

Recent Trends in Canadian Defined-Benefit Pension Sector Investment and Risk Management

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- *Defined-benefit (DB) pension funds continue to account for the largest share of the assets of employer pension funds.¹ In recent years, many DB pension plans have become underfunded, prompting a reassessment of investment and risk-management practices.*
- *In Canada, as in other industrialized countries,² funding deficits have highlighted the challenges of managing the financial risks of older DB pension plans that have a high ratio of retired to active employees. There has been substantial growth in pension assets and liabilities as the workforce has aged and benefit obligations have accrued. Consequently, short-term volatility in pension fund returns can have an increasingly large effect on the financial status of the plan sponsor.*
- *In light of these challenges, there is a broader interest in liability-driven approaches to investment and risk management. This has not yet resulted in a significant reallocation of assets, but as funding improves and the workforce continues to age, pension funds could shift an increasing share of portfolio assets into fixed-income securities that provide a better match to plan liabilities.*
- *Low interest rates and reduced expectations for returns on publicly traded equities are also influencing pension sector investment, prompting many plan sponsors to invest in alternative assets and to shift more resources into active management.*

1. DB and defined contribution (DC) are the two basic types of benefit associated with employer pension plans. At the end of 2002, DB plans accounted for 92 per cent (\$512 billion) of the assets of trustee pension plans, compared with 7 per cent (\$42 billion) for DC and combined DC/DB. The focus of this review is on the DB pension sector, but it should be noted that there has been an increasing trend towards DC plans over the past 15 years.

2. DB pension sector underfunding is not unique to Canada. Beginning in about 2002, the DB pension sector became underfunded in other countries, including the United Kingdom and the United States.

Many Canadian defined-benefit (DB) pension funds³ have become underfunded in recent years, in sharp contrast to the late 1990s, when numerous pension funds had large actuarial surpluses.⁴ A severe downturn in global equity markets from 2000 to 2002 reduced the value of pension assets substantially because many pension funds had large allocations to equities. At the same time, a decline in long-term interest rates increased the present value of accrued pension liabilities.

Over the short term, continued improvement in pension fund returns⁵ and an increase in interest rates would help to alleviate pension underfunding. However, the deterioration in the financial health of DB pension plans has underlined various longer-term structural issues that could make it increasingly difficult for plan sponsors to manage the financial risks of DB plans.⁶ For example, improved longevity and generous benefits, such as an early-retirement

3. We examine both public (PS) and corporate (private) sector (CS) pension funds. PS plans are subject to somewhat different regulation, accounting, and incentive structures; however, they are generally funded similarly to CS plans and face common investment and risk-management issues. A key difference is that taxpayers assume the role of shareholders and could ultimately bear the cost of PS pension deficits.

4. The funded status of DB plans in the Canadian private sector is explored in Armstrong (2004). Note that many PS pension funds are underfunded as well.

5. Median nominal pension fund returns for a typical balanced fund were 13.5 per cent in 2003 and 10.1 per cent in 2004 (RBC Global Services).

6. A number of these issues pertain to weaknesses in the design and regulation of DB plans, a topic which is generally beyond the scope of this article. For a discussion of these issues, see Ambachtsheer (2004), Bonnar and Service (2004), and CGA Canada (2004). Note also that public consultations on the regulation of DB pension plans were launched this year by the federal government (for federally regulated pension plans) and by the Régie des rentes du Québec. See the respective websites for more details (http://www.fin.gc.ca/activity/consult/PPBnfts_e.html and http://www.rqgouv.qc.ca/en/programmes/rcr/consultation_financement.ht).

option, have increased the cost of providing a DB plan by lengthening the period for paying out the pension benefit. At the same time, the assets and liabilities of DB plans have grown substantially as the workforce has aged, sometimes equalling or exceeding the market capitalization of the firm. As we have seen in recent years, swings in pension fund performance can cause increasingly large unexpected cash contributions and adjustments to the financial results of plan sponsors.⁷

Investment strategies focused mainly on asset returns are giving way to a liability-driven approach to investment and risk management.

To better address these risks, a number of plan sponsors appear to be directing more time and effort towards aligning the funding of pension plans with investment policy. Investment strategies focused mainly on asset returns are giving way to a liability-driven approach to investment and risk management. The broad interest in this type of approach is tempered, however, by such factors as the need to eliminate funding deficits, a low yield environment, and changing investment beliefs. With regard to the latter, most fund managers expect that traditional asset classes will produce modest returns, at best, over the next decade or more, presenting a considerable challenge for returning pension funds to financial health.

Objectives and Scope

In this article, we examine how funding deficits, a greater focus on plan liabilities, a low yield environment, and changing investment beliefs are influencing investment decisions in the Canadian DB pension sector, which includes both public sector (PS) and private (corporate) sector (CS) funds. We focus on the main emerging trends and consider the implications for domestic financial markets. Over the past two decades, the assets of Canadian trustee pension funds, which include both DB and DC plans, have grown considerably, to a market value of

7. For example, off-balance-sheet debt, such as pension fund liabilities, is beginning to be reflected in the firms' credit rating. In 2002, Standard and Poor's downgraded the ratings of General Motors Corporation (GM) and Ford Motor Credit Company (Ford), citing pension deficits as the primary reason.

\$688 billion,⁸ equivalent to about 50 per cent of gross domestic product (GDP). Even a small reallocation of sector assets, for example, from publicly traded equities to long-term bonds, has implications for the efficiency and stability of financial markets and government borrowing programs.

Our findings draw heavily on interviews with industry professionals, since the existing data sources are limited, particularly with regard to investment policy and risk management. The information acquired in interviews complements that obtained from a literature review, selected PS pension fund annual reports, and an analysis of the available data sources.⁹ Interviews were conducted with representatives of selected public and private sector DB pension plans, multi-fund asset managers, the Canada Pension Plan (CPP), and consultants.¹⁰ The selection of interviewees was biased towards mid- to large-sized pension funds,¹¹ since these funds represent a large share of overall sector assets and tend to be innovative in investment strategy and risk management. Interviews were held with managers of PS pension funds and assets¹² that collectively totalled over \$280 billion at the end of 2003. CS pension funds were selected both on the basis of size and to include a broad cross-section of industry groups; these funds managed assets of nearly \$50 billion.

We begin by describing how DB pension plans are funded. This leads into a discussion of changing views regarding the equity-risk premium (ERP). We then examine the shift towards liability-centred approaches to investment and how these developments are beginning to influence pension sector investment in three related areas: a reduced exposure to publicly traded

8. As of 1 December 2004 (Statistics Canada). Trusteed pension plans (see De Leon 1995–1996) are the main type of employer pension plan, accounting for 70 per cent of assets. The figures do not include the assets of the Canada and Quebec pension plans.

9. The available data on actual sector investment is typically highly aggregated, unweighted to adjust for the size of the pension fund, and may not adequately reflect the pension sector's use of derivatives to gain exposure to various assets.

10. Interviews were held in December 2004 and early 2005 with staff of the three largest actuarial/investment consulting firms: Mercer Investment Consulting, Watson Wyatt, and Towers Perrin. Consultants at Greenwich Associates were also interviewed.

11. The funds were selected from the *Benefits Canada* list of top 100 pension funds, which represent about 85 per cent of the assets of trustee pension funds. Mid- to large-sized pension funds include those with assets above \$900 million.

12. Including the Caisse de dépôt et placement du Québec, which manages the assets of the Quebec Pension Plan (QPP) and provincial PS plans.

equities in the policy asset mix, an increased role for active management, and greater attention to asset-liability (A/L) matching. We then consider additional influences on the pension sector: the limited supply of long-term bonds, the elimination of the foreign-property rule, and the movement towards fair-value pension accounting and a financial-economics approach to actuarial valuation. We conclude with a brief discussion of how these developments could influence financial markets over the longer term.

DB Pension Funding

In a DB plan, the retirement benefit is typically based on a formula that can be linked to an employee's wages or salary and years of employment. Pension regulation generally requires that the employer set aside assets to pre-fund the obligations as they accrue, with a view to ensuring that plan contributions and investment returns are sufficient to cover future benefit payments. The financial and longevity risks are largely borne by the employer.¹³

Plan contributions are typically pooled as a fund.¹⁴ Plan sponsors aim to have their plan assets in the fund at least equal the present value of accrued liabilities, in accordance with regulatory requirements (see Box). It should be noted that plan liabilities are uncertain future obligations, linked to the specific terms of the plan and workforce demographics. Liabilities are estimated using several assumptions, including projected retirement age, expected longevity upon retirement, and wage and salary increases prior to retirement. In addition, liabilities are sensitive over time to emerging inflation, since the benefits of active employees are typically linked (directly or indirectly) to their wages, and retiree benefits are increased in line with some portion of price inflation by many plan sponsors. In effect, the plan liabilities are a stream of future cash flows that have similar characteristics to bonds. The values of both liabilities and fixed-income securities move inversely to changes in interest rates through

13. Longevity risk is the risk that plan beneficiaries will live longer, on average, than originally expected, increasing the time period for paying the benefit. Note that the employer is able to transfer some risks to the employees through increased contributions in a contributory plan or a reduction in pension or other types of benefit.

14. The term "pension fund" refers to total assets accumulated from plan contributions and the investment earnings on those contributions less benefit payments. "Pension plan" refers to the contractual arrangement that specifies the terms of the retirement benefits. A pension fund may manage the assets of one or more pension plans.

the discount rate used to determine their present value.¹⁵

It is the plan sponsor's fiduciary responsibility to select a mix of assets that, combined with the desired level of plan contributions, will generate sufficient returns to ensure that liabilities are funded. There is a linkage between the overall level of investment risk taken and the expected level of contributions. Riskier assets can generate a higher return, reducing plan contributions over the long term. At the same time, investing in riskier assets exposes the plan to a greater risk of a shortfall, which could require special plan contributions over the near term. Historically, plan sponsors believed that the expected incremental return from investing in equities instead of bonds more than compensated them for accepting the additional volatility of equities, since it would reduce plan costs in the long run.

The persistence of funding deficits in recent years is largely attributable to the interest rate sensitivity of pension liabilities.

During the 1990s, many pension funds increased their stock allocations. As a result, the decline in global equity markets at the beginning of the decade contributed to poor performance of the asset portfolio and DB plan underfunding. The persistence of funding deficits in recent years, however, is largely attributable to the interest rate sensitivity of pension liabilities. In 2003 and 2004, pension assets grew, mainly as a result of a recovery in global equity markets and an increase in plan contributions. But liability growth kept pace, owing in part to a continued decline in long-term interest rates (Chart 1).¹⁶ Consequently, the funded status of DB pension plans did not improve (Purcell 2005),

15. As a rule of thumb, consultants estimate that, for the average pension fund, a 1 per cent decrease in interest rates leads to a 10 per cent increase in the present value of plan liabilities.

16. Chart 1 shows the components of the Watson Wyatt Pension Barometer, constructed to provide a timely estimate (monthly) of the effects of expected asset and liability movements on the expected funding status of DB pension funds. The calculation is based on an index of DB pension plan liabilities, assets, and the funded ratio (asset/liability index) for a representative pension fund with an asset mix of 60 per cent equities and 40 per cent fixed-income securities and with retirees representing half of the liabilities.

Box

Key Regulatory Influences on DB Pension Funding

The sponsor of a DB pension plan must set aside assets to fund uncertain future obligations that will require payouts over several decades. The funding of plan liabilities is mainly influenced by pension regulations specifying minimum funding rules and by tax policy.¹ Typically, regulators require an actuarial valuation of assets and liabilities to be completed at a minimum of once every three years.² The actuarial values of assets and liabilities are compared to determine the funded status of the plan, which is typically expressed as a ratio. A pension plan is considered to be in surplus if the funded ratio of assets to liabilities, in percentage terms, is greater than 100, in deficit if the ratio is less than 100, and fully funded if the ratio is equal to 100.

Two types of valuation are required for regulatory purposes: a going-concern (funding) valuation and a solvency valuation.³ In the latter, assets are valued at market or fair value (with smoothing generally permitted over a period of up to five years) and wind-up values used for plan liabilities (i.e., there is no salary growth and the retirement age is assumed to be the age that maximizes the liabilities). Liabilities are usually discounted based on current market interest rates for Government of Canada bonds. Under existing provincial and federal legislation, plan sponsors must make special payments to eliminate any solvency deficiency within five years.⁴

1. At the federal level, pension funds are regulated under the Pension Benefits and Standards Act (PBSA) 1985, administered by the Office of the Superintendent of Financial Institutions (OSFI). The majority of pension plans are administered by provincial regulatory authorities. All provinces except Prince Edward Island have enacted pension benefits legislation with provisions similar to those of the PBSA.

2. Pension legislation is somewhat variable across jurisdictions. The discussion here is intended to present the most common practices.

3. Another type of valuation, an accounting valuation, is used to determine the pension expense reported in financial statements.

4. In 2004, the Government of Canada extended Air Canada's payment schedule for solvency deficiencies from five to ten years. Although that change applied only to Air Canada, the government intends to review ways to provide similar flexibility to all federal pension plans of companies under the protection of the Companies' Creditors Arrangement Act or the Bankruptcy and Insolvency Act. In 2003, New Brunswick amended the province's legislation to allow companies that meet certain conditions to make special payments to restore any solvency deficiency over a period not exceeding 15 years.

A going-concern valuation assumes that the plan will continue indefinitely. It is based on long-run values for plan assets that typically incorporate the ERP expected over the long term. This assumption of a long-term return on assets (ROA) may also be used to discount plan liabilities, since a market interest rate is not required. A going-concern deficit must be funded by the employer within 15 years.

If pension plans have a funding deficit, as many currently do, the shortfall must generally be made up with an increase in employer contributions. However, plan sponsors may also have the option of reducing benefits, increasing employees' required contribution rates (in contributory plans), or closing the plan.

For the plan sponsor, one of the most contentious issues in the regulation of DB pension plans pertains to surplus ownership and risk sharing. Under current pension legislation and trust law (absent specific language in the instrument creating the plan), surpluses generated beyond statutory requirements are shared with plan members, while deficits are seen as the sponsor's responsibility.⁵ This asymmetry of risk creates a disincentive for plan sponsors to build a surplus cushion⁶ as protection against a period of adverse market conditions and ultimately makes it more challenging for plan sponsors to offer DB plans.⁷

The recent Supreme Court of Canada ruling in the *Monsanto* case involving the interpretation of Ontario's pension legislation has further highlighted the issue of surplus ownership. The ruling requires an immediate distribution of a portion of any actuarial surplus on partial plan wind-up. In the past, legislation had been assumed to mean that

5. The asymmetry of risk is a complex issue and is not consistent across plans or regulatory jurisdictions.

6. There may be accounting incentives for doing so. See Wiedman and Goldberg (2002) and Zion (2002).

7. From the employee's perspective, there is a risk that promised pension benefits, which are a form of deferred compensation, may not be fully obtained. If there is a deficit in the future, the employee may be exposed to increased contributions, reduced benefits, or wage concessions as a result of the employer being forced to fund its pension deficit.

Box (cont'd)

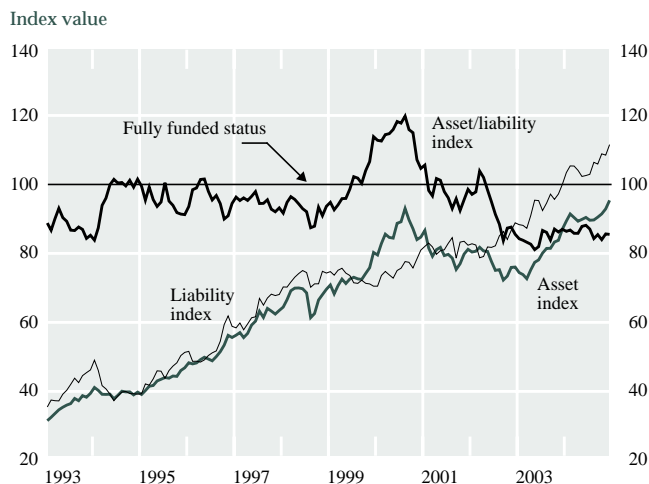
Key Regulatory Influences on DB Pension Funding

surplus distribution would occur at full wind-up when the final value of the plan assets and liabilities are known with certainty. Industry experts argue that plan sponsors affected by the recent *Monsanto* ruling will have even less incentive to target a surplus cushion in the future.

Another issue relates to the Income Tax Act (ITA) and the tax-exempt status of pension fund income. Under the ITA, if a plan has a surplus of assets over liabilities exceeding a specified regulatory threshold, sponsors may face a tax penalty if they do not

cease making contributions. During the 1990s, this situation occurred often, and surpluses that could have provided a buffer in later years were distributed to current employees and pensioners. However, until surplus ownership rules provide more certainty for employers, an increase in the regulatory threshold limit is unlikely to result in higher employer pension contributions and higher surplus levels for most medium- and large-sized CS pension plans.

Chart 1
Estimated Funded Status of a Typical DB Plan



Source: Watson Wyatt

and plan sponsors faced higher contributions.¹⁷ An increase in interest rates would reduce the present value of accrued liabilities, but the impact on funded status would also depend on the effect of higher interest rates on asset values.

17. Trusteed pension plan contributions more than doubled between 2000 and 2004, from \$12.4 to \$30.3 billion, following the resumption of regular contributions by many plans that had been taking contribution holidays because of previous funding surpluses and special payments to eliminate funding deficits (Statistics Canada).

Drivers of Change

Equity-risk premium¹⁸ (ERP)

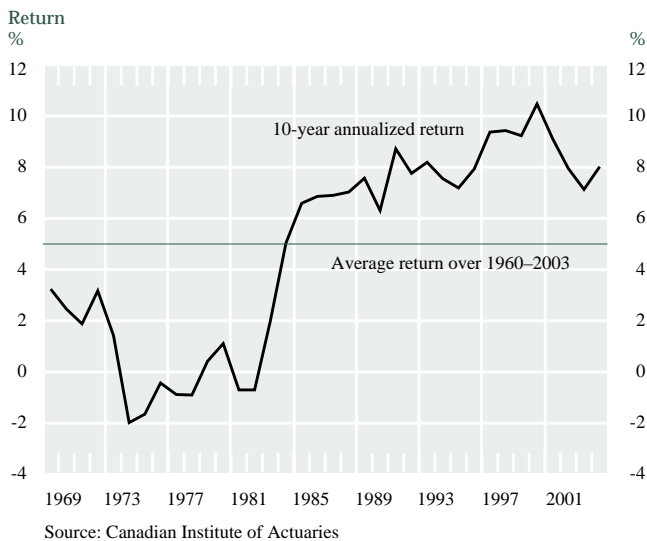
Plan sponsors have come to expect a substantial risk premium for investing in equities.¹⁹ This belief has been supported by accepted actuarial practices that assume the use of a long-term, stable ERP to value assets and, in many cases, liabilities as well. In recent years, these views have been challenged, particularly the desirability of using a static, long-term ERP. Research has suggested that the ERP is time varying across a wide range of values and that expected returns in future time periods vary, depending on the starting point (e.g., Arnott and Bernstein 2002). Nonetheless, considerable debate regarding the value and behaviour of the ERP continues.

From a practical point of view, many pension funds have reduced their ERP assumptions in recent years; those of the pension funds that we interviewed ranged from 2 per cent to 3.5 per cent over long-term bonds. More broadly, consultants commented that their clients are using an ERP of, on average, about 3 per cent. Several interviewees commented that they expect real pension fund returns over the next several years to be quite volatile and considerably lower than during the

18. The ERP is the expected excess return earned on equities relative to the risk-free interest rate. For a pension fund, the relevant risk-free rate is that of an instrument with the same duration as plan liabilities, typically proxied using the rate on long-term (>10 years) bonds.

19. As a result, the allocation to equities has tended to rise over time, exceeding 60 per cent for a number of pension funds during the 1990s stock market bubble.

Chart 2
Median Real Pension Fund Returns



1980s and 1990s, perhaps in line with those of the 1960s and 1970s²⁰ (Chart 2). Equity returns will likely depend on single-digit growth in earnings and dividends, since further expansion of the price-earnings ratio is unlikely. Given that yields are currently near historic lows, returns on fixed-income securities (nominal and real) are also expected to be modest.

Liability-focused investment

Historically, pension fund investment has tended to focus on asset returns.²¹ Interviewees indicated that, until recently, many plan sponsors did not fully appreciate the interest rate sensitivity of plan liabilities and the risks of a large mismatch in the characteristics of the plan's assets and liabilities.²² Investment tended to be asset-driven, with performance measured on a relative basis by comparing returns with those of the appropriate asset-class benchmark.²³ An acceptable return for the overall pension fund was typically

defined by comparing the plan's performance against the median of a universe of pension plan returns. Recently, liabilities have been driving pension fund investment and risk management to an increasing extent.

In a liability-focused investment framework,²⁴ the objective of the policy asset allocation²⁵ is the maximization of the surplus (assets-liabilities) at a given level of surplus risk (standard deviation of surplus). Conceptually, a minimum-risk portfolio (MRP) provides a starting point for a plan sponsor seeking to reduce the size and possibility of unanticipated swings in the surplus. This portfolio is composed primarily of fixed-income securities that respond to changes in interest rates and inflation, much like the present value of the liabilities. Using this portfolio as a base, the policy asset mix is then developed relative to this minimum-risk position, with the risks of deviating from the MRP clearly articulated. Performance is measured relative to plan liabilities rather than to the market. A key benefit is that this approach provides the plan sponsor with a much better framework for understanding how long-term funding and contribution rates are linked to strategic-asset allocation—in other words, how funding policy is linked to investment policy.

A handful of pension funds have adopted a risk-budgeting framework that applies the techniques of financial risk management to pension funds.²⁶ Since the systems for measuring and monitoring risk are quite complex and resource intensive, few pension funds have implemented a pure risk-budgeting system. However, many funds are taking a risk-budgeting approach in A/L studies, where plan sponsors determine the risk budget²⁷—the amount of risk that they want to take, typically defined as the maximum amount of surplus that could be lost in a year. The policy asset allocation is determined within the context

20. Over the 20-year period from 1964 to 1983, the median real return for a balanced fund averaged 1.2 per cent, based on data for a sample of pension funds.

21. Even though many pension funds engaged consultants to complete A/L studies, where both the assets and the liability cash flows are modelled to determine the appropriate policy asset mix.

22. Note that, at times, the focus on asset returns is a result of poorly designed governance and incentive structures, which, according to some industry experts (e.g., Ambachtsheer 2004), encourage the use of risky assets.

23. Managing risk relative to liabilities is somewhat more challenging, because liabilities are not market-based and are typically valued infrequently. For more detail regarding a liability-focused approach, see Waring (2004).

24. We use the term liability-focused investment as an alternative to A/L management to avoid a narrow interpretation. A/L (surplus-risk) management was applied to pension finance during the 1980s but was typically used in the restrictive sense of duration and cash-flow matching.

25. The principal tool used to manage risk. It determines the mix of assets that provide the greatest return for a given level of risk within the context of choosing the appropriate trade-off between expected contributions, pension expense, and long-term cost.

26. Risk budgeting is best suited to managing market and credit risk. See McCarthy (2000), de Bever (2003), and Urwin et al. (2001).

27. The risk budget, or surplus-at-risk (SAR), is defined in terms of the liabilities and is measured using value-at-risk (VAR). SAR is the amount by which the pension plan assets (policy asset allocation) might underperform the liabilities over a given period, at a specific confidence level (e.g., 95 per cent).

of the risk budget, that is, where best to undertake the risk, and in what amount.

Key Developments in Pension Investment and Risk Management

A greater focus on plan liabilities and reduced expectations for returns is affecting pension sector investment and risk management in three ways. First, a handful of large PS pension funds are beginning to modify their policy asset mix, reducing exposure to publicly traded equities in favour of alternative assets that enhance returns, reduce risk, and/or better match the long duration of plan liabilities. Second, limited A/L matching is being implemented in fixed-income portfolios to better manage funding risk. Finally, the passive management strategies that dominated pension investment in the 1990s are giving way to a renewed focus on active management. A related trend is towards freeing managers from benchmarks and specifying performance requirements in absolute rather than relative terms.²⁸

The policy asset mix

The emergence of funding deficits has prompted considerable debate regarding the appropriate asset mix. The policy asset allocation of the majority of Canadian DB plans has been close to a 60/40 (equity/fixed-income) split since about the mid-1990s.²⁹ While there is no apparent consensus regarding the “optimal” asset mix,³⁰ some interviewees believe that current equity allocations are excessive, particularly given changing beliefs regarding the ERP. That said, pension funds that stayed the course in 2003 and 2004 were rewarded by the recovery in equity markets, particularly in 2003.

Some pension funds are considering a change in the policy asset mix to reduce exposure to the volatility of returns on publicly traded equities. However, given low yields on fixed-income securities, they are implementing the change through an increased allocation to alternative assets, including real estate, private equity, hedge funds, infrastructure, commodities, and

timberland.³¹ For strategic purposes, alternative assets are increasingly viewed as a third distinct asset class, based on properties that distinguish them from publicly traded equities and fixed-income securities.³² They are incorporated into the asset portfolio as return enhancers, risk reducers, or both. Hedge funds, for example, have historically offered high returns but also provide diversification benefits, owing to the low or negative correlation of certain hedge-fund strategies with publicly traded securities. Alternative assets can also provide a better match to the long duration of pension liabilities.

Some pension funds are considering a change in the policy asset mix to reduce exposure to the volatility of returns on publicly traded equities.

Changing asset mix of selected large PS funds

For a handful of industry leaders, the asset mix has changed considerably over the past several years. Some large PS pension funds have reduced their exposure to publicly traded equities (and often to fixed-income securities as well) in favour of investments in alternative assets. To determine the extent of the shift, we reviewed the annual reports of the PS pension funds represented by the industry members that we interviewed.³³ We also included the CPP and the Quebec Pension Plan (QPP),³⁴ considering the large size of the assets under their management.³⁵ In aggregate, these entities managed assets of \$341.8 billion at the end of 2003 (\$259.3 billion if the CPP and QPP assets are excluded), or just under half of the assets of the

28. These trends are influencing the asset-management industry overall. See, for example, Bernstein (2003).

29. It should be noted that the 60/40 (equity/fixed-income) split is a simplification that is used mainly at the policy level. Many pension funds also had small allocations to other assets, such as real estate, cash, and private equity.

30. The optimal asset mix depends on several factors, many of them plan-specific. Recently, a long-standing debate as to whether pension funds should be invested primarily in bonds has been rekindled.

31. Some alternative assets are distinct asset classes, while others are best considered as investment strategies. Hedge funds, for example, are investment strategies using traditional asset classes, although they are often referred to as alternative assets.

32. The Ontario Teachers' Pension Fund has created an asset class based on liability-hedging properties. It includes infrastructure, Real Return Bonds, commodities, and real estate.

33. Included in this group are all pension funds known to have made large allocations to alternative investments.

34. The CPP and QPP do not have the same liability structure as DB plans, since they are only partially funded.

35. The CPP has made only a small commitment to date, but expects to increase the policy weighting to 20 per cent over the longer term.

Table 1

Aggregate Alternative Asset Allocations for Selected Large Public Sector Pension Funds and CPP/QPP, 2003

	\$ billions	%
Total assets	341.80	
Actual allocation		
Private equity	14.78	4.3
Infrastructure	5.59	1.6
Hedge funds and absolute-return strategies	13.28	3.9
Real estate	27.62	8.1
Total	61.27	17.9
Policy allocation*	101.61	29.7

* Annual reports do not consistently provide breakdowns of policy allocations for each alternative asset class.

Source: Annual reports

100 largest pension funds in Canada. We reviewed actual investment in alternative assets as well as long-term policy asset allocations (Table 1).

Actual investment in alternative assets accounted for nearly 18 per cent of the aggregate assets of these pension funds, representing over \$60 billion in four asset classes: real estate, hedge funds, infrastructure, and private equity.³⁶ The range of investments in each fund was quite broad, however, from a low of less than 1 per cent³⁷ to a high of 37 per cent. Table 1 also shows the aggregate policy asset allocation across the pension funds. The policy asset allocation is the *desired* level of investment in alternative assets. In aggregate, the pension funds plan to invest 29.7 per cent of total assets (\$102 billion) in alternative assets, but to date have only invested 18 per cent (\$61 billion). Note that the annual reports provide very little detail regarding the target allocation across each individual type of alternative asset.

Next to real estate, which is held by all of the pension funds, private equity is the most common investment. Like real estate,³⁸ private equity is not a new asset class for pension funds; some have been invested since at least the early 1990s. Recently, the magnitude of actual and planned investment has increased; many of the pension funds plan to allocate

36. Some pension funds have modest investments in other alternative assets, such as timberland and commodities.

37. The pension fund with the extremely low allocation had just begun to consider alternative assets. If this fund is removed, the lowest allocation among this group is 5 per cent.

38. Several pension funds and asset managers have established real estate subsidiaries. Some are using leverage in real estate investment by issuing debt through these entities.

up to 10 per cent of their portfolio to the class. They are also investing across a broader range of private equity subclasses, including venture capital, which is the riskiest form of private equity investment.

Although investment in hedge funds is a form of active management, these funds were included in Table 1 along with other alternative assets because a number of the pension funds are allocating capital to them within the policy asset mix. (Note also that Table 1 does not distinguish between investment in externally managed hedge funds and internal absolute-return (AR) strategies implemented by pension fund staff³⁹ because not all pension funds provide a breakdown between the two.) With the exception of the Ontario Teachers' Pension Plan (OTPP), investment in hedge funds has been quite modest.⁴⁰ At the end of 2003, OTPP had invested 5.4 per cent of its assets (\$4.1 billion) in hedge funds, making it one of the largest such investors globally (Adamson 2004). Their use of AR strategies in-house accounts for a larger share of this type of investment (\$6.6 billion, or 9 per cent of assets). If Table 1 is adjusted to exclude OTPP's AR strategies, the aggregate percentage allocated to alternative investments falls to about 15 per cent of total assets.

Infrastructure is a relatively new asset class, consisting of large investments in public infrastructure; for example, toll highways, airports, power plants, and bridges. The asset class provides stable cash flows that are weakly correlated with public markets and a good inflation hedge, particularly in regulated industries. Infrastructure investments are long term, often 30 years or more, matching the long duration of pension liabilities. Globally, Canadian pension funds were among the first to invest in the asset class. Some have made large, direct investments in infrastructure projects in the United Kingdom through partnerships and joint ventures (Capon 2005) and, more recently, in the United States.

One of the more interesting findings shown in Table 1 is the large discrepancy between actual investments and long-term policy asset allocations. Several factors account for the challenges of achieving the desired weighting of alternative assets. First, many alternative assets are quite complex, involving a steep learning curve. Investing in these assets requires a long lead time to complete due diligence, educate plan sponsors,

39. At least five of the pension funds or asset managers use AR strategies in-house.

40. This applies to the sector overall. Tremblay (2004) estimated that Canadian pension funds have invested a total of \$10 billion in hedge funds. This compares with \$8.2 billion estimated by Greenwich Associates.

and set up the appropriate infrastructure for investment and risk management. We found that actual asset allocations were closest to policy weightings for pension funds that had made initial small investments in the early to mid-1990s. These funds were further along the learning curve, which facilitated the large increase in actual investment that has occurred since the beginning of the decade.⁴¹ Several pension funds that we interviewed were just beginning to make initial investments in alternative assets other than real estate. For these pension funds, it may be years before actual investment matches the policy allocation.

One of the more interesting findings . . . is the large discrepancy between actual investments and long-term policy asset allocations.

Other reasons for the discrepancy between policy and actual asset allocations include a lack of good investment opportunities, owing to a smaller universe of investable assets relative to public markets; high current valuations; and a limited supply of top-tier managers. With regard to the latter, interviewees frequently commented that the high returns associated with alternative assets are limited mainly to top-quartile managers. Median returns are modest across many alternative assets.⁴² Also cited was the 30 per cent foreign-property limit designated under the Income Tax Act (ITA), which will be discussed in more detail below. Large PS pension funds frequently invest in private equity and infrastructure through limited partnerships. Although most pension fund investments in private equity, hedge funds, and infrastructure tend to be non-domestic, limited partnerships are generally deemed foreign property under the ITA, even if all aspects of the partnership are fully Canadian.⁴³

41. A handful of pension funds or asset managers have specialized in a particular type of alternative investment, such as private equity, infrastructure, or hedge funds. These pension funds have enjoyed distinct first-mover advantages. At the extreme, OTPP, for example, which seems to have made early initial investments across all types of alternative investments, was able to more than double its investment between 1999 and 2003. OTPP currently has the highest allocation (about 40 per cent).

42. Median returns for some alternative assets can sometimes be lower than returns for publicly traded equities.

43. Unless they meet the conditions of qualified limited partnerships (QLPs). Recent changes to the definition of QLPs have made them more investment-friendly, but they remain an administrative burden for private equity firms, which prefer to use the more common limited-partnership structure.

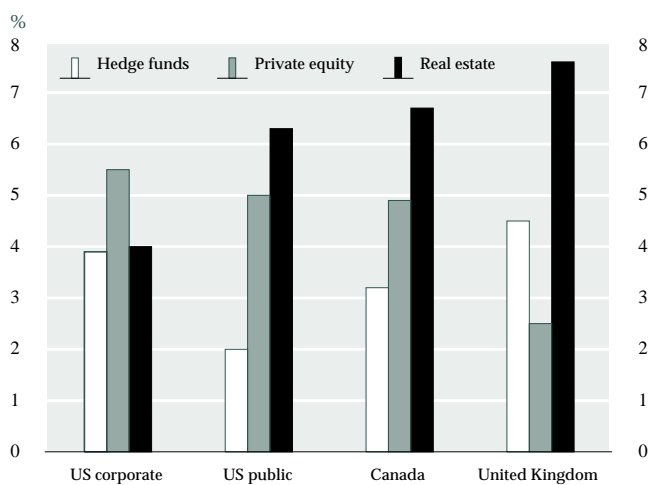
Asset mix within the sector overall

Investment consultants commented that most CS pension funds and smaller PS funds are also reviewing their investment policies with respect to alternative assets. Although they would like to allocate 5 to 10 per cent of their assets over time to reduce risk and add incremental return, to date, the policy asset mix for most pension funds remains close to the traditional 60/40 split.

Apart from the largest PS pension funds, funds currently invested in alternative assets have generally made actual allocations of no more than 3 to 5 per cent of total assets. Typically, they have made a small investment in private equity or hedge funds through funds-of-funds structures,⁴⁴ or real estate. Most pension funds are still early in the process of conducting due diligence and educating plan sponsors. Furthermore, most plan sponsors are taking a prudent approach, making small initial investments to determine whether they have sufficient resources to effectively and efficiently manage the asset class. According to Greenwich Associates, actual investment in alternative assets (private equity, real estate, and hedge funds) nearly doubled between 1999 and 2003, but still represented less than 10 per cent of total assets, most of which were invested in real estate.⁴⁵

Chart 3 shows investors' average allocation to alternative assets, including the largest pension funds, grouped

Chart 3
Average Allocation to Alternative Assets*



* Calculated for invested funds only and not the entire sector
Source: Greenwich Associates

44. Interviewees commented that investment in 20 to 30 individual investments is required to diversify risk—one reason why funds-of-funds structures have become so popular. Only the largest pension funds have the capacity to economically invest directly.

45. Based on interviews with about 270 pension funds.

by asset class. Figures for Canada and the United Kingdom include endowments and foundations, although these entities account for only a small share of the aggregate investment. Canadian investors holding alternative assets have an aggregate allocation of about 15 per cent overall. Reflecting, in part, pension sector developments similar to those underway in Canada, investors in the United States and the United Kingdom are also increasing their allocation to alternative assets. Currently, weightings are similar to those of Canadian investors.

Limited A/L matching

As noted, although there is greater interest in asset-liability (A/L) matching, few pension funds have reduced their allocation to equities in favour of fixed-income securities. As we have seen, some pension funds have achieved a limited extension in the duration of their portfolios by investing in certain types of alternative assets. As well, a number of pension funds are implementing a limited form of duration matching (one of the two main types of A/L matching⁴⁶), by extending the duration of their fixed-income portfolios.

Duration matching is accomplished by investing in assets whose duration matches the average duration of the plan liabilities. At the extreme, a plan sponsor could attempt to hedge out (immunize) the liability completely by investing the entire portfolio in matching fixed-income securities, which is similar to purchasing an annuity.⁴⁷ However, this strategy presents practical challenges; for example, the supply of longer-duration fixed-income securities, particularly Real Return Bonds (RRBs), which provide the most effective match for plans indexed to inflation, is limited. The choice of instrument used to hedge the liabilities also depends on how the liabilities are measured, including, for example, whether future salary increases are incorporated. Fixed-income securities are best suited for hedging liabilities that are known with a high level of certainty, one reason why it is possible to immunize terminated DB plans.

46. Duration is a measure of interest rate sensitivity. Matching the average duration of plan assets and liabilities is a hedge against movements in interest rates. Cash-flow matching links cash flows from bonds with expected pension payments.

47. Originally articulated by Black (1980) and Tepper (1981), this view is referred to as the financial-economics approach. The argument for holding an all-bond portfolio is developed in terms of the capital structure of the firm, considering tax policy and shareholder interests. Proponents of this view typically point to the example of Boots in the United Kingdom, which put all of its assets into fixed-income securities in 2001. Boots was able to do this because at the time it had a very large funding surplus. It has since added a small share of equities to the policy asset mix.

A/L matching is also costly, given current low interest rates. The return on a matched portfolio would be insufficient to meet most funds' target return on assets (ROA) or long-term funding target, requiring plan sponsors to increase contributions and expense recognition substantially over the long term. PS pension funds, for example, typically need to earn a minimum real return of about 4 to 5 per cent. At the end of 2004, the yield on the benchmark RRB was substantially lower, at about 2 per cent.

Based on our interviews, Canadian pension funds are not undertaking full A/L matching. However, they are achieving greater matching at the margin by extending duration in their fixed-income portfolios. The average duration for pension plan liabilities ranges from about 10 to 20 years, but historically, the majority of pension funds have benchmarked their fixed-income portfolios to the universe of bonds, whose duration is much lower. Several pension funds are reducing the duration gap by benchmarking the portfolio to long bonds.⁴⁸ Consultants believe that pension funds are likely to increase the level of A/L matching once funding deficits are eliminated.

Passively indexing to market benchmarks is no longer expected to generate sufficient returns to meet targets.

Active management

Active management is assuming a more important role in pension investment. Given reduced expectations for returns in public markets, passively indexing to market benchmarks is no longer expected to generate sufficient returns to meet targets.

In contrast to passive management, which focuses on earning market returns (beta), active management focuses on earning returns regardless of market direction (typically referred to as earning alpha). Alpha is generally expressed as the excess, or incremental, return over the designated asset-class benchmark. Active management relies on managers having superior skill or information that can be used to beat the market. The more efficient the market, the more difficult this

48. For example, at the end of 2004, the Scotia Capital Universe Index had a duration of over six, while the Long Bond Index had a duration of over 12.

tends to be. Managers who exceed the market benchmark do so at the expense of others, since they are betting against each other in a zero-sum game. Finding managers who can consistently outperform their benchmark is the major challenge.

Investment consultants commented that most pension funds are finding it necessary to shift more resources into active management in order to meet return targets, which they are accomplishing in a variety of ways, such as investing in hedge funds and private equity, increasing the number of active mandates, and using overlay strategies. Active management is increasingly viewed as “separable” from the policy asset allocation. Historically, pension funds actively managed the policy asset class but, now, through the use of derivatives, they are able to separate active management from the policy mix.⁴⁹ The most significant departure from past practices is in the use of AR strategies, including investment in hedge funds, changes in the mandates of traditional asset managers, and the use of these strategies in-house. As noted earlier, many large PS pension funds are allocating a growing share of their active risk budget to in-house AR strategies.

The objective of AR investment strategies is to generate positive returns, regardless of the movements in the markets where the asset classes are invested. While traditional asset managers have been constrained to relative performance against asset benchmarks, AR strategies have been the domain of hedge funds, since they are not limited to asset benchmarks or to using long-only strategies.

Other Influences

Limited supply of long-term bonds

There is a limited supply of nominal bonds and RRBs to accommodate increased pension sector demand for purposes of A/L matching. Table 2 shows the supply of marketable long-term Government of Canada (GoC) bonds and the assets of trustee pension funds.⁵⁰ (Note that the longest-maturity bond currently issued by the Government of Canada is 30 years, for both nominal bonds and RRBs.) As indicated, the supply of bonds outstanding is small⁵¹ relative to the large size of pension sector assets. Interviewees consistently commented that they would like to see more issuance

49. This view of active management is typically referred to as “portable” alpha.

50. Note that the assets of trustee pension funds do not include those of the CPP or QPP.

51. There are also provincial and corporate issuers of long-term nominal and inflation-linked bonds, but the supply is a small fraction of GOC bond issuance.

Table 2

Government of Canada Long-Term Bonds and Pension Sector Assets at Year-End (Can\$ billions)

	2004
Nominal bonds, 10 yrs +	58.8
Real Return Bonds	18.7
Assets of trustee pension plans	688.0

Source: Bank of Canada, Statistics Canada

of RRBs to augment this supply, as well as issuance across a wider range of maturities to create an RRB yield curve.⁵² Given the challenges the federal government is already facing to maintain the existing supply in the face of falling borrowing requirements and issuance, it is unlikely that the demand from pension funds will be met unless other provinces or corporations decide to issue these types of securities.⁵³

Foreign-property rule (FPR)

In its 2005 budget, delivered in February, the federal government announced that it would eliminate the foreign-property rule (FPR) of the ITA, effective immediately.⁵⁴ The FPR set a ceiling on the share of the book value of assets that tax-deferred retirement plans (Canadian pension plans, registered retirement savings plans, and registered retirement investment funds) can invest outside of Canada. The ceiling had been incrementally increased from the original 10 per cent in 1971 to 30 per cent in 2001. In practical terms, however, many pension funds were able to exceed the limit by using derivatives to establish foreign content.⁵⁵

In our interviews, the FPR was the most frequently cited constraint on investment. Interviewees commented that it was costly to circumvent, particularly for smaller pension funds, and created inefficient structures and suboptimal investment portfolios. As pension sector assets have grown, competition for domestic assets has increased, particularly now that the CPP is partially funded. The Toronto Stock Exchange represents about 3 to 4 per cent of global equity markets and is concentrated in a limited number of sectors,

52. Note that these views are a subset of those addressed in the regular debt market consultations (footnote 53) and in the recent “2003 Market Consultations on Real Return Bonds: Summary of Comments,” available at http://www.bankofcanada.ca/en/notices_fmd/2003/market_consult03.html.

53. The Government of Canada conducts regular debt market consultations when it is determining its yearly borrowing program, which is outlined in its annual Debt Management Strategy. For the latest report, see <http://www.fin.gc.ca/toce/2005/dms05e.html>.

54. The budget bill (C-43) received Royal Assent on 29 June 2005.

55. Derivatives are not treated as financial assets.

making portfolio diversification difficult to achieve in the domestic market. In recent years, as we have already noted, the FPR was also constraining investment in domestic and foreign alternative assets.

It is difficult to assess how the removal of the FPR will influence pension investment, and to what extent. Although the benefits of international portfolio diversification are well known, institutional investors continue to exhibit a strong home-country bias. In the absence of the FPR, it is unclear how much investors would wish to increase their holdings beyond 30 per cent. Those wanting higher exposure, mainly larger pension funds, were already able to legally circumvent the limit using derivatives (e.g., foreign-equity futures or swaps).

The elimination of the FPR is providing the occasion for pension funds to review their foreign-currency hedging practices.

Most interviewees felt that elimination of the FPR was likely to have the greatest impact on fixed-income markets. Historically, aggregate sector investment in non-domestic fixed-income securities has been less than 5 per cent of total foreign investment. The elimination of the FPR makes it possible to hold foreign fixed-income securities directly within a more diversified global bond portfolio. It also broadens the universe of long-duration bonds (nominal and inflation-indexed) available to pension funds seeking greater A/L matching, although this may introduce more complications. For example, matching liabilities denominated in Canadian dollars with assets denominated in foreign currencies exposes pension funds to adverse relative movements in inflation, interest rates, and currencies.

The elimination of the FPR is providing the occasion for pension funds to review their foreign-currency hedging practices. During interviews it was clear that current practices varied considerably across funds. Most pension funds tend to hedge only U.S.-dollar assets, but the share of assets hedged varies from 20 per cent to 50 per cent. Note that the average Canadian pension fund holds more than 10 per cent of its assets in U.S. equities, and that several pension funds are also invested in other U.S.-dollar assets, such as hedge funds, private equity, and infrastructure. If allocations

to foreign assets increase, it could lead to an increase in currency hedging.

Accounting standards and actuarial practices

The growing focus on corporate governance by shareholders, ratings agencies, and regulators has renewed a long-standing push for greater transparency in pension accounting and comparable global standards. Practices such as delayed recognition of actuarial and investment gains and losses, the smoothing of plan assets, and the use of expected rather than actual returns to calculate pension expenses tend to obscure the actual value and performance of the pension fund and the firm in any given period.⁵⁶ While the United Kingdom and, more recently, Europe have recently adopted new accounting standards that address some of these issues,⁵⁷ this has not yet occurred in Canada and the United States, where reform has been mainly limited to improving disclosure.

However, in April 2005, the Canadian Accounting Standards Board (AcSB) launched a consultation process to solicit views on its plans to make Canadian Generally Accepted Accounting Principles (GAAP) consistent with the standards of the International Accounting Standards Board (IASB). If the AcSB proceeds with this initiative, a move towards fair-value pension accounting is likely. Most observers believe this would accelerate the shift to DC plans for corporate sponsors, owing to the considerable volatility in earnings that it is likely to create.⁵⁸

Many of the criticisms of pension accounting are also being applied to actuarial standards of practice. Particularly contentious are the smoothing of asset and liability values and the use of an ERP rather than a market interest rate to discount plan liabilities.⁵⁹ A debate currently underway within the actuarial profession concerns the relative merits of traditional actuarial practices that tend to obscure the economic value of

56. For simplicity, accounting changes that remove these effects are collectively referred to as fair-value accounting. For a discussion of recent and anticipated changes in worldwide standards for pension accounting and how they are likely to influence pension sector investment, see Fore (2004).

57. Financial Reporting Standard (FRS) 17 and International Accounting Standard (IAS) 19. IAS 19 is widely used in Europe.

58. The introduction of fair-value accounting in the United Kingdom is cited in the large number of DB plan closures in recent years.

59. Actuaries can reduce the funding liability by assuming pension assets will earn an ERP. On the basis that the pension assets will earn a premium, actuaries use a higher discount rate when calculating the present value of the funding liability, which decreases the value of the liability. Effectively, the higher the ERP (or the more risk a fund takes on the asset side of the balance sheet), the lower the additional funds required to hedge that risk.

the pension fund and the valuation principles of financial economics.⁶⁰ At the heart of the debate is the issue of whether the pension fund and, ultimately, the corporate financial statements should be subjected to the volatility of marked-to-market values. Following a rationale similar to the one used for pension accounting, traditional actuarial practices such as smoothing have historically been intended to help alleviate the short-term effects of market volatility on what is essentially a very long-horizon investment. The outcome of the debate will have considerable influence on the investment behaviour of pension funds, owing to the central role of actuarial valuation in pension investment, risk management, sector regulation, and even financial reporting.

Implications for Financial Markets

Over time, more pension funds may shift towards liability-driven investment and risk-management practices. This would clearly have implications for financial markets, given the potential for a fairly large reallocation of assets as the workforce ages and pension funds mature.

The reduction in the allocation to publicly traded equities observed in large PS pension funds could gradually occur in many more pension funds. Over the short term, this reallocation is likely to be constrained by low interest rates and an attempt to earn high returns to eliminate funding deficits. The extent to which a reduction in publicly traded equities can be offset with an increased allocation to alternative assets is limited. Not only is the universe of alternative assets small relative to publicly traded securities, these investments are much more challenging to manage, particularly for smaller pension funds. Also, the high historic returns that are currently driving investment decisions are likely to diminish as these markets become more efficient.

The demand for longer-duration fixed-income securities could increase substantially as pension funds manage the risks of older plans where the stream of benefit payments becomes more certain.⁶¹ The demand of DB pension funds for fixed-income securities could also be augmented by demand from retirees who wish to reduce equity allocations in their RRSPs and DC plans.

60. For a detailed discussion of some of the issues, see Society of Actuaries (2004).

61. The first wave of the large baby-boom cohort will begin to retire in 2010. DB pension plans will have increasingly fewer active members than retirees.

Some governments have begun to issue longer-maturity bonds, partly in response to pension sector demand; 50-year bonds have recently been issued in the United Kingdom and in Europe.⁶² Given the limited supply, the additional demand may contribute to a distortion of the yield curve. Indeed, it has already been cited as one of the factors behind the recent pressure on the long end of the U.S. yield curve. In Canada, pension sector demand for RRBs has been particularly strong relative to supply, which is one explanation offered for recent distortions in RRB yields.⁶³ Interviewees consistently commented that they would like to hold more RRBs for purposes of hedging liabilities.

As noted, there is a limited supply of long-term bonds outstanding relative to pension sector assets. Although the federal government has maintained its commitment to 30-year bonds and RRBs against a backdrop of debt reduction and reduced bond issuance, there are no plans to increase issuance from current levels. In its *Debt Management Strategy 2005–2006*, the government indicated that while it will continue to target a gradual reduction in the share of fixed-term debt to lower public debt charges (by increasing the issues of treasury bills while reducing the bond program), it has made a commitment to maintain issuance of RRBs in 2005–2006 at a level similar to the \$1.4 billion issued in 2004–2005. The elimination of the FPR may address some of the supply concerns. However, some interviewees were reluctant to hedge their Canadian-dollar liabilities, domestic inflation surprises, and domestic interest rate moves using foreign securities. These risks must be thoroughly researched, since they may offset the benefits of A/L matching, which aims to hedge the plan against movements in interest rates and, in the case of indexed plans, inflation. If cross-country shifts in the yield curve and changes in inflation are not comparable, the objective will not be achieved.

The adoption of fair-value accounting has the potential to introduce considerable volatility to the financial statements of corporate plan sponsors. This could prompt a reallocation of assets into fixed-income securities that provide a better match to plan liabilities and reduce volatility. It could also accelerate the shift away from DB plans, as it has in other countries.

62. At least one issuer is structuring a bond to manage longevity risks.

63. Reid, Dion, and Christiansen (2004) noted that these distortions limit the usefulness of the spread between nominal bonds and RRBs as an indicator of inflation.

Conclusion

Developments in the past few years have underlined the financial risks inherent in DB pension plans. Many Canadian pension plans appear to be taking steps to better manage these risks by increasing their understanding of pension obligations and the volatility of the returns on their pension portfolios. For the majority of pension funds, however, this has not yet resulted in

significant changes to their policy asset allocations or investment strategies. Given the sector's conservative nature, it is likely that a reallocation of pension sector assets will progress gradually. As the workforce ages and DB pension funds continue to mature, more assets could be shifted into fixed-income securities that better match the duration of liabilities and benefit payouts.

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