual tax-sheltered limit is the total percentage of earnings that can be contributed to an individual’s Retirement Account including both the Lifetime and the Personal Accounts. Rather than the artificial “9” factor that is used now to calculate the Pension Adjustment (PA) for DB plans, the actual portion of the Lifetime Account tax shelter limit used will be based on the actual combined

contributions made by both the employer and the employee in any year. This will eliminate the need for the current system of PAs and Pension Adjustment Reversals (PARs).

In several provinces, one of the most complex, time-consuming and inconsistent processes in the current retirement system is the division of pensions as a result of a marriage breakdown. Under TCB this could be handled easily just as it is under the CPP by a simple transfer of Pension Units from one spouse to the other. This item by itself will save some plan sponsors and members millions of dollars.

8.3 Phasing in the TCB Model

This section gives a brief discussion of the phasing in of the TCB model.

8.3.1 Early Years

The first step will be the development of the master TCB administration system and the rules for AAFs and ASPs. Pension Units and ASFs should be introduced early into the tax shelter rules to help people see where they are with respect to their current plans. By introducing the terminology early, the transition from current plans will be made easier. Once this has been done, the actual plan transition to the TCB model can begin by setting up the first group of AAFs and ASPs. One of the first ASPs to be set up should be the ultimate TOP plan for immediate use by current plan sponsors who are winding up their plans.

For years the focus in Canada has included trying to standardize current pension legislation. That has proven to be an impossible task. The transition to the TCB model will permit the standardization to occur going forward. Each pension regulator may need different transition rules, based on current laws, for transferring current plans to the TCB model, but once the transition is over the national standardization will have happened.

In the early years employers, as is the situation now, will not be required to provide retirement benefits. Over time rules should be established, likely varying by size of employer and income level of employees, that will require that a portion of all employee compensation be deferred until retirement through employer contributions to the employee's Retirement Account. Employee contributions should be required at a level at least equal to the CPP contribution rate on income above the YMPE.

8.3.1.1 Tax Shelter Transition

The transition of an individual's tax shelter room to the TCB model will be highly dependent on both the individual's age and the individual's history with respect to both prior contributions and plan membership. The first step would be to determine how much tax shelter room, as a percentage of the current YMPE, that the individual would have accumulated had the TCB model been in place from the individual's age 18.

Once that is determined the actual amount that the individual has used must be calculated based on the individual's history, which will be affected by the type of plan, if any, that the individual was in. Members of current "rich" plans, as well as younger individuals who have maxed out their RRSP contributions, may be over the career-to-date limits under TCB. Virtually all other non-DB plan members will be under the career-to-date TCB limits. Decisions would be required for each scenario.

8.3.1.2 Transition from Current Plans

A current DC plan has an account balance for each employee. The current balance would be directly transferred into the employee's Lifetime Account. For tax shelter purposes this amount would be deemed to be equal to a specific number of Pension Units. The employee would be given a choice as to whether to actually convert to Pension Units immediately, which most should do, or to leave the balance as DC. The employee's RRSPs would be assigned to the employee's Personal Account (they would not have to actually be transferred). Again the RRSPs would be deemed to be equal to a specific number of Pension Units. The employee's future status from a tax shelter point of view would then be calculated. For an individual who only has an RRSP there will likely have to be some choice. The transition method most consistent with the TCB model would be to transfer at least two-thirds of the RRSP funds into the Lifetime Account. An alternative would be to put current RRSP funds into the Personal Account but with a condition that all future contributions are to the Lifetime Account until the required Pension Unit amounts have been met.

For a DB plan the process would be to calculate the value of the employee's current accrued benefits under the plan wind-up provisions, but without the "grow-in" feature if the employer is going to continue a similar plan under TCB. Employees who are currently retired obviously stay on the current system, but even for them, a process could be established such that, as the AAFs and ASPs mature, an existing plan could effectively transfer the risk, possibly to the TOP fund, just as would happen with a current plan wind-up. For an active employee, once the employer has established the level and type of TCB it will introduce, the employee's current pension value can be calculated with a portion being allocated first to the Lifetime Account of the TCB and the remainder to the Personal Account.

There will have to be a transition period, likely a minimum of 5 years and possibly up to a maximum of 15 or 20 years for existing employer-sponsored DB pension plans to evolve to the TCB system. The transition period selected will be partially dependent on how much historical earnings data can be obtained from the Canada Revenue Agency and the CPP administrative systems. A critical element in the transition will be the current funding level of the plan. Procedures should be established, which will be quite complex, for establishing a final wind-up date for the current plan. The transition date should be at a time when the plan is fully funded to cover all current accrued benefits. A possible alternative would be for the plan sponsor to establish a new plan under the TCB system, which is projected to provide the same "total" value to employees as the current plan. If the plan is currently in a deficit position, such that a 100 percent transfer of current accrued member benefits to the new plan cannot be accomplished, the employer and employees could agree, subject to specific transition regulations, that rather than continue funding the current plan any deficiencies could be determined on a member-by-member level and funded in the new TCB plan.

Union-sponsored multi-employer plans may be the most difficult transition group, primarily because of the potential need to fund current plan obligations. They may also be the easiest to transition since going forward TCB is the ultimate multi-employer plan. The unions can negotiate the benefit level of the Lifetime Account on either a DB basis or a DC basis or possibly both.

Those who are self-employed or small employers are the group that will receive the most immediate benefits from the TCB model. If they do not currently have a registered DB or DC plan, they can introduce either, or both, by contacting an AAF. Transition from a current Individual Pension Plan (IPP) should be easy since the sponsor and the member are one and the same. In addition there is a strong possibility that the institution holding the funds for the IPP will become an AAF.

There are some special plans, or plan features, currently for certain groups such as firefighters, judges, etc., in which the annual accrued benefit or early retirement age is much more generous than proposed under TCB or even, in some cases, more generous than permitted under current legislation. Any benefits that are over and above the standard benefits available to the general public will have to be handled as “special cases” with any extra benefits administered and funded outside of the TCB model.

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Glossary for the Total Career Benchmark Model

Age-Specific Plans (ASPs): ASPs will be the actual pension plans under the TCB model and are the plan “governors.” There will be ASPs for each year of birth (e.g., 1965 plan), effectively owned by the members, which will merge in stages during the post-retirement phase until finally becoming part of the TOP plan.

Annual Pension Accrual: For each year in the Pension Accrual Period an individual can accrue defined benefits and/or contribute to a tax-sheltered retirement savings fund an amount sufficient to provide an annual pension benefit, commencing at age 65, equal to 2 percent of employment income, or self-employed income, earned during the year. The annual pension benefit will be indexed in accordance with the YMPE before retirement and at the same rate as CPP retirement pensions, using the CPP Pension Index, after retirement.

Annual Service Factors (ASFs): For each year during the Pension Accrual Period an ASF equal to the individual’s pensionable earnings divided by the YMPE will be calculated and recorded on the individual’s permanent records.

Approved Annuitization Fund (AAF): AAFs are designated by the government to provide annuity benefits known as Pension Units for plan sponsors and individuals. Under TCB the proposal is that the largest pension plans, especially the large public sector plans that have very large pools of funds and employ many pension and investment experts, may be permitted to be designated as AAFs. Other financial institutions in the market, like insurers and banks, could also provide AAFs. Some AAFs may also manage some ASPs.

“Best 5” Factor: The “best 5” factor is defined as the average of the best five consecutive ASFs during the 35-year accrual period.

Career Service Factor: The Career Service Factor is the sum of the ASFs accrued to date.

Centralized Retirement Account System: This is the system used to track all individuals’ Retirement Accounts and tax shelter room.

Future Service Factor: The Future Service Factor is the sum of the ASFs from the current date until the Canadian Retirement Age.

Lifetime Account: The Lifetime Account covers the “lifetime risk” and includes all employer contributions and all “required” employee contributions to a sponsored plan. At any time the Lifetime Account

may include both Pension Units and a cash amount. As long as an individual has not exceeded annual or career limits, the individual can, at any time, voluntarily contribute to the Lifetime Account and/or to the Personal Account.

Lifetime Freeze Factors: For employees whose employer sponsors a plan, whether DB or DC, the TCB model would include a requirement that all employer contributions be annuitized prior to, or upon, retirement. This requirement is consistent with the employer's purpose for providing retirement benefits. Further, such a requirement reduces risk for both employees and employers. For employees who do not have the benefit of an employer-sponsored pension, annuitization of a defined amount will be required. The amount would be calculated to provide a Mandated Income Replacement Ratio (including government benefits such as CPP and OAS). The income replacement ratio, and the income it is applied to, would reflect the year-by-year tax-sheltered limits up to the date of retirement. It would also be possible to set income breakpoints so that the required locking-in/annuitization portion could trend downward as income rises (e.g., for an employee with 35 years of employment: 70 percent income replacement ratio for salary up to the YMPE, 50 percent income replacement ratio for salary between 1 and 2 times the YMPE and 30 percent income replacement ratio for salary greater than 2 times the YMPE).

Lifetime Risk: The Lifetime Risk component of the TCB model incorporates two key factors: 1) the risk of outliving your retirement funds if you retire at the Canadian Retirement Age; and 2) the annual inflationary increases (as measured by the YMPE of the CPP before retirement and the increase in CPP benefits after retirement). The YMPE increases are based on the annual increase in the Average Industrial Wage (AIW). Annual CPP benefits after retirement increase annually by using the CPP Pension Index, which follows the consumer price index.

Lifetime Worth Factor: A Lifetime Worth Factor will be established for each age (initially by age in years but ultimately evolving to a factor specific to the individual's birth date by month and year) that shows the value of the annual pension benefit provided by one Pension Unit. The assumptions used for these factors will vary by age using sophisticated analytical techniques.

Pension-Accrual Period: The Pension-Accrual Period begins with the calendar year an individual turns 30 and ends with the calendar year the individual turns 65. The first accrual year begins on the first of the month immediately following the month in which the 30th birthday occurs. The last (35th) accrual year ends on the last day of the month immediately preceding the month in which the 65th birthday occurs. The YMPE used for pension accumulation for all accrual ages is the calendar year during which the age is attained.

Pension Unit: A Pension Unit provides an annual deferred pension, commencing at the Canadian Retirement Age, equal to YMPE divided by 1,000. After the Canadian Retirement Age the Pension Unit is indexed at the same rate as CPP retirement pensions using the CPP Pension Index.

Personal Account: The Personal Account is an account in which an individual accumulates funds for the "personal risk" component of retirement savings. The Personal Account can also be used for other special benefits such as the Home Buyer's Plan and the Lifelong Learning Plan, which are currently available to people with registered retirement savings plans (RRSPs) and to accumulate funds for post-retirement health risks.

Personal Risk: The Personal Risk component of the TCB model incorporates risks other than the risks included in the Lifetime Risk component and includes:

- Early retirement
- Spousal survivor benefits
- Bridge benefits
- Salary increases greater than YMPE (i.e., AIW) increases
- Cost-of-living increases greater than YMPE increases
- Pension participation gaps during the Pension Accrual Period
- Spousal Pension Participation Gaps
- Post-retirement health risk.

Phase-In Period: The Phase-In Period is any year prior to the year an individual turns 30. During the Phase-In Period the employee does accrue ASFs, which can be used to top up benefits in the future. Employer and employee contributions are permitted during this period. The employer contributions will be made to the Lifetime Account, and the employee contributions will be made to the Personal Account.

Phase-Out Period: The Phase-Out Period is any month, up to age 70, after the individual turns 65—the Canadian Retirement Age. During the Phase-Out Period the employee does accrue ASFs, which can be used to top up benefits in the future. Employer and employee contributions are permitted during this period. The employer contributions will be made to the Lifetime Account, and the employee contributions will be made to the Personal Account.

Retirement Service Factor: Until the Canadian Retirement Age the Retirement Service Factor is equal to the Career Service Factor plus the Future Service Factor.

Spousal Pension Participation Gaps: A Spousal Pension Accrual Gap occurs during any year of the Pension Accrual Period when the spouse has no taxable employment income.

Target Career Average Pension: The Target Career Average Pension commences at the Canadian Retirement Age on a life-only basis (i.e., without survivor benefits) and is equal to 70 percent of the individual's career average earnings between age 30 and age 65 (the Pension Accrual Period), including any ASFs from the Phase-In Period that have been used to purchase Pension Units, indexed in accordance with the annual increase in the YMPE before retirement and the annual increase in the CPP after retirement.

TOP Plan: The TOP plan will be the only ASP which lasts forever. It will be established in a manner that it includes the portion of the population at the upper level of their life expectancy and will be the final plan into which the ASPs merge. The entry-age level into the TOP plan will change over time as life expectancy changes.

Appendices

A1: Example of Company Communication to Employees

A Quick Overview of YOUR GREAT COMPANY PENSION PLAN

Within the pension system in Canada it is well recognized that each employee has to spread his career income out over an entire lifetime. This means that a portion of total income must be set aside and saved until retirement. The portion set aside is called “deferred compensation.”

We are very proud of the pension system in Canada, which uses the Canada Pension Plan as a base upon which company pension plans, such as ours, can be built. We are even more proud of the significant portion of our employees’ retirement needs which can be achieved by the deferred compensation funding that we provide for our employees through our company Pension Plan. In addition to the deferred compensation that we provide to you each year through your Retirement Account, we also want to help you plan for your retirement as you proceed through your career. We will do this by providing additional information and training for you as you manage your Retirement Account.

This brochure is intended to give you a quick overview of our plan and how it integrates with government-sponsored plans such as Old Age Security (OAS) and the Canada Pension Plan (CPP). Our pension plan helps by providing you with Pension Units each year that will be an income source when you retire.

OAS

- Old Age Security
- Available to all Canadians; no contributions required

CPP

- Canada Pension Plan
- Available to all employed Canadians. Funded by equal contributions from both employers and employees.

Our Plan

- Available to all of our employees whether part-time or full-time
- Employer pays for all benefits calculated based on plan formula. Employees have the right to purchase additional benefits to payroll deductions.

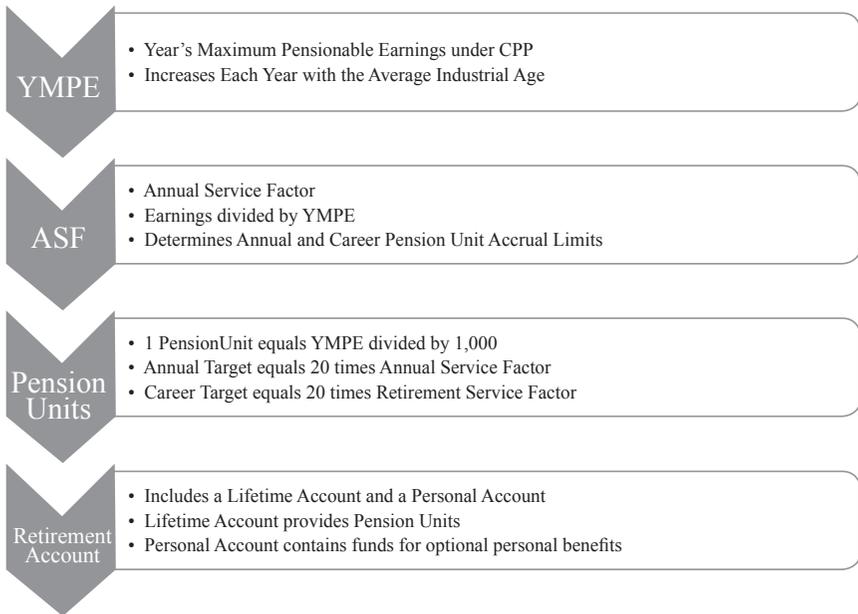
First, what is a Pension Unit? Every year the CPP updates the maximum earnings level for which CPP retirement benefits are earned. This maximum (known as the YMPE) is based on the Average Industrial Wage in Canada. In 2010 the YMPE has been set at \$47,200. An individual retiring at the Canadian Retirement Age, which is age 65 in 2010, with 1,000 Pension Units, would receive an annual lifetime pension, without survivor benefits, equal to the YMPE of \$47,200. This means that each Pension Unit that you accumulate will provide you with deferred compensation equal to the YMPE divided by 1,000 (i.e., \$47.20 in 2010). The amount of deferred compensation provided to you by each of your Pension Units increases each year at the same rate as the YMPE. For example the YMPE has grown to \$47,200 in 2010, from \$37,600 in the year 2000. As a result, the amount provided by a Pension Unit earned in 2000 has grown from \$37.60 in the year 2000 (\$37,600 divided by 1,000—or just replace the comma with a decimal point!) to \$47.20 in 2010. After the Canadian Retirement Age the amount you receive each year from one Pension Unit increases at the same annual rate as CPP retirement benefits.

The number of Pension Units that are earned each year under our plan, and other employer-sponsored pension plans in Canada, is based on a factor called the Annual Service Factor, which restates your income each year as a multiple of the maximum income for which the CPP provides benefits (i.e., the YMPE). For example if your annual earnings in 2010 are equal to the YMPE at \$47,200 your Annual Service Factor will be 1.0000. If your annual earnings in 2010 are equal to one-half of the YMPE (one-half of \$47,200 equals \$23,600) your Annual Service Factor will be 0.5000. Similarly, if your annual earnings in 2010 are equal to double the YMPE (2 times \$47,200 equals \$94,400), your Annual Service Factor will be 2.0000.

Each year your goal should be to accumulate total Pension Units equal to 20 times your Annual Service Factor. This will be equal to 2 percent of your income. If your Annual Service Factor is 0.5000, you should aim for 10 Units. If your Annual Service Factor is 1.0000, you should aim for 20 Units. If your Annual Service Factor is 2.0000, you should aim for 40 Units. For the portion of your income less than the YMPE, the combined benefits from the OAS and the CPP are likely to provide more than one-half of your annual goals. In your Retirement Account you will be shown "career data," which includes all Annual Service Factors that you have accrued to date. There will also be a target career pension shown based on a 35-year career. Since the target is based on a 35-year career, the total number of Pension Units that you should aim for over a career is 20 times the total of your Annual Service Factors during the 35 years before you retire.

Why does your Retirement Account show this target? This target recognizes that once you retire the income that you need to maintain your pre-retirement lifestyle is likely to decrease somewhat, compared to your working income, due to several factors. These factors include reduced taxes, reduced work-related expenses, no need to continue saving for retirement, etc. The target aims to replace 70 percent of your career average earnings with Pension Units plus benefits from the OAS and CPP. It is important to note that because the Annual Service Factors are synchronized with the YMPE, your career average earnings have been adjusted for the average increase over the total Canadian workforce. For example, an Annual Service Factor of 1.000 in 1990 shows that your income was \$28,900 (the YMPE in 1990). When that factor is used to calculate your career average earnings in 2010, the \$28,900 has been adjusted to \$47,200 to reflect the growth in the Average Industrial Wage over that 20-year period. This is also the case for any Pension Units that you have accrued. Your Annual Service Factors only increase significantly from year to year when you are receiving promotions or annual raises that are much in excess of the general average wage growth. Your Annual Service Factors only decrease significantly from year to year when you have a period of unemployment or accept a lower-paying job.

The following chart shows the flow from the YMPE to your Retirement Account.



Let us now look at our company plan and show how it helps you to achieve your goals. Our plan is a very generous “10 plus 6” plan. Under our plan we calculate the number of Pension Units that we will pay for and have deposited into the Lifetime Account portion of your Retirement Account. For our “10 plus 6” plan the calculation takes two steps. First we multiply your Annual Service Factor by 10. In step 2 we allow for the fact that the CPP provides retirement benefits only up to an Annual Service Factor of 1 (which means income equal to the YMPE). We do this by multiplying the portion of your Annual Service Factor that is greater than 1 (i.e., the part of your income that does not generate CPP benefits) by 6.

If your Annual Service Factor is 0.5000, our plan provides 5 Pension Units (10 times 0.5000). If your Annual Service Factor is 1.0000, our plan provides 10 Pension Units (10 times 1.0000). If your Annual Service Factor is 2.0000, our plan provides 26 Pension Units (10 times 2.0000 plus 6 times 1.0000). Let us check what proportion of the career target pension you can expect our plan to fund if you spend the last 35 years of your career with us.

Over 35 years an average Annual Service Factor of 0.5000 would result in a target number of Pension Units equal to 350 (20 times 35 times 0.5000). Over the 35-year period our plan will provide 175 Pension Units (5 times 35). The combined CPP and OAS benefits will provide more than enough benefits (an amount in excess of 260 Pension Units) to significantly exceed the Target Pension of 350 Pension Units when added to the 175 Units from our plan.

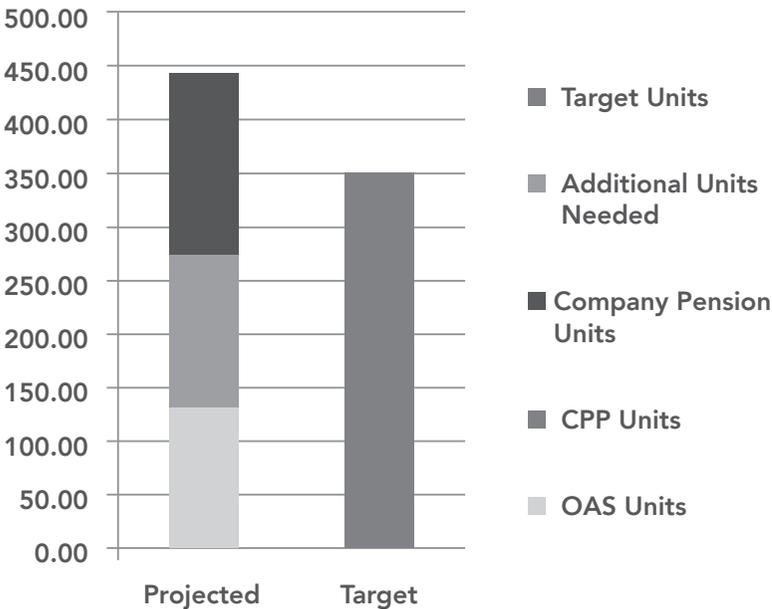
Over 35 years an average Annual Service Factor of 1.0000 would result in a target number of Pension Units equal to 700 (20 times 35 times 1.0000). Over the 35-year period our plan will provide 350 Pension Units (10 times 35). The combined CPP and OAS benefits will provide more than enough benefits (an amount in excess of 350 Pension Units) to exceed the Target Pension when added to the 350 Units from our plan.

Over 35 years an average Annual Service Factor of 2.0000 would result in a target number of Pension Units equal to 1,400 (20 times 35 times 2.000). Over the 35-year period our plan will provide 910 Pension Units (26 times 35). The combined CPP and OAS benefits will provide enough benefits (an amount in excess of 350 Pension Units) to exceed 90 percent of the Target Pension. An employee at this income level should make some voluntary contributions to the Lifetime Account to top up to 100 percent of the Target.

Pension Units help you to keep your retirement planning easier because you don't have to guess how much a dollar today will be worth 25 years from now. In our examples you just think of it as, "If I was retiring today with my 35 years of service, what would my retirement income be compared to my current working income?"

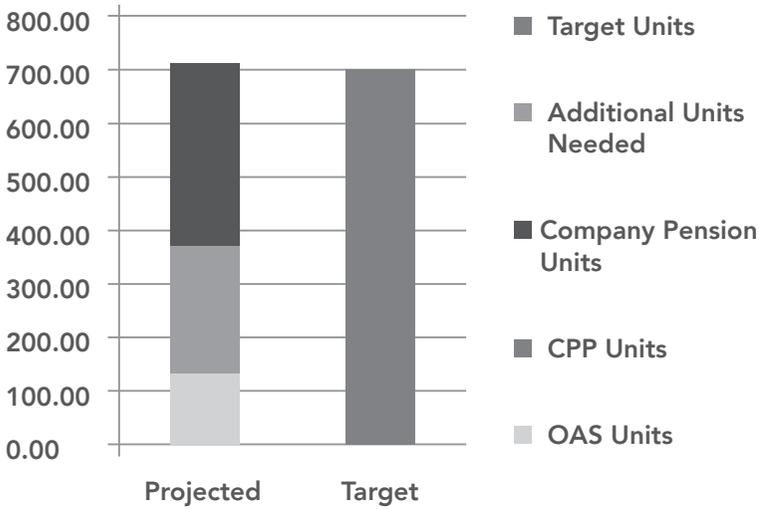
If your 35-year average Annual Service Factor is 0.5000, our pension plan plus CPP plus OAS will give you about 435 Pension Units (175 plus 260). If you were at the end of your 35-year career today, these Pension Units would provide you with \$20,532 (435 times \$47.20) of annual income in retirement. This is equal to 87 percent of your current income of \$23,600. Chart 1 shows that you are projected to be well above your target of 350 units. Therefore you do not have to plan for additional Pension Units to meet the target.

Chart 1



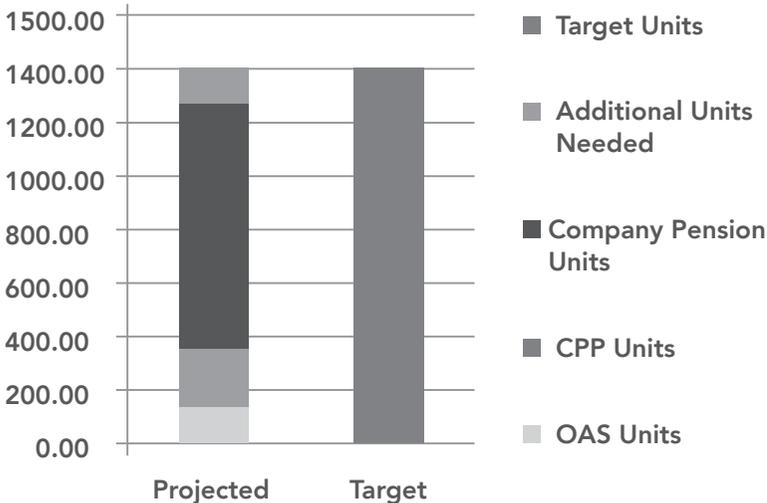
If your 35-year average Annual Service Factor is 1.0000, our pension plan plus CPP plus OAS will give you slightly more than your target of 700 Pension Units. If you were at the end of your 35-year career today, these Pension Units would provide you with at least \$33,040 (700 times \$47.20) of annual income in retirement. This is equal to 70 percent of your current income of \$47,200. Chart 2 shows that you are projected to be just over target. You do not have to plan for additional Pension Units to meet the target but it might be prudent to add some to give yourself margin.

Chart 2



If your 35-year average Annual Service Factor is 2.0000, our pension plan plus CPP plus OAS will give you about 1,260 Pension Units (910 plus 350), which is a little below your target of 1,400 Pension Units as can be seen in Chart 3. If you were at the end of your 35-year career today, these Pension Units would provide you with \$59,472 (1,260 times \$47.20) of annual income in retirement. This is equal to 63 percent of your current income of \$94,400. You have a higher-than-average income and you might not need to hit the 70 percent target due to higher post-retirement tax savings or other differences. However, you should review your financial situation and, if you feel that a bigger retirement income is needed, you can purchase additional Pension Units for your Lifetime Account. You can do this by payroll deduction and purchase your Pension Units directly from our company's AAF.

Chart 3



Please remember that your target pension is based on accruing Pension Units at a rate equal to 20 times your Annual Service Factor. On the portion of the Annual Service Factor greater than 1 (i.e., the portion of your income greater than the YMPE), you need to aim for an additional 4 Units per year to achieve the target since the company “10 plus 6” plan provides you with 16 of the targeted units. At a certain high pension income level (an amount just in excess of that provided by 1,400 Pension Units in 2010), some benefits from the OAS will be reduced. The Targeted Number of Pension Units shown in your Lifetime Account will reflect this adjustment.

Now let's look at how your Pension Units are managed throughout your career and your retirement. We, as your employer, purchase the Pension Units for you from our AAF. Your accrued Pension Units are then immediately reported to your ASP. The ASP that you belong to is based on your year of birth. For example, if you were born in the year 1980, you are a member of the “1980 Plan.” You will be a member of the same ASP until about five or six years after the Canadian Retirement Age, at which point your ASP becomes part of an “Ages-Specific Plan,” which includes more than one year of birth. This process of increasing the number of years of birth within the Ages-Specific Plan you belong to will continue until you reach an age at which you have outlived about 95 percent of those who were born the same year as you. At that point you will become a member of the TOP plan, which will continue to pay your Pension Unit benefits until your death.

Now let's cover some questions and answers.

Question 1: What happens to my Pension Units when I die?

Answer 1: If you die before the Canadian Retirement Age the value of your Pension Units will be paid to your named beneficiary by your ASP. If your spouse is the named beneficiary it may be possible to transfer your Pension Units to your spouse's Retirement Account on a tax-sheltered basis if there is room in your spouse's Lifetime Account. If you have a spouse at the date you first become eligible for early retirement, currently age 55, you and your spouse will have to make a decision about what your target spousal survivor benefits will be. This may require some funding from your Personal Account depending on the decision that you and your spouse make. If you die after you retire all benefits cease unless you have elected and paid for survivor benefits using funds from your Personal Account.

Question 2: What happens if I decide to retire, or work part-time, before the Canadian Retirement Age?

Answer 2: If you retire before the Canadian Retirement Age any pension income that you elect to receive before the Canadian Retirement Age will be by using funds accumulated in your Personal Account. If you have exceeded the minimum requirements within your Lifetime Account it may be possible to cash in some Pension Units. This will reduce the amount of Pension Income that you will have available when the Pension Unit annuity payments begin at the Canadian Retirement Age. It will be possible for you to cease full-time employment and continue to accrue Pension Units from any part-time employment. If you are working only part-time you will also have the option to top up your income using funds from your Personal Account.

Question 3: What happens if I decide to retire, or work part-time, after the Canadian Retirement Age?

Answer 3: If you continue working after the Canadian Retirement Age you will still be able to accrue additional Pension Units until age 70. Note, however, that the annuities from your Pension Units accrued before, and after, the Canadian Retirement Age will be in pay mode. You will have the option

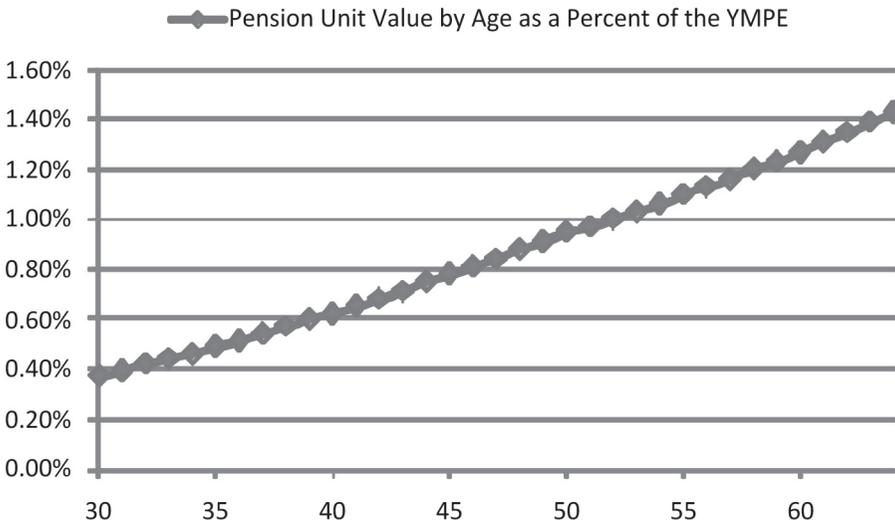
to have these payments directly transferred to your Personal Account on a tax-sheltered basis, provided you have not exceeded the career limits. You will also have the option to use the annuity payments within your Lifetime Account to purchase additional Pension Units, provided you have not exceeded the career limits.

Question 4: What happens if I change employers?

Answer 4: If you change employers the Pension Units that you have accrued to date are totally unaffected. Before changing jobs a key factor that you should check is if your new employer provides a pension plan that is as generous as our “10 and 6” plan. The “deferred compensation” provided by your new employer might be considerably lower than that provided by our pension plan and might offset any increase in your immediate compensation.

Question 5: How much is a Pension Unit worth?

Answer 5: The value of your Pension Units will constantly increase as you get closer to the Canadian Retirement Age. This is because the annual amount payable grows each year and also because you are getting closer to the payout phase. This also means that the cost of Pension Units purchased by you or by your employer will increase as you get closer to retirement. A bigger proportion of your income should be consistently set aside for retirement as you proceed through your career. The chart below shows the current value of 1 Pension Unit expressed as a percent of the YMPE.



In our next brochure we will discuss how to effectively use your Personal Account.

A2: Flowing Examples Data

FIRST PAGE OF DATA FOR "FLOWING EXAMPLES"	
These examples are all based on an individual names "Sam" (Samuel? Samantha? I don't know!) Sam was born on Jan. 1, 1965.	
The Data below are at the end of 2010. Sam became a member of an "a plus b" plan upon entering the Pension Accrual Period at age 30 in 1995.	
Phase-In Period Years to Date	12
Pension Accrual Period Years to Date	16
Total CPP Contributory Years to Date	28
Years Remaining Until Canadian Retirement Age	19
Total Annual Service Factors During the Phase-In Period	6.4600
Total Annual Service Factors During the Pension-Accrual Period	20.8800
Total Career Service Factor to Date	27.3400
Most Recent Year ASF	1.5000
Projected Future ASFs Based on 2010 Annual Service Factor	28.5000
Projected Total PAP ASFs	49.3800
Projected PAP 35 Year Average Service Factor	1.4109
Target Career Average Pen. Units (20 times Total PAP ASFs)	987.6000
Target PAP Career Average Income Replacement Ratio	70.00%
Estimated Units from CPP	235
Estimated Units from OAS	131
Target Pension Units Needed in Lifetime Account at Retirement	621.6000
Current Accrued Pension Units	238.0800
Projected Additional Units from Employer Plan	342.0000
Projected Total Units in Lifetime Account	580.0800
Projected Total Units Including CPP and OAS	946.0800
Additional Units Needed to Meet 35-Year Average Target	41.5200
Projected PAP Career Average Income Replacement Ratio	67.06%
Additional Units Needed per Year to Meet Target Career Average	2.1853
Projected "Best 5 Factor"	52.5000
Target "Best 5" Pen. Units (20 times Projected Best 5 Factor)	1050
Additional Units Needed to Meet "Best 5" Target	103.9200
Additional Units Needed Per Year to Meet "Best 5" Target	5.4695
Current Value of One Unit	\$382
Cost to Add Needed "per year" units in 2011 to meet Career Average Target	\$835
Cost to Add Needed "per year" units in 2011 to meet "Best 5 Target"	\$2,089

A2: Flowing Examples Data

SECOND PAGE OF DATA FOR "FLOWING EXAMPLES"

		Pension Units Multiple for Total Income-a			10					
		Extra Units over YMPE-b			6					
Age at Start of Year	Year	YMPE	Annual Service Factor	Career ASFs	Annual Pension Units Accrued	Annual Unit Limit	Total Pension Units Accrued	Career Unit Limit to Date	Pro-Rated CPP + OAS	Unused Portion of Career Limit
45	2010	47,200	1.5000	27.3400	18.0000	30.0000	238.0800	546.8000	192	116.7200
44	2009	46,300	1.4100	25.8400	16.5600	28.2000	220.0800	516.8000	183	113.7200
43	2008	44,900	1.4000	24.4300	16.4000	28.0000	203.5200	488.6000	174	111.0800
42	2007	43,700	1.4000	23.0300	16.4000	28.0000	187.1200	460.6000	165	108.4800
41	2006	42,100	1.3900	21.6300	16.2400	27.8000	170.7200	432.6000	156	105.8800
40	2005	41,100	1.3800	18.8600	16.0800	27.6000	154.4800	404.8000	146	104.3200
39	2004	40,500	1.3800	18.8600	16.0800	27.6000	138.4000	377.2000	137	101.8000
38	2003	39,900	1.3600	17.4800	15.7600	27.2000	122.3200	349.6000	128	99.2800
37	2002	39,100	1.3500	16.1200	15.6000	27.0000	106.5600	322.4000	119	96.8400
36	2001	38,300	1.3400	14.7700	15.4400	26.8000	90.9600	295.4000	110	94.4400
35	2000	37,600	1.3200	13.4300	15.1200	26.4000	75.5200	268.6000	101	92.0800
34	1999	37,400	1.1600	12.1100	12.5600	23.2000	60.4000	242.2000	92	89.8000
33	1998	36,900	1.1400	10.9500	12.2400	22.8000	47.8400	219.0000	82	89.1600
32	1997	35,800	1.1300	9.8100	12.0800	22.6000	35.6000	196.2000	73	87.6000
31	1996	35,400	1.1200	8.6800	11.9200	22.4000	23.5200	173.6000	64	86.0800
30	1995	34,900	1.1000	7.5600	11.6000	22.0000	11.6000	151.2000	55	84.6000
29	1994	34,400	1.0400	6.4600	0	0	0	0	46	N/A
28	1993	33,400	1.0300	5.4200	0	0	0	0	37	N/A
27	1992	32,200	1.0200	4.3900	0	0	0	0	27	N/A
26	1991	30,500	0.9200	3.3700	0	0	0	0	18	N/A
25	1990	28,900	0.8200	2.4500	0	0	0	0	9	N/A
24	1989	27,700	0.4400	1.6300	0	0	0	0	0	N/A
23	1988	26,500	0.2900	1.1900	0	0	0	0	0	N/A
22	1987	25,900	0.2500	0.9000	0	0	0	0	0	N/A
21	1986	25,800	0.1700	0.6500	0	0	0	0	0	N/A
20	1985	23,400	0.1700	0.4800	0	0	0	0	0	N/A
19	1984	20,800	0.1600	0.3100	0	0	0	0	0	N/A
18	1983	18,500	0.1500	0.1500	0	0	0	0	0	N/A

A3: Canada Pension Plan Example

There are some unique aspects to the CPP methodology used to track member records. The key feature that has been incorporated into the TCB model is a simple method used to track year-by-year contributions and pensionable earnings. The maximum possible CPP contribution period to normal retirement age is 47 years (from age 18 to age 65). In simple terms any member whose income is greater than or equal to the Yearly Maximum Pensionable Earnings (YMPE) for a given year is given a service factor of “1,” which is the maximum credited service for the year. If the member’s income was just one-half of the YMPE the members credited service is “0.5.”

When a member retires or becomes eligible for benefits, the year-by-year factors are added up. The proportion of the maximum possible benefit that the member is entitled to is simply the sum of the member’s year-by-year factors divided by the number of years in the contributory period (the actual CPP benefit calculations reflect the number of months rather than years in the contributory period). The CPP does provide for “dropouts” of a certain percentage of low-income years and also allows for dropouts for other reasons that will not be described here. The standard dropout is the lowest 15 percent (about to increase to 17 percent by 2014) of the years from age 18 to age 65. Suppose a member reaches age 65 and has had 30 years in which income was greater than the YMPE, 15 years where income was equal to one-half of the YMPE and two years with zero income. In this case the dropout period is 15 percent of 47 or 7 years. Therefore the number of years in the contributory period is 40 (47 minus 7). The sum of the member’s highest 40 credited service factors is 35 (30 years at YMPE or greater plus 10 years at one-half of the YMPE). Note that five of the years at 50 percent plus the two years at zero have been dropped out. The proportion of the maximum benefit to which this member is entitled is therefore 87.5 percent (35 divided by 40). If there had not been a dropout period, the proportion of the maximum benefit to which this member is entitled would have been only 79.8 percent (37.5 divided by 47).

A4: TCB Example Tax Shelter Limits

The total career maximum Pension Unit accrual limit under TCB will be based on all ASFs accrued during the total CPP contributory period (i.e., age 18 to 70). For the examples in this paper the career Pension Unit limit, including units from CPP and OAS (net of required OAS repayments or “claw backs”), has been set as the smallest of 2,400 Units or 800 times the average of the “best 5” consecutive ASFs, to a maximum of 3.0, at the Canadian Retirement Age and beyond. In order to hit either of these limits the individual will have to use funds from the Personal Account or continue accruing benefits after the Canadian Retirement Age.

It is important to note that 2,400 Units is equal to 2.4 times the YMPE and 800 times the “best 5” consecutive ASFs and represents 2 percent per year for 40 years. The 40-year period is to allow for the possibility of a 70 percent income replacement ratio if unreduced early retirement is elected at age 60 (which would include 30 years during the DPAP and five years during the Phase-In Period). The maximum number of Pension Units will almost always exceed the individual’s Target Lifetime Pension Units at the Canadian Retirement Age. Age 60 is the earliest age at which benefits are available under the CPP. Beginning in 2013, the first year that a CPP member will have contributed from age 18 to age 65, the “40-year maximum” is consistent with the number of years necessary to qualify for a maximum normal retirement age pension under the CPP after the “15 percent dropout.”

Under the current 2010 tax shelter limits the maximum annual benefit for a DB plan is \$2,494.44. If we consider this amount to be indexed, which it is before retirement in final average plans and after retirement in many of the richest Canadian DB plans, the 2010 limit is equal to 52.85 Pension Units under the TCB model (\$2,494.44 divided by \$47.20). An individual with a maximum career of 40 years and final average earnings high enough to exceed the annual benefit limit could accrue the equivalent of 2,114 Pension Units (52.85 times 40). This amount does not take into account CPP benefits, which would be equal to about 237 Pension Units. Thus the overall limits used in the TCB examples (2,400 Units) are quite close to the current limits (2,351 Units).

Under TCB in any career year during the Pension Accrual Period the number of Pension Units a member is allowed to accrue will be equal to 20 times that year's Annual Service Factor (20 times the ASF equals 2 percent of earned income during the year) to a maximum of 60 Units (based on 20 times a maximum ASF of 3.0). The current salary necessary to qualify for a maximum 2 percent DB pension accrual is \$124,722 (\$2,494.44 divided by 0.02). Under TCB this would equate to an ASF of 2.6424 in 2010 (\$124,722 divided by \$47,200). The annual limits do not directly factor in payments from the CPP and OAS. In any year the employee's accrued career-to-date limit, which does include pro-rated CPP and OAS benefits, cannot be exceeded. If the individual does not exceed the annual Pension Unit limit, or the accrued career-to-date limit, cash amounts can be contributed to the Lifetime Account. In addition the individual can also contribute to the tax-sheltered Personal Account.

This results in the Pension Accrual Period portion of the career maximum being equal to 2,100 Pension Units (35 times 60), which in 2010 would result in a maximum pension, including CPP and OAS, equal to \$99,120 (2,100 times \$47.20). ASFs accrued during the Pre-Accrual Period will be carried forward to the Pension Accrual Period and can be used to top up to the career limit. Similarly ASFs accrued after attaining the Canadian Retirement Age (i.e., the Phase-Out Period) can also be used to top up Pension Units to the career limit. To achieve the career limit at least five years with ASFs in either the Pre- or Post-Accrual Periods would be necessary. If in a particular year an individual has exceeded the annual Pension Unit limit the portion of the ASF greater than the maximum can also be used, or carried forward, to top up benefits if the individual has not yet exceeded the accrued career limit.

Subject to the career limits, an individual's Target Lifetime Pension Units under TCB at the Canadian Retirement Age is equal to the Service Factors accrued during the DPAP multiplied by 20. This target number of Pension Units provides an income replacement ratio equal to 2 percent per year of career average indexed earnings from the beginning of the DPAP to the Canadian Retirement Age. This amount can be topped up for ASFs accrued during the Phase-In Period by making contributions to the Lifetime Account. At retirement the Personal Account can be used to purchase ancillary benefits including spousal survivor benefits and a shift to "best 5" average earnings. The target number of Pension Units, and the overall career limit, also includes benefits, available from both the CPP and OAS (net of required OAS repayments or "claw backs").

As noted in the Building Society's Tools section, a paper by pension lawyer James Pierlot (Pierlot 2008) analyzes the unfairness in the Canadian system for tax sheltering retirement funds in some detail. Current tax shelter limits can be found by using the link <http://www.cra-arc.gc.ca/tx/rgstrd/papspar-fefespf/lmts-eng.html>.

The following table shows the contribution limits that I used for testing the proposed structure of the TCB model. The limits shown are for illustrative purposes only. In developing these factors I used the

UP94 Projected to 2020 unisex mortality table to estimate the value of a life-only annuity commencing at age 65 with a 3 percent discount rate. The present value factor used was 14.7400. Prior to age 65 I used a discount rate of 4 percent from age 30 or less to age 65. The pre-retirement discount rate was then phased down to 3 percent by age 50, using equal annual reductions. I stress again that these factors were used to test the concepts within the TCB model and the actual factors to be used are far beyond the scope of this paper.

Tax Shelter Limits Used in TCB Model Examples as a Percentage of Income			
Age Range	Total Retirement Account Limit	Lifetime Account Limit	Personal Account Limit
18 to 24	10.00%	5.00%	5.00%
25 to 29	12.00%	7.00%	5.00%
30 to 34	19.00%	10.00%	9.00%
35 to 39	22.00%	13.00%	9.00%
40 to 44	25.00%	16.00%	9.00%
45 to 49	28.00%	19.00%	9.00%
50 to 54	31.00%	22.00%	9.00%
55 to 59	34.00%	25.00%	9.00%
60 to 66	38.00%	29.00%	9.00%
67	37.00%	28.00%	9.00%
68	36.00%	27.00%	9.00%
69	35.00%	26.00%	9.00%
70	34.00%	25.00%	9.00%

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“The Total Career Benchmark Model: A Pension Model for *Retirement 20/20*”

By Cynthia J. Levering

1. Overview

This paper is comprehensive, creative, and well-developed, proposing a mandatory retirement system that is fully integrated with and linked to the Tier I social insurance system. While the design is complex, it results in mandatory coverage that systemizes all participants into a “unit scale” based on average wages resulting in predictable and adequate base benefits as well as the ability to fund supplemental retirement income. The complexity may be mitigated somewhat by the universality of coverage and the communication aspects envisioned through the centralized administration. In addition, the design establishes targets and communicates how close individuals are to reaching those targets so they can easily see how to fill the gaps. There is a good integration with Tier I social insurance, which helps people see the value of that piece and what they have to make up through their personal savings. In addition, the Personal Accounts give individuals some discretion to plan for additional voluntary retirement savings based on their own particular needs. The plan removes the employer from being the primary “insurer” of both investment and longevity risk, while also providing some design flexibility that allows the employer to vary contribution levels to meet business needs. In fact, it is the employer’s role that changes the most from the current structure to this model. While written for a Canadian context, the ideas are generally translatable to the United States.

2. Key Elements of the System

The Lifetime Account, which includes all employer and required employee contributions, provides for a guaranteed annuitized life income through mandatory contributions on income up to Average Industrial Wage (\$47,800 for 2011) to ensure a minimum level of savings. Personal Accounts can also be established to provide individual flexibility, fund personal risks, and provide ancillary benefits such as early retirement, spousal benefits, cost-of-living greater than Average Industrial Wage increases, post-retirement medical costs, and part-time work. It provides full portability and minimizes leakage, with the possibility to transfer funds between accounts, and also ensures universal access for all types of employment.

The system provides for the ability to centralize and integrate the tracking of the overall retirement savings (Tiers I and II), while facilitating communication with individuals and enhancing their understanding of retirement goals by providing standardized information with continuous benchmarking. The employer still plays an educational role, but the administration burden is streamlined and reduced.

While the employer is a contributor and “champion,” not an insurer or guarantor, the plan can still be designed to align with the employer’s needs, goals, risk tolerance, and financial situation. Most risks are mitigated through pooling of longevity risk, automatic tracking of pre- and post-retirement inflation and ensuring a minimum amount of annuitization prior to or upon retirement. Markets and investment expertise are utilized through Approved Annuitization Funds (AAFs) and Age-Specific Plans (ASPs), which can include insurers, banks, or large pension plans. Transition from the current system through evolution over the next 15 years is also addressed.

3. Pros

- By integrating the three pillars of retirement savings and centralization, the system facilitates communication and understanding of objectives and builds social solidarity by helping individuals see the value of the social insurance and what they have to make up on their own.
- It provides individuals with universal access to professional investment expertise and guaranteed income.
- Mandatory employee contributions should increase employees' engagement in and appreciation of their retirement benefits.
- The use of Lifetime and Personal accounts helps adjust to changing conditions and minimizes demographic risk.
- Targets are designed to ensure adequacy combined with strong communications to keep individuals on track.
- The employer is not in the benefit guarantee business but does play an educational role and can continue to be a "trusted advisor" to employees.
- Benefit design is predictable through ties to external indices.
- Longevity risk is pooled, which should lower the cost of annuitization.
- Indexing to average wages includes pre-retirement inflation protection.
- It includes a universal access tool and transparent structure to ease understanding of accumulated retirement savings versus objectives.
- Design flexibility can align with employer workforce needs.
- Benefit levels can be easily tailored, which should make it easier to "compete" because all plans are comparable.
- Contributions can be increased (somewhat) to encourage early retirement.
- It is responsive to owners since contributions can also be decreased.
- It gets the employer out of the business of sponsoring plans, which is especially attractive to small employers.
- It can be operated to use the markets extensively and efficiently while allocating risk properly.
- It can be designed to have strong governance, and the similarity of plan structures should allow easy scrutiny.
- Roles are set to maximize individuals' strengths and use behavioral finance theories effectively.

- The use of career limits improves fairness in the system.
- It can be structured to hedge risks.
- Costs are minimized due to the size of the system.
- Having everyone in one centralized system and linking it to social insurance should ease administration.
- While it is relatively complex, it does systemize all participants into a “unit scale” based on Yearly Maximum Pensionable Earnings (YMPE; average wages).
- It gets small employers and self-employed individuals into the pension system on a tax- and benefit-equalized basis. In addition, groups such as unions can be plan sponsors.
- Built-in limits for tax-deductible contributions are a good level to ensure adequacy of income.
- Extensive communications and online access are generally provided by large employers now, but this model would make them available to all employees.
- The focus is on savings and not on investing.
- Accumulation of wealth is expressed in terms of income and not a lump-sum dollar amount.

4. Cons

- It does not fully address sustainability across generations.
- There is a concern about system failure in event of market meltdown or extreme events (depending on structure of ASPs).
- It does not address different retirement savings needs depending on income level.
- It appears to be a very complex system to set up and for individuals to understand initially with a steep learning curve.
- Individuals still need to make decisions to convert credits into Lifetime Account and manage their Personal Accounts.
- It may lead to employers having less control over design and workforce management.
- Tying retirement age to the Tier I definition may send a signal about what the “normal” retirement age is.
- Risk bearing may not be obvious to individuals due to the complexity of the system.
- It is not fully clear who bears investment risk.

- The use of market mechanisms is not transparent.
- It is not obvious how the transition from current plans would work.
- The proposal feels onerous (e.g., having to recalculate the available tax deductions).
- The addition of more autopilot features (e.g., automatically recommending a personal contribution for next year to keep employees on track or providing set packages of personal benefits) may be desirable.
- It may not be practical or cost-efficient to figure out everyone's accumulated tax limit at transition.

5. Questions for the Author

- Who chooses the AAFs and how are they monitored?
- Is the employer a fiduciary?
- What happens if ASP operators take too much risk?
- What happens if ASP operators generate additional profits?
- What do AAFs trading ASP units do to help them; e.g., if it is a group annuity, how can that be given to another insurer, and shouldn't it have the same value for one AAF as another? Can they be hedged like insurers?
- If an AAF manages an ASP, are there conflicts of interest?
- Is it clear who bears what risks? If not, how can this be addressed?
- What happens if there are significant cohort longevity gains?
- How would the universal national mandatory provision "play" in the United States, especially in light of the ongoing debate over mandatory health care and the fact that businesses and employees generally do not like mandates and there is increasing concern over government control?
- Can employers tailor retirement ages to meet specific needs (e.g., public safety employees or those in physically demanding jobs who have a shorter working lifetime)?
- Can employers offer ad hoc early retirement "windows"?
- Can the markets hedge the YMPE indexation?
- Will individuals understand how to manage their Personal Accounts?
- Will all employees have access to the online tools that are necessary for understanding and managing their accounts?

- How will the transition from existing plans work?
- Will the transition be too difficult if we have to “reboot” the systems?
- Who pays the fees?
- If we build it, will they come; i.e., will the markets step up and create the innovative products needed in a timely manner, especially for disability benefits?

6. Conclusion

The Total Career Benchmark (TCB) model effectively solves the problems of coverage, portability, income adequacy, and income security in the current retirement system through nationalization, standardization, centralization, mandates on contributions, and annuitizations. It highlights the need to make financial education and literacy a top priority. It includes elements of shared responsibility and transparency but doesn't lose sight of the importance of the employer role. It is generally a well-thought-out proposal, and the pros greatly outweigh the cons. It contains viable components that effectively incorporate *Retirement 20/20* principles and can be used to advance the discussion of a national retirement income policy in both the United States and Canada.

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Author's Response to Comments by Cynthia J. Levering

By Thomas J. Walker

I would like to thank Ms. Levering for the significant time and effort that she has put into this project. Her overview clearly outlined the essence of the Total Career Benchmark model, and I am very pleased with the conclusion that she arrived at. I will give a brief response with respect to each section of her commentary.

Ms. Levering's Key Elements section shows a very accurate understanding of both the goals and the tools included within the TCB model. In particular I appreciate her recognition of the role changes for the stakeholders and the goal to mitigate risk and increase understanding within the model. In the most recent draft of my paper I did make a change with respect to the requirement for voluntary contributions. This change specified that employee contributions could be non-mandatory on the portion of income up to the Average Industrial Wage (AIW) and/or until employer contributions reach a certain level. This was a change that I intended to make before submitting my paper and is to recognize that mandatory contributions should be smaller for low-income employees.

The Pros, Cons, and Questions raised in the commentary are consistent with those raised in the Judging Panel Review. In this response I will attempt to clarify which of the "Pros" was intended to alleviate the "Cons." This approach will also answer some of the questions.

With respect to addressing sustainability across generations and/or in the event of a market meltdown, the entire structures of ASPs and AAFs were intended to address this issue. This is the area that needs much more research. I have not yet received any comment that reduces my confidence in the workings of the TCB "tools" to handle these issues. In the paper I make many comments—particularly in Section 7 about these issues. I admit that my comments are not yet backed up because of the need for further research beyond the scope of my paper. In Section 2.7.6 I have added a sentence to highlight that in an extreme event the market downturn is shared nationally by the reduction in the number of Pension Units that provides the necessary tax shelter room to recover. Under the present Canadian rules this tax shelter recovery room is available only to DB plans.

One of the Cons states that the model does not address different retirement savings needs by income levels. I admit that detailed examples were not given, but variation by income level is referenced in Section 2.2, Tool Number 11, Target Career Average Pension Units, and also in the Lifetime Freeze Factors definition in the Glossary. In addition the Communications Example in the Appendices was intended to illustrate that employees at different income levels, within the same plan, may have different retirement savings needs. The TCB model is designed to provide the flexibility to adjust for changing conditions throughout a working and retirement lifetime. Several items in the Pros acknowledge this flexibility.

The TCB model, particularly the structure for AAFs and ASPs, is complex behind the scenes. The level of complexity can be significantly reduced by a comparison to our current "simple" system. I think that the first step should be to introduce Pension Units and Annual Service Factors into our system to help individuals and employers "picture their pension." A reference to this is now in Section 8.3.1. This would be an effective start to transition. Recalculating available tax deductions could be onerous but is doable with modern technology and available data—particularly if a significant proportion of prior years, likely all years prior to 1990 in Canada, and possibly those over a certain age are excluded. The total transition process will require more research.

As stated in the Cons it is true that individuals do still need to make decisions. However, the TCB tools are such that the rules and structure can be set up in a manner that guarantees that the decision aspect is primarily on the lower risk items and specific to individual needs. This is another issue that the standardization is intended to cover by having financial planners and advisors speaking a common language. The individuals with the greatest ability to make their own decisions will also be those with the lowest risk.

Employers can still have control over design and workforce management. The difference will, however, be strictly by quantity not quality. The difference from employer to employer will be much more transparent since the value of “deferred income” to an existing or targeted employee will be as obvious as the difference in “immediate income.”

I see sending a signal about normal retirement age as a Pro rather than a Con. At some point, probably soon, it may be necessary to change the normal retirement age for the CPP. If the TCB model is in place, an increase in the normal retirement age will immediately increase the number of Pension Units in an individual’s account and also reduce the cost to purchase new “punies.”

Who bears what risk? I believe that it may be necessary to restate Pension Units as “target annuities” to help in this regard. My intention has always been that Pension Units are like “shares” in a company. A portion of the investment risk would be borne by the AAFs since they are providing Pension Units to the ASPs. The remainder would be borne by the members of the ASPs. This is an area where the additional research is absolutely critical both with respect to the structure of AAFs and ASPs as well as developing appropriate investment policies that recognize that each ASP, except the TOP plan, will be wound up at a future date that might change from time to time but is very predictable.

Market mechanisms, including risk and profits for AAFs and ASPs, are an area that will require much more research. The merging of the Age Specific plans after the Canadian Retirement Age will enable some additional risk management. Each plan’s wind-up is implemented over a century. This merging also helps to minimize any bounces in the cost of Pension Units. It will no longer be necessary to plan for “hypothetical” wind-ups but for a certain, timed wind-up for all ASPs except the TOP plan. I have explicitly added to the paper the always intended fact that members effectively “own” the ASPs. In several sections reference is made to the “participation” aspect. The relative profits of AAFs and ASPs should be transparent since, as noted in the Pros, “the similarity of plan structures should allow easy scrutiny.”

The monitoring of AAFs and ASPs is also an area in which more research is needed with respect to the structure and rules. For the trading of ASP units by AAFs it is very important to note that the group annuitant is the ASP. The units being traded would be units of one ASP for units of another. Therefore some AAFs could focus on “younger” ASPs while others focus on “older” ASPs. The employer’s fiduciary responsibility is intended to be fulfilled once contributions are made.

The addition of more “autopilot features” would definitely help both in the transition and in the ultimate TCB system. A new autopilot feature could help alert individuals if there are “significant cohort longevity gains.” The phasing in to the ultimate TOP plan is intended to address this issue, and the entry points would be regularly benchmarked, communicated, and updated. This is the critical behind-the-scenes complexity that emphasizes the need for actuarial risk management.

The “mandatory” aspects will definitely be a big issue in both Canada and the United States. Hopefully the phase-in can also include the “mandatory” aspect. Ideally a big part of the mandate for both

individuals and employers will be an increased understanding by both that their future security depends on adequately fulfilling their role. For the markets this will hopefully include “innovative products needed in a timely manner, especially for disability benefits.”

Any benefits, such as those for physically challenging jobs demanding a shorter working lifetime, which are over and above the standard benefits available to the general public, will have to be handled as “special cases” with any extra benefits administered and funded outside of the TCB model.

I wish to conclude by again thanking Ms. Levering for her insightful and very helpful analysis of my paper. Any future research or papers, which I truly hope will happen, on the TCB model will benefit from her response.

