

Reports

Introduction

Reports address specific issues of relevance to the financial system (whether institutions, markets, or clearing and settlement systems) in greater depth.

Maple Bonds are defined as Canadian-dollar bonds issued by foreign borrowers in the Canadian market. In his article, **The “Maple Bond” Market**, James Hatley examines what has become the fastest-growing sector of the Canadian bond market since the elimination of the Foreign Property Rule in 2005. The development of the foreign-issue market reflects the increase in the global mobility of capital and is likely increasing the efficiency of the international financial system. In Canada, the Maple Bond market has contributed to a wider range of possible investments for domestic investors, permitting increased portfolio diversification, lower risk, and potentially higher returns. Although the market for Maple Bonds is still in its infancy, the popularity and durability of foreign-issue bond markets in other countries suggests that it will remain a viable segment of the Canadian bond market.

Since 2000, the funding challenges of defined-benefit pension plans in Canada and in other industrial economies have increased significantly, largely reflecting financial market developments that have adversely affected both pension fund assets and liabilities. Unfunded pension obligations can adversely affect the financial position of the sponsoring corporation or government entity, representing a potential drain on cash flow. At a minimum, this creates a financial “headwind” and, under an extreme scenario, could have adverse consequences for the financial system. In the report, **An Update on the Funding Status of Defined-Benefit Pension Plans in Canada**, Jim Armstrong reviews recent developments related to the funding situation of pension plans in Canada and assesses their impact

on the financial system. The article highlights the results of a new study by Mercer Human Resources Consulting that updates an earlier study discussed in the June 2004 issue of the FSR. The study provides an assessment of the current situation and a 5-year projection under three economic scenarios.

In December 2005, the Bank of Canada surveyed the readers of the FSR. In **Results of the FSR Readership Survey**, Jean Mair summarizes the survey findings. The results suggest that the FSR has a diverse audience with a wide range of interests, and that readers seem to be generally satisfied with the FSR.

The “Maple Bond” Market

James Hately

Corporate bond issuance in Canada has grown significantly over the past decade. Since the elimination of the Foreign Property Rule (FPR) early in 2005, one specific sector of that market, Maple Bonds, has shown particularly rapid growth. Maple Bond issuance has totalled over \$17 billion so far in 2006 and approximately \$30 billion since the beginning of 2005.

Maple Bonds are defined as “Canadian-dollar-denominated bonds issued by foreign borrowers in the domestic Canadian fixed-income market.” Foreign-issued bonds are popular in most major fixed-income markets, including the United States (Yankee Bonds), the United Kingdom (Bulldog Bonds), Japan (Samurai Bonds), New Zealand (Kiwi Bonds), and Australia (Kangaroo Bonds). Even though the Canadian fixed-income market possesses the conditions that make these other markets attractive to foreign issuers (including a developed government bond market and a liquid foreign exchange derivatives market), the Maple Bond market was practically non-existent until 2005.

This report discusses the development of the Maple Bond market and how it has likely improved the efficiency of the Canadian financial system. We begin with an examination of the growth of the Maple Bond market, including an analysis of why the market has developed. The second and third sections provide an examination of the reasons why Maple Bonds are attractive to both issuers and investors. The fourth section discusses issues related to secondary-market liquidity. The fifth concludes with an evaluation of the potential impact of this relatively new class of fixed-income securities on the efficiency of Canadian capital markets.

Development of the Maple Bond Market

The rapid development of the market for Maple Bonds can be primarily attributed to the underlying positive financial environment that has supported the continued growth of Canadian corporate bond issuance, combined with the recent elimination of the FPR. While these factors have supported strong investor demand for Maple Bonds, the supply of this nascent fixed-income instrument has also benefited from favourable conditions in the swap market.

A supportive environment for the Canadian corporate bond market

Two features have supported growth in the Canadian corporate bond market. The first is the reduction in federal government borrowing. The fiscal deficits of the 1980s and early 1990s resulted in large borrowing requirements for the federal government, with gross federal debt issuance reaching \$60 billion in 1996. This level of government issuance tended to crowd out corporate bond issuance in Canada, and the amount of non-government issuance was relatively small (Chart 1).

The subsequent reduction in gross borrowing by the federal government has been largely mirrored by a significant increase in corporate bond issuance, which has doubled since 1996 (Chart 2).

The second contributing factor is the increasing size and sophistication of fixed-income institutional investors in Canada. The enhanced ability of Canadian institutional investors to analyze credit risk, the increasing range of products, and the ability to hedge some credit risk through the use of derivatives have all helped to increase investor interest in this type of security.

Elimination of the Foreign Property Rule

The federal government announced the abolition of the FPR in its 2005 budget. The FPR was originally introduced in 1971 to limit tax-shielded individual and institutional investments in foreign assets to a maximum of 10 per cent of the total value of a portfolio. In subsequent years, the maximum was increased a number of times and, since 2001, the FPR had restricted Canadian retirement plans and pension funds from holding more than 30 per cent of their portfolios in foreign assets.

Each time the FPR ceiling was raised, net investment by Canadians in foreign securities also rose. Most investors, however, used almost all of their allowable foreign content to buy foreign equities, which are generally seen as providing more significant diversification benefits and returns than bonds. Reflecting this concentration in equities, the amount of foreign stocks purchased by Canadians almost tripled, increasing from slightly over \$20 billion in 1999 to over \$60 billion by 2000 as the foreign content was raised from 20 per cent to 25 per cent (Statistics Canada 2006). The total amount invested in foreign bonds, however, remained fairly low, at approximately \$3 billion. The Canadian fixed-income market was seen as generally “closed,” with investors continuing to hold almost all of their fixed-income assets in domestic Canadian issues. This was generally regarded as causing domestic issues, particularly those of financial firms, to be valued at narrower spreads vis-à-vis Government of Canada bonds in the domestic market than was necessarily warranted by their credit quality.

The removal of the FPR, however, provided investors with an increased opportunity to diversify their holdings, investing not just in foreign equities, but also in foreign debt. Since the abolition of the FPR, the amount of foreign securities purchased by Canadian investors, particularly foreign bond issues that include Maple Bonds, has increased significantly, reaching a monthly record of \$5.2 billion in March 2006.

Conditions Supporting the Issuance of Maple Bonds

Issuers of Maple Bonds are typically large institutions with sophisticated treasury operations

Chart 1 Gross Canadian Bond Issuance

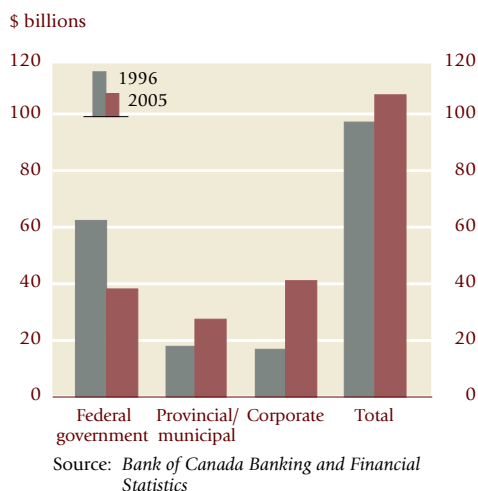


Chart 2 Gross Canadian Corporate Bond Issuance

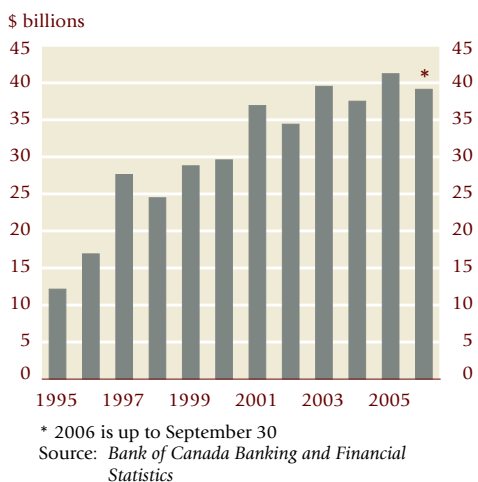
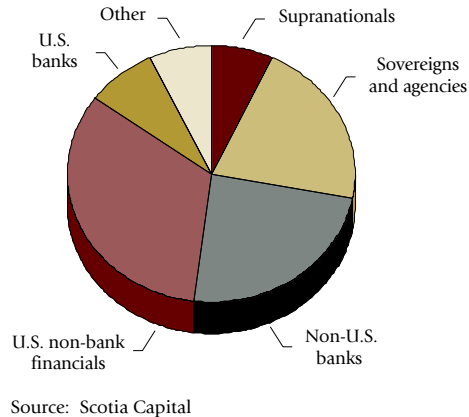


Chart 3 Maple Bond Issuers**Chart 4 Canadian 5-Year Basis Swap versus U.S.**

that are active borrowers globally. Approximately 50 per cent of Maple Bond issues have been completed by European-domiciled borrowers, while U.S issuers have been responsible for slightly more than 40 per cent.¹ Approximately two-thirds of the Maple Bonds issued in 2006 have been by sovereigns and agencies and U.S.-domiciled financial firms (Chart 3).

Given that most Maple Bond issuers have no natural need for Canadian dollars, activity in the market tends to be driven by arbitrage opportunities. Borrowers will generally issue in the Maple Bond market if they can attain funding at an equivalent or lower cost than what is available in other markets. The issuance of Maple Bonds is therefore affected by how cost-effective it is for the issuer to borrow in Canadian dollars and swap the proceeds back into their funding currency of choice.

Prior to the elimination of the FPR, transactions in the Canada-U.S. basis swap market were generally driven by large Canadian borrowers, predominantly the provincial governments and chartered banks, issuing U.S.-dollar debt in the U.S. market and swapping the proceeds back to Canadian dollars. The lack of transactions occurring in the opposite direction tended to result in relatively wide basis swap spreads.²

The recent increased issuance of Canadian securities by foreign entities and the resulting need to swap the Canadian-dollar proceeds into a different funding currency have offset, and put downward pressure on, the basis swap (Chart 4). This narrowing of the basis swap should act to reduce the incentive for foreign issuers to issue Maple Bonds, potentially making the supply dependent on the cycles of the basis swap market. This would be consistent with conditions in other foreign-issuer bond markets, such as the Kangaroo market, where issuance diminished in 2002–03 when the Australian basis swap narrowed.³

1. The remaining 10 per cent has been from issuers domiciled in Australia and Asia.
2. There is no economic reason why a basis swap should have a spread of anything other than zero. Any positive or negative spread is generally indicative of an imbalance between supply and demand pressures for a particular currency or floating-rate index.
3. See Australian Bureau of Statistics for issuance statistics. For background on Kangaroo Bonds, see Battellino and Chambers (2006).

The general level of corporate bond spreads in the Canadian market also affects the cost competitiveness of issuing in the Maple Bond market. It is generally believed that, owing to the existence of the FPR, the cost of funding for financial firms and provincial governments in Canada has been low in recent years, compared with what entities of a similar credit quality could issue in other markets. As evidence of this, highly rated foreign creditors can often issue Maple Bonds at spreads that are above lower-rated domestic issues, yet still provide cost-effective funding for the issuer. Recent examples include KFW, a AAA-rated German financial institution whose debt is fully guaranteed by the German government. KFW issued in the Canadian market at a slightly higher spread than that available on bonds of similar term issued by the Province of Ontario, which is a AA credit (Chart 5).⁴

KFW's total cost of funds on this issue was, however, comparable to what it could obtain by issuing similar debt in other major bond markets. While most of the issuers in the Maple Bond market have been financial corporations or supnationals, the market is also open to non-financial corporations. For example, Britain's Network Rail, France Telecom, and New Zealand Telecom have also completed Canadian-dollar bond issues.

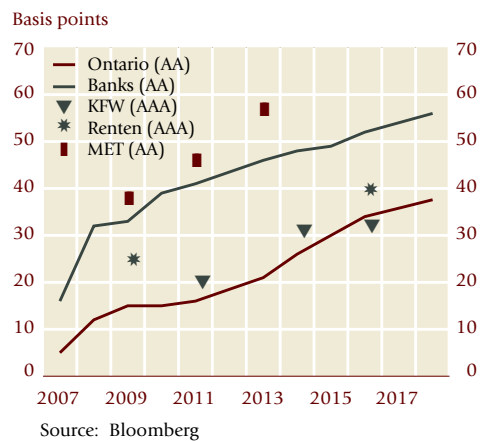
Maple Bond Investors

Investor interest in Maple Bonds continues to grow, and there are currently about 100 institutional accounts buying them, about three times the number recorded a year ago. In addition, other investors have suggested that they will buy Maple Bonds in the coming months.⁵

Maple Bonds expand the universe of investable fixed-income assets available to domestic Canadian institutional investors. They also offer domestic investors the ability to diversify their fixed-income holdings and earn incremental yield (relative to domestic issues of similar credit quality), while avoiding foreign exchange risk.

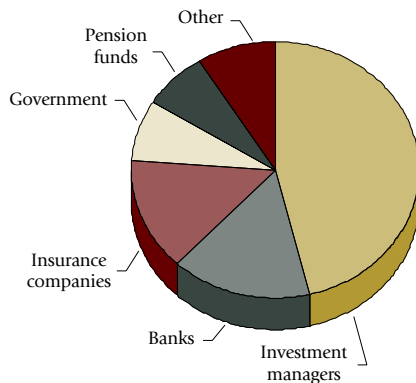
Chart 5 Comparative Credit Spreads

July 2006



4. Some of this higher spread is also likely to be compensation for the lower level of liquidity of Maple Bond issues. Rentenbank (Germany's AAA agency for agriculture) and MetLife are also shown on Chart 5.

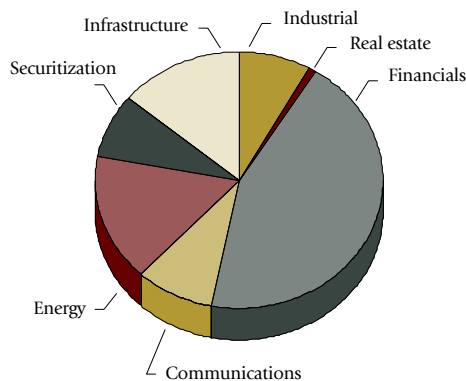
5. Sources: Scotia Capital Markets and Greenwich Associates.

Chart 6 Buyers of Maple Bonds in 2006

Source: Scotia Capital

Chart 7 Scotia Capital Corporate Bond Index

Weightings by sector



Source: Scotia Capital

The largest purchasers are investment managers (Chart 6).

Diversification of credit exposure is the most popular reason cited by investors for purchasing Maple Bonds, because they allow these institutions to reduce their exposure to large provincial and domestic financial issuers. Domestic issuance in the Canadian fixed-income market remains relatively concentrated, with approximately 75 per cent of provincial issuance coming from Ontario and Quebec. In 2005, less than \$25 billion in bonds was issued by non-financial firms in Canada. Financial firms, predominantly the major banks, make up 44 per cent of the Scotia Capital Corporate Bond Index (Chart 7).⁶ In a recent survey, 35 per cent of institutional clients indicated that they would use Maple Bonds as a substitute for provincial bonds.⁷

Most of the diversification benefits from owning Maple Bonds come in the form of specific credit (or name) diversification, and not diversification across sectors, because of the large number of international financial firms that have issued Maple Bonds. The Maple Bond market does, however, offer investors the ability to diversify their financial holdings away from Canadian financial firms to the larger international firms at similar credit spreads.

Maple Bonds also offer opportunities to diversify credit exposure beyond the large domestic issuers without any currency risk. Issues may also offer more attractive spreads than similar domestic credits, since highly rated Maple Bond issues typically include a risk premium on the yield that is higher than that offered by large domestic issuers.

Domestic fixed-income investors can create this diversification without Maple Bond issues by purchasing a foreign-pay bond in the issuer's local market and then swapping the cash flows into Canadian dollars. This is a more complicated transaction than purchasing the Canadian-dollar-denominated security, because a swap requires that investors have an ISDA agreement with their banks since they may, at some time,

6. The Scotia Capital Corporate Bond Index includes all Canadian-dollar investment-grade corporate bond issuance from Canadian-domiciled issuers, subject to a minimum size of \$100 million and at least 10 buyers.

7. Fixed-income survey of 85 institutional clients by BMO in March 2006.

have to post collateral. Keeping track of the value of the swap and a foreign issue may require additional systems and increased operational costs for the investor. Moreover, many investors have mandates that limit their use of swaps.

Liquidity in the Maple Bond Market

Secondary-market liquidity is limited, as would be expected in a developing bond market. Issues may be irregular and are sometimes small in size. There are also two structural factors that may be limiting liquidity in the secondary market.

First, the process of issuing a Maple Bond often differs from that for a regular domestic corporate bond and may be limiting liquidity in the secondary market. Maple Bonds are typically issued as a Foreign Property Private Placement (FPPP), while most corporate bonds are sold through a public offering by a group, or syndicate, of investment dealers. The advantage of an FPPP for a foreign issuer is that the issuer does not need to file a full prospectus in Canada for disclosure purposes.⁸ Instead, the issuer uses an outstanding shelf prospectus filed in Europe or the United States. This form of prospectus saves the issuer time and money and is used to issue bonds regularly in other markets. Legal fees are lower, quarterly statements do not have to be audited, and filings with provincial and territorial securities commissions are not required.⁹

While demand for Maple Bonds from institutional investors is relatively strong and continues to grow, it is possible that the reliance by issuers on a self-prospectus route is acting as a constraint to liquidity. A Canadian investor may be required to undertake legal action in another country if the issuer goes bankrupt. Some Canadian investors have restricted their purchases of Maple Bonds because of this concern.

8. The multi-jurisdictional disclosure system is another way that allows firms to issue without having to file a full prospectus. It is a joint initiative by the CSA and the SEC to reduce the need for continuous disclosure and other filings.

9. Many Canadian retail investors are unable to purchase Maple Bonds that are issued as private placements. Provincial securities regulations generally limit the purchase of non-exempt private-placement issues to qualified investors (as defined by net worth and income levels).

Second, liquidity may also be limited because of the relatively small size of the dealer syndicates used to issue Maple Bonds. Many Maple Bond issues have involved only one, or sometimes two, dealers. This means that few dealers are prepared to make markets in a specific Maple Bond, thus limiting the overall liquidity of the specific issue. This has caused some concern among investors over conditions in the secondary market. These concerns, coupled with the tendency for these bonds to be privately placed (via the FPPP process), may lead investors to hold Maple Bond issues until maturity, thus compounding the lack of liquidity for these securities. As the market matures, issuers would be expected to seek out multiple-dealer syndicates, establish a more frequent issuance calendar, and issue through the public markets, rather than through private placements. This would contribute to a higher level of secondary-market liquidity, similar to that in other foreign bond markets.

Impact on Efficiency of the Canadian Fixed-Income Market

The development of foreign-issuer bonds in a number of countries is contributing to the improvement of market efficiency globally. They have increased the pool of investable assets for investors and provided issuers with more cost-effective financing. The recent growth of the Maple Bond market since the removal of the FPR has allowed the Canadian market to follow this global trend and has helped to improve the efficiency of Canadian capital markets.¹⁰

The development of the Maple Bond market has increased the completeness of the Canadian bond market by broadening the spectrum of assets available to Canadian investors. This provides investors with increased opportunities for portfolio diversification and the construction of more efficient portfolios.

By increasing competition for domestic investment funds, the development of the Maple Bond market has also enhanced allocative efficiency. This is because the presence of Maple Bonds may lead to better pricing of other

10. See Bauer (2004) and Hendry and King (2004) for discussions on the efficiency of financial markets.

domestic corporate issues and a narrowing of the basis swap. While this does not necessarily result in cheaper financing for large domestic borrowers, better pricing of risk benefits the Canadian financial system as a whole. There is some anecdotal evidence that Maple Bond issuance has been putting some upward pressure on domestic credit spreads, particularly for Canadian financial firms and provincial borrowers.¹¹ Any such widening, however, would be partially offset by the benefit certain Canadian issuers get from the narrowing of the basis swap and the benefit Canadian investors receive from a better, more representative return for their risk. A narrower swap creates cheaper funding opportunities in foreign markets for large domestic issuers.

While the development of the Maple Bond market has helped to improve the efficiency of Canadian fixed-income markets, that contribution has been held back by secondary-market activity and by the limited range of foreign issuers. A more active secondary market in existing Maple Bond issues would further increase market efficiency by lowering the cost of adjusting investor portfolios. In addition, a wider range of foreign issuers would allow investors to further diversify their holdings and benefit from sectoral diversification in addition to name diversification. It is possible that this will occur as the market matures. More gains in efficiency are thus expected in the future.

The Maple Bond market is continuing to develop in important ways. For instance, Scotia Capital has created Canada's first Maple Bond Index. The index started with 55 securities comprising a total market value of approximately \$20 billion. The index is important, since it provides a benchmark against which Canadian bond investors can measure their performance. In addition, Moody's announced in May 2006 that they are starting credit research on all rated Canadian bonds issued by foreign entities. Moody's has added more than 70 foreign issuers to its Canadian research service and will add new companies as they enter the market.

11. CIBC World Markets (4 July 2006) suggests that some widening of corporate spreads in 2006 has been due to Maple Bond issuance.

Conclusion

Foreign-issued domestic currency bonds have been popular in most major fixed-income markets for some time. Historically, this has not been the case in Canada, however, since legislative restriction on the amount of foreign assets that could be held by tax-exempt investors had restricted this type of market from developing.

The recent development of this market has increased the efficiency of Canada's financial system. Domestic investors benefit from a wider range of possible investments, allowing for increased portfolio diversification, lower risk, and potentially higher returns. In addition, increased competition for domestic investor funds leads to better pricing of risk on corporate deals. The Maple Bond market is still in its infancy, with limited secondary-market activity, and issuance is highly concentrated in the financial and supranational sectors. But the experience with foreign-issue bond markets in other countries suggests that the Maple Bond market will remain a viable segment of the Canadian bond market in the future, although its relative size is likely to be driven by cyclical factors.

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An Update on the Funding Status of Defined-Benefit Pension Plans in Canada

Jim Armstrong

Since 2000, the funding adequacy of defined-benefit (DB) pension plans in Canada and in other industrial economies has deteriorated, largely reflecting financial market developments that have adversely affected both pension fund assets and liabilities. Unfunded pension obligations can affect the financial position of the sponsoring corporation or government entity, representing a potential drain on cash flow through the need to make special contributions. At a minimum, this represents a financial burden and, under extreme scenarios, can have adverse consequences for the financial system, as well as for the sponsor and its employees.

Of course, employees might well bear some of the burden of persistent deficits in DB pension plans through higher contribution rates, reduced benefits, and, in some cases, plan conversions or terminations. Indeed, pension deficits are one factor that can threaten the viability of DB plans.¹

The pension system is an important element of the financial system. The focus of this report is on the near-term outlook for the solvency situation of pension plans, particularly its sensitivity to financial market developments. It highlights the results of a new study by Mercer Human Resources Consulting conducted for the Bank of Canada that is an update of a 2004 study (Armstrong 2004). The study is based on Mercer's client database of plan sponsors, which contains information on registered federal and provincial pension plans across Canada in both the public and private sectors.²

1. For more on the issues concerning the future of DB plans in Canada see Armstrong and Selody (2005).
2. Mercer's plans represent about 35 per cent of the registered pension plan universe in Canada, using Statistics Canada data as the benchmark. It is the private sector database that provides the largest snapshot of the system. Excluded from the study are government plans, such as the Old Age Security (OAS) and the Canada/Quebec Pension Plans (CPP/QPP) that are partially funded and are not registered pension plans, as well as public service pension plans having all or a portion of their assets in governments' consolidated revenue funds, such as the federal and Quebec plans.

The study assumes that, over the near term, sponsors bear the burden of a funding deterioration through higher special contributions, although it is understood that this is a simplification of likely outcomes where employees would also have to bear some of the costs.

Background

Weak equity markets from 2000 through late 2002 initially raised concerns about the deteriorating funding condition of corporate defined-benefit pension plans in Canada (Chart 1). This is because the typical large Canadian corporate pension fund has 50 to 60 per cent of its assets invested in equities. An even more important adverse factor for pension plan funding has been the decline in long-term interest rates, which has increased actuarial estimates of pension plan liabilities. These liabilities are a function of the present value of future retirement benefits.³ While equity markets have subsequently recovered, bond yields have tended to stay low (Chart 1).⁴

Compounding the problem is the fact that many sponsors took contribution holidays in the 1990s when plans were in surplus, either voluntarily or because of the limits imposed by Income Tax Act regulations.

3. Lower bond yields increase the value of bond holdings (which typically comprise about 40 per cent of pension plan assets), but also increase the value of 100 per cent of plan liabilities. The net effect is substantially unfavourable for funding. This problem is amplified by the fact that the duration of the bond portfolio tends to be shorter than the duration of liabilities, making liabilities relatively more sensitive to interest rate movements.
4. It should also be noted that the funding positions of plans have been hurt by recent changes in actuarial standards that reflect longer life expectancy. This makes the calculation of solvency liabilities more sensitive to prevailing market interest rates.

Regulations Pertaining to Pension Funding

In Canada, defined-benefit plans are regulated at either the federal or provincial level, depending on whether employees work in business areas that fall under federal or provincial jurisdiction.

Funding rules

With respect to funding, DB pension plans must file an actuarial valuation report at least once every three years with their respective regulator (OSFI at the federal level or one of the provincial pension regulators).

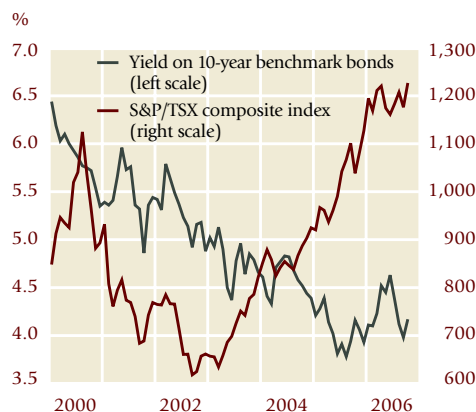
Both a *going-concern* and a *solvency* valuation are required. The going-concern assessment is based on long-run values for plan assets and liabilities.⁵ A going-concern deficit (i.e., liabilities exceed assets, resulting in a funded ratio under 100 per cent) must be funded by the employer sponsor over a maximum of 15 years—the sponsor must make special contributions to close the shortfall, in addition to the normal contributions to cover ongoing pension service costs.

A solvency assessment is made on the assumption that the plan is wound up on valuation day. This method typically uses market value or fair value for plan assets and windup values for plan liabilities. A solvency deficit must be funded over a maximum of five years.

If a plan is facing both a solvency and going-concern deficit, the higher required minimum payment is binding. In the vast majority of cases, the higher payment would be the required solvency payment. Thus, the focus of this study is on the solvency situation.

In terms of other applicable funding rules, the federal Income Tax Act prohibits the sponsors of plans in surplus from making contributions

Chart 1 Key Variables Affecting Pension Funding



Source: Bank of Canada

5. The going-concern assessment can be based on either market values or long-run values for plan assets, the latter being derived from smoothing or modelling procedures. Liabilities are calculated as the present value of the expected stream of pension payments, factoring in the effect of variables such as salary increases.

Table 1
Evolution of Solvency Position
 \$ billions

	31 December 2003	31 May 2006
1 Number of plans	847	761
2 Number of plans in deficit	603 (71%)	594 (78%)
3 Number of plans in surplus	244 (29%)	167 (22%)
4 Assets of plans in deficit/total assets	79%	44%
5 Aggregate solvency ratio	93%	95%
6 Solvency ratio of plans in deficit	89%	85%
7 Solvency ratio of plans in surplus	112%	104%
8 Aggregate solvency position of all plans—surplus (deficit)	(15.4)	(14.1)
9 Aggregate solvency position of plans in deficit	(20.0)	(20.2)
10 Yield on Canada bonds 10 years and over	5.13%	4.53%

when pension surpluses exceed certain thresholds.⁶

Solvency-relief measures

In the May 2006 Federal Budget, the federal government introduced temporary solvency funding relief—“to help re-establish full funding of federally regulated defined benefit pension plans in an orderly fashion, with safeguards for promised pension benefits.” The principal measure (among others) permits plan sponsors to extend the solvency payments from five to ten years, subject to certain terms and conditions. These include achieving a certain level of approval from members and retirees, or obtaining letters of credit for the difference between solvency payments made on a ten-year schedule and those that would have been required on a five-year schedule.

The Province of Quebec, through its pension regulator *la Régie des Rentes*, also implemented similar funding relief measures for Quebec plans.

Estimating the Current Solvency Situation

The Mercer study estimates the current solvency situation as follows. First, for each plan in the sample, Mercer extrapolates the funding situation from the time of its last regulatory filing to 31 December 2005 and 31 May 2006. The projected market value of plan assets is based on the pension fund returns derived from each plan’s target asset mix and actual market returns. Plan liabilities are projected based on the information for each client in the database.

Table 1 presents the situation on a solvency basis as of 31 December 2003 (the date of the previous study) and as of the latest estimated date of 31 May 2006. On balance, it appears that there was some improvement in the funding situation over the two-and-one-half-year period:

- the proportion of assets of insolvent plans (solvency ratio less than 100 per cent) to total assets in the sample (row 4) decreased from 79 per cent to 44 per cent;

6. Under Section 147.2 of the Income Tax Act, employer contributions to registered pension plans must stop when a certain maximum allowable surplus is reached, typically 10 per cent of plan liabilities.

- the aggregate solvency ratio (assets/liabilities) for all plans (row 5) increased from 93 per cent to 95 per cent, mainly because some large plans have gone from being moderately underfunded to being moderately overfunded.

The moderate improvement achieved over this period reflects strong equity markets in Canada and the fact that many plans have been making special solvency payments. However, the yield on benchmark Government of Canada bonds declined by about 0.60 per cent over the period (row 10). This factor significantly hindered efforts to improve solvency ratios.

Distribution of solvency ratios

Table 2 presents the distribution of plan assets on a solvency-ratio basis as of the three estimation dates: 31 December 2003; 31 December 2005; and 31 May 2006.

It indicates that, as of 31 May 2006, about 46 per cent of plan assets were in plans with a small surplus (100 to 110 per cent), 22 per cent of assets were in plans that were only moderately underfunded (with a solvency ratio between 90 and 100 per cent), 10 per cent were underfunded at 80 to 90 per cent, and about 12 per cent were severely underfunded, with solvency ratios under 80 per cent.

Note that, between 31 December 2005 and 31 May 2006, there was a large shift in assets from the moderate deficit category (90 to 100 per cent) to the moderate surplus category (100 to 110 per cent). It is also interesting to note that the proportion of plans that were severely underfunded (solvency ratio less than 80 per cent) fell back from 16 per cent at the end of 2005 to 12 per cent at the end of May 2006.

The improvement in the distribution of solvency ratios in the very short period between 31 December 2005 and 31 May 2006 highlights how sensitive the solvency situation is to movements in the bond yield, which increased almost 50 basis points over this period.

Comparison of study results with OSFI solvency test for federal plans

It should be noted that OSFI (2006) released the results of its solvency test for all federally regulated defined-benefit plans, which represent about 10 per cent of all defined-benefit

Table 2

Distribution of Solvency Ratios

Per cent of assets

Ratio (%)	31 December 2003	31 December 2005	31 May 2006
<80	11	16	12
80-90	11	15	10
90-100	57	51	22
100-110	10	9	46
>110	11	9	10

Table 3

Economic Assumptions

Per cent

Yields	Current 31 May 2006	2010 Baseline case	2010 Case A	2010 Case B
Differential between the long-term GOC nominal and Real Return bonds		2.25 ^a	2.62	1.94
GOC treasury bill	4.18	3.76	4.49	3.12
GOC bonds 10 years and over	4.53	4.53	5.27	3.90
Real Return Bond	1.87	2.28	2.65	1.96
Average portfolio returns ^b		5.76	8.80	2.88

a. The long-term yield differential between GOC nominal and Real Return bonds is used as a proxy for expected inflation, bearing in mind potential distortions, such as liquidity in the Real Return Bond market. The differential has been 2.25 per cent, on average, since 1998.

b. These are projected returns for a plan with a typical asset mix: 35 per cent Canadian equities, 12 per cent U.S. equities, 10 per cent international equities, 40 per cent fixed-income investments, and 3 per cent short-term investments.

Table 4

Evolution of the Solvency Situation for Plans in the Mercer Study

Per cent

	31 May 2006	2010 Baseline case	2010 Case A	2010 Case B
1. Solvency ratio—all plans	95	109	131	92
2. Solvency ratio—plans in deficit as of 31 December 2005	85	107	128	91
3. Solvency ratio—plans in surplus as of 31 December 2005	104	120	150	100
4. Proportion of system assets accounted for by plans in deficit	44	6	0	94

plan assets in Canada. Its results are broadly similar to the Mercer sample for Canada. OSFI estimates an average aggregate solvency ratio of about 90 per cent as of December 2005, compared with 91 per cent as of June 2005. It estimates that about three-quarters of federally regulated defined-benefit plans are in deficit.

The Mercer sample includes both federal plans and provincially regulated plans. At the national level, Ontario accounts for about 50 per cent of all plan assets.

Funding Projections to the end of 2010

In a forward-looking exercise, Mercer uses a model to project solvency ratios ahead to 31 December 2010 under three economic scenarios: baseline, Case A (favourable for solvency positions), and Case B (unfavourable for solvency positions).

These scenarios are obtained in two steps. A stochastic model (with percentiles) is used to project the end points in 2010. A deterministic model is then used to project the values of the variables on intervening dates. Each variable converges to its 2010 value.

Table 3 presents these scenarios. The baseline scenario is a continuation of the current low-inflation environment over the projected horizon. The Case A scenario assumes economic developments that are favourable for pension plan solvency assessments; that is, higher interest rates and higher equity returns. This scenario uses the 25th percentiles of these variables under Mercer's stochastic model. The Case B scenario assumes economic developments that are unfavourable for pension plan solvency assessments; that is, lower interest rates and lower equity returns, reflected by the 75th percentiles of these variables coming from Mercer's model.⁷

Table 4 presents the projections for the solvency position in 2010 for the three cohorts as measured at 31 December 2005—*all plans, insolvent plans, and solvent plans*—under the three scenarios.

7. The net impact of inflation on projected solvency positions is complex. It depends of the proportion of plans in the sample that have liabilities indexed to inflation versus non-indexed plans. It also depends on the impact of inflation on portfolio returns.

Incorporated in the projections in Table 4 is the fact that plans starting in deficit are, in most cases, making special contributions to eliminate solvency deficits over five years. The required solvency payment tends to be a “moving target” from year to year, since financial market movements affect the estimated solvency position and, in the study, the required solvency contribution is reset each year to capture this effect.

The bottom line: Solvency projections to 2010

The Mercer solvency projections are as follows.

Under the baseline scenario, there will be a substantial improvement in the system in aggregate, resulting in a surplus of 109 per cent in 2010 (Table 4, row 1). Moreover, only a very small proportion (6 per cent) of pension assets will be in deficit (row 4).

Under the Case A scenario, the system will be robustly in surplus with a projected aggregate solvency ratio of 131 per cent, and a negligible proportion of system assets would be insolvent.

Under the Case B scenario, the system would persist in deficit to the extent of 92 per cent (row 1), lower than at the starting point of 31 May 2006. Furthermore, 94 per cent of plan assets in the sample would be in deficit, compared with 44 per cent at the end of May 2006 (row 4).

Projected Solvency Contributions

The next step in the study is to project solvency contributions to 2010 on a year-by-year basis.

Charts 2 and 3 present projections to 31 December 2010 for total employer contributions (expressed as a per cent of total payroll) for deficit plans and surplus plans, respectively, under Mercer’s three scenarios. Implicit in the projections is the assumption of all funding risk by the employer and no adjustment of employee contribution rates or benefit rates to offset current or anticipated changes in financial variables.

Chart 2 shows that the cohort of plans starting in deficit face the need to make contributions that are relatively high as a share of payroll compared with those in surplus (Chart 3). Under the baseline scenario (gold line), the group of sponsors with plans in deficit at the start of the period would need to pay, as a group, between

Chart 2 Deficit Plans

Total employer contributions as a percentage of total payroll under three scenarios

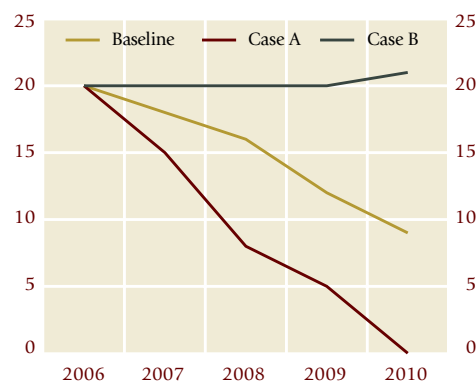
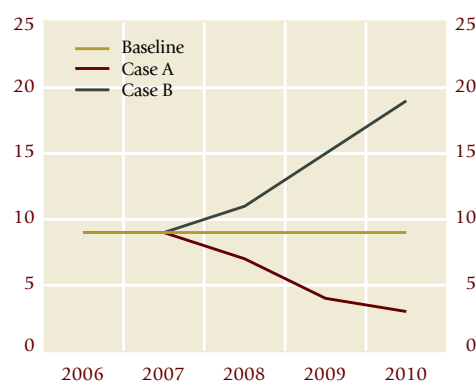


Chart 3 Surplus Plans

Total employer contributions as a percentage of total payroll under three scenarios



16 and 20 per cent of their payroll in total contributions to cover the deficit in the first three years, before falling to 11 per cent in year 4 and 9 per cent in year 5. This compares with a constant 9 per cent of payroll throughout for sponsors with plans starting in surplus at the end of 2005 (Chart 3).

Under the Case B unfavourable scenario (Chart 2, green line), the group of companies with plans in deficit at the start of the period will be paying, through the period, 20 to 21 per cent of their payroll in total contributions to cover the deficit—much more than under the other two scenarios.

Impact of the Solvency-Relief Measures

The updated Mercer projections do not incorporate the potential effects of solvency-relief measures.

To assess the possible impact of the temporary federal and Quebec solvency-relief measures, a projection was made assuming that, on average, employers will elect to amortize solvency deficits over 7 years instead of 5 years.⁸ It is estimated that the measures have their maximum benefit in year 1, reducing solvency special contributions by 9 per cent, followed by reductions of 4 per cent in years 2 and 3.

Thus, it appears that, in aggregate, the potential impact of the measures is fairly modest. They could, however, be quite important for individual plans, particularly plans that choose to extend the solvency period to 10 years, as allowed under the regulations.

Other Studies on the Canadian Pension Funding Situation

Other studies have recently reviewed the pension funding situation, using different samples of sponsors than the Mercer study.

For example, Dominion Bond Rating Service (DBRS 2006) has shed some light on the sectoral dimensions of pension deficits. The study notes the following with respect to Canadian and U.S. corporate defined-benefit plans:

“Pension plans are only a concern for a minority of industries and companies, typically those that exhibit the risks of an aging workforce and are highly labour-intensive with strong unions. Examples of these industries are auto parts, forestry and manufacturing.”

The DBRS study goes on to list about 40 corporations in Canada and the United States that report a pension deficit, on a GAAP basis (rather than a solvency basis), in excess of 20 per cent of net worth. DBRS calculates that a 200-basis-point increase in interest rates would significantly reduce underfunding with no action by the companies necessary.

The firm of Towers Perrin completed its sixth annual review of defined-benefit pension plan financial disclosures by 83 of the 100 largest Canadian companies traded on the Toronto Stock Exchange (S&P/TSX). The study compares a number of key financial results for 2005 derived from the annual reports of non-financial corporations. Towers Perrin found that, in spite of double-digit equity returns and sponsors making record contributions, there was no improvement in the funding position (as measured under GAAP accounting) for the third straight year. The authors attributed this lack of improvement to lower bond yields but expressed hope that rising yields in 2006 would provide some relief for sponsors.

Conclusion

The results of the updated Mercer pension study are moderately encouraging, but highlight the high sensitivity of the pension-solvency situation (and the path of future contributions) to economic conditions, in particular, movements in high-grade bond yields.

The baseline scenario—essentially a continuation of the current low-inflation environment with moderate portfolio returns—suggests that the system as a whole will be in surplus in 2010 (enjoying an aggregate 109 per cent solvency ratio). Of course, to achieve this improvement, many plans that are starting in deficit will be making special contributions over the roughly 5-year period, representing a substantial

8. The decision to use 7 years as the effective amortization period in aggregate for applicable plans is a function of Mercer’s judgment of the number of federal and Quebec plans that will either chose not to take advantage of the relief measures or will not be able to because of the various conditions attached to the measures.

proportion (up to 21 per cent) of their total payroll costs. It seems reasonable to assume that, in many cases, this will entail hardship for sponsors.

Furthermore, it is important to keep in mind that the unfavourable Case B scenario would have plans making high contributions for almost five years and, in the end, the solvency situation would be worse than at the start.

To conclude, it appears that the direct consequences for the Canadian financial system of current pension deficits are not large. However, they can have important consequences for the financial condition of individual firms in vulnerable sectors, particularly if combined with another shock. And ultimately, plan members will probably have to share in the adverse consequences falling out of a major funding problem, with the potential for increased contributions, reduced benefits, and even the elimination of the plan.

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Results of the FSR Readership Survey

Jean Mair

Table 1

Summary of Survey Responses

Reader profile	Number of respondents	Per cent of total
Domestic	112	83.0
Foreign	16	11.9
Did not identify themselves	7	5.2
Affiliation		
Banking/financial services	34	25.2
Academia	24	17.8
Corporation/business	20	14.8
Government	16	11.9
Student	9	6.7
Other	21	15.6
Did not identify themselves	11	8.1

Table 2

Sections of the FSR Read Regularly

Section	Per cent of respondents
Financial System Risk Assessment	69.6
Important Financial System Developments	71.9
Reports	50.8
Policy and Infrastructure Developments	47.4
Research Summaries	49.6

Table 3

Views on the FSR

Question	Average rating ^a
High-quality writing	4.03
Interesting topics	3.98
Visually appealing layout and design	3.96
Rigorous economic analysis	3.86
Clear assessment of risks to the financial system	3.82
To the point	3.73

a. Respondents were asked to evaluate various aspects of the FSR on a scale of 1 (lowest rating) to 5 (highest rating).

The *Financial System Review* (FSR) has been published since December 2002. Currently, the FSR has about 1,500 subscribers. As well, some 3,000 persons are notified of its publication through Bank Messenger, an email alert service.

Early in 2005, the Bank of Canada decided that it was time to collect readers' views on the publication. A readership survey was circulated with the December 2005 issue and was also posted on the Bank's website. This note presents the results of that survey. We thank those readers who took the time to complete it.

Some 135 readers responded to the survey questionnaire. The results are summarized in Tables 1 to 3. They suggest that the FSR has a diverse audience with a wide range of interests, and that the readership seems generally satisfied with the publication. We will be taking into account the interests and views of our readership as revealed in this survey as we draft future issues of the FSR.

Who reads the FSR?

The survey results indicate that the audience is primarily domestic (close to 90 per cent of those respondents that identified themselves). The audience is also very diverse, with no single group accounting for much more than a quarter of the readership. The largest groups of readers are in banking/financial services, academia, business, and government.

Why do they read the FSR?

The FSR aims to improve the reader's understanding of current developments and trends in the Canadian and international financial systems and of the factors affecting them. It also summarizes recent work by Bank of Canada staff on specific financial sector policies and on aspects of the structure and functioning of the financial system.

About 80 per cent of the respondents said that they read the FSR for "information on developments in the Canadian financial system." Close to half read it for information on the Canadian banking sector, information on the global financial system, and for an assessment of the soundness of the Canadian financial system. About one-third wanted to learn about initiatives to enhance the efficiency of the Canadian financial system. And

about half of the respondents use it as a reference.

Most people were looking for relatively wide coverage:

- Virtually all respondents said that they read the FSR to obtain information on the Canadian financial system. But over 70 per cent were also looking for information on developments outside of Canada.
- Over 80 per cent were interested in current analysis. Two-thirds of those replying read the FSR for the “research articles.” And some 60 per cent of respondents said that, on average, they read more than one research article per issue.
- Close to 60 per cent of respondents were looking for both quick updates and in-depth assessments of financial system issues. About 30 per cent wanted only a quick update of these issues, and the balance, only in-depth analysis.

Information content was rated as more important than topic timeliness by a ratio of about 2 to 1.

What do they read?

The Developments and Trends section was the most widely read part of the FSR, with close to 70 per cent of respondents regularly reading both the Financial System Risk Assessment and Important Financial System Developments. Close to 50 per cent stated that they regularly read the other three sections (Reports, Policy and Infrastructure Developments, and Research Summaries).

What do readers think of the FSR?

Overall, survey respondents seemed satisfied with the FSR.

Respondents were asked to assess various aspects of the FSR on a scale of 1 to 5, with 1 being the lowest rating and 5 the highest. The weighted-average answers clustered between 3.7 and 4, a reasonably favourable result. The highest marks were for high-quality writing, interesting topics, and layout. The lowest mark was in the “to the point” category. With these comments in mind, every effort will be made to ensure that

the material in the Bank’s *Financial System Review* is presented in a clear and direct manner.

Most respondents found the language in the FSR to be at an appropriate technical level.

Over 80 per cent of respondents were satisfied with the current frequency (twice per year) and length of the publication.

How do readers access the FSR?

The print version of the FSR is available to subscribers on request. The FSR can also be accessed on the Bank’s website. About two-thirds of those replying to the questionnaire use only the print version of the FSR, while another 13 per cent use both the print and online versions. Some 20 per cent of respondents (many from abroad) read the FSR only online.