Is the Term Structure of Interest Rates Related to Debt Magnitude? Some Evidence from Recent Canadian Experience

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January 2004

The author thanks Michael Bradfield, Patrick Coe, Derek Hermanutz and Jim Storey for many perceptive comments on earlier versions of this paper, though in no way holding them responsible for any shortcomings of the paper.

Abstract

This paper investigates the key question of whether the term structure of interest rates in a small open economy is related to debt magnitude and to the composition and maturity structure of the debt. A carefully designed debt management strategy could lead to a significant reduction in debt service charges through a readjustment of the maturity structure and composition of the debt. This study considers the inherent fluctuations in interest rates of varying durations, the characteristics of money and bond markets, how different parts of the term structure are related to each other, the correlation structure between the term structure and debt magnitude, and so forth.

The results lead to four conclusions with respect to the management of the federal debt. First, no significant correlation is observed between the relative share of each type of debt and its corresponding yield. Second, the recent trend to lengthening the maturity structure of federal government debt should be reversed and more use made of short-term debt, which is usually issued at lower yields. Third, that the composition of the longer maturity portion of the debt be adjusted with more reliance placed on real return bonds, foreign currency bonds, and Canada Savings bonds. Fourth, despite declining debt finance requirements, the federal government should consider at least maintaining its Treasury-bill borrowing levels, using the proceeds to acquire debt instruments issued by high-quality domestic and international borrowers. This would help to maintain liquid money markets domestically and ensure some Canadian visibility in international markets for loans and securities.

Keywords: *term structure of interest rates, federal debt, debt magnitude, debt instruments, debt management strategy, maturity structure, fiscal rule, yield curve, bond markets, correlation structure, marketable bonds, Treasury-bills, real return bonds, foreign currency bonds, Canada Savings Bonds, loans, securities.*

JEL **Classification Codes:** H3 H6

1.0. Introduction:

In formulating a prudent debt management strategy, an important issue to consider is whether the term structure of interest rates is in any way related to debt magnitude and to the composition and maturity structure of the debt. The assumption that interest rates have little or no connection with the particular characteristics of the debt is crucial in determining the appropriate distribution of the debt and the potential for any change in this distribution that might be implemented to lower debt service charges. For example, if shortening the maturity structure also lowered the prices at which those securities could be issued, any advantage of doing so could dissipate rapidly.[1] This assumption also says something about the neutrality issue. That is, impacts on the term structure of government borrowing could potentially alter private behaviour through the transmission mechanism.[2] Thus, if the positive impact, for example, of maintaining liquidity in the money markets via larger issues of Treasury-bills impacts on interest rates, the advantage of pursuing this strategy will not be as great. Such a correlation between interest rates and the size distribution of debt issues will lead to a situation whereby the greater the supply of a particular type of security the greater will be the cost of borrowing for the issuing authority. Alternatively, the relationship could be one where there is little or no correlation between the maturity composition and term structure of interest rates. This issue is central to this study.

Section 2 reviews the literature on the relationship between the maturity composition of the debt and the corresponding yield structure. It also discusses the spread in the yield structure between short-term and long-term securities over a period spanning several decades. Section 3 provides an empirical analysis of the correlation between the term structure of interest rates and debt magnitude using recent Canadian data. Section 4 is concerned with an analysis of

[1] The *price* of securities in this and other contexts would have to be adjusted for commissions and various other transaction costs.

[2] Another fruitful research question that arises is the extent to which one might expect the private sector to provide liquidity in place of the government, especially if there is a premium available for such liquidity. Likewise, the question of the impacts that developments in debt management, and private provision of liquidity, might have on the transmission of monetary policy, is important.

the debt instruments used by the government. It also identifies the potential for modifying the reliance on each of these instruments as a way of lowering debt service charges.[3] Section 5 discusses foreign borrowings and the alternative uses of foreign exchange reserves in addition to merely supporting the Canadian dollar. Section 6 is a conclusion.

2.0. The Maturity Composition of the Debt and the Yield Structure:

There has been a fair amount of research on the relationship between the maturity composition of the debt and the corresponding yield structure, but the results are inconclusive. Okun's (1963) findings reveal that there is little correlation between the maturity structure and interest rates. While Scott (1965) shows that average maturity does indeed influence some of the variations in both the short- and long-term rates, Modigliani and Sutch (1966, 1967) find that re-arranging the distribution of debt issues has only a slight impact on the stucture of yields. More recent work in this area also provides mixed results. Benjamin Friedman (1977, 1980), independently and with others (Agell, Persson and Friedman, 1992), demonstrates that deliberate manipulation of the issues of each debt instrument will influence yields, but Wallace and Warner (1996) show no relationship between the maturity period of the debt and returns. Park's (1999) findings are somewhat tentative in that bonds with all the same characterisitics except maturity are not *perfect* substitutes and that maturity composition occasionally, but not necessarily always, helps to predict future returns. Curiously, Hejazi, Lai and Yang (2000) using monthly data to examine the determinants of term premia implicit in the Canadian Treasury-bill term structure of interest rates find that the conditional variances of US macroeconomic variables – *not* Canadian macroeconomic variables – are important determinants of Canadian term premia. Since interest rates are affected by monetary policy, a debt manager should factor this in with the maturity period, especially if the expectations hypothesis holds.

In the case of the United States, at least, past research does not indicate, even in general terms the nature and characterisitics of the relationship between the length of debt maturity and

[3] See Siddiq (2000) and Siddiq and Mercer (2000) for background information on this topic.

interest rates. For Canada, using an extended version of the stochastic model of the federal budget and building on the model by Boothe and Reid (1998) [see Hermanutz and Matier (2000)], Hermanutz and Poitras (2001) show the amount of fiscal room can be increased – without undue risk to the budgetary surplus – by increasing the amount of short-term debt. Their conclusion is fully consistent the present study. Indeed, at a time when the federal debt is potentially on the threshold of a steady decline, both the *relative* share of each debt instrument and the *absolute* demand for it could determine its interest rate and hence the cost of borrowing. If, however, interest rates are not sensitive to the size of the debt, the implication is that interest rates are determined by other considerations, possibly by events in the broader domestic and world markets. This latter scenario seems to be more likely for a number of reasons.

First, results based on US data, for example, in studies by Friedman (1977, 1980), Roley (1982) and Park (1999), are not totally relevant within a Canadian context simply because variations in the issues of a particular type of debt could influence North American and even world rates because of the sheer magnitude of the debt. The Canadian economy, by virtue of being less than one-tenth the size of the US economy, is much less likely to have an impact on North American or world markets in comparison to the United States. Thus, despite the *still* relatively high debt-to-GDP ratio, marginal adjustments in its maturity structure are unlikely to have a perceptible impact on interest rates.

Second, it is important to note that the federal government is *not* the only Canadian institution in the market for loanable funds although it is indeed the single biggest debtor. Provincial governments also routinely engage in new borrowings and the refinancing of existing debt, as do both public and private corporations. Much of this debt is secured by issuing bonds and securities similar to federal bonds and securities.

Third, since Canadian institutions increasingly borrow internationally, just as foreign institutions are borrowing in Canada, the market for both short- and long-term securities is sufficiently large that no single borrower influences particular yields significantly through changes in its borrowing strategy. Thus, for a small open economy like Canada, fluctuations

in interest rates depend more on the broader international macroeconomic events than on the patterns of domestic public borrowing.

These arguments might appear to be convincing, but in the absence of empirical testing they remain somewhat conjectural. A closer investigation focusing on the actual relationship, if any, between the structure of interest rates and the size of debt issues is therefore required before any clear conclusion can be drawn.

A quick review of the key interest rates is therefore useful before engaging in the correlation analysis. Figure 1 tracks interest rates for Treasury-bills and long-term bonds since 1980. Although the Treasury-bill rates display a greater level of variation than the long-term bond rates, the yield associated with the former, with few exceptions, is generally much lower than that for the latter. The details of the yield structure of short-term and long-term securities since 1969/70 are presented in Table 1. The spread between the Treasury-bill rate and the long-term rate, in particular, is nearly always quite pronounced. Indeed this spread widened rather significantly in 2001/02 and 2002/03, the two years immediately following the end of this study period. The years 1992/93 and 1993/94, the two years immediately preceding the beginning of this study period, were also characterized by significant spreads.[4]

Table 2 is more focused in the sense that it presents the quarter-end (annualized) yields of three month Treasury-bills and long-term marketable bonds for all fiscal years from 1994/95 to 2000/01, the period of primary interest for this study.[5] The bank rates that existed at each of these intervals are also noted. It can be seen quite readily that the spread in the average yields of marketable bonds and Treasury-bills has generally been quite significant although the gap did narrow somewhat in 2000/01, but widened again in subsequent years. These rates, especially for marketable bonds, are not necessarily similar to the corresponding

[4] In only five – 1979/80, 1980/81, 1981/82, 1989/90 and 1990/91 – of the 43 years recorded in Table 1 were the 10+ year bond rates *less* than the T-Bill rates. These years were all characterized by high inflation and in each of these years the T-Bill rate was in excess of 12 percent.

[5] One reason why this period is of particular interest is because of the stable economic environment that it represents. The low interest, low inflationary environment and fiscally conservative budgetary stance that has characterized the Canadian economy since the mid-1990s and which is now a hallmark of public policy is likely to continue.

average annual rates presented in Appendix Table A.1 for two reasons. First, the latter rates are the weighted rates that prevailed at the time each portion of the debt was issued (or re-issued in the case of maturing debt). Second, in the case of marketable bonds, the rates in Table 2 are the long-term (ten to thirty years to maturity) rates whereas Appendix Table A.1 reports the average rates for *all* marketable bonds, i.e., ranging from two to thirty years. Hence the apparent discrepancies.

From the point of view of an appropriate debt management strategy, the relevant rates are the rates at which each portion of the debt was issued and must therefore be serviced. These are the rates that are presented in Appendix Table A.1, which naturally will form the basis for the correlation analysis.

3.0. The Correlation of Interest Rates and Debt Magnitude:

The purpose of this analysis is to determine if the increase in the issues of marketable bonds between 1994/95 and 2000/01 from $233.5 billion (or 42.5 percent of the interest-bearing debt) to $315.3 (52.7 percent of debt) billion resulted in higher interest rates for such bonds. Alternatively, the question from the perspective of Treasury-bills can be posed as whether the reduced issues of Treasury-bills from $164.5 billion (or 29.9 percent of interest-bearing debt) in 1994/95 down to $99.8 billion (16.7 percent of debt) in 1999/2000 resulted in lower interest rates. If such a correlation exists, i.e., if the yield structure is sensitive to the size of debt issues by instrument, then any recommendation with respect to varying the holdings of a particular debt instrument would have to consider the potential change in interest rates. If, however, there is no correlation between the size of debt issues and the yield structure then no such consideration will be required.

Tables 3.1, 3.2 and 3.3 present the results of the correlation between the term structure of interest rates and debt magnitude for the two principal categories of market debt, marketable bonds and Treasury-bills. The interest rate for marketable bonds for each year is the weighted average rate for bonds of two to thirty years in duration as reported in the public

accounts. The interest rate for Treasury-bills for each year is an average annual rate derived from the weekly sales over the year for 90-day Treasury-bills.

Table 3.1 presents the results of correlation using the nominal dollar values of marketable bonds and Treasury-bills on the one hand and the average annual yields of these debt instruments on the other. The results of correlation with the bank rate are also presented which, until December 1995, was pegged at 25 basis points above the 90-day Treasury-bill rate. Since then the difference between these two rates has ranged anywhere from less than 5 basis points to over 80 basis points as can be seen from Table 2. The negative correlation between marketable bonds and the marketable bond rate seems spurious and could well be due to the use of unadjusted nominal values. The lack of correlation between Treasury-bill holdings and the Treasury-bill rate is consistent with the hypothesis that variations in the issues of Treasury-bills do not affect the interest rate, but here again the use of unadjusted nominal values would cast some doubt on such a conclusion.

The correlation results presented in Table 3.2 are similar to those in Table 3.1 except that the *proportion of* marketable bonds and Treasury-bills relative to the interest-bearing debt are used instead of nominal dollar values. The pattern of results in the two tables is quite similar. This may be because there is some built-in correlation between the different rates of interest since increases in the trend-setting bank rate will generally create an upward pressure on all rates while decreases in the bank rate will also tend to drag other rates down. One way of getting around this problem is to control for the bank rate.

Table 3.3 presents the results of correlation *controlling for the bank rate* by removing the effect of this rate on the other rates. Thus, the measured correlation is between the relative share of each type of interest-bearing debt on the one hand and the corresponding yield structure – after removal of the overall trend in interest rates – on the other. This is achieved by weighting the interest rates in question by the reciprocal of the bank rate thereby preventing the overall *trend* in average yields from biasing the results. The purpose of this exercise is to determine the sensitivity, if any, of the rate structure on the relative size of each debt holding. The results are quite revealing. No significant correlation is observed between the relative share of each type of debt and the corresponding yield, leading to the conclusion

that increases or decreases in the holding of a particular type of debt is unrelated to the interest rate for that portion of the debt.

In summary, the data presented in Appendix Table A.1 show no clear correlation – for each type of debt – between the interest rate and the size of debt issues. This suggests that changes in debt management operations do not necessarily affect interest rates.[6] Indeed these tables indicate that for both marketable bonds and Treasury-bills, the two most important types of market debt instruments in terms of size holdings, there are instances of interest rates rising (and also falling) while the debt was rising at certain times and falling at other times. Thus, it is assumed in the analysis which follows that changes in the holdings of a particular type of debt do not affect the interest rate for that type of debt.

4.0. Federal Net Debt Issues by Debt Instruments:

The period since 1994/95 has been characterized by a rapid decrease in the share of the government's issues of Treasury-bills, despite the relatively low rate of interest associated with such bills. This is largely because of the government's preference for fixed-rate bonds and its desire to reach a target ratio of two-thirds of its gross debt portfolio consisting of such bonds (Department of Finance, 1999b, p. 8, 12; 2002, p. 17).[7] This strategy of issuing public debt according to a fixed-floating ratio of two-thirds long-term and one-third short-term is somewhat perplexing in an environment where fixed-rate long-term bonds carry with them a much higher rate of interest. Clearly, the government – by virtue of its significantly improved fiscal position – is now able to withstand a slightly higher level of risk such as that, for example, associated with holding a higher proportion of the lower-rate short-term

[6] The actual decline in the federal debt will depend on a number of variables, including the strength of the economy, changes in the rates of taxation and total expenditures, especially program spending and the extent of intervention to achieve the goals of economic stabilization. While it is premature to make predictions about the actual *size* of the debt in the foreseeable future, it seems almost certain that some debt reduction will occur in the years ahead. The net federal debt was reduced by $15 billion in the fiscal year ending March 31, 2001 and by another $8.9 billion by March 31, 2002. The debt-to-GDP ratio is now well below 50 percent from a peak of over 70 percent in 1995/96.

[7] By March 2000, 69 percent of the federal *market debt* and 52.7 percent of the *interest-bearing debt* (which includes borrowings from public sector pensions) were held in the form of marketable bonds. See Appendix Table A.1 for details.

Treasury-bills. Hermanutz and Poitras (2001) show that the fiscal rule with a target fixed:floating ratio of 2:1 or two-thirds in fixed debt holdings and one-third in floating is key in evaluating a debt management strategy.[8] It is also critical in formulating optimal debt structures.[9] As part of this fiscal rule, if the government adopts a plan that requires an annual assesssment of the conversion potential of *all* its holdings, it could benefit by holding proportionately more short-term securities than the desired fixed:floating ratio if the yield spread is high and if it can be predicted with a reasonable degree of accuracy that a significant narrowing of this spread is not likely to occur in the forseeable future.[10] This will not necessarily involve a policy change in the fixed:floating ratio, but simply a *temporary* deviation from the desired ratio. The holdings of Treasury-bills would increase and its conversion to long term bonds would be delayed for as long as conditions are favourable. A greater reliance on Treasury-bills would also inject more funds into the sagging money market where demand for such bills continues to be strong, despite the low interest rates. This would also help mitigate the impact of shrinking government debt on money market operations and overall market liquidity.

It is interesting to note that in 1994/95, the year the federal government registered a deficit of $37.5 billion, Treasury-bills accounted for 29.9 percent of all interest-bearing debt. That year and the years immediately preceding it and following it were historically high deficit years. Yet, the relatively higher risk Treasury-bills were employed to a far greater extent then than at the present time when the government's fiscal position is more secure with the annual budgetary balance recording surpluses year after year and with the debt-to-GDP ratio

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[8] As part of the government's overall debt management strategy, the Department of Finance determines the fiscal rule. It is administered by the Bank of Canada, serving in its capacity as the government's agent for the implementation of monetary policy.

[9] Optimal debt structures are influenced not simply by the fiscal rule, but also by the objectives of the government such as achieving a balanced budget, reducing the debt-to-GDP ratio to some desired level, maintaining a stable rate of growth over the long-run and providing social services at some minimum level. There is nothing in any of these criteria to contradict a fiscal rule that would rely on a flexible fixed/floating ratio within a defined band as a vehicle for reducing debt service charges.

[10] It is worth mentioning that much of FY 2003/04 has been characterized by a soft US economy and declining interest rates, which is an ideal environment for holding short-term securities.

declining rapidly.[11] Thus, stability in debt payments is being emphasized to a far greater degree during a period when the government can afford to take the small risks associated with possible fluctuations in interest rates.[12] This emphasis on the stability in debt payments is perhaps most explicitly reflected in the government's fiscal rule, which as already mentioned calls for a 2:1 ratio between fixed and floating debt issues. As a result, the average maturity period on debt has gone up dramatically in recent years. More generally, debt management strategy was significantly more risk-prone in the mid-1990s when federal finances were in a precarious situation and the government could hardly afford to take the risks associated with short-term borrowing.

Treasury-bills, despite the loss of the exclusive position they once held, remain the preferred money market instrument. If its share in the money market is further reduced because of the declining federal debt and the government's objective to maintain the target of two-thirds of the interest bearing debt in fixed-rate form, this preference could indeed shift to other money market instruments. The decline in the share of Treasury-bills in the money market has already generated significant competition from non-governmental issues such as short-term, private sector paper, futures contracts on bankers' acceptances, and forward rate agreements (Boisvert and Harvey, 1998). An increasing supply of Treasury-bills therefore would address this problem and would also increase turnover in the money market thereby helping to achieve a high volume of trade without affecting the price significantly.

Consider now a number of hypothetical but realistic cases involving a reduction in fixed rate marketable bonds that are offset by an equivalent increase in Treasury-bills since every year a significant amount of marketable bonds mature. For example, marketable bonds worth $45 billion or 14.3 percent of the total matured in 1999/2000. There is clearly the potential

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[11] Mattina and Delorme (1997) show that there is some evidence that a lower level of government indebtedness reduces the risk premia. Goldstein and Woglom (1992) provide similar evidence in an earlier study.

[12] This relative security in the government's fiscal position has also been echoed by John Manley, the federal Minister of Finance until December 2003, when he stated that "… reducing our debt means that Canada is less vulnerable to interest rate shocks sparked by events beyond our borders" (Department of Finance, 2002). In this statement, he seems to be implying a clear awareness that interest rate shocks are triggered by "events beyond our borders."

therefore to substitute a sizeable quantity of marketable bonds for Treasury-bills and other low cost instruments. As mentioned above, as recently as 1994/95 Treasury-bills accounted for almost 30 percent (see Appendix Table A.1) of the total interest-bearing debt, such a substitution does not seem to be implausible nor without precedent. This would also help to increase turnover and hence liquidity in the money market, which governments and analysts agree are desireable.

Table 4 shows that by 1999/2000 the federal government had increased its share of marketable bonds issued as a proportion of the total amount of interest-bearing debt to 52.7 percent, reducing the share of Treasury-bills to 16.7 percent. A consequence of holding these two types of debt in such proportions has meant that debt service charges for these two instruments alone totalled $28.488 billion, which is over 92 percent of debt charges on market debt and 62.9 percent of all debt service charges (see Appendix Table A.1 for details). Fiscal year 1999/2000 was similar to previous years insofar as the interest rate spread between marketable bonds and Treasury-bills was concerned. With the yields on marketable bonds and Treasury-bills averaging 7.21 percent and 5.31 percent respectively over the year, the resulting spread of 1.9 percent was below the average spread of 2.75 percent in the five previous years – 2.57 percent in 1998/99 3.34 percent in 1997/98, 4.33 percent in 1996/97, 2.5 percent in 1995/96, and 0.98 percent in 1994/95.[13] It was still high enough to generate substantial interest cost savings by shifting some of the debt from the more expensive marketable bonds to the less expensive Treasury-bills. The point is that although the interest rate spreads have fluctuated over time, they have generally been quite significant over much of the past several decades (see Table 1). Reinhart and Sack (2000) argue that expectational crowding out did cause the yield curve to steepen in the 1980s in the United States because expectation of future short-term rates were immediately reflected in long-term rates. Hence, periods of surpluses could potentially lead to some flattenning of this curve, but there is no evidence to suggest this – not to speak of an inverted yield curve! On the contrary, despite the annual budgetary surpluses since 1997/98, short-term rates were noticeably lower than

[13] It might also be worth pointing out that the interest rate spreads between Treasury-bills and marketable bonds of all duration have widened significantly since FY 2000/01. See Table 1 for details.

long-term rates in both Canada and the United States during the 2001/02 fiscal year, leading to a steepening of the yield curve (Department of Finance, 2002).

Using the interest rate spread for 1998/99 as an example, since this spread is more or less representative of past trends, Table 5 shows that the potential savings due to the substitution of each five percent of the debt from marketable bonds to Treasury-bills would be well in excess of three-quarters of a billion dollars, reaching $3 billion for a 20 percent substitution.[14] Given that interest rates for Treasury-bills have largely been below those for marketable bonds, the added risk in terms of higher debt service charges in the long-run because such a substitution would appear to be negligible. Why the government has taken steps to move in exactly the opposite direction defy most reasonable explanations.[15]

Of late, Canada Savings Bonds (CSBs) have been an attractive source of borrowing for the government. In 1997/98, the interest rate on such bonds dropped to as low as 3.61 percent before rising to 4.28 percent the following year and to 5.13 percent in 1999/2000. These bonds are typically held by risk averse investors and are highly liquid, making them an attractive investment for certain classes of people. CSBs have served the country well in the past and should continue to be a good source of borrowing, despite the inherently liquid nature of these bonds.

The increase in the share of Real Return Bonds (RRBs) and Canada Notes and Euro Medium-Term Notes (EMTNs) is a positive development.[16] RRBs also fall under the category of marketable bonds, but since they are guaranteed against inflation, the holders of these bonds

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[14] The background information used in developing the calculations for Table 4 was derived from Appendix Table A.1.

[15] In this context, an interesting question to ask is why the government wishes to be so insured. There are a number of arguments in support of this position that one might think of and these are presented in Appendix 1.

[16] It will be interesting to see if the Bank of Canada – following up on its issuance of Euro Medium-Term Notes (EMTN) for European markets – begins to issue similar notes for markets elsewhere, and not merely as a vehicle for cross-country swaps. Euro Notes are issued with fixed or floating interest rates, include embedded options, and make coupon payments in one currency and the principal payment in another currency. Notes denominated in the currencies of the economically strong European and Asian countries will also serve as a useful hedge against US dollar denominated notes.

are primarily risk-averse investors. The cost of this *real interest rate guarantee* is in the form of a lower rate of return for these bonds and therefore lower debt service charges for the government. Campbell (1995), however, points out that real rates are more volatile on the long side. Most real return bonds are long term, but the evidence for Canada does not suggest such volatility. Indeed the RRB rates cited in the public accounts show much less variation than the rates for other long-term marketable bonds (Receiver General of Canada, 1995, 1996 … … 2001).

The interest rate on RRBs, first introduced in 1991, has remained consistently lower than the average interest rate on marketable bonds. Since 1994/95, this rate has held steady at 4.25 percent while the rate for marketable bonds has ranged from a low of 7.21 percent in 1999/2000 to a high of 8.58 percent in 1994/95. Equally important has been the low and stable rate of inflation as measured by the consumer price index (CPI) in the latter half of the 1990s. For example, in the period between 1997 and 2000, this rate has varied from a low of 0.86 percent in the third quarter of 1998 to a high of 2.36 percent in the fourth quarter of 1999. This rate remained below 1.75 percent throughout the period from the second quarter of 1997 until the second quarter of 1999, rising to 2.17 percent in the third quarter (Federal Reserve Bank of St. Louis, 2000). Relatively low rates of inflation and a stable rate of interest of 4.25 percent make RRBs an attractive instrument of borrowing. At less than 2 percent of all interest-bearing debt, there is clearly room for expanding the use of this instrument and with it a reduction in debt service charges.

Canada Notes are medium-term securities issued in the United States money market under the government's foreign currency borrowing program. Euro Notes, introduced in 1997/98, like Canada Notes, are medium-term notes issued by the government of Canada in the Euro markets. The proceeds of these notes – not sold in North American markets – are exchanged for US dollars**,** which in turn provide an additional source of medium-term U.S. funds. Between 1997/98 and 1998/99, borrowings in Canada and Euro Notes doubled from $3.2 billion or 0.5 percent of the outstanding debt to $6.2 billion or 1 percent of the debt before dropping to $5.2 billion or 0.9 percent of the debt in 1999/2000. Although much of this

increase was due to the government's deliberate policy of bolstering its exchange fund account, at an average interest rate of 4.95 percent in 1999/2000 it is one of the most cost effective intruments of borrowing. With the Canadian economy performing well relative to the economies of other industrialized countries, and with the budgetary surplus and the strong currency, these notes should continue to prove to be cost effective in the foreseeable future. A further expansion in the use of Canada and Euro Notes would therefore seem to be a sensible strategy.

Rounding out the government's foreign currency borrowings are Canada Bills, which are short-term securities issued in US dollars. The issuance of Canada Bills was restored to 1.7 percent of the interest-bearing debt in 1998/99 after having fallen to 1.2 percent in 1995/96 from 1.7 percent in 1994/95. It dropped sharply to 1 percent of the interest-bearing debt in 1999/2000 as the interest rate on these bills rose from 4.81 percent in 1998/99 to 5.87 percent in 1999/2000. Here again is another example that an increase (decrease) in debt issues is not accompanied by a rise (fall) in the interest rate. As with Canada and Euro Notes, these bills have relatively low rates of interest associated with them. Canada Bills therefore is also a good instrument worthy of further expansion.

Potential interest cost savings by substituting marketable bonds through an expansion of foreign currency denominated instruments of borrowing is likely to run into the hundreds of millions of dollars per annum. As the analysis with Treasury-bills has shown in Table 5, the more aggressive the implementation of such a policy the greater will be the savings.

The non-market borrowing from various public sector pensions and the Canada Pension Plan (CPP) with interest rates hovering around the 10 percent mark are the most expensive of all borrowings. These programs clearly require major revisions. One option is to privatize all such pension plans, but that discussion is beyond the scope of this paper.

As the net debt continues to diminish, the government could begin a process of purchasing high quality securities from national and international markets thereby stimulating the money market through an infusion of Treasury-bills and ensuring both turnover and liquidity. This

accumulation of financial assets would widen the gap between gross debt and net debt, but would not affect the normal decline in the *net* debt-to-GDP ratio – as the debt is gradually paid down – and the corresponding decline in *net* debt service charges.

To summarize, the evidence presented in this section shows that a significant reduction in federal debt service charges can be achieved through a gradual substitution of the longer term and more expensive types of marketable bonds with the relatively cost effective and mostly shorter term Treasury-bills, certain types of low yield bonds (for example, RRBs and CSBs) and foreign currency denominated bills and notes. The potential savings to be generated by increasing the holdings of Treasury-bills alone is in the billions of dollars per annum. Evidence from the experience of the mid-1990s confirms that this subsitution can be achieved without significantly compromising the stability of debt payments. As well, there does not seem to be any particular sign that interest rates and the size of debt issues are positively correlated.

It is true that the data used for this study are from 1994 to 2000, a period of essentially uninterrupted growth, low and stable inflation, and relatively stable interest rates. The questions that might arise then are whether the policy prescriptions made here ideal under all circumstances and are there circumstances when this policy might be unwise, especially if the future is not like the immediate past.

Beyond very general specifications, however, and given that short-term interest rates historically have nearly always been lower than long-term rates, a carefully designed debt management strategy can reasonably be developed *only* for a number of years at a time. This means that for such a strategy to remain effective, it will have to be reviewed periodically and, if necessary, adjusted as required. Hence, events that occurred say, prior to the mid-1990s and those that might occur at the end of this decade are not necessarily relevant from a practical standpoint in formulating strategy at the present time.

In any event, the strategy that is employed must always be reviewed at each interval to adjust – should that be required – the relative share of each debt instrument and to take advantage of

market opportunities as they arise. This makes debt management strategy by its very nature somewhat opportunistic in scope. It can be said with confidence, though, that the recommendations contained in this study are likely to generate substantial savings in the short- to medium-term at little or no risk. Perhaps this strategy can be continued indefinitely with success, but that will only become apparent with the passage of time. Ultimately, the appropriate debt management strategy over the long run is essentially a *series* of strategies formulated over time based on the demands of changing circumstances, including the vagaries of business cycles. These strategies depend, in part, on public sensitivities and on the degree of public acceptance (*or* tolerance) of particular approaches, which also can change over time. In this sense, debt management strategy follows much the same path as public policy in other contexts and jurisdictions.

5.0. Foreign Currency Borrowing and the Exchange Fund Account:

The federal government borrows in foreign currencies to raise foreign exchange reserves for the Exchange Fund Account (EFA). This account provides the government with the resources (i) to intervene in foreign exchange markets to support the Canadian dollar; (ii) for commercial transactions, such as buying expensive hardware for the military; and (iii) for emergencies and disaster support. Borrowing for the EFA consists of short-term promissory notes denominated in US dollars such as Canada Bills, fixed- and floating-rate notes such as Canada Notes that have a term to maturity longer than nine months, Euro Notes denominated in a range of currencies and the more conventional foreign currency-denominated fixed-rate marketable bonds of longer term duration. The remainder of the foreign currency liabilities is held in the form of cross-currency swaps of domestic obligations, which are a cost-effective alternative to foreign-currency obligations.[17]

As of March 31, 1999, the government's total official foreign exchange reserves were US $24.6 billion and its foreign currency liabilities US $33.8 billion (Department of Finance,

[17] *Cross-currency swaps* involve swapping a domestic Canadian-dollar liability into a foreign-currency denominated liability. It can also be an agreement that exchanges one type of return for another such as a fixed for a floating type of interest or vice-versa. Such exchanges involving different types of interest also allow for the exchange of the principal amount for the term of the swap.

1999a, pp. 22-3). By December 31, 2000, reserves had risen to US $32.2 billion of which 89 percent (US $28.8 billion) was held in liquid foreign currency assets while the remainder was held in the form of reserves with the IMF (US$ 2.5 billion), Special Drawing Rights (US $ 574 million) and gold (US $323 million). Outstanding foreign currency liabilities on December 31, 2000 was US $34 billion and of this 80 percent was evenly split between bonds and outstanding cross-currency swaps. The remaining issues were held in the form of Canada Bills (11 percent) and Canada/Euro Notes (9 percent) [see DeLeon (2001) for details].[18] As of March 31, 2002, foreign exchange reserves had increased to US $34.0 billion from US $33.5 billion a year earlier, maintaining the steady increase that has been witnessed in recent years. Liabilities on March 31, 2002, including assets related to IMF commitments, which are part of Canada's official international reserves, exceeded assets by US $3.5 billion (Department of Finance, 2002).

Although the government's stated objective is to match foreign currency assets and liabilities as closely as possible, the gap can sometimes be quite substantial as for the fiscal year ending in March 31, 1999. There is nothing wrong or unusual about this situation since governments are sometimes in a net asset position with respect to their foreign currency holdings and sometimes in a net liability position, as in the case of Canada at the present time. This situation could indeed continue indefinitely without compromising the integrity of Canada's public debt. It also provides room, especially in a declining debt environment to acquire foreign currency reserves instead of reducing the holdings of Treasury-bills, for example. Such a policy could eventually lead to a surplus with respect to net foreign currency assets, especially if the net debt continues to decline over time.

On the surface, a zero net asset position with respect to foreign currency holdings is neither beneficial nor harmful nor does such a 'balance' imply a certain neutrality that is better or worse than a non-zero asset position. Beyond the necessity of maintaining an adequate

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[18] Of the total foreign currency liabilities at the end of December 2000, less than 60 percent or C$ 30.4 billion (approximately US $20 billion) was held in the form of marketable securities such as marketable bonds, Canada Bills and Canada/Euro Notes. Cross-currency swaps accounted for the remainder. Swap operations that are carried out between the Bank of Canada and EFA are related to the implementation of monetary policy.

foreign exchange reserve to maintain the stability of the domestic currency in the event of unexpected – but possible – fluctuations in foreign exchange markets, and for routine commercial transactions and emergencies, an appropriate strategy with respect to the size of foreign currency assets relative to foreign currency liabilites should consider the cost of borrowing in the domestic market versus the cost of borrowing internationally. Clearly, there are interest cost savings to be achieved if the cost of borrowing foreign currency denominated bonds is less than the cost of borrowing domestic currency denominated bonds provided of course that the exchange rate remains stable.

Assume that the target level of foreign exchange reserves has been set at US $40 billion. How should this reserve be funded? A zero net asset position in foreign currency holdings would suggest issuing foreign currency denominated bonds and securities of an equivalent amount. But is this prudent strategy? The answer depends on the *net opportunity cost* of doing so. If the debt service charges associated with issuing a basket of foreign currency denominated bonds is lower than that of issuing a basket of domestic currency denominated bonds then the former – based on the criterion of minimizing debt service charges – should be the preferred alternative and vice-versa. The amount, however, should not necessarily be limited to the desired size of the exchange fund account. It could be greater if it more than offsets the reduction in debt service charges of bonds issued in the domestic currency, without of course taking undue risks. Furthermore, as the size of the net debt decreases, the size of foreign exchange holdings could also increase simultaneously instead of having to reduce the amount of domestically issued bonds and bills too drastically. This strategy, if undertaken on a relatively small scale so as not to affect the stability of exchange rates, will help to maintain high liquidity and turnover in the domestic bond market despite the shrinking net debt.

6.0. Conclusions:

Four key conclusions regarding the federal government's debt management strategy emerge from this study.

First, no significant correlation is observed between the relative shares of each of the two principal types of Canadian federal market debt – marketable bonds and Treasury-bills – and their corresponding yield structures. This would imply that the debt issues for each of these two types of market debt could be varied within a reasonable band without having to consider any perceptible impact on debt service charges.

Second, the recent trend to lengthening the maturity structure of federal government debt should be reversed and more use made of short-term debt, which is usually issued at lower yields. Even a marginal adjustment to the fixed/floating ratio from its current target level of two-thirds/one-third is likely to generate significant savings. Periodic reviews of this key ratio will help to identify the potential for modifying the reliance on each debt instrument as a way of lowering debt service charges and maintaining fiscal order by preventing sudden or unexpected surges in interest costs. Given that the yield curve is positively sloped with a particularly steep gradient for terms to maturity ranging from three-months to five years, an increased reliance on the use of low cost borrowing instruments such as Treasury-bills will greatly help to reduce debt service charges.[19]

Third, that the composition of the longer maturity portion of the debt be adjusted with more reliance placed on innovative borrowing instruments such as real return bonds, foreign currency denominated securities – Canada Bills, and Canada and Euro Notes – and Canada Savings Bonds. These all carry lower rates of interest than the traditional long-term marketable bonds. With respect to the size of foreign currency assets relative to foreign currency liabilities, an appropriate strategy should consider the cost of borrowing in the domestic market versus the cost of borrowing internationally. The important guideline here is not to be too fixated on the relative size of foreign currency denominated debt or the size of the gap between foreign currency assets and liabilities.

[19] See Department of Finance (2002) for details on the shape of the Canada yield curve. As the analysis in the text and in Table 5 has shown, an expansion in the use of Treasury-bills from 16.3 percent of the interest-bearing debt to 36.3 percent through an equivalent reduction of marketable bonds could reduce debt service charges by an amount in excess of $3 billion annually.

Fourth, despite declining debt finance requirements, the federal government should consider maintaining its Treasury-bill borrowing levels, using the proceeds to acquire debt instruments issued by high-quality domestic and international borrowers, to help maintain liquid money markets. As the size of the net debt decreases, the size of foreign currency assets could increase simultaneously instead of having to reduce the amount of domestically held bonds and Treasury-bills. This would have the effect of bolstering the Exchange Fund Account and also protect the integrity of the domestic money market through a more visible presence of government bills and securities in the money market alongside private sector financial securities and commercial paper. It will also ensure a greater role for Canada in international markets for securities and loans. Maintaining a zero net asset position with respect to foreign currency assets and liabilities is ultimately of little overall importance.

In the final analysis, re-arranging the government's debt portfolios through the use of new and innovative borrowing instruments, and effective utilization of the existing ones, will reduce the cost of servicing the federal debt and hence make an important contribution to the overall fiscal situation facing the federal government. In the absence of any clear correlation in the magnitude of debt issues and the corresponding yield structure for each of the principal debt instruments, this task should not be too difficult to accomplish.

Appendix 1

Rationale for Long Term Borrowing: A Counter-Argument[20]

This appendix presents alternative explanations for the government's relative preference for longer term securities, despite the higher debt service charges associated with the use of such securities. It is possible that the government is concerned that too much exposure to the short end of the term structure will mean that debt service payments grow just when revenues are squeezed, cramping fiscal discretion, compounding adjustment cost and/or tax distortion problems, and disturbing planning processes. For this reasoning to be valid, however, empirical correlation structures would have to support these conjectures!

In the corporate context, assuming that 'insurance' is priced correctly, and that managers are acting in the best interests of the firm's owners, hedging has value if, for example, there are bankruptcy costs, or convexities – perhaps induced by a progressive tax structure – that penalize variability in an uncertain net income stream. In the current context, if the role of government is assumed to be the provision of public goods, then interruptions in this provision carry real costs. If taxes must be raised to prevent this interruption and these taxes are distortionary then this is also a cost.

Alternatively, the government may be 'hedging' solely to serve its own interests. Under some circumstances, corporate hedging may be undertaken to benefit the firm's managers rather than its shareholders. The idea that government might use public resources to advance its own interests is not entirely far-fetched. The ability to avoid unanticipated spikes in debt service – and the consequent need to adjust tax policy, or to borrow to make up the shortfall – may be less politically appetising than simply paying higher (nominal) interest rates.

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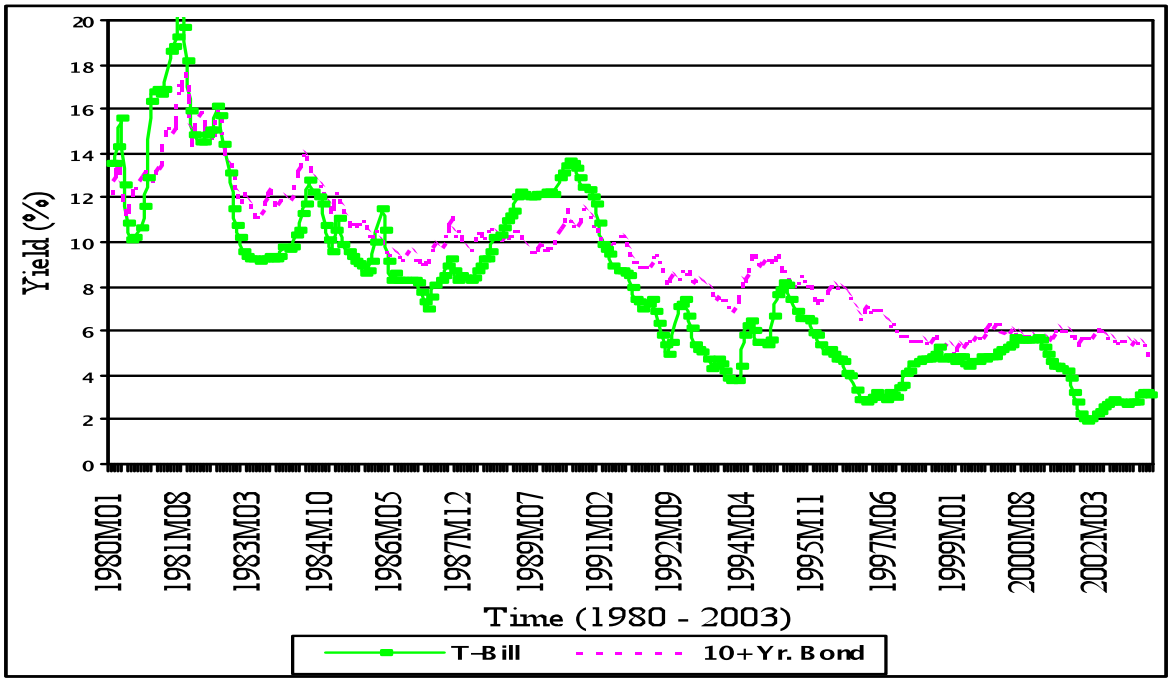
[20] The author is indebted to Jim Storey for raising some of the issues discussed in this appendix.

The question of political motivations for long-term borrowing also has some impact on the suggestion that the government continue to issue Treasury-bills and use the proceeds to invest in high-quality securities issued by others, if this is to include corporate securities. There are a number of incentive issues raised by the thought of government that has a vested interest in the success of one firm – potentially at the expense of another. Such a mechanism would have to be very carefully organized. Perhaps the best approach would involve something like parking the funds in a number of blind trusts, so that discretion over the analogy to free cash flows might not breed temptation!

Figure 1

The Yield Structure of
Treasury-bills and Long-term Bonds over Time

(1980 – 2003)



Sources: CANSIM II SERIES' V122484 and V122487.

Table 1

The Yield Structure of Short-term and Long-term Securities over Time

(Fiscal Year 1969/70 – 2002/03)

Fiscal Year	T-Bill	1-3 Year Bond	3-5 Year Bond	5-10 Year Bond	10+ Year Bond
1969/70	7.441	7.671	7.852	8.005	7.817
1970/71	5.249	5.921	6.484	7.027	7.572
1971/72	3.440	4.979	5.679	6.238	6.997
1972/73	3.689	5.648	6.378	6.829	7.298
1973/74	5.943	6.884	7.173	7.332	7.728
1974/75	7.835	7.871	7.978	8.168	9.008
1975/76	7.953	8.073	8.181	8.529	9.286
1976/77	8.644	8.051	8.196	8.519	9.011
1977/78	7.239	7.573	8.089	8.328	8.818
1978/79	9.458	9.311	9.354	9.357	9.463
1979/80	12.321	11.635	11.233	10.929	10.946
1980/81	13.417	12.447	12.465	12.378	12.595
1981/82	17.246	16.438	16.129	15.793	15.735
1982/83	12.514	12.638	12.806	12.972	13.403
1983/84	9.464	10.328	10.792	11.341	11.925
1984/85	11.209	11.723	11.873	12.319	12.603
1985/86	9.533	9.767	10.008	10.347	10.576
1986/87	8.154	8.643	8.834	9.023	9.273
1987/88	8.431	9.463	9.679	9.764	10.155
1988/89	10.199	10.226	10.154	10.025	10.369
1989/90	12.318	10.865	10.311	9.881	9.951
1990/91	12.162	11.148	10.839	10.586	10.718
1991/92	8.095	8.513	8.755	9.084	9.529
1992/93	6.217	6.773	7.192	7.986	8.595
1993/94	4.401	5.503	6.194	6.996	7.621
1994/95	6.401	7.908	8.418	8.753	9.009
1995/96	6.315	6.632	7.124	7.507	7.961
1996/97	3.735	4.999	5.923	6.633	7.311
1997/98	3.587	4.821	5.273	5.652	6.090
1998/99	4.819	5.084	5.132	5.202	5.371
1999/2000	4.788	5.621	5.814	5.860	5.909
2000/01	5.438	5.597	5.683	5.709	5.784
2001/02	3.131	3.958	4.798	5.327	5.809
2002/03	2.762	3.551	4.307	4.938	5.575

Note: The interest rates given in this table are the average of the monthly rates for each of the five types of securities for each fiscal year.

Sources: CANSIM II SERIES' V122484, V122558, V122485, V122486 and V122487.

Table 2

A Comparison of Average Yields of Treasury-Bills and Marketable Bonds (10+ years) Relative to the Bank Rate

(Fiscal Year 1994/95 – 2000/01)

The top entry in each cell is the average yield for three-month *Treasury-bills*.
The second entry is the average yield for *marketable bonds* over ten years.
The third entry (in bold print) is the *bank rate*.

	June 30	**Sept 30**	**Dec 31**	**Mar 31**
1994/95	6.67 9.29 **6.92**	5.29 9.04 **5.54**	7.18 9.16 **7.43**	8.22 8.70 **8.47**
1995/96	6.72 8.02 **6.97**	6.46 8.11 **6.71**	5.54 7.43 **5.79**	5.03 7.94 **5.25**
1996/97	4.70 7.98 **5.00**	3.96 7.48 **4.25**	2.80 6.77 **3.25**	3.19 6.97 **3.25**
1997/98	2.86 6.49 **3.25**	3.10 5.99 **3.50**	4.46 5.80 **4.50**	4.57 5.54 **5.00**
1998/99	4.88 5.45 **5.00**	4.94 5.15 **5.75**	4.70 5.08 **5.25**	4.75 5.23 **5.00**
1999/2000	4.62 5.63 **4.75**	4.69 5.92 **4.75**	4.93 6.25 **5.00**	5.28 5.96 **5.50**
2000/01	5.55 5.90 **6.00**	5.56 5.83 **6.00**	5.56 5.59 **6.00**	4.60 5.74 **5.25**

Notes: In an official statement to the Commons Finance Committee on May 17, 2001, the federal Minister of Finance at that time, Paul Martin, reported that three-month Treasury-bill rates were forecast to yield 4.6 percent in 2001 and 4.7 percent in 2002. The 10-year marketable bond yield was estimated at 5.3 percent in 2001 and 5.6 percent in 2002.

Source: Bank of Canada – dataBank Results: http://www.bank-banque-canada.ca/

Table 3.1

The Correlation of the Term Structure of Interest Rates and Debt Magnitude for Marketable Bonds and Treasury-Bills

(Fiscal Year 1994/95 – 1999/2000)

The first entries in each cell are *Pearson's correlation coefficients*.
The second entries are the two-tailed *significance levels*.
The third entries are the *t-values*.

	Marketable Bond Rate (two to thirty years)	**Treasury-Bill Rate** (three-month rate)	**Bank Rate** (year average)	
Marketable Bonds	r = -0.9318 P = 0.007 t = -5.1343	r = -0.7928 P = 0.060 t = -2.016	R = -0.8081 P = 0.052 t = -2.7438	
Treasury-Bills	r = 0.9619 P = 0.002 t = 7.0365	r = 0.5658 P = 0.242 t = 1.3724	r = 0.6249 P = 0.185 t = 1.6009	

Table 3.2

The Correlation of the Term Structure of Interest Rates and the *Proportion of* Debt Magnitude for Marketable Bonds and Treasury-Bills

(Fiscal Year 1994/95 – 1999/2000)

The first entries in each cell are *Pearson's correlation coefficients*.
The second entries are the two-tailed *significance levels*.
The third entries are the *t-values*.

	Marketable Bond Rate (two to thirty years)	**Treasury-Bill Rate** (three-month rate)	**Bank Rate** (year average)	
Proportion of Marketable Bonds	r = -0.9510 P = 0.004 t = -6.1515	r = -0.7188 P = 0.108 t = -2.0678	R = -0.7565 P = 0.082 t = -2.3135	
Proportion of Treasury-Bills	r = 0.9681 P = 0.002 t = 7.7274	r = 0.6490 P = 0.163 t = 1.7061	r = 0.6907 P = 0.129 t = 1.9103	

Table 3.3

The Correlation of the Term Structure of Interest Rates and the *Proportion of* Debt Magnitude for Marketable Bonds and Treasury-Bills *Controlling for the Bank Rate*

(Fiscal Year 1994/95 – 1999/2000)

The first entries in each cell are *Pearson's correlation coefficients*.
The second entries are the two-tailed *significance levels*.
The third entries are the *t-values*.

		Marketable Bond Rate *Controlling for the Bank Rate* (two to thirty years)	**Treasury-Bill Rate *Controlling for the Bank Rate*** (three-month rate)
	Proportion of **Marketable Bonds**	r = 0.4483 P = 0.373 t = 1.0030	r = -0.0128 P = 0.981 t = -0.0256
	Proportion of **Treasury-Bills**	r = -0.3652 P = 0.477 t = -0.7846	r = -0.0115 P = 0.983 t = -0.0230

Table 4

The Relative Distribution of Interest-Bearing Debt Issues by Debt Instruments over Time

(All figures are in percentages)

(Average interest rates for each debt instrument by year are given in brackets)

(Fiscal Year 1994/95 - 1999/2000)

Debt Instruments	1994/95	1995/96	1996/97	1997/98	1998/99	1999/2000
Marketable Bonds	42.5 (8.58)	44.7 (8.39)	49.1 (8.01)	52.0 (7.75)	53.0 (7.51)	52.7 (7.21)
Treasury-Bills	29.9 (7.60)	28.3 (5.89)	22.5 (3.68)	18.9 (4.41)	16.3 (4.94)	16.7 (5.31)
Canada Savings Bonds	5.5 (5.75)	5.2 (6.58)	5.4 (6.75)	5.0 (3.61)	4.6 (4.28)	4.4 (5.13)
Bonds for CPP	0.6 (10.21)	0.6 (10.21)	0.6 (10.21)	0.6 (10.22)	0.6 (9.39)	0.6 (10.04)
Canada Bills	1.7 (6.16)	1.2 (5.20)	1.4 (5.37)	1.6 (5.49)	1.7 (4.81)	1.0 (5.87)
Canada/Euro Notes	0.0 (N/A)	0.0 (N/A)	0.4 (6.12)	0.5 (5.87)	1.0 (4.70)	0.9 (4.95)
Total (market debt)	**80.2 (7.97)**	**80.0 (7.34)**	**79.4 (6.66)**	**78.5 (6.64)**	**77.4 (6.70)**	**76.3 (6.15)**
Public Sector Pensions	18.9 (10.4)	19.0 (10.4)	19.0 (10.0)	19.7 (10.0)	20.6 (9.6)	21.5 (10.35)
Other Accounts	0.9	1.0	1.6	1.7	2.0	2.2
Grand Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Notes: Canada Notes were introduced in FY 1996/97 and Euro Notes in 1997/98. There is no column for 2000/01 in this table since the Public Accounts data for this year will not be available until November 2001.

Sources: Appendix Table A.1 and Receiver General for Canada (Volumes I and II, 1995, 1996, 1997, 1998, 1999, 2000).

Table 5

Potential Savings by Shifting Debt Issues from

Marketable Bonds to Treasury-Bills

(Base Fiscal Year: 1998/99)

	Actual 1998/99 Debt Outstanding $,000,000 *(% of Total)*	**Case 1**	**Case 2**	**Case 3**	**Case 4**
Marketable Bonds Average 98/99 Interest Rate: 7.51%	315,399 (53.0%)	285,644 (48.0)	255,890 (43.0)	226,135 (38.0)	196,381 (33.0)
Treasury-Bills Average 98/99 Interest Rate: 4.94%	96,950 (16.3)	126,705 (21.3)	156,459 (26.3)	186,214 (31.3)	215,968 (36.3)
Gross Debt Charges ($,000,000)	-	28,086	27,322	26,557	25,793
Potential Savings ($,000,000)	-	764.556	1,529.112	2,293.667	3,058.223

Notes: The first of two entries in the cells corresponding to *marketable bonds* for cases 1 through 4 is the debt outstanding if the debt held in marketable bonds is reduced incrementally by 5 percent. The corresponding entries for *Treasury-bills* is the debt outstanding if this reduction is exactly offset by an equivalent increase in the debt held in Treasury-bills. The second entries (in parentheses) are the corresponding percentages of the total debt held as reported in Appendix Table A.1. The *gross debt charges* and *potential savings* are the synthetic calculations using the 1998/99 interest rates from Appendix Table A.1 for each of the four hypothetical cases.

Appendix
Table A.1

Interest-Bearing Debt with Associated Interest Rates and Debt Service Charges
(Fiscal Years 1994/95 – 1999/2000)

Type of Bond/Security	***Average Interest Rate*** *(%)*						***Debt Outstanding*** $,000,000 *(% of Total)*						***Debt Charges*** $,000,000 *(% of Total)*					
	94/95	**95/96**	**96/97**	**97/98**	**98/99**	**99/00**	**94/95**	**95/96**	**96/97**	**97/98**	**98/99**	**99/00**	**94/95**	**95/96**	**96/97**	**97/98**	**98/99**	**99/00**
Marketable Bonds	8.58	8.39	8.01	7.75	7.51	7.21	233,553 *(42.5%)*	262,214 *(44.7%)*	294,958 *(49.1%)*	309,234 *(52.0%)*	315,399 *(53.0%)*	315,339 *(52.7%)*	19,537 *(46.5%)*	21,242 *(46.5%)*	23,037 *(51.2%)*	24,128 *(55.3%)*	24,585 *(55.8%)*	24,112 *(53.2%)*
Treasury-Bills	7.60	5.89	3.68	4.41	4.94	5.31	164,450 *(29.9%)*	166,100 *(28.3%)*	135,400 *(22.5%)*	112,300 *(18.9%)*	96,950 *(16.3%)*	99,850 *(16.7%)*	9,343 *(22.2%)*	11,118 *(22.2%)*	7,021 *(15.6%)*	4,314 *(9.9%)*	4,266 *(9.7%)*	4,376 *(9.7%)*
Canada Savings Bonds	5.75	6.58	6.75	3.61	4.28	5.13	30,460 *(5.5%)*	30,460 *(5.2%)*	32,470 *(5.4%)*	29,769 *(5.0%)*	27,662 *(4.6%)*	26,489 *(4.4%)*	2,070 *(4.9%)*	2,184 *(4.9%)*	2,421 *(5.4%)*	2,005 *(4.6%)*	1,309 *(3.0%)*	1,358 *(3.0)*
Bonds for CPP	10.21	10.21	10.21	10.22	9.39	10.04	3,489 *(0.6%)*	3,478 *(0.6%)*	3,468 *(0.6%)*	3,456 *(0.6%)*	4,063 *(0.6%)*	3,552 *(0.6%)*	359 *(0.9%)*	379 *(0.9%)*	367 *(0.8%)*	361 *(0.8%)*	391 *(0.9%)*	420 *(0.9%)*
Canada Bills	6.16	5.20	5.37	5.49	4.81	5.87	9,046 *(1.7%)*	6,986 *(1.2%)*	8,436 *(1.4%)*	9,356 *(1.6%)*	10,171 *(1.7%)*	6,008 *(1.0%)*	342 *(0.8%)*	304 *(0.8%)*	371 *(0.8%)*	429 *(1.0%)*	499 *(1.1%)*	340 *(0.8%)*
Canada/Euro Notes	***NA***	***NA***	6.12	5.87	4.70	4.95	***NA***	***NA***	2,121 *(0.4%)*	3,176 *(0.5%)*	6,181 *(1.0%)*	5,168 *(0.9%)*	***NA***	***NA***	106 *(0.2%)*	141 *(0.3%)*	191 *(0.4%)*	330 *(0.7)*
Total (market debt)	**7.97**	**7.34**	**6.66**	**6.64**	**6.70**	**6.15**	**440,998** ***(80.2)***	**469,547** ***(20.0%)***	**476,852** ***(79.4%)***	**467,291** ***(78.5%)***	**460,427** ***(77.4%)***	**456,406** ***(76.3%)***	**31,651** ***(75.3)***	**35,227** ***(75.3)***	**33,323** ***(74.1%)***	**31,378** ***(72.0%)***	**31,241** ***(70.9%)***	**30,936** ***(68.3%)***
Public Sector Pensions	10.4	10.4	10.0	9.90	9.6	10.35	104,438 *(18.9%)*	111,518 *(19.0%)*	114,204 *(19.0%)*	117,456 *(19.7%)*	122,407 *(20.6%)*	128,346 *(21.5%)*	10,234 *(24.3%)*	10,973 *(24.3%)*	11,137 *(24.8%)*	11,705 *(26.9%)*	12,160 *(27.6%)*	13,290 *(29.3%)*
Other Accounts	–	–	–	–	–	–	4,756 *(0.9%)*	5,631 *(1.0%)*	9,500 *(1.6%)*	10,160 *(1.7%)*	12,151 *(2.0%)*	13,181 *(2.2%)*	161 *(0.4%)*	677 *(0.4%)*	513 *(1.1%)*	509 *(1.2%)*	653 *(1.5%)*	1,084 *(2.4%)*
Grand Total	–	–	–	–	–	–	**550,192** ***(100%)***	**586,387** ***(100%)***	**600,557** ***(100%)***	**594,907** ***(100%)***	**594,985** ***(100%)***	**597,933** ***(100%)***	**42,046** ***(100%)***	**46,877** ***(100%)***	**44,973** ***(100%)***	**43,592** ***(100%)***	**44,054** ***(100%)***	**45,310** ***(100%)***

Notes: The ratio of debt charges for each category to the corresponding stock of debt (i.e., the effective interest rate) is different from the *average* interest rate (see Table 1) for each year, which is for the *current year only* (i.e., FY 1994/95 or 1995/96 … … or 1999/2000). The reason for this seeming discrepancy is because the debt service charges on each portion – within each of the categories – of the debt carries with it the rate of interest that existed at the time that portion of the debt was issued. The *Debt Outstanding* and *Gross Debt Charges* columns are adjusted for amortization of premiums, discounts and commissions. The latter also includes servicing costs and the costs of issuing new borrowings. It is primarily for these reasons that the official debt charges reported in the detailed public accounts and included in this table are greater than the more commonly reported *interest only* debt service charges. As well, starting with Fiscal Year 1997/98, the adoption of new accounting procedures in 1998 have further contributed to this discrepancy. Summary statistics of the *Public Accounts* are reported each year in Volume I while the details are included in Volume II.

Source: Receiver General for Canada (Volumes I and II, 1995, 1996, 1997, 1998, 1999, 2000).

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