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# Editor's Introduction

By Faisal Siddiqi

Welcome to the 2019 *Retirement Forum* on shared risk plans!

During 2012 to 2017, a new type of pension plan was developed in Canada: the shared-risk pension plan. It became a necessity in the province of New Brunswick to solve the problem of providing a defined benefit plan with fixed contributions for certain industries. This didn't seem possible, but it became so using the advent of a target benefit plan concept: Set up a defined benefit formula but don't promise it. Instead, let the promise be a defined benefit promise related to a plan's funded status and set up a tight regulatory system to help keep the target benefit promised. Jana Steele was heavily involved in the creation of this plan, and her paper with Mary Kate Archibald discusses various issues for consideration now that these plans have been in place for a number of years. Together Steele and Archibald discuss a number of actuarial issues that have arisen for shared risk plans in New Brunswick. Doug Chandler discusses some broader issues, such as sustainability for such plans, which lead into our second paper.

Soon after New Brunswick allowed shared risk plans, many other provinces became interested in allowing this plan type, and legislation was introduced or was becoming formulated in Alberta, British Columbia, Quebec and Ontario on target benefit plans (TBPs). Barbara Sanders discusses the more general plan design and regulatory implications of these plans and asked a series of well-known and prominent experts to weigh in on her paper. Keith Ambachtsheer wonders whether TBPs can be defined benefit or defined contribution or more general. Robert Brown asks whether the University of British Columbia approach can be extended to newer plans. Dirk Broeders discusses how the four basic functions of pension plans can be reflected in a TBP. Greg Heise asks about intergenerational transfers.

This leads to an even more interesting analysis of the same issue from the U.S. context. Lee Gold examines variable annuity plans. Just providing a barbell approach with either defined benefit or defined contribution does not represent the full spectrum of options. There are pluses and minuses to traditional defined benefit and defined contribution plans. Gold's paper provides modeling results that illustrate how a variable annuity plan can provide superior results in decumulation or the retirement phase. Jeanette Cooper discusses the employee and employer risks further.

We hope you'll enjoy reading these thoughtful and interesting papers and comments on this subject. We thank the authors for their contributions. The Society of Actuaries (SOA) continues to do lots of research on retirement and aging issues at the plan and individual level. Please see <https://www.soa.org/research/topics/aging-ret-topic-landing> for the SOA's work in this area.

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# Single Employer Target Benefit Plans: Issues for Consideration

By Jana Steele and Mary Kate Archibald

In this paper, we review recent developments in single employer target benefit pension legislation across Canada, highlighting some of the lessons learned and observations stemming from the early experiences of new single employer target benefit plans (TBPs). In particular, we focus on issues relating to TBPs with members in multiple jurisdictions, plan administration and actuarial review of TBPs.

The purpose of this paper is to highlight certain matters where legislators may wish to consider reforms for existing TBPs and, as other jurisdictions contemplate TBPs, may wish to incorporate improvements. In this paper, we do not address specific income tax issues related to TBPs.

Although target benefits have existed in the multiemployer sector in many jurisdictions for years, target benefits were not available to single employers until recently. In 2012, New Brunswick implemented changes to its Pension Benefits Act<sup>1</sup> (the NB PBA) to provide a framework for TBPs (known in New Brunswick as shared risk plans) registered in that province. Additionally, there is now comprehensive target benefit legislation in force in Alberta and British Columbia. Quebec also has target benefit legislation that applies to certain employers in the pulp and paper sector. Saskatchewan recently introduced regulations to accommodate limited liability plans, which are a form of TBP for collectively bargained plans. Other provinces such as Nova Scotia have also contemplated such legislation, although the full framework is not yet in place.

By way of example, in this paper we focus our points of review on the experiences coming from New Brunswick's shared risk regime, although our commentary in many cases would apply to a single employer target benefit plan established in any province.

## **New Brunswick Shared Risk: Background**

It has been almost seven years since New Brunswick implemented changes to the NB PBA to enable shared risk plans as a design option. Numerous plans in the public sector, and a few in the private sector, have converted to shared risk under the NB PBA (or under special legislation in some cases), with the first plans converting in 2012.

As many are aware, the biggest issue confronting New Brunswick's shared risk model has been certain court challenges launched regarding the conversion of the Public

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<sup>1</sup> Pension Benefits Act, SNB 1987, ch. P-5.1.

Service Superannuation Act to a shared risk plan.<sup>2</sup> The three lawsuits relate to the plan's conversion under specific legislation and not the shared risk regime under the NB PBA. Also, none of these lawsuits has yet been heard on its merits. We do not discuss the conversion issue or these lawsuits in this paper.

In the next three sections, we will discuss issues relating to single employer TBPs with members in multiple jurisdictions, to plan administration, and to actuarial review of TBPs.

## **TBPs With Members in Multiple Jurisdictions**

Because many jurisdictions do not yet have comprehensive target benefit legislation, complications can arise where a single employer TBP has members in various provinces. This is largely due to the fact that pension standards legislation is minimum standards legislation designed to protect members.

In this section of the paper, we consider, for example, a situation where a TBP is registered in New Brunswick but includes a number of Ontario members. We discuss issues related to benefit reductions, marriage breakdown and termination.<sup>3</sup>

### **BENEFIT REDUCTIONS**

The shared risk regime provides that shared risk plans must have a funding policy, which must contain a funding deficit recovery plan. The funding deficit recovery plan must provide, as a final step, that past base benefits and future base benefits must be reduced by a sufficient amount to meet certain funding tests.<sup>4</sup> That is, the regulations under the NB PBA require reductions to accrued benefits in certain circumstances. This can be contrasted with pension standards legislation in most jurisdictions. Generally, an amendment is void if it purports to reduce a benefit that has accrued. This is the case under section 14 of the Pension Benefits Act<sup>5</sup> (the ON PBA; Ontario).

Accordingly, if the New Brunswick shared risk plan ran into significant funding problems such that reductions to base benefits were necessary, the benefits could not be reduced in respect of the Ontario members. This would be an inequitable result, because only the New Brunswick members would bear the cuts. While this situation isn't entirely new (note, for example, multijurisdictional target benefit multi-employer pension plans [MEPPs] with members in Quebec and New Brunswick), it represents a challenge for single employer target benefits plans.

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<sup>2</sup> An Act Respecting Pensions under the Public Service Superannuation Act, SNB 2013, c. 44.

<sup>3</sup> Note that this issue could also present itself even in jurisdictions with TBP legislation, to the extent it differs from the TBP or shared risk plans legislation in the other jurisdiction.

<sup>4</sup> New Brunswick Regulation 2012-75 under the NB PBA (the Shared Risk Regulations), subsection 11(5).

<sup>5</sup> Pension Benefits Act, R.S.O. 1990, ch. P.8

## **MARRIAGE BREAKDOWN**

Under the shared risk regime, any references to commuted value in Part 1 of the NB PBA are read as references to “termination value” for purposes of Part 2 of the NB PBA (the shared risk provisions).<sup>6</sup> The termination value reflects the funded position of the shared risk plan as of the most recent annual actuarial valuation date. The termination value is determined based on the funding policy liability basis and is adjusted for the funded ratio of the plan. On marriage breakdown, the NB PBA provides for a division of the pension in accordance with a decree, order, or judgment of a competent tribunal based on the commuted value of the benefit.<sup>7</sup> In the case of a marriage breakdown of a shared risk regime plan member, the pension division will be based on the benefit’s termination value.<sup>8</sup>

If we again consider our example of a shared risk plan registered in New Brunswick and an Ontario member with a marriage breakdown, inequity can arise. If the shared risk plan was not fully funded as of the last actuarial valuation, this would be reflected in the termination value, and that would be divided under the NB PBA. However, because this member and the member’s spouse resided in Ontario, the marriage breakdown rules in Ontario would apply. In Ontario, for a defined benefit plan, the member’s commuted value of benefits is generally used for calculation of the payment on marriage breakdown. In this case, the Ontario member’s spouse may receive more than half the value of what the member would eventually receive on a funding policy liability basis, if the member terminated the next day.<sup>9</sup> This is clearly an inequitable result from the plan member’s point of view.

## **TERMINATION**

As set out above, under the shared risk regime, any references to commuted value in Part 1 of the NB PBA are read as references to termination value for purposes of Part 2 of the NB PBA. On termination of employment, a member is entitled to transfer the commuted value of the deferred pension in accordance with the NB PBA and the regulations thereunder. In the case of a termination of a shared risk plan member, the member will be entitled to portability based on the termination value of the pension. Again, the termination value reflects the funded position of the plan as of the last filed actuarial valuation.

If an Ontario shared risk plan member terminated employment, the individual would be entitled to portability based on the ON PBA. Under section 42 of the ON PBA, the determination of the amount that could be transferred would be based on the commuted value of the member’s pension. In the case of an underfunded shared risk plan, and in our current low-interest-rate environment, the terminated Ontario member would be able to transfer more out of the plan than a terminated New Brunswick member could

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<sup>6</sup> NB PBA, subsection 100.3(2).

<sup>7</sup> NB PBA, section 44.

<sup>8</sup> NB PBA, subsection 100.3(2) and 100.62(6).

<sup>9</sup> Although unlikely, it is possible that the termination value could be more than the commuted value.

and also arguably more than the plan could afford to pay. This is an inequitable result from the plan's and other plan members' point of view.

### **ALTERNATIVES FOR RESOLUTION**

To address the three multijurisdictional issues, legislative amendments in provinces without target benefit legislation are required. If all provinces adopted a target benefit regime with some basic similarities, then there could be equal treatment across the provinces. Alternatively, provinces that do not have their own target benefit rules could provide that their residents, who participate in TBPs registered in another province, become subject to the target benefit regime of the province of registration with respect to rules such as those pertaining to marriage breakdown and portability. Recognizing that this would be unlikely, another alternative would be for these issues to be addressed in the new Agreement Respecting Multi-Jurisdictional Pension Plans, which ideally all provinces would sign onto.

Resolution of some of the inequities relating to the differing measures of benefit value on settlement from a shared risk plan may also be resolved under future actuarial standards on determining pension commuted values, because consideration is being given to an asset share approach for plans that fall into the category of TBPs.<sup>10</sup>

### **Plan Administration**

In this section, we discuss certain administrative issues that may arise in the administration and investment of TBPs.

### **MEMBER COMMUNICATION**

There is a spectrum of possible target benefit plan designs, ranging from defined-contribution-like plans where the contribution levels remain fixed and the benefit levels fluctuate with a higher probability in line with plan experience to the defined-benefit-like plans that provide for a high probability of maintaining the target benefit and allow some level of fluctuation in the contribution levels. Key to the successful management of a single employer TBP is to clearly articulate to all stakeholders—including current and retired members, committee members, trustees, the plan sponsor and regulators—the nature of the specific TBP deal.

In a traditional defined benefit plan, the benefit promise is communicated to the member, while the sponsor absorbs the risks to ensure paying the promised benefit. The members may be unaware of the risks the sponsor bears in such plans. However, shifting along the risk spectrum requires clear and robust communication of the nature of the targeted benefit, as well as the potential risks that all stakeholders bear in a TBP. Members need to understand the distinction between a target benefit and

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<sup>10</sup> Exposure Draft, Amendments to Section 3500 of the Practice-Specific Standards for Pension Plans—Pension Commuted Values Actuarial Standards Board, Document 217075 (July 2017).

a promised or defined benefit. They need to understand the modeled likelihood of achieving the full targeted benefit and the downside risks to the member, in particular when the member has previously participated in a defined benefit plan.

The success of a single employer TBP depends on the ongoing success of the plan sponsor.<sup>11</sup> Unexpected changes in the overall level of payroll for a single employer TBP sponsor can lead to significant changes in the TBP's outlook, including, for example, the plan's failure to maintain the high degrees of certainty around providing target benefits as is modeled in New Brunswick shared risk plans. All stakeholders must enter into the plan with this clear understanding: that the plan, and its supporting sponsor and payroll base, may be set up as an assumed going concern, when—with a single employer as sponsor—the risk that this may not unfold is not insignificant.

With target benefit legislation, we have generally observed additional disclosure requirements. For example, under the NB PBA, certain information is required to be disclosed to members, including the requirement to provide plain language disclosure to members that the contributions are limited to those permitted under the funding policy and that benefits may be reduced.<sup>12</sup> However, until there is a circumstance where benefits are negatively impacted, it is difficult to assess the effectiveness of the communications.

## INVESTMENTS

Shared risk plans, due to certain requirements under the regime, generally have a different asset mix when compared to other plans of similar sizes. Specifically, these plans will have longer-term asset classes and frequently invest in alternatives such as real estate, infrastructure and private equity. While a comprehensive discussion of the potential legal issues related to such alternative investments is well beyond the scope of this paper, we want to highlight the following issues.

With any investment, there is the requirement to comply with the plan's investment policy and the applicable pension standards legislation and regulations, as well as the Income Tax Act (ITA; Canada). Although most provinces incorporate by reference the investment restrictions set out under Schedule III to the regulations under the federal Pension Benefits Standards Act, 1985, New Brunswick is one province that does not. New Brunswick has its own investment provisions that must be respected. There may be a need to negotiate specific terms in a side letter to address pension investment restrictions.

Compliance with the ITA may necessitate the use of a blocker entity to ensure that any borrowing is not attributed back to the plan. Under the regulations to the ITA, borrowing by a pension plan is only permissible in limited circumstances. Where a particular

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<sup>11</sup> For defined benefit plans, the benefit is only guaranteed to the extent that the plan sponsor is able to pay. Over the past several years, there have been numerous high-profile corporate insolvencies, where defined benefit pensions have been negatively impacted.

<sup>12</sup> Shared Risk Regulations, subsection 20(2).

investment is structured as a partnership, for example, depending on the jurisdiction of the partnership, the partnership's borrowing may be imputed to the limited partners. Where this is the case, a pension plan will generally use a blocker for the investment.

Finally, depending on the investment, there can be significant U.S. tax consequences that need to be addressed. Issues related to investments in alternative asset classes are extremely complex. Where any pension plan is considering such investments, legal counsel should be engaged to review and negotiate the transaction.

## **JOINT GOVERNANCE**

For traditional multiemployer pension plans, the administrator is typically required to be a board of trustees, at least half of whom are representatives of the MEPP members.<sup>13</sup> This is not necessarily the case for shared risk plans or TBPs. In New Brunswick, for example, the legislation requires that a shared risk plan be administered by “a trustee, a board of trustees or a non-profit corporation.”<sup>14</sup> The NB PBA does not, however, specify a minimum number of trustees or require that employee or retiree representatives be members of a board of trustees.

There is an argument to be made for joint governance, or, at a minimum, a requirement for member and/or retiree representation on a board of trustees—in particular for shared risk plans and TBPs where members bear the risk of reduced benefits. Joint governance can help bring different perspectives to plan administration and governance, including member and potentially retiree perspectives. However, recognizing that it can be a more expensive administration model to maintain, joint governance should not be mandatory for all pension plans. For example, smaller pension plans may be better suited to other models of administration. Further, there is a strong case to be made for qualified independent trustees on any pension boards of trustees. Independent trustees, who have pension expertise, can assist boards of trustees in fulfilling their fiduciary obligations.

## **Actuarial Review of TBPs**

In this section of the paper, we discuss certain complexities relating to the actuarial review of TBPs.

## **ECONOMIC ASSUMPTIONS**

New Brunswick requires a risk management test to be performed on plan conversion to shared risk. This risk management test models a 20-year stochastic asset-liability projection to assess the sustainability of the shared risk plan, reflecting the plan's investment policy, funding policy (which includes the funding excess utilization and funding deficit recovery plans), and benefit provisions. In particular, the risk management test must

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<sup>13</sup> See, for example, paragraph 8(1)(e) of the ON PBA.

<sup>14</sup> Subsection 100.5(1) of the NB PBA.

assess the probability of past base benefits being reduced, which is the last step taken in the funding policy in situations when the plan is underfunded. The regulatory requirement for these plans is that, on conversion to a shared risk plan (or at certain other points in time), there must be at least a 97.5 percent chance that the past base benefits will not be reduced during the next 20-year period.

Generally, the shared risk plan is designed on conversion with adequate funding levels such that base benefits can be provided with this required high level of certainty. Underlying the actuarial models that make this assessment is a stochastic range of economic outcomes. Typically, there would be 1,000 to 5,000 examples of plausible investment scenarios ranging from catastrophic economic crashes to booms and everything in between.

It is the crashes, or the sustained poor investment results, that would lead to failures of the shared risk plan to maintain those past benefits in the risk management test's model. Thus, the results of the required risk management test are highly sensitive to the frequency and magnitude of the model's economic crashes. Therefore, two legitimate and justifiable risk management models could result in very different results, or funding policies, simply because the model's economic input outliers differ.

It is arguable that, given that the risk management test is key to the development of the plan design (e.g., to set its funding requirements and benefit levels), and given that these items are highly sensitive to a model's inputs, additional guidance or legislation may be beneficial. For example, actuarial standards or guidance (as the Canadian Institute of Actuaries is currently reviewing) could be introduced to assist actuaries in setting and/or disclosing economic inputs.<sup>15</sup> Even if such standards are introduced, it is possible that governments may legislate minimum funding standards (e.g., a minimum provision for adverse deviation on funding targets), which override such standards to provide an additional level of benefit security.

## Conclusions

The introduction of legislation to permit design alternatives, such as single employer TBPs, is a welcome change. Because employer-sponsored pension plans are voluntary, providing more design options may be beneficial and may encourage more employers to continue to provide pension coverage to their workforce.

In this paper, we have set out certain potential considerations that we have identified with single employer TBPs and, where appropriate, discussed possible avenues to

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<sup>15</sup> See Faulds, Ty, and Tony Williams. 2016. Memorandum to all Fellows, Affiliates, Associates and Correspondents of the Canadian Institute of Actuaries and Other Interested Parties. Notice of Intent to Establish Standards of Practice in respect of Calibration of Stochastic Models used for the Purposes of Certification of Pension Plan Funding Requirements (new subsection 3270 Stochastic Modelling), June.

address them. We encourage governments to continue to implement legislative changes to accommodate different plan designs, such as target benefit. As with any new design, potential issues such as those identified in this paper may arise. Governments, regulators and actuarial standards boards, as appropriate, should consider appropriate changes and accommodations as plan designs evolve.

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Comments on

## “Single Employer Target Benefit Plans: Issues for Consideration”

By Doug Chandler

Target benefit plans (TBPs) seem like a good idea whose time has come. Traditional pension plans may have started out as mere plans but, through a combination of ambiguous communication and creeping legislation, they would be better described today as pension promises. The cost of turning a plan in into a promise has been substantial.<sup>1</sup> For publicly traded companies, accountants’ and investment analysts’ scrutiny has fully exposed this cost.

Employer-sponsored savings plans (including defined contribution pension plans) have not fared better. Even while they were being promoted as a replacement for defined benefit (DB) pension plans, industry insiders understood that individual investment choice, the absence of risk pooling, and inadequate contribution rates would lead to disappointments. TBPs aim to achieve the advantages of risk pooling and expert asset allocation without the burdens of guarantees and individual choice.

To date, most of the research and commentary on TBPs has been from an actuarial perspective. Are these plans sustainable in the face of a wide range of market conditions? Is there a combination of rules for benefit adjustments, contribution adjustments and investment strategy that can be expected to deliver acceptable outcomes in almost all circumstances?<sup>2</sup> Jana Steele and Mary Kate Archibald look beyond this basic actuarial problem to the more practical, everyday problems that will arise with TBPs. Their insights will no doubt be helpful to legislators and industry insiders seeking to clear a path for TBPs’ evolution and growth.

Their insights also highlight the fundamental challenge of moving beyond the established dichotomy between defined contribution (DC) and DB retirement income plans. As the authors point out, there is a spectrum of possible TBP designs between these two extremes. A New Brunswick shared risk plan (NB SRP) lies near the DB end of the spectrum. An Ontario Jointly Sponsored Pension Plan (JSPP) is a risk-sharing arrangement even closer to the pure DB end of the spectrum. In contrast, the Alberta and British Columbia Joint Expert Panel contemplated “Specified Contribution, Target Benefit” pension plans that would fall under the DC rules for corporate accounting.

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<sup>1</sup> For a discussion of the differences between going concern funding and wind-up funding, see Chandler, Doug. 2018. *Settlement Cost Compared to Going Concern Funding Targets*. Society of Actuaries and Canadian Institute of Actuaries. <https://www.soa.org/research-reports/2018/settlement-cost>.

<sup>2</sup> Sanders B. 2016. *Analysis of Target Benefit Plan Design Options*. Society of Actuaries. <https://www.soa.org/research-reports/2016/2016-target-benefit-plans>.

It is not surprising that these different perspectives lead to different conclusions about administrative matters.

The TBP design for New Brunswick public sector employees was determined to be a DB plan for Canadian public sector accounting purposes.<sup>3</sup> The range of potential employer contributions was too broad to be considered merely a variation in the value of current service, and the rules for adjusting contributions were too closely tied to funding for past service benefits. Although the accounting standards for Canadian private sector companies are different, the conclusion would likely be similar: For a target benefit plan to be classified as a DC plan under IAS 19, there can be no legal, moral or ongoing business requirement to fund deficits.<sup>4</sup> Under U.S. accounting standards (applicable to Canadian subsidiaries of U.S. companies and some major Canadian companies with U.S. securities listings), DC pension plans have an account balance for each member. Although beyond the scope of Steele and Archibald's research, similar considerations will determine the tax treatment of TBPs.

A target benefit plan at the DC end of the spectrum would be quite distinct from a NB SRP or a JSPP. Each plan member would have a notional share of the plan's assets. Even though this asset share might not be reported to the plan member or even determinable except as part of a full actuarial valuation of the plan, it would be possible to conceive of an allocation of the employer and employee contributions, the investment returns, and the actuarial gains and losses that reflects each plan member's individual target benefit and normal cost.

This is not to say that a TBP at the DC end of the spectrum must have fixed contributions with all gains and losses translated immediately into benefit adjustments or that this is a prerequisite for DC accounting treatment. The cost of retirement income varies with interest rates and age. Even a pure DC pension plan can have a contribution rate that is amended from time to time as circumstances warrant or a contribution formula that varies between plan members by age and service. The key to a TBP plan's long-term sustainability is that the contributions must make sense in the context of a broadly defined measure of value of the benefits that current plan members are earning. Surplus attributable to long-term members cannot be stripped away to provide unreasonably inexpensive benefits for new entrants. Deficits cannot lead to contribution rates so far beyond their value that they place the employer in an uncompetitive position in the labor market.

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<sup>3</sup> MacPherson K. 2015. *Report of the Auditor General 2015* Volume III, "Province of New Brunswick: Audit Observations on Pension Plans." <http://www.agnb-vgnb.ca/content/dam/agnb-vgnb/pdf/Reports-Rapports/2015V3/Chap3e.pdf>.

<sup>4</sup> "Defined contribution plans are post-employment benefit plans under which an entity pays fixed contributions into a separate entity (a fund) and will have no legal or constructive obligation to pay further contributions if the fund does not hold sufficient assets to pay all employee benefits relating to employee service in the current and prior periods." International Accounting Standard 19 Employee Benefits, paragraph 8. <http://www.frscanada.ca/international-financial-reporting-standards/resources/unaccompanied-ifrss/item45615.pdf>.

One feature of a NB SRP or a JSPP that would not be found further along the spectrum toward DC is the strong protection for basic benefits. In a variable annuity or collective DC arrangement, pensions would be adjusted every year. By design, increases would be more common than decreases, but decreases would not be unexpected. Participants in Canadian and U.S. variable annuities are accustomed to these fluctuations. Presumably, the conversion of a DC pension plan to this sort of collective DC arrangement would not lead to consternation, since DC pension plan members are used to seeing fluctuations in their projected monthly retirement income.

The challenge lies in the transition from a DB pension plan to any sort of TBP. The first generation of plan members expects negligible risk of benefit decreases. If this is achieved through conservative funding, then subsequent generations will probably receive a windfall. Any attempt to build reserves to protect against decreases in benefits leads to intergenerational inequities that—although not verboten—need to be carefully managed.

The natural consequence of a DC perspective on a TBP would be that the lump sum benefit payable upon termination of employment would be equal to the asset share, adjusted to the calculation date for investment experience. Similarly, marriage breakdown calculations would naturally follow DC principles. Nothing else would seem equitable, once it is accepted that each member's target benefit is linked to a share of the assets. In this context, increasing a member's asset share at the expense of other members simply because the individual received an unusually large pay increase could seem inequitable. Thus, a traditional final average earnings accrual formula could prove problematic.

In addition to the everyday administrative problems discussed by Steele and Archibald, regulators and employers who are venturing into the design of TBPs would be well advised to anticipate challenges throughout the life cycle of a pension plan due to downsizing, mergers, acquisitions, divestitures and ultimately windup. For example, reducing pensions for all members due to the early retirement costs of a downsizing event could seem inequitable, even in an NB SRP. It will be important that regulators and employers are deliberate about their intentions in these matters and communicate the risk-sharing deal clearly from the outset. Once again, the logical approach will depend upon whether the underlying concept is a collective DC pension plan with asset shares or a DB pension plan with a predefined mechanism for sharing surprises between contributors and beneficiaries.<sup>5</sup>

The Canadian Institute of Actuaries prefers a holistic regulatory framework for TBPs, rooted in the DC regulatory model but supporting the full spectrum of risk-sharing

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<sup>5</sup> A classification of the different types of surprises that will arise in pension plans is included in Chandler, Doug. 2017. *Provisions for Adverse Deviations in Going Concern Actuarial Valuations*. Society of Actuaries and Canadian Institute of Actuaries. <https://www.soa.org/research-reports/2017/adverse-deviations-actuarial-valuations>.

deals.<sup>6</sup> In fact, various provinces are implementing different regulatory frameworks, more often rooted in the DB regulatory model. Currently, the Canadian regulatory framework supports multiple benefit accrual formulas and multiple jurisdictions within a single plan registration. It is even possible to include both DC accruals and DB accruals within a single plan registration and to use surplus arising from one benefit provision in the funding of others. Sharing of deficits is somewhat more problematic. If multiple target benefit risk-sharing deals were included in a single registration (because of mergers, union agreements or multiple jurisdictions), then sharing of surpluses would be just as problematic as sharing of DB funding deficits with DC account holders.

In some ways, TBPs should prove to be less problematic than traditional pension plans. They come with predetermined rules for allocation of surplus and deficits, gains and losses. The success of the system as a whole will depend upon a principled, well-articulated approach to regulation and design.

*Doug Chandler, FSA, FCLA, is Canadian retirement research actuary at the Society of Actuaries (SOA).*

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<sup>6</sup> Member Services Council. 2015. *Report of the Task Force on Target Benefit Plans*. Canadian Institute of Actuaries. <http://www.cia-ica.ca/publications/publication-details/215043>.

# Authors' Response to Comments by Doug Chandler

By Jana Steele and Mary Kate Archibald

First, we would like to thank Doug Chandler for his insightful comments on our paper and continuing the important discussion on target benefit plans. As Chandler points out, target benefit plans (TBPs) are a “good idea whose time has come.” He reiterates in his comments that TBPs are not uniform and that pension design options and risk sharing fall along a broad spectrum. Some TBPs are similar to defined contribution in their attributes, and some more resemble defined benefits.

We have a few additional thoughts based on his comments.

Chandler raises in his comments TBPs' tax and accounting treatment, which may be important in defining the broader adoption of these plans. Without changes to tax legislation, there will remain uncertainty regarding certain elements of TBP taxation. Further, unless defined contribution accounting is broadly adopted under accounting standards for TBPs, the uptake in such plans may be limited.

Chandler also points out that in addition to the administrative problems discussed in our paper, TBP stakeholders and regulators need to anticipate challenges through the life cycle of a pension plan, such as mergers, divestitures and windup. In this regard, he emphasizes the need for accurately communicating the risk-sharing nature of these plans from the outset. We agree with this comment. All stakeholders need to be apprised of the risk sharing that is part of the TBP regime. Accurate and understandable communications of this element of TBPs to members and beneficiaries is critical.

Finally, Chandler indicates that because TBPs have predetermined rules for dealing with surplus and deficits, in some ways these plans should prove less problematic. However, we agree with his concluding statement that “the success of the system as a whole will depend upon a principled, well-articulated approach to regulation and design.”

Thanks again for continuing this important discussion.

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# The Target Benefit Plan Spectrum: Implications for Plan Design and Regulation

By Barbara Sanders

In 2015, the Canadian Institute of Actuaries established the Task Force on Target Benefit Plans (the Task Force), which I chaired. The task force's report introduced the idea of the target benefit plan (TBP) spectrum and described some examples of plans at various points along it. The report also noted the near-exclusive focus that most stakeholders—especially pension policymakers, regulators and representatives of various employee and retiree groups—give to the defined benefit (DB) end of this spectrum.

This paper builds on the Canadian Institute of Actuaries task force's report, describing the impact that considering the full spectrum of target benefit plan designs could have on a number of issues of current interest, including helping stakeholders understand the fundamental nature of TBPs, creating a consistent regulatory framework for risk-sharing plans, and finding solutions to the DC decumulation challenge.

## Introduction

TBPs have emerged as an alternative to traditional DB and defined contribution (DC) plans in Canada during the past decade. The goal of these plans is to provide lifetime retirement income at some targeted level; however, this income is not guaranteed, and actual benefits may differ from the target. Contributions to the plan are either fixed or fluctuate within some predetermined range. Plan assets are commingled, and individual accounts are not maintained.

Most target benefit plan designs in Canada today can be characterized as DB-like in their benefit ambitions, attempting to produce a stable income stream for retirees, while maintaining the cost stability associated with DC arrangements. However, the broader target benefit plan family encompasses a much wider spectrum of potential designs, including some with significantly less stable income patterns. The Task Force described this spectrum in some detail in its report.<sup>1</sup>

The next three sections review the concept of the TBP spectrum, describe the benefits of viewing the entire spectrum instead of just a small subset of it, and discuss what this may mean for the future of pension design and regulation.

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<sup>1</sup> *Report of the Task Force on Target Benefit Plans*. June 2015. Canadian Institute of Actuaries. <http://www.cia-ica.ca/docs/default-source/2015/215043e.pdf>.

## Describing the Spectrum

To determine the position of a TBP along the spectrum, consider both the security of the retirement income stream (that is, the likelihood that actual benefits payable from the plan meet or exceed the target over time) and the stability of benefits (that is, how much they fluctuate from year to year).<sup>2</sup> The DB-like end of the spectrum is associated with high levels of security and stability; the DC-like end is associated with lower levels of one or both.

In theory, a relatively high level of security and stability is achievable by treating the target benefit as guaranteed, fixing contributions accordingly, and employing a liability-driven investment strategy. However, this is considered unaffordable in most practical situations today, especially if the target is indexed to inflation after retirement. In practice, plans tend to deviate from a strict liability-driven investment policy. This leads to asset risk, which is then combined with demographic and wage risks. The resulting loss of benefit stability and/or security can be mitigated by various contribution and benefit policies, which are described in the Task Force's report. By offsetting or smoothing out the impact of gains and losses, these contribution and benefit policies effectively determine how the total risk is allocated between plan members both within and across generations.

This is a critical point: In a TBP, stability and security can be improved via risk sharing between members<sup>3</sup> or between members and the sponsor, if desired. The overall risk profile of a TBP, and hence its position along the TBP spectrum, is thus determined by the combination of its investment policy and its policy for adjusting contributions and benefits.<sup>4</sup>

As the Task Force noted, existing TBP regulations have largely followed the DB paradigm, insisting on producing a very stable and predictable income stream in retirement. For example, under the New Brunswick Shared Risk Plan framework, the modeled probability of a reduction in accrued benefits must be less than 2.5 percent over a 20-year horizon. Under the Going Concern Plus regime in Alberta and British Columbia,

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<sup>2</sup> Since target benefit plans are allowed to reduce the accrued benefits of active and/or retired members while a going concern, theoretically the benefits provided by the plan could go up and down in response to plan experience. By contrast, traditional defined benefit plans are only allowed to reduce future service accruals while a going concern.

<sup>3</sup> From an academic perspective, the most effective form of risk sharing between members is intergenerational: Under the assumptions of fixed contributions and a stationary population, the optimal plan design (that is, the one under which the expected utility of lifetime consumption is maximized) has future members entering into significant risk transactions with existing members (see, for example, Teulings, C.N. and C.G. De Vries. 2006. Generational Accounting, Solidarity and Pension Losses. *De Economist* 154, p. 63–83). However, without mandatory participation and the assurance of a stable workforce, intergenerational risk sharing is vulnerable and can damage, rather than improve, sustainability (see Teulings & De Vries, 2006, again, or Kocken, T. 2012. Pension Liability Measurement and Intergenerational Fairness: Two Case Studies. *Rotman International Journal of Pension Management* 5(1), p. 16–24, available at <http://www.icpmmnetwork.com/research-paper/pension-liability-measurement-and-intergenerational-fairness-two-case-studies>.)

<sup>4</sup> In the Task Force's report, this combination is referred to as the benefits/funding/investment (BFI) policy. Pension regulations tend to distinguish between the parts of the policy that are invoked for surpluses versus deficits, referring to them by names like "funding excess utilization" and "funding deficit recovery" plans, respectively.

current service contributions must include a provision for adverse deviations, and benefit improvements cannot be made unless the plan has a sizeable risk buffer in place. As a result, TBPs—which must satisfy these regulatory requirements—end up near the DB end of the spectrum, employing complex risk-sharing mechanisms to increase benefit stability and security while trying to keep costs affordable.

Even though most TBPs currently fall close to the DB end, the Task Force deliberately included in its report other plans that are close to the DC end of the spectrum. These plans tend to be much simpler with minimal risk sharing between a more homogeneous group of members. They maintain the advantage of mortality risk pooling after retirement but leave most or all other risks (investment, inflation, etc.) with individuals, resulting in a lifetime income whose level may vary often.

A frequently cited example of such a plan is the Variable Payout Life Annuity (VPLA) option offered to retired members of the University of British Columbia (UBC) Faculty Pension Plan.<sup>5</sup> This is a single premium life annuity whose payouts are adjusted each year based on the mortality and investment experience of the group of annuitants, relative to an assumed investment return (AIR) and a specific mortality table. The UBC VPLA has two variants, one with a 7 percent AIR and another with a 4 percent AIR. Both variants are invested in the same underlying balanced fund. Based on current projections, the 7 percent option is expected to produce a decreasing income stream, and the 4 percent option is expected to produce an increasing income stream over time; however, actual benefits may increase or decrease year to year under either option. Since the UBC VPLA consists entirely of retired members (active employees participate in a traditional DC plan during the accumulation phase) and because it makes no effort to smooth out experience, the full impact of gains and losses is passed on to each pensioner every year, resulting in low levels of benefit stability. Benefit security, which is interpreted in this context to mean “likelihood of maintaining initial benefit,” depends on the AIR and is relatively low (less than 50 percent) for the 7 percent AIR option. Nonetheless, each year, new retirees choose to buy units in the VPLA, demonstrating that such arrangements do have value and use to individuals.

Other designs that fall between the DB and DC ends of the spectrum can also be constructed, corresponding to different levels of benefit stability and security. From a practical perspective, many Canadian negotiated-cost, multiemployer pension plans (which have many features in common with TBPs but which tend to fall short of the benefit security threshold associated with New Brunswick’s shared risk plans) can be considered to sit at such intermediate points on the TBP spectrum.<sup>6</sup>

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<sup>5</sup> The VPLA option is described on the UBC Faculty Pension Plan’s website (<http://faculty.pensions.ubc.ca/life-events/retiring/ubc-variable-payment-life-annuity/>). Recent coverage includes an article on Benefits Canada’s website (<http://www.benefitscanada.com/pensions/cap/a-look-at-ubcs-variable-payment-lifetime-annuity-option-88296>), a joint SOA/CIA webcast, as well as sessions at several industry conferences.

<sup>6</sup> Many of these multiemployer plans that are registered in British Columbia have converted to TBP status under the Going Concern Plus framework and will, as a result, be expected to migrate closer to the DB end of the spectrum over time.

## Why Expand the Definition?

Expanding the definition of TBPs to include the full spectrum was important to the Task Force for a number of reasons.

First, doing so allows stakeholders to ask how much flexibility in benefits is actually desirable. Under the DB paradigm, creating more security and stability is the ultimate goal. However, in a TBP framework, it is clear that security and stability come at a cost, whether in terms of higher contributions, lower expected benefits, or more complex risk-sharing arrangements with potentially larger intergenerational risk transfers.<sup>7</sup> Finding the optimal amount of benefit flexibility is far from straightforward and involves taking into account the specific circumstances of each case: whether benefits are being converted from a DB plan, the sponsor's financial prospects, the predecessor plan's financial position, whether members have other stable retirement income sources, and more. It involves striking a balance between the needs and desires of various stakeholders, including plan sponsors, active members and pensioners.

Second, thinking of the full spectrum allows stakeholders to see target benefit plans as DC plans with risk-sharing elements added in (the DC-plus view) instead of would-be DB plans with guarantees stripped out (the DB-light view). In shifting the perspective from DB-light to DC-plus, attention is drawn away from what TBPs lack (guarantees) and is directed toward the features they all have in common: a series of implicit or explicit risk transactions between members.

This change of perspective has subtle but far-reaching implications. As stakeholders bring risk transactions to the foreground and look at which risks are shared—with whom, to what extent, how and why—their understanding of TBPs deepens. Looking at TBPs from a DC-plus perspective, stakeholders can assess the suitability of a particular design to a given set of circumstances by decomposing the risk-sharing deal into its constituent risk transactions and by asking whether these transactions make sense, instead of evaluating all TBPs against the same DB-inspired benchmark. The exercise of dissecting the deal forces any opaque cost and risk subsidies—that are routinely accepted in DB plans—to be identified, promoting transparency. As risk transactions gain focus, stakeholders begin to naturally scan for implicit and explicit forms of intergenerational risk sharing in order to assess their contribution—and potential threat—to long-term sustainability. Most important, shifting the perspective helps stakeholders recognize that the central task of TBP management is protecting and maintaining the risk-sharing deal (wherever it happens to fall on the spectrum) through a combination of communication, governance and risk-management efforts commensurate with the complexity of the deal itself.

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<sup>7</sup> As noted, when conditions shift, large and opaque intergenerational risk transfers can destabilize a plan. In this way, benefit risk is exchanged for discontinuity risk.

## Pie in the Sky: A Preposterously Optimistic View of Potential Implications for Plan Design and Regulation

What if all stakeholders stepped out of the old DB paradigm and adopted a DC-plus perspective on TBPs? I suspect stakeholders would begin to appreciate all TBPs along the spectrum for what they bring to the pension landscape and not try to force all of them toward the DB end. Without a doubt, TBPs at the DB end are important and a good idea when benefits are being converted from an existing DB arrangement, especially where the sponsor's covenant was strong. However, TBPs elsewhere on the spectrum make eminent sense, too, when there isn't a predecessor plan with strong third-party funding commitments, for example, when a negotiated cost multiemployer plan or an individual DC plan is converted to TBP status.

The latter example of a DC-to-TBP conversion is particularly important: As individual DC plans reach maturity, more and more members will look for reasonable decumulation options, including cost-effective insurance against longevity risk. Even the simplest TBPs can meet this goal. Depending on stakeholders' preferences, sponsors of individual DC plans may wish to establish DC-like TBPs similar to the UBC VPLA for their retirees, or they may put in place more complex arrangements that extend risk-sharing to active members as well.<sup>8</sup> A VPLA-type solution has the additional benefits of ease of understanding, transparency, individual choice (members have the option to join, instead of being forced into a risk-sharing deal they may not value or trust), and the ability to accommodate members with different risk appetites and retirement income needs (such as, through combinations of the 4 percent and 7 percent AIR options under the UBC plan).

Note: What were listed earlier as benefits of TBPs near the DC end of the spectrum (i.e., mortality risk pooling, simplicity, transparency and individual choice) are the same attributes that Dutch policymakers deemed desirable in their decade-long effort to redesign their occupational pension system. The Task Force's report summarizes the Dutch experience since the turn of the millennium in Appendix A, all the way from conditional indexation, through their exploration of the Defined Ambition idea (the Dutch version of TBPs), to the newly proposed Personal Pensions with Risk-sharing. One of the key takeaways is that if the attributes above are valued, then more complex and opaque arrangements near the DB end of the TBP spectrum (which are vulnerable to discontinuity risk on account of potential intergenerational conflicts) are not necessarily superior to arrangements near the DC end. It is regrettable that limitations imposed by the Income Tax Act and Regulations currently block the establishment of new VPLA-type arrangements.

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<sup>8</sup> Three-quarters of the members of the BC Government Employees' Union (BCGEU) are covered by large public sector DB plans (the Municipal Pension Plan, the College Pension Plan, and the Public Service Pension Plan). The remaining one-quarter of BCGEU members were covered by a DC plan which was recently converted to a target benefit plan. See the BCGEU's website for more information: <http://former.bgeu.ca/targetpension>.

Suppose for a moment that TBPs were allowed to exist at various points along the spectrum: at the DB end, the DC end and possibly in-between. The resulting regulatory challenge would be immense, at least when considered within the DB paradigm, since the usual tools and metrics regulators use to assess and monitor DB plans (and DB-like TBPs) are unsuitable for this broader set of designs. It may be tempting for regulators to ignore (or prohibit) the middle part of the spectrum so that only very DB-like (New Brunswick-style) and very DC-like (VPLA-style) variants were allowed. Such action would likely lead to a fragmented regulatory approach: DC-based regulations at the DC end (along the lines of the guidelines for capital accumulation plans created by the Canadian Association of Pension Supervisory Authorities, with minor modifications) and DB-based regulations at the DB end, without acknowledging that these plans are members of the same family of designs.

A more consistent approach could emerge from the DC-plus perspective described. If, under the DC-plus paradigm, the goal of TBP management is to protect and maintain the risk-sharing deal regardless of the form it takes (DB-like or DC-like), then TBP regulations ought to be focused on each plan’s ability to do so. Table 1 summarizes the key questions that regulatory oversight should seek to answer. The principles-based regulations that emerge from this approach could work for any TBP. Supervisory effort would be commensurate with the complexity of the TBP and its position along the spectrum.

**TABLE 1**

***Regulatory Focus Areas for Target Benefit Plans***

1. Risk management	What are the risk exposures of the plan? What measures are in place to manage those risks? Are those measures sufficient and appropriate in relation to plan stakeholders’ goals and risk tolerances?
2. Disclosure and communication	Are the benefits and their associated risks disclosed clearly and in a timely manner to stakeholders?
3. Financial health	Can the pension fund live up to the benefits communicated to members, both in the short and long term?
4. Governance	Are plan management and oversight adequately organized?

This table is an adaptation of the areas of supervision discussed in a 2012 presentation made by Dirk Broeders, who was senior strategy analyst at De Nederlandsche Bank (the Dutch pension regulator and central bank) at the time. The table was also included in the Task Force’s report. For more information, see Broeders, Dirk. 2012. Strong Pension Supervision. Presentation made at Discussion Forum organized by the International Centre for Pension Management, October 2012, London, <http://icpmnetwork.com/event/icpm-discussion-forum-october-2012-london/>.

**A More Modest and Practical View**

How likely is it that TBP regulations will evolve according to this view in Canada? If existing regulations are any indication of what the future holds for Ontario, Quebec and the federal jurisdiction, then the answer is not very likely. One reason is that once a regulatory regime opens the door to the possibility of past service conversions from DB

plans to TBPs, the discussion immediately shifts to the DB end of the spectrum: No one wants to get this part wrong, so this is where all effort is spent. An equally important obstacle is the lack of capacity of most Canadian pension regulators to maintain a principles-based system that requires a customized response to each plan. And yet, I believe some elements of this approach can still be implemented.

Treating VPLA-like arrangements as TBP variants and establishing regulations for them that are philosophically consistent with those applicable at the DB end of the spectrum is perhaps still achievable. It is critical to get it right at this end of the spectrum as well, especially given the potential for a sudden proliferation of such plans in the future in response to the looming decumulation challenge.<sup>9</sup>

I also hope that policymakers and regulators will embrace and promote a culture of risk management for TBPs, like New Brunswick has, and recognize the critical contribution that stochastic projections can and should make to the set-up and maintenance of risk-sharing deals. It is encouraging to see that a designated group of the Actuarial Standards Board is now developing standards for the calibration of stochastic models used in pension plan funding, which would also apply to TBPs. Once such standards are in place, policymakers may be less hesitant to prescribe the use of stochastic models for TBPs at any part of the spectrum, enabling regulators to assess plans' risk-management efforts and financial health (No. 1 and No. 3, respectively) according to the framework discussed.

## Conclusions

This is an exciting time for target benefit plans in Canada. Interest in risk-sharing designs continues to grow, and more jurisdictions are expected to set out regulations for such plans in the coming years. As the pension landscape evolves, it is time to stop applying the traditional DB paradigm to target benefit plans. Stakeholders, including actuaries, need to shift to a DC-plus view, considering the entire spectrum of TBP designs and focusing on what ties them together rather than trying to measure how far they are from the DB end. There is much to be gained from such a change in perspective, both in terms of an enhanced conceptual understanding of risk-sharing plans and a deeper appreciation of how TBPs all along the spectrum can help solve the challenges facing our occupational pension system.

*Barbara Sanders, FSA, FCLA, is associate professor at Simon Fraser University.*

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<sup>9</sup> There is a growing lobby effort underway to enable the creation of new plans of this type by lifting the corresponding restrictions in the Income Tax Act and Regulations. I assume this effort will be successful.



Comments on

## “The Target Benefit Plan Spectrum: Implications for Plan Design and Regulation”

By Keith Ambachtsheer

Barbara Sanders has written a thoughtful, timely article that argues that the time has come for pension plan designers and regulators to take target benefit plans (TBPs) seriously. These plans are the logical in-between outcome in a world where both pure defined benefit (DB) and defined contribution (DC) plans have become increasingly problematical. At one end, the hard guarantees embedded in pure DB have become too expensive for most employers to carry. At the other end, it is becoming increasingly clear in pure DC plans that leaving plan members to design and execute their own accumulation and decumulation strategies often lead to outcomes that produce too little pension at too high a cost. On top of that, DC plans leave plan members on their own to deal with the risk of outliving their money.

### Overcoming Legislative and Regulatory Biases

Regulators are now busy catching up with this movement away from pure DB and DC plans. Sanders observes that regulators thus far have carried a DB bias into rewriting pension regulations to accommodate the shift to TBPs. This is the natural result of the fact that recent shifts have been largely from pure DB to various forms of TBPs. However, this needs to change. Likely, future shifts will increasingly be from pure DC starting points.

As an example, she points to the Variable Payout Life Annuity (VPLA) option for retirees in the University of British Columbia Pension Plan. While this vehicle pools longevity risk, its payouts are adjusted based on actual versus expected investment and mortality experience and has successfully operated since 1967. However, current Canadian tax and regulations do not permit employers to establish new VPLA-type arrangements. Tax law and regulations also stand in the way of retirees purchasing their own deferred annuities. In a recent article that the C.D. Howe Institute published, Bonnie-Jeanne MacDonald proposed the creation of LIFE (Living Income for the Elderly), a deferred annuity option that could be bought at age 65, with payouts starting at age 85.<sup>1</sup> Once again, MacDonald notes that current tax law stands in the way of this becoming a viable way for people approaching retirement to cost-effectively purchase longevity insurance.

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<sup>1</sup> MacDonald, Bonnie-Jeanne. 2018. *Headed for the Poorhouse: How to Ensure Seniors Don't Run out of Cash Before They Run Out of Time*. C.D. Howe Institute.

## A Vision

How does Sanders propose to move Canadian pensions-related tax law and regulations in the right direction? Her answer is that legislators and regulators need to move to a wider view of the 21st century pensions forest rather than their current approach of dealing with changes tree by tree.<sup>2</sup> Ultimately, pension design and regulation should be based on transparent trade-offs between certainty versus cost, simplicity versus complexity, and upholding the principle of intergenerational fairness. The same message holds for the people in the pension governance and management trenches: Sustainable pension designs have solid approaches to allocating the risks embedded in the design. Further, that design must be clearly understood and effectively managed through time. In short, TBPs are here to stay. Let's get on with ensuring they serve their intended purpose.

*Keith Ambachtsheer is director emeritus of the International Centre for Pension Management and a faculty member of the Rotman School of Management, University of Toronto. He is also the cofounder of KPA Advisory Services.*

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<sup>2</sup> There is a growing coalition of Canadian retiree associations and pension industry organizations engaging federal and provincial tax and regulatory authorities on these matters.

Comments on

## **“The Target Benefit Plan Spectrum: Implications for Plan Design and Regulation”**

By Dirk Broeders

Society, consumers and labor markets are changing and so should pensions. Pension redesign typically is synonymous with pension plan redesign. Barbara Sanders bravely classifies the various plans out there in the defined benefit (DB)-defined contribution (DC) spectrum, known as target benefit plans (TBPs). The TBP discussion is challenging. It is difficult to come up with a single plan configuration that is optimal for the heterogeneous consumers in such a plan. The DB/TBP/DC debate, therefore, is unlikely to end anytime soon. In this review, I therefore offer an alternative framework for pension plan redesign. This framework is also convenient for assessing the effectiveness of different TBP structures in delivering adequate pensions to consumers.

Key to this approach is to consider the various functions a pension plan performs for consumers. The most important ones are saving, investing, decumulation and risk sharing. All these functions combined on a single pension platform target a post-retirement income stream to optimally smooth consumption over the life cycle. The platform should do this both cost-efficiently and tailored to consumers' needs. By the latter, I mean that it should take into account consumers' differences in age, income, wealth, labor mobility, risk aversion and life style.

### **Key Pension Functions**

Let's look at the four functions in more detail. Each function has its own, unique objective.

The first function is saving. The objective of saving is capital accumulation. The savings decision entails the part of income that is set aside for retirement. Policymakers should carefully consider a default pension saving obligation. Without this, it is a known fact that consumers save too late, too little. However, an active opt-out decision can be part of this.

The second function is investing. The investment decision differs from the savings decision. The objective of investing is capital growth. The target pension benefit, investment beliefs and risk aversion determine the optimal balance between return and risk in financial markets. A key driver in this decision is also human capital, or the present value and the riskiness of the wages that the consumer will earn in the future. The pension platform can easily offer consumers guarantees through its investment policy. It could even create an internal market where consumers buy and sell guarantees

at fair prices.<sup>1</sup> The benefits of guarantees are excellently described in *Frontiers in Pension Finance*.<sup>2</sup> If the cost of these guarantees is high, it will be evident to consumers that the risk is also high.

The third function concerns decumulation. The objective is to optimally draw down on the accumulated pension assets over the remaining life expectancy after retirement. The assumed investment return (AIR) and remaining life expectancy play a key role in this decision. Sanders rightfully points to the risks of assuming a high AIR—an element in the system that should be regulated.

The fourth function is risk sharing. The objective is to minimize the impact of biometric risks on pension benefits. Sharing idiosyncratic longevity risk is an efficient way of assuring consumers of an income, even if they become centenarians. For this to work, consumers need to forego on their bequest motive.

## Clear Property Rights

An important precondition to optimally use these four functions is to define clear property rights for the consumers based on the value of the underlying assets on their pension account. Douglass North received the Nobel Prize in economics in 1993 for showing how important property rights have been for the Western economy's strong growth. Property rights give consumers protection against rent-seeking. Rent-seeking, or political interest, is economic agents' attempt to gain financial benefits through politics rather than through production. Many rules and institutions in society, therefore, have the purpose to protect property rights: patents, copyrights, share certificates, the land register and the administration of justice, to name a few examples. The better property rights are defined, the smaller the chance of rent-seeking behavior. In this context, Sanders rightfully points to the instability of opaque intergenerational risk-sharing mechanisms for managing guarantees.

Property rights are also essential to any pension plan design, including the TBP configurations. Here are five reasons why.

1. **It greatly reduces the complexity of a pension system.** The numeraire of the system is the wealth on consumers' personal pension account. It creates the basis for consumers to do optimal financial planning, and the decision to transfer pension wealth when changing jobs becomes more straightforward.

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<sup>1</sup> See Binsbergen, J. van, D. Broeders, R. Koijsen, and M. de Jong. 2014. Collective pension schemes and individual choice. *Journal of Pension Economics and Finance* 13(2), 210–225.

<sup>2</sup> Bodie, Zvi. 2008. Pension Guarantees, Capital Adequacy and International Risk Sharing. In *Frontiers in Pension Finance*, 243–254. Dirk Broeders, Sylvester Eijffinger, Aerd Houben, eds., Cheltenham UK: Edward Elgar.

2. **It allows for flexibility.** The pension platform will be able to optimize the four functions for consumers with different characteristics in achieving their post-retirement income target.
3. **Managing the shortfall risk of not achieving this income target becomes direct.** Consumers will have to save more for retirement and lower their lifetime consumption level, work longer before retiring, or take more investment risk. The latter requires consumers to be ready for the consequences if the risk appears.
4. **It offers protection against rent-seeking.** Changes in, for example, the pension scheme, the investment policy, the AIR or pension regulation do not affect consumers' property rights. Only the value of the underlying assets will influence the property rights value. Full attention can be given to dynamically managing the assets on consumers' behalf.
5. **There is full representation and thus no governance gap.** The pension fund board only represents the current pension platform consumers. The board does not have to take into account the interests of the employer or consumers who will join the pension platform in the future. This reduces agency costs. The platform is also not exposed to discontinuity risk. If a sponsor company shrinks or disappears, it has no consequences for the pension platform and its consumers. Also, no pension guarantee system is required to absorb sponsor risk.

## Substance Over Form

Setting and managing a retirement replacement income goal are key design criteria for any pension system. Sanders' paper is a very thorough and welcome contribution to organizing and understanding the world of pension plans in between the archetypical DB and DC plans. Understanding the full DB/TBP/DC spectrum may be enhanced even further by unraveling the various functions a pension plan performs and by defining clear property rights for the consumers. In the end, it is about substance over form or about what the pension platform can do for its consumers.

*Dirk Broeders, Ph.D., is professor of pension finance and regulation at Maastricht University.*



Comments on

## **“The Target Benefit Plan Spectrum: Implications for Plan Design and Regulation”**

By Robert L. Brown

I have been a supporter and promoter of target benefit plans (TBPs) for more than a decade. I like TBPs a lot and think they are the solution for the unfortunate spin into individual account defined contribution (IA DC) accumulation plans. And this is extremely important now, because the baby boom generation is entering its decumulation phase. In this regard, a TBP has huge advantages over IA DC plans. Some things, like health care, need to be managed collectively. The provision of retirement income security also requires a collective approach.

In Barbara Sanders’ paper on TBPs, she correctly defines the full spectrum of possible TBP models from those at the defined benefit (DB) end of the spectrum to those at the DC end. She also correctly points out that, to date, most TBP designs and regulation have assumed a TBP at the defined benefit end of the spectrum. This leads to a higher level of security and stability, but it also results in either higher contribution rates or lower benefits.

If we could allow ourselves to move more closely to the DC end of the spectrum, we could get either lower contribution rates or higher benefits by accepting a lower level of security and stability. Sanders points out that in the University of British Columbia Faculty Pension Plan, those retiring can effectively choose their level of “risk” versus “security” and seem to be happy with this acceptance of less stability.

One matter that seems to be forever lost in the pension plan design and regulation debate in Canada is that all Canadians start with a significant, fully guaranteed (or about as guaranteed as possible) pension in the form of Old Age Security and the Canada/Quebec Pension Plans. For someone consistently earning the average industrial wage, the total benefits provide about a 39 percent replacement ratio and CPP Tier 2 will raise that ratio. So, why are we so overwhelmed by the thought that benefits above that level may be slightly at risk?

Kudos to Sanders for forcing us to rethink what may be a natural bias for defined benefit plan actuaries. Let’s face it: large collective defined-contribution-type TBPs are so superior to individual account DC plans that they should not be obviated without a second or even a third thought.

*Robert L. Brown, FSA, ACAS, FCIA, HONFIA, is a retired professor of actuarial science.*



Comments on

## **“The Target Benefit Plan Spectrum: Implications for Plan Design and Regulation”**

By Greg Heise

It is my pleasure to have the opportunity to review and comment on Barbara Sanders’ paper focusing on the plan design and regulation implications of the spectrum of target benefit plans (TBPs).

While the term “target benefit plan” is fairly new, the concepts and practical elements of these plans’ designs have existed for decades in Canada and the U.S. under the guise of multiemployer negotiated cost pension plans. These plans were often lumped in with defined benefit (DB) plans historically, much to not only their detriment from an operational standpoint but also to their membership. As the article confirms, plans that aim to provide a targeted pension amount versus a promised pension amount are very different and require different communications with membership as well as regulatory oversight tailored to their characteristics.

My experience with multiemployer negotiated cost plans is significant, and my comments herein come from that perspective. What is quite interesting is that I have found in practice that some of these plans have differed historically in their approach and would be at different points along the target benefit plan spectrum that Sanders has described, some closer to the defined contribution end but with most closer to the DB end (presumably as a result of the regulation under which they operated).

I intend to focus my comments on a few points that Sanders made:

1. British Columbia’s and Alberta’s approach to target benefit plan regulation currently follows a DB paradigm.
2. Intergenerational risk transfers.
3. Battling preconceived notions of what TBPs are.

### **British Columbia’s and Alberta’s Approach to Target Benefit Plan Regulation**

Up until new rules were released in the past three to four years, TBPs focused a great deal of energy trying to maintain existing benefit levels, primarily because of the stress imposed by solvency funding, an inappropriate test for these types of plans. I concur with Sanders that the new regulatory approach to TBPs in Western Canada is effectively very similar to the DB paradigm. As a society, we tend to be a result of our experiences. Our experiences—at least the most publicized, negative ones—have been a

small number of high-profile DB plan failures, and the government's view is likely that we have to protect against these types of failures in the future.

The hopeful result was that with solvency now behind us, sponsors could revisit their policies and decide how best to move forward, designing a plan that best-suited their membership's needs. The reality is that these new rules instead create a significant buffer for risk, which will likely only end up benefiting the last generation participating in the particular plan. Legislation has effectively taken away the ability to have a plan design closer to the defined contribution end of the spectrum. While the new buffers in place are far more appropriate than the buffer that solvency legislation created, they are not conducive to all target benefit plan designs.

That said, whether these plans truly end up being DB-like will depend on whether the provisions for adverse deviation that legislation laid out are sufficient. For the most part, no one can presume to know the answer to this question. Only time will tell as to whether the buildup of large provisions for adverse deviation today will translate into a huge wealth transfer to a later generation.

## **Intergenerational Risk Transfers**

I have heard Sanders speak on the topic of intergenerational risk, and I find it hugely beneficial to hear an academic view of this topic, given the lack of attention it is given around the board room tables of target benefit plan sponsors. There needs to be a significant amount of work done in this area to further educate sponsors on this topic and have them set out in writing what their beliefs are. Frankly, it is a sponsor's beliefs on risk transfers that will very much guide the foundations of plan design and benefit, funding and investment policy. Unfortunately, this is never where the conversation begins; intergenerational risk ends up being a topic that is discussed, at best, but not given much attention in policy documents.

## **TBPs in the Press**

I applaud Sanders' points concerning speaking about TBPs in the context of defined contribution-plus. That said, I think we all realize that this will take time, potentially a long time. For my part, I have been quite concerned about the lack of clarity in the media regarding target benefit plan topics. On one hand, the recognition of these plan types is a huge boon for future Canadian retirees, because the possibility is now there for improved designs and options for occupational pension plans. Further, the existing plans that were being "mistreated" as DB plans, namely multiemployer negotiated cost plans, now have a place, albeit imperfect, to slot themselves in under legislation. However, despite these positives, the negative press regarding TBPs is not doing the future of the Canadian retirement system any favors.

Of particular concern are the Canadian Labour Congress' anti-target benefit plan comments, without qualifying those comments to only apply to situations where conversion from a DB plan is being considered. The Canadian Labour Congress also represents thousands of members in plans that are already effectively TBPs, and having their membership hear their anti-target benefit plan rhetoric is serving to confuse Canadians about the efficacy of their own retirement programs.

## **Conclusion**

There is little, if anything, in Sanders article that I disagree with; it is a valuable contribution toward the discourse needed on TBPs and their evolution in today's post-defined-benefit society. What is clear is that additional work is needed, in particular advocacy, with various governments across Canada concerning what these plans' regulation should be founded on.

*Greg Heise, FSA, FCA, FCLA, is a partner at George & Bell Consulting Inc.*



## Author's Response to Comments

By Barbara Sanders

I would like to thank the four discussants for their valuable comments. They inspired me to take my ideas about target benefit plans (TBPs) a step further. I offer a few additional thoughts in the hope that they will add value to the discussion.

First, let me join Robert Brown as a strong supporter of collectivism in retirement income provision. The “power of the collective,” as Brown put it, is clearly valuable to those seeking to avoid catastrophic economic losses due to unforeseeable events, which in the context of retirement may include severe negative returns, runaway inflation or simply the gift of a very long life. One of the great features of TBPs is that they allow us to deploy collectivism strategically—only for the right risks and in the right amount. What is “right” varies from plan to plan and defines where a TBP lands on the spectrum. Coming from the defined benefit (DB) paradigm, it may seem odd that the right protection from the members’ perspective could be anything less than complete stability and security, but we must acknowledge that members (and their employers) have limited resources, which often fall short of the cost of providing an adequate benefit with certainty. The right level of protection is then one that effectively balances cost and risk.

Leaving some risk with members is not a bad thing: As Brown points out, Canadian workers already have access to very secure, inflation-indexed pensions through the Old Age Security program and the Canada/Quebec Pension Plans (C/QPP). With the coming C/QPP enhancements, this secure income base will increase. For many workers, these benefits will be sufficient to provide for the essentials of life. Any additional retirement wealth can then support retirees’ desired lifestyle choices beyond the essentials or, once their desired lifestyle is achieved, can provide for bequests.<sup>1</sup> While it is important that guaranteed income cover the essentials, it may be reasonable to leave some of the wealth beyond this level to be subject to some risk. Since the dividing lines between the essential, lifestyle and bequest zones vary from individual to individual, the level of risk that individuals are willing to take with their retirement income also varies. This is one of the reasons the University of British Columbia Variable Payout Life Annuity option works so well: It allows each retiring member to customize (within some constraints) the type and extent of protection the individual receives. Unfortunately, Canadian TBPs at other points on the spectrum cannot easily accommodate individual choices and risk preferences; however, as Dirk Broeders notes, this does not have to be the case.

Second, I would like to follow up on Greg Heise’s lament over the lack of attention given to intergenerational risk transfers in the context of TBPs. I think the low level of consideration given to this issue in most TBPs is unfortunate, at best, and imprudent or reckless, at worst. As the Task Force on Target Benefit Plans (the Task Force) noted,

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<sup>1</sup> The concepts of the “essentials zone,” “lifestyle zone” and “bequest zone” are described in the popular 2009 book *The Retirement Plan Solution: The Reinvention of Defined Contribution* by Don Ezra, Bob Collie and Matt Smith.

intergenerational risk transfers are a critical element of the operation of many TBPs. The Task Force's report made it clear that these transfers, when handled well, can contribute to a plan's success; however, if handled poorly, they can also destroy it. The key is transparency. Stakeholders need to clearly define the limits of the intergenerational solidarity that is expected in the plan and identify where members' individual responsibility begins. Only then can they understand the true nature of the risk-sharing deal they enter. Unfortunately, even when TBP stakeholders discuss these issues today, they may only address them qualitatively. As a result, many of the cost and risk transactions remain opaque, even to the plan actuaries.

An entirely new level of transparency could be achieved if, as Broeders suggests, we were to clearly define property rights within TBPs—that is, specify who is entitled to what. Conceptualizing such a setup is not difficult: Start from a personal pension account (individual defined contribution) and add explicit risk-sharing transactions between members, as needed, buying or selling protection against specific risks. If society believed that certain types of risk sharing should exist as a default (for example, that a certain proportion of income should always be protected from longevity risk), these can be added as minimum requirements.

In his discussion, Broeders describes the five advantages of clearly defining property rights. Flexibility is one—this addresses my comment about accommodating individual choice in TBPs all along the spectrum. Another advantage I would like to draw attention to (No. 4 on Broeder's list) is the ability to protect the plan from political maneuvering: Having clearly defined property rights limits agents' ability to invisibly shift value or risk from one set of participants to another. This can be a particular concern when valuation assumptions are changed in current TBPs.

I imagine that the concept of clearly defining property rights in TBPs may seem counterintuitive to some, especially those who are used to working with opaque DB arrangements. After all how can individual accounts be reconciled with collectivism? The truth is that these concepts are not either/or. They can be layered on top of each other in a flexible and transparent way—we just need to look beyond the structures we are familiar with. The Pension Guarantee Exchange idea described by Broeders and his colleagues in the *Journal of Pension Economics and Finance*<sup>2</sup> is but one possibility.

In closing, I agree fully with Keith Ambachtsheer's comment that our concept of TBPs, indeed our concept of occupational pensions suitable for the 21st century, needs to evolve further. Yes, benefit flexibility can add resiliency to a collective plan, but having flexible benefits without transparency can destabilize the plan over time. True innovation will come when we can move away from opaqueness while we maintain the benefits of risk sharing.

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<sup>2</sup> See Binsbergen, J. van, D. Broeders, R. Koijen, and M. de Jong. 2014. Collective pension schemes and individual choice. *Journal of Pension Economics and Finance* 13(2), 210–225.

# In Search of a More Efficient Retirement Plan

By Lee Gold

Defined benefit (DB) or defined contribution (DC)? The debate has raged for years about which type of retirement plan is the best. Opinions on this matter depend largely on which plan characteristics a person feels are most important. There are certainly positive qualities to both DB and DC plans. The problem with this debate is that it is based on the assumption that these are the only two options. What's missing from the debate is an option that blends the best features of both DB and DC plans. The variable annuity plan (VAP) is one such option and is the focus of this paper.

Traditional DB plans have failed the American worker. The reason for this failure is that these plans have become unacceptable to employers. The single-year funded status risk from investments and interest rates is too high. Employers have been closing and freezing traditional DB plans for years, and employees are certainly impacted. As these employers move from supporting DB plans to supporting DC plans, many employees find that their retirement benefits have been slashed. Older employees have been especially hard hit as their significant DB accruals are replaced with much smaller DC contributions.

With an emphasis on removing financial risks from employers, the most redeeming feature of DB plans has been forgotten: longevity pooling. By pooling longevity risk, employers are able to provide lifetime income to retirees at relatively low risk compared to other types of risk, such as investment risk. Employees benefit greatly from longevity pooling, because the cost to self-insure longevity risk is expensive. A DB plan that could leverage the benefits of longevity pooling while eliminating investment and interest rate risk would be a great plan. Employers would not be afraid to sponsor these plans because the financial risks would be very limited. And employees would welcome these plans because of the lifetime income guarantee they can provide. The VAP is such a plan.

This paper will present modeling results that provide numerical evidence that a VAP can be superior to a DC plan in terms of the income provided to retirees. Due to length limitations, this paper will not focus on the accumulation phase and the various accrual characteristics of DB or DC plans. Rather this paper will focus on the outcomes achieved during retirement by looking at the retirement income received under various designs and spend-down approaches. The reason for this is to allow for appropriate comparisons. Determining "equal cost" plans can be difficult, given all the various elements that go into determining the costs of any retirement program. Consequently, the analysis that follows will assume that a pool of employer money has been accumulated at retirement to fund the retirement benefits of a group of retirees. That asset pool can be used to pay benefits annually to the retirees who are still alive each year, or it can be divided equally at the time of retirement (into individual accounts) among the group

of retirees. Using this individual account, the retiree can then receive benefits under a variety of withdrawal approaches.

## **Risk Allocation: Employer Risks**

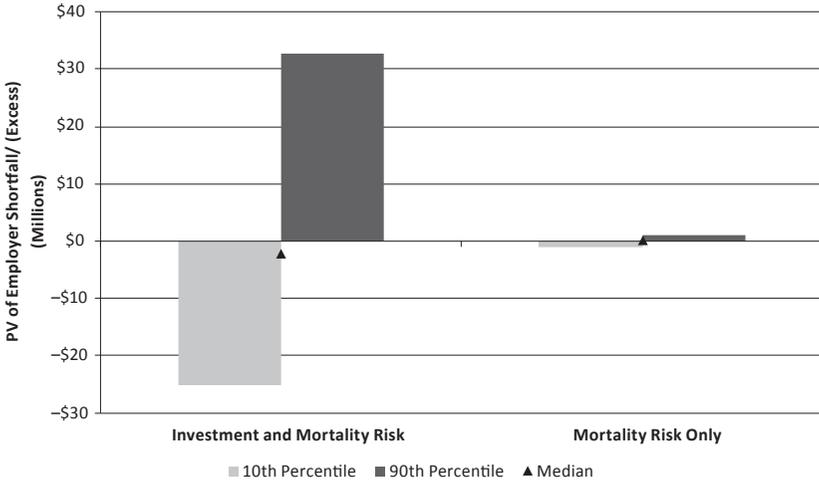
What is the biggest source of risk for an employer sponsoring a DB plan? It is not mortality risk—the risk of individuals living longer than expected. It is interest rate risk and investment risk. Interest rate risk—the risk of liabilities increasing when market interest rates fall—is a newer risk that has emerged as pension liabilities begin to incorporate elements of financial theory. The impact of changing interest rates on funded status over a short time frame can be significant. Investment risk can have a significant impact on single-year funded status if investments change dramatically. If investment risk and interest rate risk can be removed, the resulting plan is much more likely to have an acceptable level of risk for the employer.

In the analysis that follows, I have ignored interest rate risk. The goal in the modeling is to see whether an initial pool of assets is sufficient to pay all promised benefits. The periodic reporting of the liability based on market interest rates is not important for this analysis. I have also ignored interest rate risk (used in calculation of liabilities) because it doesn't exist in a DC plan and because in a VAP, interest rate risk is eliminated. Due to length limitations, this paper will not explore how interest rate risk is eliminated within a VAP. I encourage you to seek other sources for a discussion of this issue (such as the Pension Committee of the American Academy of Actuaries' *Exposure Draft of the Public Policy Practice Note, Variable Annuity Plans*, December 2015).

Figure 1 is based on 1,000 female retirees who have been promised \$7,870 per year for their lifetime. A fund of \$100 million has been accumulated to pay this benefit to each of these retirees who, at the beginning of the year, are living. Payments to these retirees have been modeled under 1,000 economic and mortality scenarios. The benefit amount of \$7,870 was arrived at by assuming that mortality experience is as expected and annual asset returns are 5.79 percent. However, there will be some variation as to the exact timing of each death. There will also be variation in the annual asset returns. Is \$100 million really enough to provide the promised benefit?

FIGURE 1

*Investment vs. Mortality Risk*



At the median, the answer is yes. In this simulation of outcomes, the median present value (at retirement) of the amount of extra funding the employer needs above \$100 million was actually a negative \$2.1 million, meaning that \$97.9 million is the median amount needed to fund the benefits. But what happens with other outcomes at the 10th and 90th percentile? With a probability of 10 percent, an additional \$32.7 million or more will be needed at retirement to fund these benefits. Also, with a 10 percent likelihood, \$25.1 million or less money will be needed. The employer has a 10 percent probability of needing at least \$132.7 million or no more than \$74.9 million to fund the promised benefits depending on what investment scenario plays out. That’s a lot of uncertainty for employers!

What happens if we remove any uncertainty in asset returns and simply allow people to die based on Monte Carlo simulations according to probabilities of an underlying mortality table? The variation drops significantly. Now there is a 10 percent probability that more than \$101.0 million will be needed at retirement to fund these benefits, or less than \$98.9 million will be needed. That’s a pretty tight range of outcomes.

What if the underlying mortality assumption is simply wrong? Even if assumed mortality rates are 20 percent too high at every age, the amount of extra funding needed at retirement to account for this is only \$3.9 million at the median and \$4.8 million at the 90th percentile, much less than what may be needed due to the uncertainty of asset returns.

To summarize, the largest risk factor in determining whether an employer will need to provide additional funding is clearly investment risk. Mortality risk is very small by comparison.

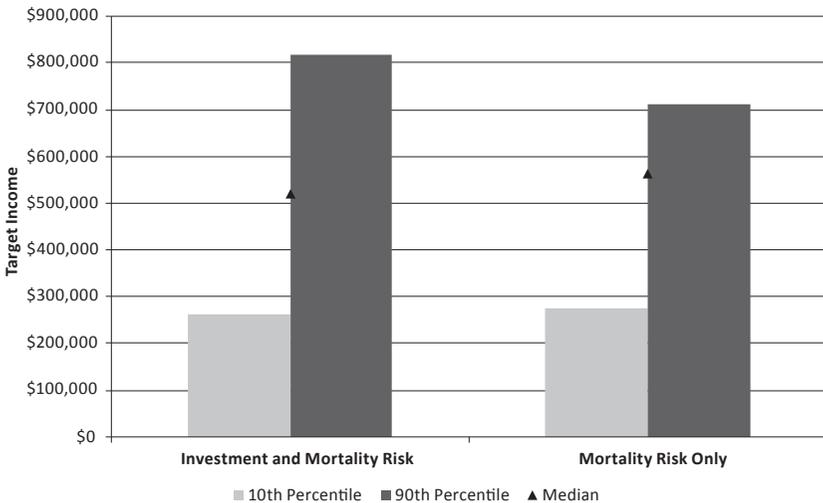
### Risk Allocation: Employee Risks

Turning to the employees, what is the biggest source of risk during retirement for the retirees who want to receive a certain amount of income during their entire lifetime? It turns out that how long the retirees will live is the most important factor in determining whether they have enough money to retire, not what investment returns will be.

Figure 2 is based on a simulation of 1,000 female retiree lives and economic scenarios, with the goal of replacing 35 percent of preretirement income (of \$100,000) increased annually for life with inflation (2.2 percent). The amounts shown in Figure 2 are the 10th and 90th percentile values representing the amount of funds needed at retirement to provide the desired level of income for life.

**FIGURE 2**

*Retirement Funds Needed to Meet Desired Target Income*



A female retiring at age 65 will need either 2.6 times preretirement income or 8.2 times preretirement income with equal likelihood, when considering both investment and mortality risk. If asset returns during retirement are guaranteed, then the necessary fund amounts become 2.8 (10th percentile) and 7.1 (90th percentile) times preretirement

income. How long an individual will live accounts for a large portion of the variation in how much money will be needed during retirement.

Based on this analysis of risk, the apportionment of that risk could be done so that the party most able to bear the risk does so. In this case, employers should take on longevity risk and employees should assume investment risk. Traditional DB and DC plans do not apportion risk in this manner. To do so requires a different design.

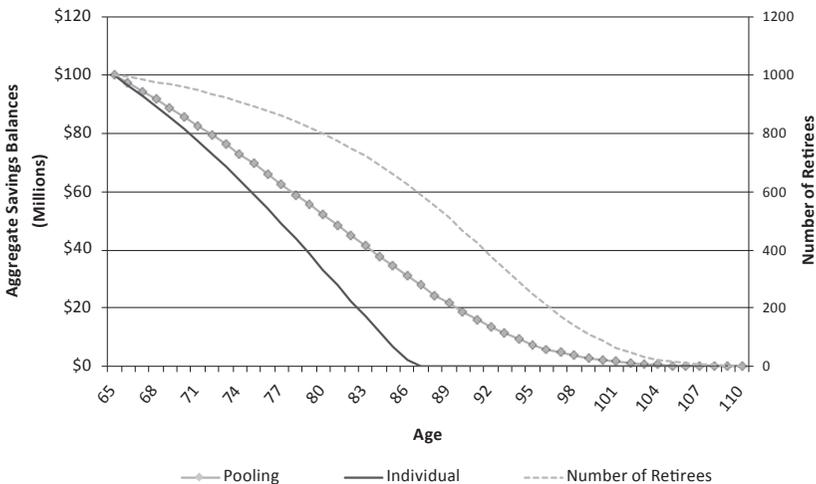
### The Power of Pooling

While employers are best positioned to bear mortality risk, the pooling of mortality risk (such as in a DB plan) has beneficial impacts for retirees as well.

For this analysis, we start with our population of 1,000 female retirees and our accumulated assets of \$100 million. What if we pay each surviving retiree \$7,342 at the start of each year in which the individual is alive? For the individual account option, when the retiree dies, any remaining amount in the individual account is given to the retiree's heirs or estate. This residual amount does not remain in the overall pool of assets. Figure 3 shows the number of retirees expected to be alive at each age (right axis) and the value of the asset pool at each future age, assuming the assets earn 5 percent per year (left axis). For the individual account approach, the value of the asset pool is just the sum of all the individual accounts.

FIGURE 3

*Fund Balance Under Individual vs. Pooling Approach*



A few initial observations:

- Under the individual account approach, the sum of all remaining account balances reaches \$0 following payouts at age 86. There are 626 retirees still alive at age 86 when their account balances reach \$0.
- Life expectancy for these female retirees is 23.7 years, almost age 89.
- Although difficult to see from the figure, assets under the pooling approach reach zero only after paying the last surviving retiree her final payment at age 110.
- The total amount of payments made under these two approaches is shown in Table 1.

**TABLE 1**

<i>Total Benefit</i>		
	POOLING APPROACH (MILLIONS)	INDIVIDUAL ACCOUNT APPROACH (MILLIONS)
Total amounts retirees receive	\$173.6	\$136.3
Total amounts heirs or estates receive	\$0	\$16.6

The reason for the higher retirement income received under the pooling approach is most easily seen by simply looking at the seven individuals expected to die before reaching age 66. Under the pooling approach, these individuals each receive \$7,342 in year one and nothing further because they have passed away. Under the individual account approach, these seven individuals each also receive \$7,342 as a withdrawal, but then their heirs or estate receive the remaining \$92,658 in each of their accounts. Under the pooling approach, the \$92,658 for each of the seven individuals would have remained in the pool, continuing to earn interest, and would eventually be used to continue payments to those who live beyond age 86. The pooling approach is able to pay out more than \$37 million to retirees and more than \$20 million in total (retirees and heirs combined).

In summary, by moving to individual accounts, money that would have remained in the pool to provide payments to those living beyond age 86 will now be provided to the heirs or estates of those who die prior to reaching age 86, ensuring that no individual will be able to receive \$7,342 beyond age 86. Is providing an inheritance of enough importance that more than 60 percent of the retirees will now receive less retirement income than if a pooled approach was employed? And it's not just that they receive less money. More than 60 percent of the retirees will also face the stress of still being alive, not knowing when they are going to die, and being out of money.

DB plan critics will rightly point out that the \$100 million may prove to be insufficient to support the promised payment of \$7,342 per month if 5 percent is not earned each year. Thus, the plan sponsor would have to contribute even more funding to make up

the potential shortfall. DC critics will also rightly point out that under the individual account approach, the \$100,000 may also not be enough to take withdrawals of \$7,342 per month up to age 86 before the account balance reaches zero. The account balance may reach zero sooner (or later).

To deal with these uncertainties and limit employer risk, we need a different approach. A plan is needed where future investment returns and interest rates are irrelevant because the benefit amount is self-adjusting, eliminating market risk for the employer. The plan also needs to provide a lifetime income stream to the retirees. The VAP will accomplish these objectives.

## **Brief Review of VAPs**

A VAP is a retirement plan that provides a benefit based on a formula. That formula consists of both an annual benefit accrual and an annual benefit adjustment.

The annual accrual is typically in the form of a career average formula, such as 1.5 percent of current year pay. These annual accruals are converted to units, and the units are added together to determine the total benefit the employee earns. The number of units an employee accumulates will not decrease. The value of those units may change, thus changing the dollar value of the benefit received.

The unit value is adjusted, usually annually. These annual adjustments take the beginning-of-year unit value and adjust it for asset performance during the year relative to a “hurdle rate” of return. Suppose the hurdle rate for the plan is 5 percent. Earnings above 5 percent will cause the unit value to increase. Earnings below 5 percent will cause the unit value to decrease. Any accrual for the current year is converted to units using the end-of-year unit value.

For example, suppose an individual is making \$100,000 annually in compensation. The VAP formula is 1.5 percent of each year’s pay. Thus, after one year of service, the employee has accrued a benefit of \$1,500, which is payable annually beginning at normal retirement age (e.g., age 65). At the end of the second year of employment, plan assets grew during the year at an annual rate of 6 percent. Since 6 percent is higher than the hurdle rate of 5 percent, the prior year end-of-year benefit will increase. Table 2 illustrates the calculations.

TABLE 2

*VAP Benefit Accrual Calculation*

	CALCULATION SPECIFICS	UNITS	UNIT VALUE	BENEFIT
Salary during year 1 and year 2	\$100,000			
Accrued benefit at beginning of year 1		0.00	\$10.0000	\$0.00
Accrual for year 1	1.5% of \$100,000	150.00	\$10.0000	\$1,500.00
Accrued benefit at beginning of year 2		<b>150.00</b>	<b>\$10.0000</b>	<b>\$1,500.00</b>
Adjustment for year 2 earnings	Earnings in year 2: 6% Hurdle rate: 5% $1.06/1.05 \times \$10 = \$10.0952$	150.00	\$10.0952	\$1,514.29
Accrual for year 2	1.5% of \$100,000	148.58	\$10.0952	\$1,500.00
Accrued benefit at beginning of year 3		<b>298.58</b>	<b>\$10.0952</b>	<b>\$3,014.29</b>
Adjustment for year 3 earnings	Earnings in year 2: 4% Hurdle rate: 5% $1.04/1.05 \times \$10.0952 = \$9.9991$	298.58	\$9.9991	\$2,985.58
Accrual for year 3	1.5% of \$100,000	150.01	\$9.9991	\$1,500.00
Accrued benefit at beginning of year 4		<b>448.60</b>	<b>\$9.9991</b>	<b>\$4,485.58</b>

**Modeling Outcomes: Variable Annuity Versus DC Plans**

In this section, we will allow the annual withdrawal from the DC plan to be modified each year based on asset performance relative to a 5 percent hurdle rate. In other words, if the annual return is less than 5 percent, the withdrawal will decrease in the following year. Conversely, if the year's return is more than 5 percent, the withdrawal amount will increase. The amount of the decrease or increase will be equal to  $W \times [(1 + I)/1.05 - 1]$  where  $W$  is the prior year withdrawal amount and  $I$  is the annual investment return for the year. This adjustment will make the annual withdrawals from the DC plan equal to the annual payments being received from the VAP, as long as there are still DC funds available to withdraw.

The analysis that follows is based on these additional assumptions.

- Retirees pass away based on Monte Carlo simulations rather than using a predetermined expected number of deaths at each age.
- Initial amount withdrawn from DC plan is based on a life annuity factor for a 65-year-old female retiree.
  - Life annuity factor at 5 percent (hurdle rate): 13.171
  - Initial withdrawal amount: \$100,000 divided by 13.171 = \$7,593
- For comparisons, additional initial withdrawal amounts were modeled (7 percent, 6.5 percent and 6 percent of initial balance).

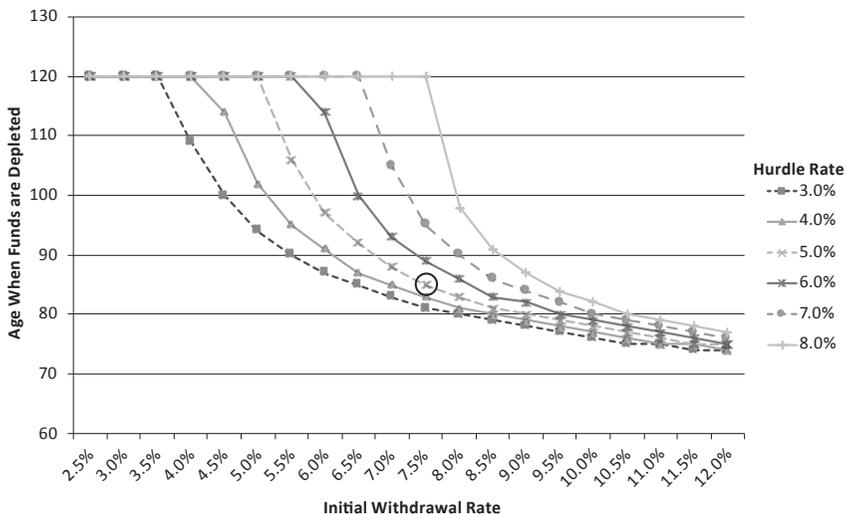
**KEY OBSERVATION**

For an individual account using this withdrawal process, the combination of hurdle rate and initial withdrawal rate determines how long the withdrawal pattern can continue before the account balance reaches zero. The age at which the account balance reaches zero is only dependent on the combination of the hurdle rate and the initial withdrawal rate. The actual returns over time have no impact. For example, using a 5 percent hurdle rate and a 7 percent initial withdrawal rate, the account will reach \$0 at age 88, regardless of asset returns from age 65 to age 88. The total amount received during the 23-year period will obviously depend on returns during that period, but the mechanics of determining the annual withdrawal will cause the funds to be depleted by age 88 under all economic scenarios.

Figure 4 shows some additional hurdle rate/initial withdrawal rate combinations and the age at which funds will be depleted in an individual account if this annual withdrawal adjustment method is followed. Data points at age 120 indicate that payments will last to an age in excess of 120.

**FIGURE 4**

*Affects of Hurdle Rate and Withdrawal Rate on Age of Depletion*



**RESULTS OF ANALYSIS**

Withdrawing \$7,593 initially and adjusting annual withdrawals based on asset performance relative to a 5 percent hurdle rate will cause individual account assets to be depleted at age 85 (approximately where the circle is in Figure 4). The likelihood of an individual living beyond age 85 is more than 60 percent. To decrease the likelihood of running out of money, the initial withdrawal rate will need to be lowered. The analysis that follows includes scenarios where 7 percent, 6.5 percent and 6 percent withdrawal

rates were used to lengthen the time that the fund will have a positive balance. Using these withdrawal rates, the ages at which the individual account funds are exhausted are 88, 92 and 97 respectively.

Table 3 summarizes the results of 1,000 economic and lifetime scenarios for a single retiree. Shown is the total income received under the various payout scenarios. A couple of observations:

- The VAP provides the highest level of payouts at each percentile.
- Lower initial withdrawal rates cause the pool to last longer and can increase the total amount paid out for those who live a long time.

**TABLE 3**

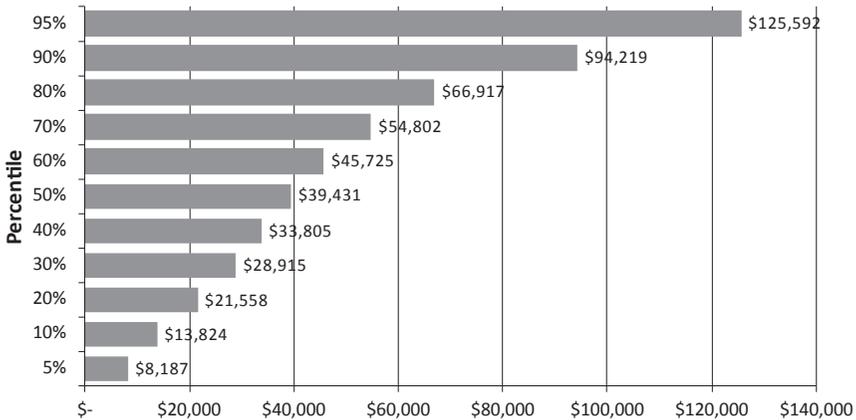
*Total Income Received in Retirement*

PERCENTILE	VAP	INDIVIDUAL ACCOUNT (7.59% WITHDRAWAL)	INDIVIDUAL ACCOUNT (7.0% WITHDRAWAL)	INDIVIDUAL ACCOUNT (6.5% WITHDRAWAL)	INDIVIDUAL ACCOUNT (6.0% WITHDRAWAL)
5%	\$39,032	\$39,032	\$35,986	\$33,415	\$30,845
25%	\$120,785	\$112,130	\$107,506	\$102,563	\$95,246
50%	\$187,991	\$153,552	\$157,458	\$155,142	\$148,311
75%	\$274,697	\$190,677	\$200,280	\$208,802	\$211,746
95%	\$441,818	\$253,262	\$277,215	\$296,781	\$328,332

Assume that a retiree is risk averse and would like to limit the chances of outliving the assets. Consequently, this person chooses a 6 percent withdrawal rate from the individual account, meaning that the funds will last until age 97. Figure 5 summarizes the 1,000 economic and lifetime scenarios by percentile, looking at the difference in total benefits received between the VAP and an individual account using a 6 percent initial withdrawal rate. The VAP always provides more, because the payments start out higher (\$7,593 vs \$6,000), and the annual benefit adjustment for asset returns is always the same percentage increase or decrease for both. Thus, the individual account benefit payment can never catch up to the level of the VAP payment.

FIGURE 5

*Difference in Total Payouts, VAP Minus Individual Account With 6 Percent Initial Withdrawal Rate (Amounts to Heirs not Included)*



For individuals who do not outlive their assets, the ratio of the total amounts received under the various payout options (same hurdle rate) will be a constant ratio equal to the ratio of the initial withdrawal rates. For individuals with an initial withdrawal rate of 7.593 percent (also the VAP payout rate), the VAP and the individual account payments will be identical until the individual account runs out of money. For initial payout rates below 7.593 percent, the ratio of total payments from the VAP versus the other methods will be greater than 1.0.

For example, for an initial payout rate of 6 percent, the ratio of total payments received will be 7.593 percent divided by 6 percent or 1.2655. The VAP will payout 26.55 percent more than the individual account option. This will be true regardless of the age at which the person dies up until age 97. Anyone living longer than age 97 will benefit even more from the VAP, because the VAP keeps paying, while the individual account option will no longer have any funds available to withdraw. Said another way, an employee wanting funds to last until age 97 will need to save 26.55 percent more money to provide the same level of income as a VAP could provide.

For comparability, we have assumed that assets in the VAP and the individual account are invested in the same manner: 55 percent global equity and 45 percent in bonds. For retirees, especially older retirees, this may feel too risky. Consequently, some retirees may invest more conservatively as they get older. On an expected basis, this will lower the amount of expected retirement income further, because earnings over the retired life are expected to be lower.

## CONCLUSIONS FROM ANALYSIS

By keeping all funds in a VAP and paying out benefits to those retirees still living, the VAP can pay out more in benefits to everyone—with a lifetime guarantee—than an individual account under multiple withdrawal method scenarios could provide. So, who benefits when individual accounts replace a pooled approach? There are a few categories of winners in our example:

1. Retirees who die before age 85, who know they will die early, and who can spend the funds in their account before they die.
2. Retirees who withdraw funds from their account slowly, leaving more of their account to grow with interest, which they then withdraw at the end of life. While they may be winners in total benefits received during retirement, they receive less almost every year than they would have under other payout methods. Are they really winners?
3. Heirs and estates of retirees who die early, leaving residual amounts in their accounts as an inheritance.

The losers are everyone else . . . the majority who will live beyond age 85. These individuals will now be forced to receive less money annually than they would under a VAP to ensure that their money can last a lifetime.

It doesn't have to be this way. If employers spend their retirement dollars for a VAP instead of a DC plan, most employees would enjoy better outcomes (more money received in retirement) with more security, knowing they will not have to worry about outliving their money. And employers can do this without the financial risks of traditional DB plans.

## Employers Who Should Consider VAPs

Employers should consider adopting a VAP if the following statements resonate:

- Employer retirement funds are intended to provide retirement income only (to retiree and spouse) and are not intended to provide an inheritance.
- Efficiency is a business imperative, and retirement income benefits should be no different. If more retirement income can be provided for the same amount of money under a different plan, that plan should be looked at immediately.
- Costs for the business must be reasonably predictable. Zero risk and variation are not needed, but the risks associated with traditional DB plans are unacceptable.
- DC plans rely too heavily on employees to engage in the right savings and investing behaviors.
- Employees' inability to retire, because they need to keep working and saving, becomes a workforce management issue with real costs to the employer.

## What's Not to Like

VAPs are not perfect. They would work best if certain changes or clarifications are made to current pension legislation. Here are some common complaints about these plans:

- The need to pay Pension Benefit Guaranty Corporation (PBGC) premiums, which are becoming very expensive.
- The uncertainty in determining a lump sum value.
- The participants' inability to choose their own risk level (investments) for the funds backing the VAP benefit.
- The monthly benefit can go down.

To address these complaints and make VAPs more attractive, I offer several suggestions.

- **PBGC premiums:** These plans present vastly lower risk to the PBGC than traditional DB plans. By design, they should never have variable rate premiums. The per-participant premium should be waived or significantly reduced for these plans.
- **Lump sums:** Clarification as to how the lump sum value of a variable annuity should be determined would be very helpful.
- **Allow hurdle rates below 5 percent without becoming subject to statutory hybrid rules.** In today's low-yield and lower-return environment, 5 percent is not as easily achievable as it once was.
- **Allow demographic gains or losses to also impact the benefits (not just asset returns).** This would make VAPs essentially risk free to the employer, because the funded status would always be 100 percent. In conjunction with this, perhaps plans could be allowed to fund to 105 percent of expected costs so that small losses do not impact benefit values. Benefit values only change when the funded status falls below 100 percent.
- **For employers willing to assume some additional risk:**
  - Explicitly allow for return floors and ceilings, below or above which no further benefit adjustments will be required. For example, benefit adjustments are provided for asset returns during the year, but the return used in the calculation will be no less than 0 percent and no more than 10 percent.
  - Explicitly allow for return collars, in between which no benefit adjustments will be required. For example, benefit adjustments are provided for asset returns during the year, but returns within 3 percent of the hurdle rate (below or above) require no adjustment to the benefit.
- **Allow unrelated employers to band together in a multiemployer plan and gain the advantages of a larger pool of lives and economies of scale (investments, administration).**
- **Not more often than annually, allow employees to choose one portfolio—among a set of portfolios—to which the following year's benefit adjustment will be tied.** These portfolios would have different risk and return profiles, allowing employees to pick the option they think is best for their situation. For employees failing to make an active choice, default elections would be based on age (perhaps using target-date funds).

## Conclusion

Due to the failure of traditional DB and DC plans in providing adequate retirement income to retirees, a new approach is needed. That approach—the VAP—already exists within our legislative framework and should be more widely discussed than it is today. By using longevity pooling, VAPs provide income for life and can do so much more efficiently than DC plans, while dramatically limiting risk for plan sponsors. In business, 20 percent to 30 percent inefficiency would not be tolerated in other areas of a business, so why should retirement benefits be any different? Employers who realize the value these plans can bring to their employees have the potential to capitalize on a competitive advantage in attracting and retaining key talent.

Employers are not able to fund the full cost of what is necessary for a secure retirement, so DC plans will not be going away. Employees will need to continue to set aside some of their own earnings to fund their retirement, and DC plans are the best vehicle for doing so, taking advantage of automatic enrollment, automatic escalation and sound default investment options. However, for employer funds, the VAP is a more efficient way to provide retirement income to retirees and offers an approach to providing retirement income that should be seriously considered.

## Appendix: Modeling Methods and Assumptions

The analysis within this paper is based on the following:

- Assumed equity returns: 9.1 percent arithmetic return with 18.8 percent standard deviation (7.5 percent geometric return).
- Assumed fixed income returns: 3.8 percent arithmetic return with 5.3 percent standard deviation (3.7 percent geometric return).
- Asset allocation is 55 percent equities, 45 percent bonds unless stated otherwise.
- Retiree population consisting of 1,000 female retirees, all age 65.
  - All were hired at the same time, making the same salary.
- Individual accounts of \$100,000 each.
- Pooled funds of \$100,000,000.
- Mortality based on RP-2014, projected with MP-2016 to 2030.

This paper has left aside the issue of how these dollars are accumulated before retirement. Suffice it to say, that \$100 million has been accumulated for a group of 1,000 female retirees, all age 65 with equal service and pay histories. Both a pooled plan and an individual account plan could be developed such that annual contributions plus earnings would equal \$100 million when the group reaches age 65. Presumably, the annual contributions for both of these plans and the investment approach could have been identical and thus both plans are considered equal-cost plans.

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## Comments on

# “In Search of a More Efficient Retirement Plan”

By Jeanette Cooper

Lee Gold’s paper on variable annuity plans makes a compelling case for employers to consider adopting this type of design. To make his argument, Gold models pension outcomes for 1,000 females retiring at age 65 under a variable annuity plan (VAP) and a defined contribution (DC) plan.

## Description of the Variable Annuity Plan

In the beginning of his paper, Gold describes the VAP as an option that blends features from defined benefit (DB) and DC plans.

### SIMPLICITY AND TRANSPARENCY

In his explanation of the VAP, Gold describes a common design where the benefit earned to date is converted into units, the units are then adjusted annually by the market return on plan assets relative to a hurdle rate (in this case, 5 percent), and then the units are converted back into a benefit amount. This allows him to make the statement that the number of units will not decrease although the value of a unit can increase or decrease.

While this is technically true, the design is easier to understand and more transparent to employees and retirees if the conversion between benefits and units is eliminated from the calculation. The ultimate result is that the benefit can increase or decrease and the units are just a distraction.

The example shown under “Brief Review of VAPs” could be restated more simply as shown in Table 1.

TABLE 1

### *Adjusted VAP Benefit Accrual Calculation*

YEAR	SALARY	ACCRUAL	ADJUSTMENT FACTOR	BENEFIT AT YEAR-END
1	\$100,000	$1.5\% \times \$100,000 = \$1,500.00$	Not applicable in the first year	\$1,500.00
2	\$100,000	$1.5\% \times \$100,000 = \$1,500.00$	$1.06 / 1.05 = 1.0095238$	$\$1,500.00 \times 1.0095238 + \$1,500.00 = \$3,014.29$
3	\$100,000	$1.5\% \times \$100,000 = \$1,500.00$	$1.04 / 1.05 = 0.99047619$	$\$3,014.29 \times 0.99047619 + \$1,500.00 = \$4,485.58$

## VARIATIONS ON THE COMMON DESIGN

Gold describes benefits based on salary that float throughout retirement. He also mentions the possibility of return floors, ceilings and collars. It is worth noting that plan sponsors are considering other design options, such as:

- Eliminating the floating feature at retirement (puts back considerable investment risk on the employer)
- Benefits based on hours using a fixed-dollar multiplier (common for multiemployer plans)
- Basing the annual adjustment on an average of recent years' returns to dampen the year-to-year volatility in benefits

## Risk

Gold then moves on to outline risks for employers and employees with DB and DC plans and how VAPs can help overcome these.

### EMPLOYER RISK

As Gold explains, VAPs do an excellent job of limiting an employer's exposure to investment risk. However, the introduction of floors and collars or fixing the benefit at retirement can erode that protection. Employers who want to avoid that risk while not dramatically reducing participants' benefits during a market downturn may wish to consider one-time adjustments, assuming there is sufficient money to provide for this. Providing guaranteed protections in the initial design can limit an employer's ability to avoid investment risk at a time when it may need to do so.

Another employer risk mentioned in the paper but ignored in the modeling is interest rate risk, the risk of liabilities increasing when market interest rates decrease. This is identified as a newer risk due to plans having to use market interest rates for various purposes, including funding single employer pension plans. The use of these rates discourages maintaining an ongoing DB plan because of the higher required contribution levels. It would be interesting to see some modeling that shows the impact on employer contributions levels over the last 30 years of the variable annuity design versus a more traditional DB plan—and, ignoring stabilization, taking into account what the required interest rates would have been.

### EMPLOYEE RISK

Interestingly, Gold identifies mortality risk rather than investment income as the main risk for employees having adequate retirement income. In his modeling example, he describes a scenario where an annual withdrawal from a DC plan is adjusted each year based on market returns relative to a 5 percent hurdle rate. Gold then points out in the "Key Observation" that the age at which the account balance is depleted is only dependent on the combination of the hurdle rate and the initial withdrawal rate, while

the actual returns over time have no impact. However, this is only due to the initial conditions posited on the withdrawal.

In reality, if investment returns are low enough or inflation high enough, retirees may need to withdraw more than allowed under the initial conditions. Therefore, while the main risk for employees with sufficient retirement income at retirement is longevity risk, serious market downturns or high inflation periods cannot be ignored. Even if inflation for most products is relatively low, drug costs and end-of-life care can seriously erode retirees' standard of living regardless of careful planning. That said, the VAP does provide a better overall lifetime income.

## Other Considerations

Gold wraps up the paper with conclusions from the analysis, including noting which employers should consider VAPs and unpacking aspects not to like about VAPs.

### COMMON COMPLAINTS

Four common complaints Gold identifies are required Pension Benefit Guaranty Corporation (PBGC) premiums, uncertainty in determining lump sum values, participants' inability to choose investments and therefore their risk level, and the fact that the benefit can go down.

I see participants' inability to choose the investments as a positive feature of these plans. In general, the typical DB plan enjoys higher returns than individuals' DC accounts. Having individuals select a risk portfolio would likely reduce the overall return on the fund. Using target date funds for the many participants who would fail to make an election would limit older individuals from sharing in higher returns that the pooled investments would be able to earn. The addition of individual elections also adds unnecessary administrative complexity.

A fifth complaint would be the benefit's uncertainty. Although benefits are more likely to go up more often than they go down if the hurdle rate is sufficiently low, retirees cannot count on annual increases and may be unpleasantly surprised when their benefit is adjusted downward. Clear and frequent communication can help mitigate this complaint.

A sixth complaint would be a lower initial benefit at retirement than under a traditional DB plan. Most DB plans in the single employer and multiemployer sectors do not provide cost-of-living adjustments. Assuming a plan sponsor switching to a VAP with benefits floating throughout retirement wants to provide benefits at a similar cost to the current plan—and assuming that by design—benefits in most years would increase, rather than decrease, then the initial benefit at retirement would need to be lower than under the current plan.

## **Applicability to Public and Multiemployer Sectors**

Plan sponsors of public and multiemployer plans are also expressing interest in the variable annuity design.

Like single employer plan sponsors, government entities are looking at hybrid approaches. For some of these plans where the participants do not participate in U.S. Social Security, a plan design that avoids investment risk but still provides an annuity benefit is an appealing option.

Multiemployer plans are looking at this option as a way to reduce employers' investment risk, including the risk of incurring withdrawal liability.

In conclusion, Gold's paper provides additional insights into the variable annuity design. This paper is an excellent tool for consulting actuaries to use when faced with a client who is considering eliminating DB accruals in favor of a DC arrangement or for a client who has frozen a DB plan and is now looking for a way to better manage employees' ability to retire.

The opinions expressed in this response are my own and not those of my employer.

*Jeanette Cooper, FSA, EA, FCA, MAAA, is a vice president and consulting actuary at Segal Consulting in Atlanta.*

# **Author's Response to Comments by Jeanette Cooper**

By Lee Gold

I am grateful to Jeanette Cooper for her thoughtful comments on my paper. I now provide this response to her comments, with the hope that the combination of my original paper, Cooper's comments and this response will give the reader a clear understanding of variable annuity plans (VAPs) and why employers should give these plans more serious consideration.

## **Simplicity and Transparency**

Cooper states that the concept of units should be eliminated from the conversation with employees, because this concept is a distraction. I have a more flexible view of this. Having introduced a new VAP to numerous employee groups, I can state that for some employees, the introduction of units does improve their understanding. Many employees understand the concept of mutual fund shares and that the value of those shares change over time. The concept of benefit units or benefit shares resonates with these employees. However, I also will agree with Cooper that, for some employees, avoiding the concept of units may be the wiser course of action.

My advice: When introducing VAPs to employers (and ultimately to employees), consider the audience and what will be relatable to them. Start with the simplest explanation, but don't be afraid to introduce the analogy to mutual fund shares. I have found this an effective way to explain the concept for some individuals. Be clear that the mutual fund shares provide the shareowner with the right to a one-time payment of the shares at the current share price. The variable benefit units, in contrast, provide a right to a lifetime payment of the shares (annually, spread over 12 months) at the share price for each year.

## **Variations on the Common Design**

I agree with Cooper that variations on the basic design are plentiful. In fact, the potential variations are innumerable. Current regulatory guidance for these plans leave some questions unanswered as to what variations are acceptable. The attractiveness of these plans would be maximized if national retirement policy accommodates variations, allowing employers the flexibility to share risks with employees in ways that each employer finds most beneficial for their organization. If employers are allowed to provide the bookends of either (1) traditional fixed pension benefits or (2) fully adjustable variable benefits, then offering benefits that adjust somewhere in between these two extremes should be acceptable.

## Employee Risk

Cooper states that investment risk should not be ignored for retirees, and I concur. The fact that a mathematical formula exists for determining how long a lump sum will last does not mean that the monthly income provided under that formula will be enough. My primary point in raising the mathematically determinable “age at ruin” for a lump sum (using an initial withdrawal rate and a hurdle rate) is to show that the VAP is more efficient. While a withdrawal rate and hurdle rate can be established to mimic the payout of a VAP, the lump sum will be depleted before the individual reaches life expectancy. To gain longevity protection with an account-based plan, the individual must be willing to settle for a lower withdrawal rate, such that the funds will last into the individual’s 90s. This longevity protection is costly. The VAP, by comparison, is able to provide that longevity protection through pooling and can do so at a higher initial withdrawal rate.

## Employer Risk

Cooper raises an excellent point about interest rate risks. I ignored interest rate risk in my modeling, because interest rates do not affect the determination of liabilities under a VAP. However, for comparison purposes with traditional defined benefit plans, the relative risk of traditional defined benefit plans would be even higher than portrayed in my paper if market interest rate volatility were included in the modeling. Traditional defined benefit plans would show an even higher level of year-to-year risk than VAPs.

## Common Complaints

Cooper mentions the administrative complexity introduced if employees are placed in age-appropriate target date funds as opposed to a single benefit pool. The administrative burden does increase under this approach. However, for employers that wish to address the varying risk profiles presented by a multigenerational workforce or that value choice, this is an option that I would like to see available to them. Again, I fully support allowing employers flexibility as to how they design their retirement plans. Keep in mind that target date funds under a VAP may have different glide paths than what we typically see in defined contribution (DC) plans. Retirees, in particular, who have a VAP may be more tolerant of investment risk, since they do not carry longevity risk at the same time.

Cooper mentioned two additional complaints. First, the uncertainty of the benefit is definitely an issue when compared to traditional fixed-benefit defined benefit plans. Since most employers are looking to DC plans to address or avoid the risks of traditional defined benefit plans, benefit uncertainty is a reality, whether an employer adopts a VAP or a DC plan. VAPs eliminate one uncertainty that DC plans do not, and that is the certainty of payment. While the amount may be uncertain, the retirees have certainty that they will receive a payment (and cannot outlive the benefit).

Second is the potential for a lower benefit when compared to an equal-cost traditional defined benefit plan. Cooper correctly points out that the variable benefit likely has some expected inflation protection built in and is expected to increase more often than decrease, even after retirement. She also correctly points out this truism—for a given (1) pool of money, (2) annual returns on that money, (3) mortality rates and (4) benefit payout approach—the payments that can be provided are determinable. For example, by knowing these four elements, an individual can determine the level monthly payment the assets will support.

By changing element No. 4 from a level monthly payment to a variable payment based on the prior year's asset return (variable annuity), a different payment pattern emerges. In situations where element No. 2 is higher than the hurdle rate, the plan will pay lower benefits initially (compared to the level payment approach) but will be able to pay increased benefits later on. This is the situation Cooper addresses. In contrast, if element No. 2 is lower than the hurdle rate, the VAP will pay higher benefits initially (compared to the level payment approach), but the benefit will decrease over time.

All of this highlights the key advantage of the VAP compared with a fixed-benefit pension plan. Fixed-benefit pension plans are funded based on an assumed rate of return. If that assumption is realized, the amount funded will be sufficient to pay the promised benefits. Unfortunately, actuaries live in a world where they know actual experience will be different than their assumptions. The key is to have assumptions that are very close to experience. Asset returns have proven to be very difficult to estimate. Consequently, amounts initially funded to pay for fixed-benefit pension plans (the service cost) will always be too much or too little, depending on how asset returns actually play out. For VAPs, the self-adjusting nature of the benefit means that the initial amount funded (service cost) will be very close to the amount actually needed to fund the promised benefits. The actual returns no longer have any influence on whether the promised benefits can be provided with the assets available. (Note that this last comment is theoretical. Differences in the frequency of benefit adjustments and payment frequency can lead to small deviations from the theoretical answer.)

## **Applicability to Public and Multiemployer Sectors**

Indeed, public sector plans and multiemployer plans are looking for different approaches that limit risk and will find the VAP to have many attractive features, as Cooper points out. In fact, I was involved in the redesign of a public sector plan that ultimately chose a variable annuity design.

My continued hope is that consultants and employers will become informed about VAPs and include them in their decision-making process. While VAPs may not be the answer for all situations, informed decision-making is best, and the VAP should be a part of retirement redesign discussions.

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