



National Conference on Public  
Employee Retirement Systems

# NCPERS Research Series

April 2015



## What is the Cost of Transitioning from a DB Plan to a DC Plan?

**W**ill closing your Defined Benefit (DB) plan and moving some or all employees to a Defined Contribution (DC) plan be the promised panacea? If getting the most for each dollar going into the plan makes a difference in your decision making there is much to consider. If partnering with employees to create a secure retirement and to be active economic participants in your community after retirement is important, dig deeper. These outcomes are highly unlikely to occur with a DC plan being the primary retirement arrangement because research demonstrates that DC plans are at least 20% less efficient in delivering retirement benefits. Before making such a monumental change decide for yourself on the costs and merits of transitioning away from a primary DB Plan.

This paper examines the cost associated with transitioning from a defined benefit (DB) plan to a defined contribution (DC) plan. It also explores the cost difference of these two plan types in delivering retirement benefits.

### A Key Equation

As Glinda, the Good Witch says in *the Wizard of Oz*, “It’s always best to start at the beginning.” The beginning analysis for any and all retirement plans (regardless of plan type) is that for *any* retirement plan, over time, the benefits provided will equal the contributions made plus the investment income earned minus the expenses required. The following equation summarizes this fact:

$$B \text{ (BENEFITS)} = C \text{ (CONTRIBUTIONS)} + I \text{ (INVESTMENT INCOME)} - E \text{ (EXPENSES)}$$

This formula is true regardless of the type of plan (DB, DC, hybrid, IRA, or any other design one can imagine). Therefore, if the “cost” of a plan is equal

### Contents

Initial Transition Costs	2
Investment Return	3
Plan Expenses	4
Pooled Mortality	4
Comparison of DB and DC Delivery and Cost of Benefits	5
<b>Figure 1:</b> Cost of DB and DC plan as a percentage of payroll	5
<b>Figure 2:</b> Contribution rate required to provide equivalent retirement income	6
<b>Figure 3:</b> Comparative benefit provided by plans	7
<b>Figure 4:</b> Projected monthly benefit at retirement	7
Other Cost Impacts	8
Human Capital Issues	8
Given the Transition Costs, Why Switch?	9
To Transition or Not to Transition? Guidelines for Making a Decision	10
Summary	10

Illustration by: Adam Niklewicz © 2015 Stock Illustration Source

National Conference on Public Employee Retirement Systems

444 N Capitol St, NW • Suite 630 • Washington, DC 20001 • 202-624-1456 • 1-877-202-5706 • 202-624-1439 FAX • info@NCPERS.org



to the contributions made to the plan then any cost savings must come from one of the following:

- reduced benefits;
- increased investment returns; or
- lowered expenses.

So any “cost savings” due to transitioning from a DB plan to a DC plan must come from one of these sources. We will now examine each potential savings source in turn. Many hybrid plans include elements of a DB and a DC plan. In order to avoid complicating the discussion and cost analysis, this paper does not consider hybrid plans.

Let us examine the interaction among these elements of cost.

## Initial Transition Costs

Most public sector employers offer both a traditional DB plan, funded with employer contributions and most often employee contributions, and a DC plan, typically a §457 deferred compensation plan or §403(b) defined contribution plan funded with employee contributions. The fact that the basic DC plan account structure is in place may help avoid some initial transition costs. However, these plans are often administered independently by a separate entity. In that case, much of the initial transition cost may still exist.

Regardless, there will be some extra initial expense in transitioning to a DC plan. Establishing the structure to accept and account for employer contributions will be required. In addition, employee communication material will be needed to describe the expanded DC plan offerings. If current employees are given the option (or are required) to transfer to the new DC plan, significant communication pieces would be needed to fully explain the options available. In addition, the proper forms and election materials will need to be developed in order for a smooth transition.

Another potential liability increase that may occur at implementation, which is often overlooked until it occurs, results from earlier-than-expected retirements from the DB plan. This can be especially true if the transition to the DC plan is mandatory and includes all active employees. Those employees eligible for retirement may decide now is the right time to retire. Even if the change does not include current active employees, just the general upheaval can result in some eligible employees retiring earlier than had been anticipated.

---

*NCPERS wishes to thank Leon “Rocky” Joyner, ASA, MAAA, FCA, EA the primary author, as well as Cathie Eitelberg and Kim Nicholl FSA, FCA, MAAA, EA, of Segal Consulting for their research and assistance in drafting this paper. Their encouragement, determination and support helped move the financial reality of transitioning retirement plans from anecdotal knowledge to broad research-based information.*

---



Two other sources of transition cost have engendered much controversy recently. These are selecting the appropriate amortization period and investment return assumption for valuing the legacy unfunded actuarial accrued liability (UAAL). We will consider each in turn.

Amortization periods vary greatly from system to system. However, many of the systems that are considering transitioning from a DB to a DC plan are doing so because of budget issues and are amortizing their UAAL over relatively long periods. A mature, ongoing DB plan is by nature always middle aged. When a DB plan is closed to new entrants, it loses this perpetual middle aged characteristic and begins to age. Furthermore, the covered payroll for the legacy UAAL will begin to reduce as the number of covered active employees declines. If a system does not shorten its amortization and modify the amortization method, from level percent of pay to level dollar, the legacy UAAL will continue beyond the active working life of the legacy covered employees meaning that future generations of taxpayers will be burdened with this continued payment. Current actuarial profession guidance encourages such modifications to the amortization policy.

Since a closed system is no longer perpetually middle aged, in fact, it is no longer a perpetual system, care should be taken in estimating the expected rate of investment return for future years. In the same manner that financial counselors recommend clients in private DC plans gradually move toward more fixed income investments as they age, a closed DB plan will also age and should consider moving to more income producing investment as the cash flow needs of the system increase. As a closed DB plan ages, it will no longer have the perpetual investment horizon that allows time for portfolios to ebb and flow with investment cycles. Significant market downturns near the end of the working career of the plan, or individual, will be difficult or impossible to overcome with the shortened investment horizon. Actuaries recommend reducing the investment return assumption to recognize this change in the underlying mechanics of the system.

Depending upon the amount of underfunding at the point of transition, shortening the amortization period and reducing the investment return assumption can greatly increase the near term cost of the legacy DB plan. If these changes are not recognized in advance, then any system shortfalls will have to be made up by future generations of taxpayers from the general operating income of the plan sponsor.

## **Investment Return**

The distinct structures of the two types of plans result in significantly different investment characteristics. DB plans, by their very nature, pool investment risk across generations of taxpayers, as well as among current and former employees, with the investment risk predominately borne by the plan sponsor. As noted above, a mature, ongoing DB plan is, by nature always middle-aged. That is, the investment horizon remains relatively constant because group life expectancy is reasonably uniform. Even if the retiree population is gradually increasing faster than the active population (due to mortality improvements or employment reductions), the change in the investment horizon is significantly more stable than for an individual in a DC plan.



On the other hand, in DC plans, the investment risk is generally borne by the individual. As a plan participant ages, he or she faces an ever-shortening investment horizon. In practice, this means that participants in DC plans should be invested more conservatively during the years when their account balances are the largest (*i.e.*, as one approaches and after retirement). Moreover, in contrast to DB plans that benefit from pooled, professional investing with large economies of scale, DC plan participants tend to have limited investment knowledge and options, which magnifies the difference in investment returns compared to returns in DB plans.

The combination of these characteristics results in a significant difference in the investment return for the two plan types. Recent estimates indicate that switching from a DB plan's pooled investment structure to the individual retirement account structure in most DC plans will reduce investment returns from 1% to 2% over the life of the participant. This difference may grow larger as DC plan demographics mature and DC retirees invest more conservatively in retirement. Past studies have compared the returns of mature DB plans to demographically younger DC plans – and the DB plans significantly outperformed even with less favorable demographics.

Therefore, the so-called “savings” from switching to a DC plan do not come from increased investment return. In fact, investment return will likely be reduced.

## Plan Expenses

Recent studies have shown that the investment fees in a DB plan run from as low as 28 basis points to around 60 basis points depending on various factors. (A basis point is 1/100 of 1% used to briefly express differences in interest rates, *i.e.*, 1% equals 100 basis points.) An April 2011 paper, “A Role for Defined Contribution Plans in the Public Sector,” State and Local Pension Plans No. 16, Center for Retirement Research at Boston College, Chestnut Hill, MA., indicates administrative and investment expenses average 0.43% of assets for public sector DB plans and 0.95% for public and private DC plans.<sup>1</sup>

The “savings” do not come from reduced expenses.

## Pooled Mortality

A major strength of DB plans is that mortality experience is pooled. On average, each participant will receive roughly the same number of monthly payments. However, no one person knows precisely when he or she will die. In fact, some participants will live longer than their life expectancy and receive more payments and some participants will live shorter than their life expectancy and receive fewer payments. However, from the perspective of a DB plan, the participants on average will live to their life expectancy and, as a result, the expectation of payments is predictable and manageable. In a DC plan, converting the DC account balance to monthly payments is done on an individual basis, so that there is a pool of one participant. The participant must decide how long he or she wants the account balance to last. This is a daunting task to say the least. The participant can go to the market and purchase an annuity but the annuity will be priced to protect the annuity supplier

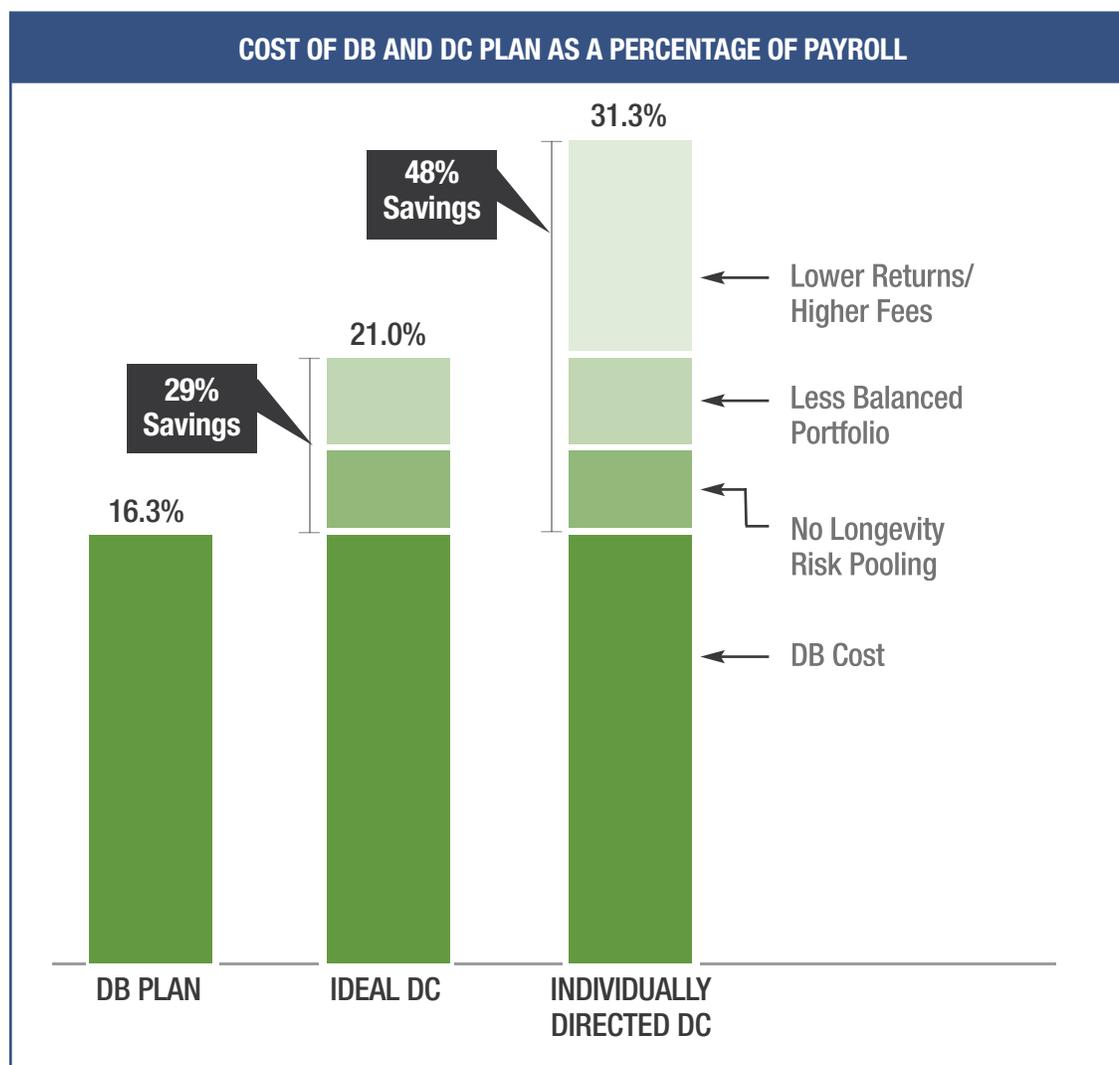
<sup>1</sup> Munnell, Alice H., Jean-Pierre Aubry, Josh Hurwitz, and Laura Quinby. “A Role for Defined Contribution Plans in the Public Sector.” State and Local Pension Plans (Center for Retirement Research) No. 16 (April 2011)



from loss. This increases the cost of the annuity relative to a pooled arrangement such as in a DB plan. In addition, insurance company pricing will likely reflect potential adverse selection if only a subset of retirees are choosing to purchase annuities.

### Comparison of DB and DC Delivery and Cost of Benefits

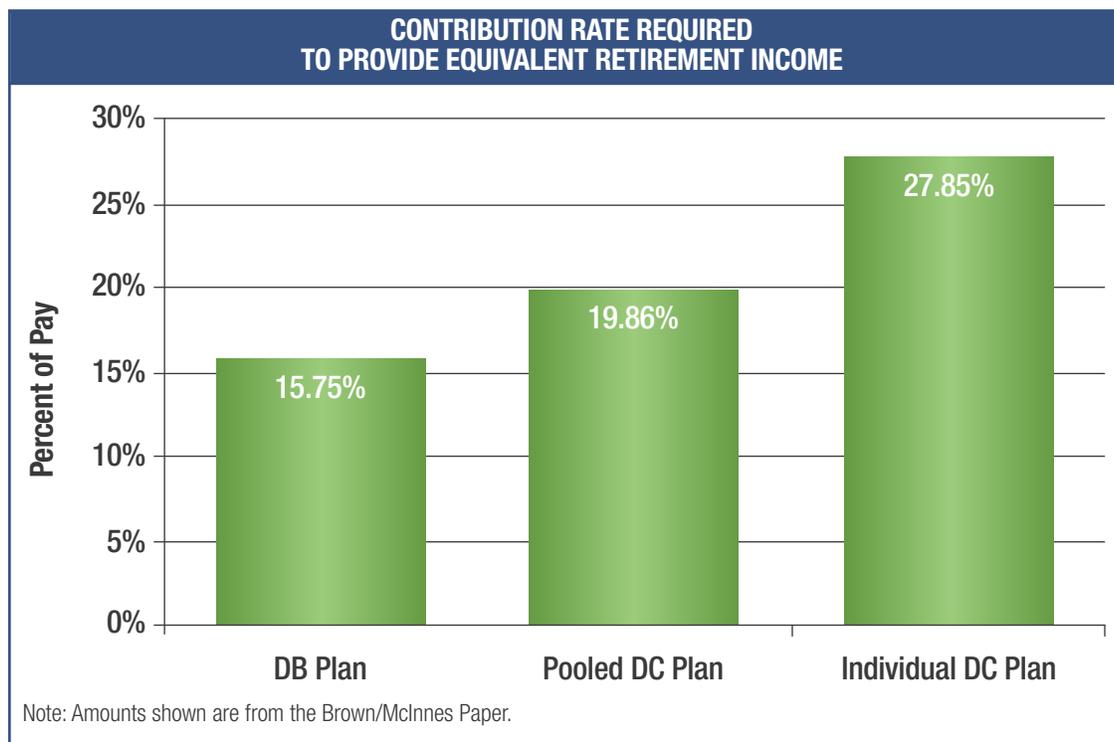
In 2008, the National Institute for Retirement Security (NIRS) prepared a paper, “A Better Bang for the Buck.” The paper showed that a DC plan would require 46% more in contributions to generate a similar target benefit stream as a DB plan. Conversely, DC contributions deliver about 65% of the benefit dollars that DB contributions deliver. In December 2014, NIRS released an update to the original 2008 study. This paper took into account improvements in the DC delivery of benefits referenced in the report as an “ideal DC”. The “ideal DC” plan has a pooled investment portfolio with mandatory annuitization at retirement. The paper found that the individual DC plan will cost 48% more than a comparable DB plan, which is very similar to the 2008 study. The ideal DC plan with all the improvements will still cost 21% more than a DB plan. The following chart comes from the NIRS paper, “Still a Better Bang for the Buck.”

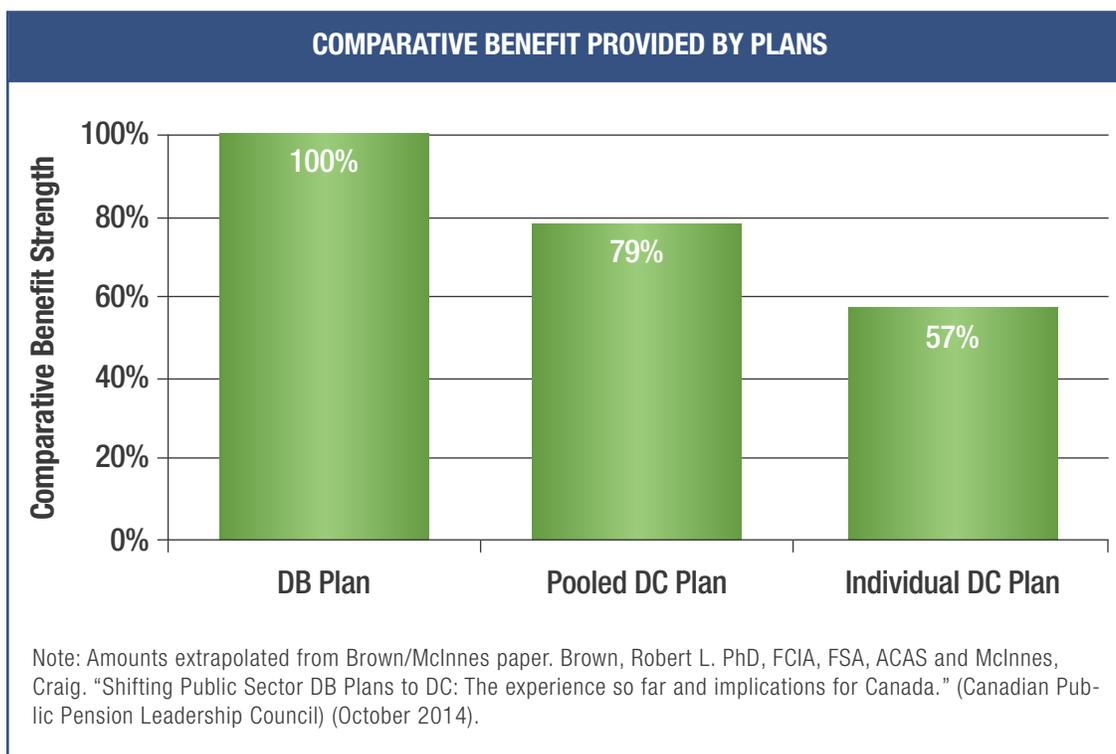




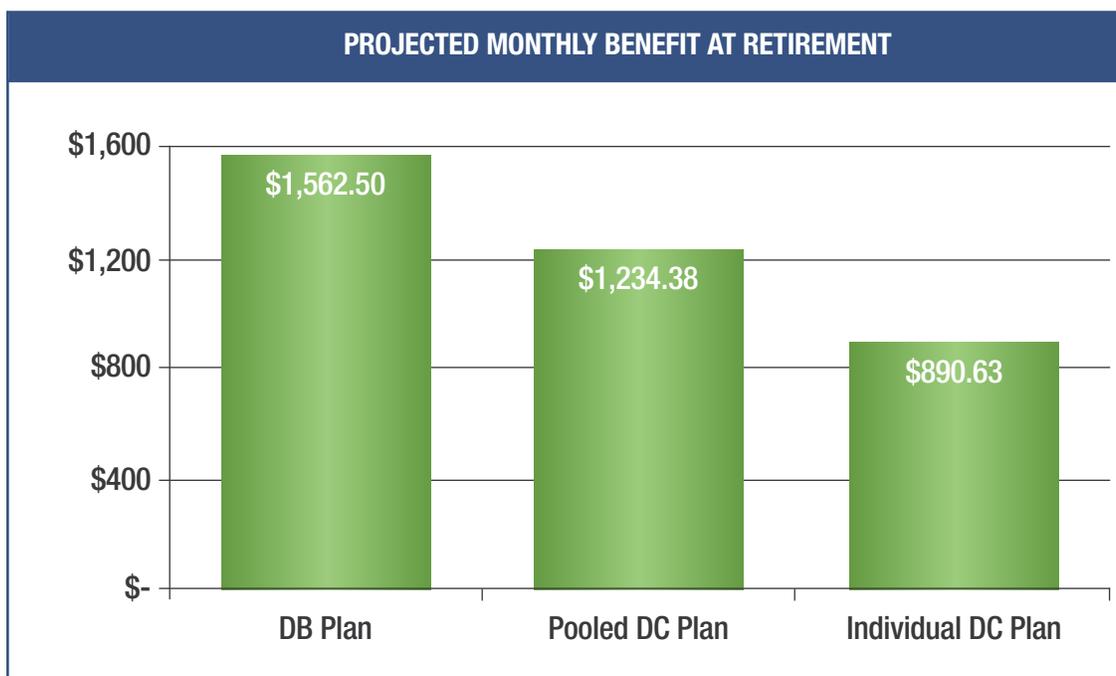
Reprinted by permission, “Still a Better Bang for the Buck: Update on the Economic Efficiencies of Pensions,” ©2012, National Institute on Retirement Security, [www.nirsonline.org](http://www.nirsonline.org)

On October 9, 2014, Robert L. Brown and Craig McInnes released a paper entitled, “Shifting Public Sector DB Plans to DC.” This paper acknowledged the earlier NIRS paper and expanded the DB/DC comparison to reflect recent advances in model DC plans. The Brown/McInnes paper refers to these as pooled DC models. The pooled DC model is similar to the “ideal DC” plan mentioned earlier in that it has a pooled, professionally administered investment portfolio with mandatory annuitization. The pooled DC model is expected to improve DC efficiency but is still predicted to be about 20% less efficient than a comparative DB plan in providing retirement income. The chart below illustrates these results. The first chart shows the contribution rate necessary to provide the same benefit. The second chart shows the percentage of benefit provided by the same contribution rate.





Another way to view the chart above is to compare the projected monthly benefit at retirement in a DB plan, a Pooled DC plan and an Individual DC plan. For illustration purposes, presume a DB plan with a 1.5% per year accrual rate, 25 years of service at retirement, and a final average salary of \$50,000. Further, presume that the DC plans each have the same contribution rate as the normal cost rate for the DB plan. This results in the following projected monthly benefits at retirement.





## Other Cost Impacts

If the legacy DB plan is “frozen” either to new entrants or for future service, additional costs may develop as the DB plan ages along with the plan population. This aging results in a shorter investment horizon. As cash flow needs rise, long-term stability vanishes and the plan needs investments with greater liquidity features. Without the addition of new employees, any fluctuations in the plan’s emerging demographic characteristics or economic results will be more acutely felt on a diminishing participant population.

Another cost consideration is the fact that DC plans are very inefficient vehicles for providing ancillary benefits, such as death and disability. Early in an employee’s career, DC accumulations are too small to provide meaningful benefits. Therefore, making a DC plan the only retirement plan will trigger a need to purchase long-term disability coverage and spousal death coverage outside of the retirement plan. That coverage is often more expensive than pooled coverage offered as part of a DB plan.

*In summary, any “cost savings” for plan sponsors associated with switching from a DB design to a DC design are due to reductions in employee benefits and shifting of risk to plan participants. There are hybrid design options that may more equitably share plan risk. That discussion is beyond the scope of this paper.*

## Human Capital Issues

Reducing contributions results in diminished participant benefits. As shown earlier, over time, Benefits equal Contribution plus Investment Return less Expenses. Since investment income is lower and expenses are higher in a DC plan, the benefits will be lower for the same amount of contributions. Thus, for an entity whose sole purpose is to supply services to its constituent base, reductions in retirement benefits can lead to changes in employee behavior, such as employees working longer than originally planned if DC benefits are not expected to support a desired standard of living in retirement. Alternatively, employees could cease employment earlier than desired since the DC balance would be available to them at an earlier age. Such changes in behavior will alter career expectations and staffing needs, including potential increases in training costs.

DB plans are often designed with specific career targets. One example is public safety with retirement ages that are often geared to specific age and service levels. In contrast, it is very difficult (and expensive) for DC plan designs to influence employee behavior.

## Given the Transition Costs, Why Switch?

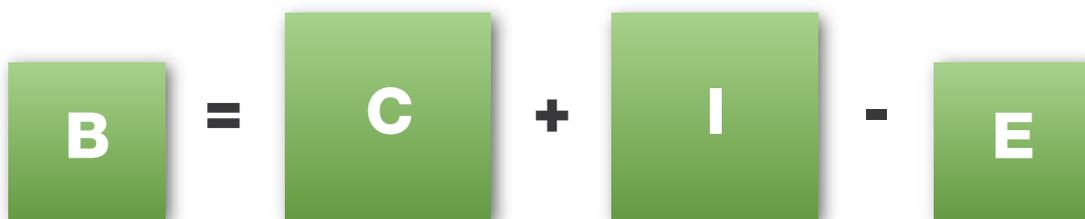
DC plans have one very significant and distinct advantage over DB plans: contribution stability. Whereas DB plans are prone to contribution volatility due to changing market and demographic conditions, DC plans have no such sensitivity to market changes. The reason DC plans are immune from contribution volatility is in the nature of the promise.

Returning to the formula mentioned at the beginning of this paper,  $B = C + I - E$ .



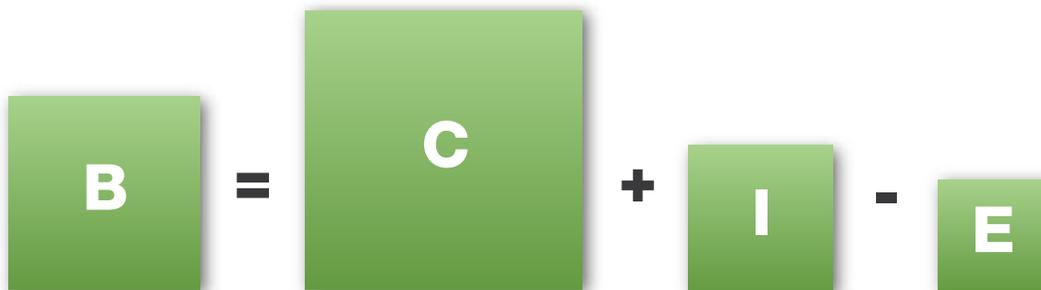
A diagram illustrating the formula  $B = C + I - E$ . The variables are represented by green squares. The square for 'I' is significantly larger than the squares for 'C' and 'E', and is the same size as the square for 'B'. This visualizes that in a DC plan model, 'I' is the dominant variable.

If C is constant and I goes down, B must go down. That is the DC plan model.



A diagram illustrating the formula  $B = C + I - E$ . The square for 'C' is significantly larger than the squares for 'I' and 'E', and is the same size as the square for 'B'. This visualizes that in a DB plan model, 'C' is the dominant variable.

If B is constant and I goes down, C must go up. That is the DB plan model.



A diagram illustrating the formula  $B = C + I - E$ . The square for 'C' is significantly larger than the squares for 'I' and 'E', and is the same size as the square for 'B'. This visualizes that in a DB plan model, 'C' is the dominant variable.



As a reminder, the promise in a DB plan is for a fixed benefit amount. In a DC plan, the promise is a fixed contribution rate.

In the DB model, if I goes up then C goes down. That is what happened in the long-ago 1990s. In the DC model, if I goes up, then B also increases.

## To Transition or Not to Transition? Guidelines for Making a Decision

The American Academy of Actuaries has established a set of principles to guide plan sponsors and participants in understanding the retirement promise and to assist in setting priorities. (Retirement for the Ages, January 2014<sup>2</sup>)

These principles called AGES are from the above document. The acronym stands for the following:

- **Alignment** – A retirement system should align stakeholder roles with their skills.
- **Governance** – Good governance provides a balanced framework for making and implementing good decisions.
- **Efficiency** – Systems should maximize retirement income while avoiding excessive risk.
- **Sustainability** – The system should be designed to support retirement income over all generations of participants while being able to withstand financial shocks, such as recession or prolonged inflation.

Alignment involves evaluating risk and determining which stakeholder is best able to deal with that risk. Governance should be transparent and understandable. Efficiency determines which plan (or combination of plans) best balances the retirement income target with risk that can be tolerated. Projections can be used to model how a system of benefits will perform under various economic conditions allowing the sponsor to incorporate features that improve plan sustainability.

## Summary

DC contribution dollars provide lower benefits than do DB contribution dollars. This is primarily due to the pooled nature of DB plans, particularly with regard to investment return and longevity.

Thus, transitioning from a DB to a DC plan for some or all employees does not by itself reduce contribution dollars. Any reduction in contribution dollars is due to reductions in employee benefits.

---

<sup>2</sup> “Retirement for the AGES: Building Enduring Retirement-Income Systems.” by Forward Thinking Task Force, American Academy of Actuaries. (January 2014).



DC plan contribution rates by design are insulated from investment market volatility and participant longevity. However, market fluctuations will directly influence employee benefits and retirement behavior.

Transitioning to a DC plan is not the panacea that some tout them to be. In considering such a move, an entity should take into account all facets that will affect the purpose and mission of the entity.

The Brown/McInnes paper includes three major points<sup>3</sup>:

- “If the motivation for a conversion to DC is to reduce costs, then it should be noted that shifting to DC actually increases the cost of delivering a comparable retirement benefit.”
- “If the motivation for a conversion to DC is to reduce government’s exposure to the financial risks associated with sponsorship of the pension plan, then it should be noted that other plan design options are available for reducing or transferring risk that do not require sacrificing the plan’s investment efficiency.”
- “If the motivation for a conversion to DC is to address an existing unfunded liability, then it should be noted that converting to DC does nothing to address past-service unfunded liability that a plan may have accumulated.”

---

<sup>3</sup> Brown, Robert L. PhD, FCIA, FSA, ACAS. and McInnes, Craig. “Shifting Public Sector DB Plans to DC: The experience so far and implications for Canada.” (Canadian Public Pension Leadership Council) (October 2014).



---

**National Conference on Public Employee Retirement Systems**

444 N Capitol St, NW • Suite 630 • Washington, DC 20001 • 202-624-1456 • 1-877-202-5706 • 202-624-1439 FAX • [info@NCPERS.org](mailto:info@NCPERS.org)