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Report on the Evaluation of the Receiver General Cash Management Program

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1. Executive Summary

The amount and timing of Canada's cash needs fluctuates throughout the year depending upon a variety of factors, including program requirements and the timing and level of cash inflow (tax collection). The Bank of Canada ("the Bank"), as Fiscal Agent for the Government of Canada ("the Government"), manages the cash Receiver General ("RG") Account, from which the balances required for Canada's day-to-day operations are drawn. This Agent role is distinct from the Bank's responsibility to implement monetary policy. There is, however, some degree of controlled interaction between the two roles which is discussed in our report.

Receiver General Cash Management Program

To fulfill its role as a prudent manager of funds, the Bank of Canada is interested in maintaining cash balances only to the extent required for funding current needs plus a contingency amount. The Bank of Canada utilizes various programs to manage the cash balances, including daily term deposit auctions, Treasury Bill auctions, Cash Management Bill sales and the Cash Management Bond Buyback Program. All of these programs involve interaction between the Bank of Canada and money market participants including Primary Dealers ("PDs"), other financial institutions, investors and issuers.

Evaluation Criteria and Attributes

It is important for Department of Finance ("Finance") and the Bank of Canada to evaluate the effectiveness of cash management programs on a regular basis. In undertaking the most recent evaluation, KPMG LLP has examined the cash management programs utilized by the Bank in light of eight key attributes: accuracy of forecast; framework and governance; participation rate and coverage; returns on collateralized and non-collateralized term deposits; risk; cost of funds; transparency and collateral implications.

In conducting our examination, we carried out a review of a variety of documents provided by representatives of the Bank and Finance. We held discussions with individuals at the Bank and Finance responsible for the cash management program. We conducted a series of interviews with a representative sample of users of the Government's cash management programs, including investors, Primary Dealers, issuers and the Government's custodian, RBC Dexia. We also conducted interviews with investors who currently do not participate in the Government's cash management programs.

In addition, we sought the views of cash managers in Australia, New Zealand, the United Kingdom and the United States to identify potential elements which might provide greater effectiveness for the Government of Canada's cash management program.

Observations and Findings

The ability of the Bank's treasury managers to forecast the movement of government cash flows has consistently improved as evidenced by a reduction in the standard deviation against the average difference in forecast. Treasury managers working in collaboration with Public Works and Government Services Canada ("PWGSC"), which processes the payments, are utilizing recently developed automated systems. Based on comments received by the current evaluation participants, we believe the Receiver General Term Deposit Auction program is effective; however, several stakeholders offered suggestions worthy of consideration in order to further enhance the program. As well, most of these parties commented on the limited availability of uncollateralized lines utilized for the RG Term Deposit Auctions.

Overall, market participants are satisfied with the Government's current Treasury Bill program. Market participants feel that they would benefit from smaller variations in the size from one auction to the next. For treasury managers, this requires a trade-off between regularity and the flexibility to meet the sometimes widely fluctuating cash needs of the Government.

Cash Management Bills ("CMBS") are well used by the treasury managers to manage cash balances. There is greater appetite by the market for fungible Cash Management Bills. As is done by the Government Accounting Office in the United States, additional analysis of the yield differential between Cash Management Bills and Treasury Bills of equivalent life to maturity could provide further insight into market receptivity towards CMBs

The Cash Management Bond Buyback program has been effective in reducing the impact of large maturities during the last three years. The Government's recently released paper on Bond Buyback Operations will aid some participants' understanding of the process for accepting bids. In utilising the program, the Government has reduced the cost of carrying higher cash balances before a large maturity as well as smoothed fluctuations in treasury bill issuance.

International Perspective

An important element of the review is the ability to compare the Government's program with cash management programs in other countries. Canada's cash management program compares well with the four international comparators. We found many similarities and many differences in the systems and processes used by Australia, New Zealand, the United Kingdom and the United States both relative to Canada and to each other.

In some areas, the Government is the most advanced, for example in the regular auctioning of Government excess cash balances. All of the countries consistently strive to improve the processes supporting forecasting cash balances and flows.

All of the countries have the ability to issue treasury bills. Currently, New Zealand, U.K. and U.S. issue 4-week treasury bills in addition to the 3-month and 6-month tranches. The Government should consider further review of a 1-month tranche issuance with the objective to reduce funding costs.

There is a diverse view towards collateral and risk tolerance among the four countries. There are options available for the Government to review and consider in the context of broadening the list of acceptable collateral, and increasing its dealings on a non-collateralized basis.

Recommendations and Suggestions for Improvement

The Government's programs for managing cash balances are effective in providing sufficient cash balances to meet the Government's needs within the framework provided. The program and instruments utilized could be enhanced by utilizing suggestions which were offered in the context of this study as well as by adopting programs which are similar to those currently in place in other countries.

The treasury managers have developed systems which have improved forecasting ability. Continuing development in this area will produce more reliable estimates.

The development and introduction of a 1-month Treasury Bill could be a useful tool to smooth balances and reduce fluctuations in the size of consecutive bill auctions.

There is no clear consensus among the market participants with respect to the complete freedom of bidding (from zero participation to 100%) for non-fungible Cash Management Bill auctions. In fact, some market participants believe that the absence of a bidding limit makes it difficult for them to pre-sell such issues as they run the risk of ending up short if another participant reaps the whole amount auctioned.

However, other participants do not see a problem and since the auctions of non-fungible CMBs are very well covered, we share the treasury managers' view that the process is successful. Consequently no change is recommended.

The concept of a Reverse RG Auction was met with mixed reaction in our interviews. While this could be a useful tool to help manage cash balances, there is a view that if no bidders respond, the Government could be put at risk of having to borrow from the Bank of Canada as a last resort.

The pressure on collateral was an issue raised by market participants and other sovereign treasury managers as well. Further review of alternatives available should be considered in context with the overall cash management program.

The suggestions provided by all parties for investment of the Government's excess balances are wide-ranging and all require further investigation. Options raised included expanding the amount of uncollateralized term deposits permitted to current market participants; sourcing the investment of some of the excess to an investment manager or other financial intermediary; and investing the excess in the debt of foreign sovereigns.

The Government would likely benefit from adapting some of the performance evaluation approaches of the other sovereigns into its cash management program. It would be useful to construct a benchmarking model that attempts to measure performance, similar to a private sector manager evaluation.

2. Introduction

In conducting the financial management of its operations, the Government of Canada maintains Canadian dollar cash balances which are referred to as Receiver General cash balances ("RG balances"). The Bank of Canada acts as fiscal agent of the Government, and is responsible for managing the RG balances. The RG balances can vary widely over the course of a year due to the size and diversity of the Government's needs and operations.

The main objectives of the RG Cash Management program are to ensure that the Government always has sufficient cash on hand to meet its obligations, while not keeping excessive and unproductive balances and minimizing cost of funds. At the same time, risks (credit, operational and interest rate risks) must be managed in a prudent fashion.

The RG Cash Management program is built upon major sub-programs which have been introduced and improved over the years: the RG term deposit auction, for investment of RG excess cash balances; the Cash Management Bill which is a short term financing instrument complementing and adding flexibility to Treasury Bill issuance; and finally, the Cash Management Bond Buy Back program, which serves to actively manage the maturity profile of Canada's shorter term bonds and attenuate the peaks in cash balances which would otherwise result from upcoming large bond maturities. For each of these programs, there exists a clear set of rules and procedures. Consultation is conducted regularly with participants in the various RG Cash Management auctions and programs.

The effective management of the RG Cash Management program involves striking the appropriate balance between a number of objectives such as low financing costs, stability, flexibility, transparency and risk management.

When evaluating the effectiveness of the RG Cash Management program in fulfilling its stated objectives, it is important to take into account several constraints, variables and obstacles that can make the management of the program challenging. These include the shape of the yield curve and absolute level of rates, maintenance of benchmark bond issues, the declining trend in the absolute size of Canada's debt, the objectives of Government in terms of the proportions of fixed and floating rate debt, the timing of RG receipt and expense flows and the fact that there is little to no flexibility on bond auction calendars, delivery and maturity dates, which are fixed and announced in advance on a quarterly basis to participants.

This report outlines the key results of our review. Section 4 contains a factual description of our understanding of the RG Cash Management program. Section 5 defines the attributes that we examined in our analysis and discussed in some detail during the interview process. Section 6 summarizes our evaluation based on the observations and findings from a series of interviews with officials from the Department of Finance and Bank of Canada in addition to individuals from fifteen external organizations. Section 7 contains a summary review of international comparators. The final section contains a discussion with suggestions for possible enhancements and recommendations based on our evaluation and comprehensive round of interviews with market participants, Finance and Bank officials and treasury managers of other sovereign states.

3. Objectives, Scope and Methodology of Evaluation

In January 2006, the Department of Finance Canada ("Finance") awarded KPMG LLP ("KPMG") a contract for the Evaluation of the Receiver General Cash Management Program. This review is conducted under the auspices of Finance's treasury evaluation program. It examines the effectiveness of the RG Cash Management program and its major sub-programs in fulfilling the core objectives of ensuring that the Government has sufficient cash available at all times to meet its operating requirements while maintaining effective low-cost borrowing under an appropriate risk control framework.

To complete this assignment, KPMG researched and reviewed a large number of proprietary and public documents (a listing is attached as Addendum 1), considered comparable sovereign borrowers and cash managers, and conducted interviews with various stakeholders – Finance, Bank of Canada, Primary Dealers, Large Value Transfer System ("LVTS") participants, investors, corporate and provincial issuers as well as RBC Dexia, the entity which provides settlement and management services for the tri-party agreements under the morning RG term deposit auction, and Public Works and Government Services Canada which processes the receipts and payments flowing to the RG account. A list of interviewees is attached as Addendum 2 and a copy of the Interview Guides that were used can be found in Addendum 3.

4. Description of RG Cash Management Program

4.1. Stated objectives

As set out in the Debt Management Strategy 2006-2007, the Government of Canada manages its cash balances in order to ensure that it has sufficient cash on hand to meet its operating and liquidity requirements. In pursuit of this core objective, three more objectives have to be met:

- Minimize the cost of maintaining cash balances
- Effectively manage risk
- Maintain effective, low cost borrowing

The key practices associated with the Receiver General cash balances, as described in Finance's annual Debt Management Strategy publication, are:

- Hold daily competitive auctions for the investment of daily cash balances;
- Ensure that counterparty credit risk is prudently managed with appropriate credit rating and counterparty limits and collateral support, and that there is broad participation in auctions of cash balances

Other key activities that support the achievement of effective, low cost borrowing are:

- Accurate forecasting of the Government's cash flows
- Treasury Bill issuance
- Cash Management Bond Buybacks
- Flexible issuance of Cash Management Bills

4.2. Overall description of the RG cash management process

The day-to-day management of the RG account balances is performed by the Bank, as fiscal agent. There are also interactions with the Bank's other major responsibility – the conduct of monetary policy. As we discuss in greater detail in section 4.4, the open market interventions of the Bank, employing domestic Special Purchase and Resale Agreements ("SPRAs" "specials" or "reverse repos") and Sale and Repurchase Agreements ("SRA" or "repos") with the objective of reinforcing its target overnight rate, have a direct impact on the size of government cash balances, as the Bank's intervention in the overnight market results in a shift in terms of where balances are held between market participants and the RG. This shift in where balances are held results in no overall impact on costs to the government, as any Bank net profits are ultimately transferred to the government by the end of the year.

Daily, the Government's Canadian dollar receipts and disbursements, including cash flows related to debt issuance, servicing and maturities, and the Canadian dollar side of foreign exchange transactions settle through the Consolidated Revenue Fund, which is the Government's account at the Bank. It is the balances in this account that we refer to as Receiver General Cash Balances.

The regular (non debt related) daily receipts and disbursements can range from $300 million to $5 billion. On days where there are new or maturing issues of large Government of Canada Bonds the debt related cash flows can reach as much as $10 billion.

To forecast RG balances, the treasury cash managers use the Government's budget and spending estimates, receive ongoing payment and receipt information from government departments, consult the Government of Canada Bond issuance and maturity calendars, and receive information on foreign exchange purchases and sales, and cross-currency swap transactions and maturities. Forecasts are updated on a daily basis.

To manage balances, the treasury cash managers use the following programs:

- RG Term Deposit auctions: The RG daily cash balances can range from less than $3 billion to more than $20 billion. Typically up to $2 billion of these balances remains overnight on the Bank's balance sheet. The remainder is auctioned twice daily to bidders in the RG, either at the morning auction for terms typically of up to one week, and often in multiple tranches, or at the uncollateralized afternoon term deposit auctions for single day tenors
- Treasury Bill program: once all major flows are integrated in the forecast, the Treasury Bill program is planned; adjustments will be made to the bi-weekly size of auction to reflect evolving aggregate deviations in forecast; very large deviations may require issuance of Cash Management Bills
- Cash Management Bill program: these instruments are used primarily to smooth out intra-month imbalances and to provide emergency funding, in the event of an unexpected large cumulative deviation in forecast; their tenors typically range from 3 days up to 1 month, although maturities of up to 3 months are possible; Cash Management Bills can be issued on any business day with as little as one day lead time
- Cash Management Bond Buyback program: The CMBB program involves the advance repurchase of large bonds maturing in the next year and a half, in order to reduce corresponding peak level requirements in cash balances

4.3. Framework

As stated on Finance's website[1], "Legal authority for the government's borrowing and cash management program is provided by Part 4 Public Debt of the Financial Administration Act (FAA). Provisions of the Currency Act govern reserves activities. Section 24(1) of the Bank of Canada Act provides statutory authority for the Bank of Canada to act as the government's fiscal agent. The Minister approves policies for treasury management activities, including funds management (debt management strategy, reserves and cash management frameworks). Operating under the direction of the Director of the Financial Markets Division (Finance) and the Chief of Financial Markets Department (Bank of Canada), officials are responsible for the day-to-day management of federal debt, reserves and cash balances, consistent with approved policies and strategies".

Public Works and Government Services Canada ("PWGSC") is responsible for issuing payments, as well as setting up and administering arrangements with financial institutions for the collection and payment of Government funds. PWGSC effectively manages the linkage of all bank accounts used by the Government so that balances are netted through a single account, the Receiver General Consolidated Revenue Fund account at the Bank.

This structure improves the visibility of flows and helps address the challenges of forecasting flows which can then be actively managed by the treasury managers of the Bank.

[1] http://www.fin.gc.ca/treas/Goveev/TMGF_1e.html#Purpose

There is an extensive level of information reporting and consultation between the treasury managers at the Bank and officials at Finance. According to the Treasury Management Framework[2] which governs the management of the federal government's financial assets and liabilities, Managers at the Department of Finance and the Bank of Canada are responsible for the development of strategies for both debt and cash management. Certain responsibilities, which are largely operational in nature, have been delegated by the Minister of Finance to senior officials at the Bank of Canada in its role as fiscal agent.

A senior committee called the Funds Management Committee ("FMC") oversees all activities covering wholesale debt, cash management, foreign reserves and risk control. The FMC is composed of the Associate Deputy Minister, Finance (Chair); the Assistant Deputy Minister, Finance; Financial Sector Policy Branch; and the Deputy Governor, Financial Markets, at the Bank. Senior officials at Finance and the Bank are regular attendees at these semi-annual FMC meetings.

The Funds Management Coordinating Committee ("FMCC") oversees cash management policy and operations. The monthly FMCC meetings are co-chaired by the Director, Financial Markets Division at Finance and by the Chief, Financial Markets at the Bank. There is also a Domestic Debt and Cash Management Working Group ("DDCMWG") composed of the Chief and officials of Finance and Assistant Directors and other officials involved in Funds Management related activities at the Bank. The DDCMWG meets regularly (typically monthly) and has the responsibility, among others, to oversee the management of the cash position and to ensure that there are funds available to meet government requirements. Within this remit, there is a clear delineation of responsibilities between Finance and the Bank.

Finance and the Bank establish policies and program reviews jointly, with reports to the FMC. The following activities have been assigned to the Bank:

- Daily size decisions and announcements for RG auctions
- Weekly size decisions and announcements for Treasury Bills, Cash Management Bills and Cash Management Buy Backs (Reports sent to DDCMWG)
- Monthly forecast of fiscal year cash flow (Reports sent to DDCMWG and FMCC)
- Forecast of daily requirements
- Production of monthly cash flows and balance reports
- Production of weekly cost-of-carry report (Reports sent to DDCMWG)
- Operational daily reports

It should be noted that, based on a survey of cash management in 22 OECD countries[3], the Canadian institutional arrangement where the central bank takes an active role in managing cash balances seems rather unique.

In all OECD surveyed countries, the bank account of the government resides at the central bank and in nine other non-OECD countries the central banks play a role in taking deposits from a debt office or in providing administrative services as agents. However, the active treasury management role played by the Bank of Canada is generally undertaken in other countries by central debt offices.

A case in point is New Zealand, where prior to the formation of the New Zealand Debt Management Office ("NZDMO") in 1986, the Reserve Bank of New Zealand ("RBNZ") was handling both debt issuance in the domestic market and implementation of monetary

[2] Department of Finance, Bank of Canada, Canada Investment and Savings, Treasury Management Governance Framework, October 2003

[3] OECD Working Party on Debt Management – Cash Management in OECD Countries – working document, October 2005

policy, without clear delineation of objectives between the two roles. The NZDMO reports to New Zealand Treasury and has entered into service agreements with the RBNZ for some operational aspects related to New Zealand Debt, such as the outsourcing to the RBNZ of the registrar and paying agents roles, the use of RBNZ as one of several authorized foreign exchange dealers, as operator for the tendering process and finally, as manager of foreign exchange reserves. It should be noted that, as with the Bank of England, the RBNZ issues its own bills, which are direct obligations of the central bank, not of the government. This is viewed as a further means of ensuring the separation of monetary policy from debt management and allowing the debt management office the freedom to issue different instruments in the domestic market for debt management purposes.[4]

In Canada, the clear delineation of roles and responsibilities between debt issuance and cash management on the one hand, and monetary policy implementation on the other hand, is achieved by the segregation of the two types of functions into distinct groups [and reporting lines] within the Bank.

4.4. RG Term Deposit Auction

Since February 1999, when the Large Value Transfer System ("LVTS") was implemented, the RG balances have been allocated to bidders twice daily, through an auction process administered by the Bank. These auctions serve two main purposes: first as a treasury management tool, the term deposit auctions are aimed at reducing the cost of carrying excess cash balances; second, the auctions are used by the Bank to transfer balances to neutralize the effect of public sector flows to/from the Bank of Canada's balance sheet to achieve the desired level of balances in the implementation of monetary policy[5]. The neutralization is effected through the transfer of government deposits from the Bank's balance sheet to the participants through the twice-daily auction, but primarily in the afternoon auction, which takes place after the cut-off time for daily LVTS payments.

As mentioned above, RG term deposits are auctioned to eligible market participants twice daily, at 9:15 a.m. Eastern Time ("the morning auction, or a.m. auction") and at 4:15 p.m. ET ("the afternoon auction, or p.m. auction"). Beginning in September 2002, new rules were implemented for the morning auction to introduce a collateralized portion of the auction, which opened access to a wider group of potential participants, while ensuring that risk was effectively mitigated.

Previously, only direct LVTS participants were allowed to participate. Eligibility criteria established for the morning auction included, amongst other things, minimum credit ratings and the requirement to be a legal entity residing in Canada. For those seeking to participate in the secured or collateralized portion of the auction, a further requirement is to have signed a Tri-Party Repo Service Agreement with Canada and its Agent (currently RBC Dexia). In addition, participants must have access to and use the Communications, Auctions and Reporting System ("CARS"). The new rules also listed eligible collateral securities and corresponding margin requirements.

Morning Auction

[4] Institutional Arrangements of Government Debt Management in New Zealand, prepared by the NZDMO for the OECD Workshop on Public Debt Management of Government Securities for Officials from the Newly Dependent States and Baltic Countries, Paris, 29 June 1993

[5] Bank of Canada, Donna Howard, *A Primer on the Implementation of Monetary Policy in the LVTS Environment* – 1998, updated 2005

Each participant is granted a collateralized and/or uncollateralized line of credit, based on its credit rating, and depending upon both its capacity and eligibility to deal on a collateralized or uncollateralized basis.

The morning auction allocates for investment the portion of RG balances that are not expected to be needed for government purposes that day in order to offset as much as possible the cost of carry of those balances by earning a competitive, market driven rate of return until the funds are needed to offset expected future cash needs. On a daily basis, late in the afternoon, treasury managers set the size of the next morning auction as well as the split among tranches of differing maturities when applicable. To decide on the size of the morning auction, the treasury managers will first determine the cushion required for the following day's afternoon auction – based on the Bank's expected LVTS target setting. Whatever is left becomes the next day's total morning auction. To determine the split of the morning auction among tranches of different maturities, the treasury managers examine the profile of projected daily RG balances over the upcoming days and weeks.

In the morning auction, participants whose credit rating is single-A or better can bid on a secured basis for up to 100% of the auction, whereas other participants are limited to $500 million less any outstanding collateralized deposits previously awarded to such participants which have not yet matured.

In the portion of the morning auction which is awarded on a collateralized basis, the deposits and collateral are exchanged via CDSX, a securities settlement system operated by the Canadian Depository for Securities Limited.

In the part of the morning auction which is awarded on an uncollateralized basis, term deposits (net of maturing deposits) are settled in LVTS between the RG and the participant prior to 1:00 p.m. the same day.

Afternoon Auction

"*In the event that less than the total amount offered in the morning tender is accepted, or the full amount of the morning tender is not covered by participants' bids, the amount not awarded may be added to the pool of funds available in the afternoon auction*."[6] In determining the amount of term deposits to auction at the afternoon auction, the Bank will determine the amount needed in order to neutralize LVTS settlement balances at the desired level (which could range from a negative amount to zero or some positive number). This amount is determined as follows: the cut-off time for processing government receipts and payments is 3:00 p.m. The neutralization amount is calculated as the amount necessary to reach the target LVTS settlement balance set by the Bank for the day, after considering Government flows for the day including all operational flows, debt related flows and FX transactions and the effect of the Bank flows (SPRAs, SRAs, and net bank note flows by participants in the Note Exchange System). The difference between the amount of term deposits auctioned and term deposits maturing represents the amount of the neutralization and change in the level of excess balances in the system.

The level of SPRAs or SRAs that the Bank undertakes with market participants will have a direct impact on the size of cash balances. The Bank of Canada sets a target for the overnight interest rate within an operating band. To reinforce the target rate, if the overnight rate is trading materially above target, the Bank will intervene through SPRAs

[6] Source: Terms and conditions governing the morning auction of Receiver General Cash Balances (4 September 2002) – Bank of Canada

through which it purchases securities (Government of Canada Bonds and Bills) at 11:45 a.m. from the Primary dealers, thus bidding up prices and applying downward pressure on overnight repo rates with an agreement for resale the next business day. Conversely, if the overnight rate trades materially under the target rate, the Bank will use SRAs ("repos") through which it sells securities to the PDs, thus applying upward pressure on rates, with an agreement to repurchase on the next business day. In doing so, the Bank will either decrease government balances available for the afternoon auction when conducting SPRAs, or conversely, the potential amount of funds for auction will be increased in the event of SRAs.

Accordingly, the Bank will have the final determination as to the amount of deposits that will be auctioned in the afternoon session.

The timetable for both auctions is as follows:

Timetable for RG Term Deposit Auctions		
Event	AM Auction	PM Auction
Decision period for the size of the auction and the number of tranches	3:30 pm to 4:15 pm on eve of auction (Day T-1)	3:15 pm to 3:45 pm (Day T)
Auction details released to participants	4:30 pm (Day T-1)	3:55 pm (Day T)
Bidding deadline	9:15 am (Day T)	4:15 pm (Day T)
Release of auction results	9:20 am (Day T)	4:20 pm (Day T)
Settlement deadline	1:00 pm (Day T)	5:00 pm (Day T)

Source: Adapted from Bank of Canada – Daryl Merrett, Receiver General Term Deposit Auctions – Revised March 2005

Participants

There are currently 21 participants in the morning auction and 13 participants in the afternoon auction. All participants in the afternoon auction are LVTS participants. The morning auction participants can be broken down into the following types:

Deposit taking institutions (direct LVTS participants)	13
Investment dealers	4
Foreign banks	2
Asset management firms	1
Credit unions (indirect LVTS participants)	1
Total	21

4.5. Treasury Bills

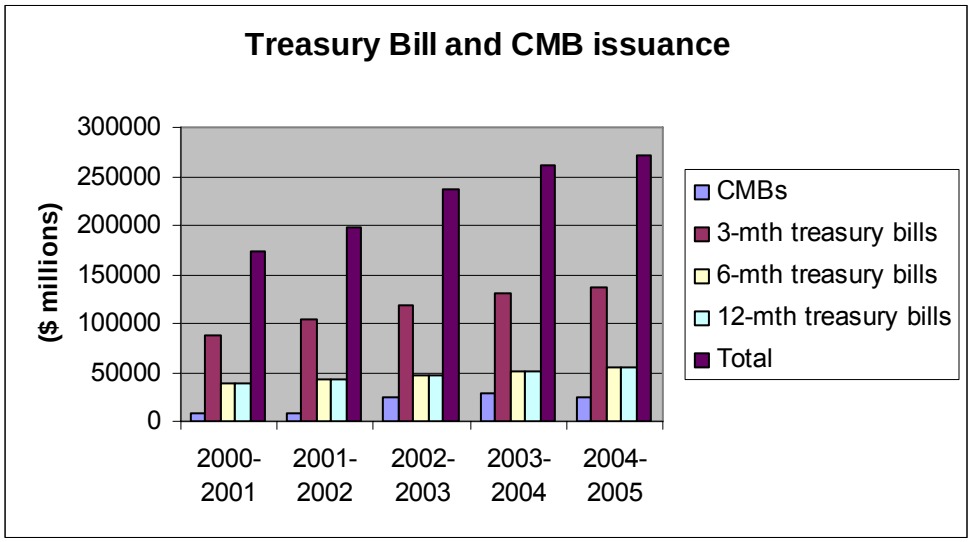
Treasury Bills are short term securities sold at a discount from their face value with maturities of 3 months (actually 98 days or 14 weeks), 6 months (182 days) and 1 year

(364 days), with the relative auction amounts being in an approximate 50/25/25 ratio for the respective maturities. Treasury Bills are auctioned under a regular, predictable bi-weekly auction calendar, in amounts that are held relatively stable from one auction to the next. The general guideline would be to have auction size not vary by more than $1 billion between two successive issues, although in practice and to accommodate large fluctuations in cash requirements, the treasury managers adopt a more flexible threshold and routinely go up by $1.5 billion or down by $2 billion from one auction to the next.

A by-product of the practice of issuing the chosen maturity range on a bi-weekly basis is that net bill issuance often does not coincide with the timing of peak outflows, creating a cash surplus or shortage for the period of time elapsing between actual receipt of auction proceeds and net disbursements of funds.

Participants in Treasury Bill auctions are Government Securities Distributors ("GSDs") (currently there are 23 such institutions, of which 10 are Primary Dealers for Treasury Bills).

In pursuit of its objective to lower overall debt costs, the Government is decreasing issuance of fixed rate debt and increasing Treasury Bill issuance. The Debt Management Strategy document for 2006-2007 outlines a plan to increase the outstanding amount from $131 billion at the end of 2005-2006 to a range of $135-140 billion by the end of the current fiscal year.



Source: Bank of Canada

4.6. Cash Management Bills

Cash Management Bills ("CMBs") are flexible, short-dated Treasury Bill instruments that can be issued on any business day, with as little as one day's notice, for terms varying typically from 3 days to one and a half months (although terms of up to 3 months are possible). They supplement regularly auctioned Treasury Bills and afford additional flexibility to treasury management officials at the Bank in taking preventive action to raise funds in advance of peaks in cash demands that are forecasted and to bridge between periods of high cash outflows and subsequent high cash inflows within a month. Treasury managers indicated that this has enabled them to effectively reduce average cash

balances. A second, albeit more infrequent use of CMBs, would be to rapidly fund a need resulting from an unusually large deviation from the original cash flow forecast.

CMBs are issued in both fungible and non-fungible form. A CMB is fungible when its maturity date coincides with the maturity of an existing Treasury Bill issuance. In the case of non-fungible CMBs, participation by Primary Dealers is not compulsory as it is for fungible CMBs or for regularly scheduled Treasury Bill or bond issues.

CMBs currently represent roughly 10% of Treasury Bill issuance and they will continue to be actively used this year as stated in the Debt Management Strategy 2006-2007 issued by Finance. However, due to their short term to maturity, CMBs play a much smaller role in overall funding, accounting on average for less than 1% of Treasury Bills outstanding. Nevertheless, CMBs are still seen as a very useful cash management tool, given the flexibility that they confer to the Receiver General to raise funds on short notice, closer to the day when such funds are needed, and thus limiting the number of days for which a cost of carry is incurred. This requires treasury managers to strike a balance between cost and the risk of not meeting their main objective of cash availability, should the funding of a significant cash requirement be left too late to be handled by CMB issuance alone.

4.7. Cash Management Bond Buyback Program

The Cash Management Bond Buyback ("CMBB") program was introduced in pilot mode in 2000-2001 for treasury management purposes, essentially to help smooth the high peaks in RG cash balances required before the date of large maturities of benchmark bonds. The benchmark bonds covered by the program are those maturing within a year and a half. Their repurchase in advance helps to stabilize the maturity profile within a given year and to manage cash balances effectively around large maturity dates. In view of the proven effectiveness of the CMBB program and strong support expressed by market participants, further to some operational adjustments, the program was made permanent in 2003-2004.

Past changes, made at the request of participants, included advancing the time of Treasury Bill auctions to 10:30 a.m., preceding the CMBB auctions which were changed in 2003 to occur at 11:15 a.m.

Furthermore, by reducing the need to accumulate large balances in advance of large bond maturities, the CMBB program allows treasury managers to mitigate seasonal fluctuations in Treasury Bill issuance. To make the program more transparent, the practice of announcing the intended size of buybacks a week in advance was initiated by the Bank in 2002.

5. Evaluation Criteria and Attributes

In conducting our evaluation of the RG Cash Management program effectiveness to meet its stated objectives, we have considered various factors and criteria referred to herein as desirable "attributes". We have identified eight key attributes as follows:

- Accuracy of forecast – stability/predictability of balances: This attribute is given more weight by the treasury managers than the actual cost of funds which is influenced by factors such as the shape of the yield curve over which they have little control. They are tracking the daily deviation from forecast receipts and disbursements and are continuously looking for ways to improve the accuracy of their forecasting. The key measure used is the deviation from forecast. A strong forecasting ability enables treasury managers to reduce the cushion of excess balances (and corresponding cost of carry) while continuing to meet the main objective of the Government, which as mentioned previously, is to have sufficient cash on hand to meet its operating and liquidity requirements.
- Framework and governance: This attribute is characterized by clear lines of reporting, well defined responsibilities, clear delegation of authority and fully outlined attribution of roles among Finance and Bank officials. It is relevant because the management of RG balances and short term funding require a robust operational structure (the Bank treasury management group) with well defined links to the policy making group (Finance Canada) and a clearly delineated framework of interactions with the monetary policy side of the Bank.
- Participation rate and coverage: This attribute is measured by the number of participants at auction as well as coverage[7] and tails[8]; in our discussions with the Bank and Finance officials, it became clear that the tail indicator is not considered to be very meaningful, as too many factors (number of participants, size of auction, tenors, and overall market conditions) can influence bidding. However we still believe this indicator to be useful to measure and observe trends over time.
- Returns on collateralized and uncollateralized term deposits: This attribute is measured as the net cost of carry of RG balances, being the differential between yields obtained on RG term deposits and the average cost of funding these balances. It is clear that treasury managers have little control on the level of this differential and put their focus on the maintenance of low balances to reduce costs – which has more to do with the quality of forecast attribute and with their ability to use the various cash management tools at their disposal and the timing of their CMB issuance to decrease average outstanding excess cash balances.
- Risk: In the investment of its short-term assets, the Government must measure and manage credit risk. To evaluate exposure to credit risk, we look at the distribution of collateralized and uncollateralized balances among participants, and mitigating factors such as credit ratings and collateral. Prior to 2002, all RG balances were invested uncollateralized, although limited to highly regulated LVTS participants; since 2002, a collateralization framework has been introduced with the dual benefit of mitigating credit risk and opening up participation to RG term deposit auctions to more participants. Additionally, operational and settlement risks must also be addressed. (See comments on the role of risk in performance measurement by

[7] Coverage is measured by dividing the aggregate bids received by total auction size.
[8] As defined in the Memorandum 2004-2005 Performance of the RG Cash Balances, the auction tail is the number of basis points between the highest accepted yield and the average yield. The smaller the tail, the better, as it indicates more aggressive bidding which, everything else being equal, implies lower costs.

other sovereigns in Section 7.6.) Risk is an important attribute as it is directly related to returns that can be obtained by the RG.

- Cost of funds – yield differential versus benchmark: When using CMBs as instruments to raise short term funding, the objective is to achieve market driven yields in the process; the rate differential between these yields and those of comparable market instruments should be tracked. However, this attribute should remain valuable as an indicator only. See related discussion arising from foreign sovereign practices in Section 6.4.5.

- Transparency: Finance and the Bank value transparency highly. This attribute is conducive to more orderly debt markets which in turn should mean lower cost funding for Government. There is however a trade-off to make between transparency and flexibility when it comes to dealing with short-term cash balances. Transparency is evaluated by observing the disclosure, consultation and announcement frameworks that are in place and by gathering comments from market participants.

- Collateral implications: In essence, there is a balance to strike between high mitigation of credit risk through stringent collateral requirements, and the impact this has on yields, given the mounting demand and diminishing supply of readily available high quality collateral. One way to gauge the impact of costlier collateral is to measure the evolution of differentials between the uncollateralized and collateralized portions of auctions. This attribute became important after having been raised by many participants to our discussions.

6. Evaluation based on our Observations and Findings

6.1. Accuracy of forecast – stability/predictability of balances

As this attribute has an impact on all parts of the Cash management program, which we evaluate individually hereafter, we decided to analyze it at the beginning of this section.

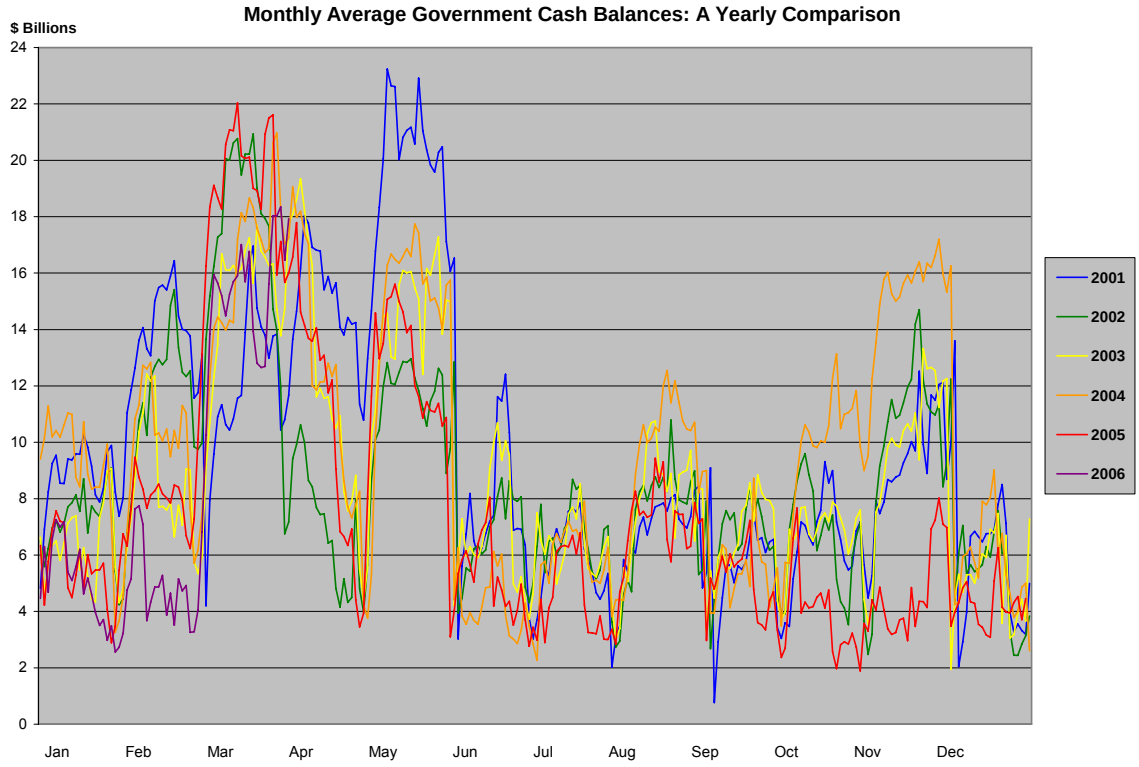
One of the main attributes driving the cost effectiveness of the RG cash management program is the ability of treasury managers to forecast government cash flow movements with a high level of accuracy. Given the fact that the maintenance of cash balances larger than required usually generates a negative carry[9], accuracy of projections has a significant impact on cost of the overall program.

Looking at the evolution of actual RG balances, we observe that while the average size of RG balances appears to be relatively stable, the volatility of these balances, which had declined after 2001, has been increasing consistently since 2003 as per the table below. This magnitude of the volatility as measured by standard deviation is largely a result of the scale of the Government flows. This does not necessarily equate to increased complexity of forecast, as the reasons to build up peak balances are known in advance. For instance, large variations in balances can be exacerbated by the integration of bond maturity and coupon schedules, and treasury bill maturities. It should be noted that with concentration of maturities and rising interest rates, this issue would be expected to put more upward pressure on balances[10].

Calendar Year	Daily Average Cash Balances	Peak	Low	standard deviation
	$ Billion			
2001	9.8	23.2	0.8	4.9
2002	8.6	20.9	2.4	3.9
2003	8.8	19.3	1.9	3.9
2004	9.8	21.0	2.3	4.6
2005	7.5	22.0	1.9	4.8
2006 up to April 28	8.4	18.3	2.6	5.0

Source: Bank of Canada

[9] Except in situations of inverted yield curve
[10] A Primer on the Federal Government's Daily Cash Balances, - Daryl Merrett, Bank of Canada, March 2005



Source: Bank of Canada

Now let us look in the following chart at the performance of treasury managers in forecasting these balances.

Summary of Differences from Forecast				
Calendar Years	Total Receipts	Large Payments	Small Payments	net
	$ Millions			
Avg2002	39	-23	9	25
s.d.2002	373	91	317	493
Avg2003	5	-16	38	27
s.d.2003	338	117	127	386
Avg2004	33	6	-19	20
s.d.2004	332	58	148	358
Avg2005	53	-6	-4	43
s.d.2005	311	70	146	334
Avg2006YTD	-4	1	-23	-26
s.d.2006 YTD	290	60	182	319

Source: Bank of Canada

We observe that despite rising volatility in actual cash balances, the treasury managers have consistently improved the accuracy of their forecast and reduced the standard deviation against the average difference in forecast.

The Bank's treasury managers face a challenge uniquely different from that which private sector managers face, given the bi-weekly cycle of Treasury Bill issuance; forecasts carry widely varying degrees of certainty from day-to-day, and the fact that in practice, there is an upper limit on CMB issuance for a single day. Thus, there is a need to provide a balance "cushion" which fluctuates in size, taking into account the cumulative potential effect of days with greater uncertainty, yet also attempts to control the cost expected from holding excess balances by setting a target for average balances under so-called "normal conditions".

The treasury managers track the daily deviation of their forecast vis-à-vis actual balances achieved. Typically a balance "cushion" of $0.5 billion above the forecast needs is targeted, which, can be assumed to be an appropriate level in order to cover variability in forecasting errors given the limited number of occasions when balances have been insufficient to hold p.m. auctions due to a large negative forecasting surprise.

The main reason RG balances are maintained at these levels is to avoid the undesirable need to resort to contingency measures to obtain funding, should the RG account ever be in the rare position of becoming overdrawn.

Managers currently set $3.5 billion as the appropriate average targeted monthly balance under "normal" monthly conditions[11]. Their purpose is to best reconcile the objective of lower balances with the desire to minimize the risk of running short of cash and having to undertake unplanned CMB issuance to fund outflows. This suggested average covers only regular Government operations and excludes any balances that are due to Government debt maturities or interest. This minimum had been previously targeted at $4 billion,[12] based on actual data for the years 2000-2004.

An alternative which might allow the RG to work with significantly lower average balances is the introduction of a reverse auction which is discussed in Section 8.2.4. However, additional study would be required to determine the specifics of such an operation and its reliability as a source of late, same-day funding for the RG.

Several measures are already in place to optimize forecasting:

- Rolling 3-month daily cash forecast updated on a daily basis
  - ✓ By major revenue and disbursement category
  - ✓ Based on profiles of previous years
- Ongoing information from government departments (materiality dictates which cash flows require that notice be given to the Bank's treasury managers, and the appropriate amount of advance notice)

About a year ago the unit which manages RG balances at the Bank introduced an "indicator" method[13] to help refine the identification of those months where reserve building needs to be done in advance. Back-testing is run regularly to compare the actual results of the last three months with the forecast. As mentioned above, the cycle of net Treasury Bill issuance not coinciding with large net disbursement flows has a significant impact on cash balances. We noted that some foreign sovereigns address this restricted flexibility by adding a shorter, 4-week Treasury Bill to their scheduled auctions. We recommend consideration of this approach (see Section 8.2.1).

[11] This excludes months such as May and November when typically cash balances must be built up in order to fund June and December 1st bond maturities.
[12] Bank of Canada, Daryl Merrett, Using Cash Balances as Business Indicators for Treasury Management Operations, April 19, 2005.
[13] Ibid.

To increase the accuracy of forecasting, the Bank treasury managers rely extensively on communications with the Government departments that need to disburse or receive material payments (≥ $25 million). The treasury managers have developed and refined forecast tools that monitor the following:

- fiscal policies
- past patterns and trends
- seasonal peaks
- unusual flows and transactions (e.g. Sale of the Government's holdings of Petro Canada shares)

Furthermore one factor that reportedly added to the challenge of minimizing balances is the level of fluctuations in the RG balances held at the Bank and their effect upon its management of monetary policy. As discussed earlier in Section 4.4 the Bank, in fulfilling its role to implement monetary policy, takes various actions to ensure that overnight rates will trade at or close to its target overnight rate. Due to the fact that in the period leading up to March 6th, overnight funds were generally trading below the overnight target rate, the Bank announced[14] temporary measures to reinforce its objectives for the overnight interest rate. It announced effectively that it was setting the target for LVTS settlement balances at zero and that it was no longer committing to neutralizing all of the Special Repurchase Agreement ("SRA") operations that would have been conducted during a given day, in order to support the overnight target rate. Refer to chart in 6.2.6.

Recently, with downward pressure on the overnight rate the Bank has been increasingly intervening in the market with SRAs. Prior to last year, interventions were infrequent (4-5 times per year). As the Bank can do up to $1.1 billion SRAs in a given operation, this can generate material fluctuations in the position of cash balances that the RG treasury managers must then auction at the afternoon session.

All disbursement and receipt instructions go into the standard payments system operated by PWGSC. PWGSC provides a daily cash report of inflows and outflows to the Bank's treasury managers who are responsible for cash management and forecast. Automation has evolved significantly over the last year at PWGSC but there is still a significant amount of manual intervention required. Plans are underway to further automate the whole payments process over the next two years. U.S. Treasury officials indicated that automation of flows had been a major reason for the improvement of the accuracy of their own forecasts. See Section 8.1.

6.2. RG Term Deposit Auction

To evaluate the RG Term Deposit Auction program, we have looked at the following six desirable attributes. Of the other two major attributes, the first one, accuracy of forecast has been discussed in the previous section, whereas the cost of funds attribute does not apply to term deposits by themselves, but does apply to the overall process of holding funds raised in the markets.

- Framework and Governance
- Participation rate and coverage
- Transparency
- Returns on collateralized and uncollateralized term deposits

[14] Temporary measures to reinforce the target for the overnight rate – Bank of Canada, 9 March 2006

- Risk
- Collateral implications.

6.2.1. Framework and Governance

As outlined above in Section 4.3 there exists a well-defined framework setting out responsibility, authority and reporting lines for all cash management programs covered here.

In the case of the RG Term Deposit Auctions, the rules of participation for the morning auction are defined at length in the Terms And Conditions Governing The Morning Auction Of Receiver General Cash Balances[15] (4 September 2002). The rules for the afternoon auction were introduced at the same time as the LVTS system was launched in 1999.

An important piece of the RG Term Deposits Auctions framework is the role played by the agent custodian, RBC Dexia. This is perceived by market participants to work relatively well, with some minor irritants and suggestions to improve the operation. These are discussed in more details after the discussion on collateral implications, in Sections 6.2.7 and 6.2.8.

6.2.2. Participation in the deposit auctions

As evidenced by Bank of Canada data and Finance Canada documents[16], the coverage ratio[17] at auctions has been consistently increasing, particularly since the collateralized portion of the morning auction was introduced (2002). The Terms and Conditions Governing the Morning Auction adopted in September 2002 aimed primarily at broadening the number of participants, while introducing measures to manage credit risk. They set out clearly the eligibility criteria and rules of participation. The afternoon auction is restricted to LVTS participants.

Coverage and tails at Receiver General Auctions

AM auctions	2001-2002	2002-2003	2003-2004	2004-2005
Coverage	2.42	3.29	3.38	4.16
Tails	2.28	0.91	1.68	1.26
PM Auctions				
Coverage	2.27	2.31	2.53	2.36
Tails	2.58	3.04	3.09	2.92

Source: Bank of Canada

As mentioned earlier, one should not put too much significance on the tails as an indicator, as many other variables are at play. Nevertheless they have some value in identifying trends. In the case of the morning auction, both participation and coverage levels indicate a trend towards more participation, thus more competition and more aggressive bidding. With respect to the afternoon auction, even if the same set of bidding criteria are applied, we observe wider tails, which are more a function of the reduced number of participants and of the different motivation of participants for that

[15] www.bankofcanada.ca/en/auction/rec_general.pdf
[16] Finance Canada Memorandum entitled – 2004-2005 Performance of Receiver General Balances
[17] Coverage is measured by dividing the aggregate bids received by total auction size

auction. The morning auction is a normal market operation, whereas the additional goal of the afternoon auction is the neutralization of LVTS balances.

Based on the attribute "participation" we conclude that RG term deposit auctions are well covered and that coverage has improved since 2002, both for the morning and afternoon auctions.

However, our interviews with various market participants indicated differing levels of participation in the auctions, particularly in the collateralized portion. It should be highlighted that all market participants that we interviewed would suggest expanding the amount of uncollateralized funds available in the morning auction to further increase participation and improve the return earned by the Receiver General. This issue is further discussed in Section 6.2.6, which deals with collateral implications.

The capital markets issuers and investors among our interviewees expressed a varied awareness of and interest in participation in the auction. There was no interest in the collateralized portion of the auction, but a range of interest from low to quite high in the uncollateralized portion. It would seem that there may be an opportunity for the RG to access some additional forms of investment, albeit on an uncollateralized basis, if there were steps taken to actively seek and implement agreements with seriously interested parties having appropriate creditworthiness.

We recommend serious consideration be given to expanding participation in the RG auctions, at least during monthly periods where the balances are high, by a combination of steps as set out in Section 8.3.

6.2.3. Transparency

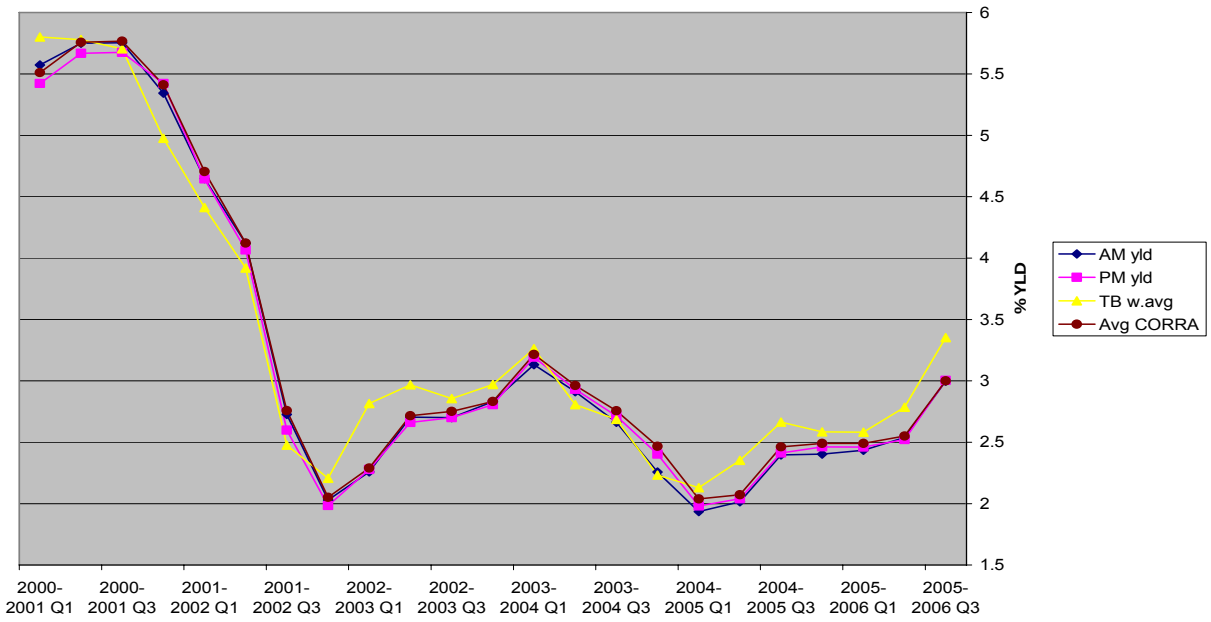
Announcements for the auctions as well as results are communicated to participants via the Communication Auction and Reporting System (CARS) under a well-known, pre-established timetable. This detailed information is provided to participants only. Aggregate information on participation at auctions and evolution of RG Cash Balances is published annually by Finance, as part of the Debt Management Report. Changes to policies governing the program, strategy or operational changes will be the object of market consultation and are described in the Debt Management Strategy document also published annually by Finance.

6.2.4. Returns on collateralized and uncollateralized term deposits

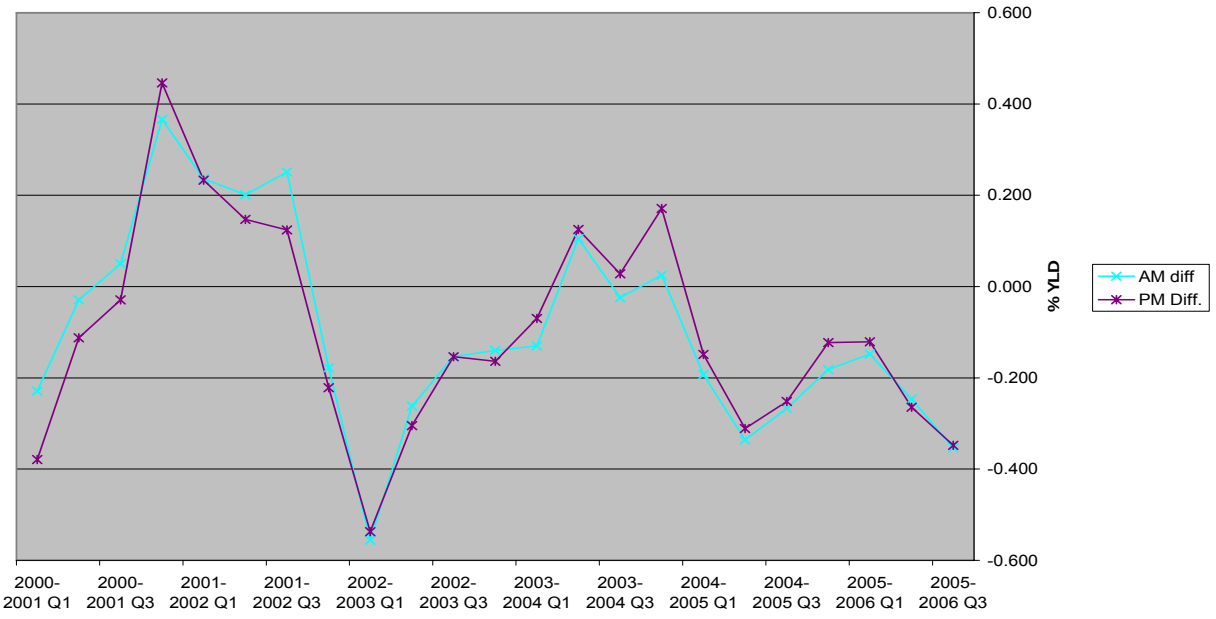
One measure of cost that the treasury managers are tracking is the interest rate differential between the yields obtained at the morning and afternoon auctions and the weighted cost of funds. The following chart displays these differentials for morning and afternoon auctions, the weighted Treasury Bill yield and the CORRA[18] average quarterly yield. A high level observation is that the differential is relatively stable and that we cannot infer from the data examined that rising levels of interest rates necessarily equate to a widening differential.

[18] The overnight repo rate or CORRA is a weighted average of the rates at which general (i.e. not special) repo transactions are traded by dealers on the screens of the following interdealer brokers: Cantor Fitzgerald Securities Co., Freedom International Brokers, Prebon Yamane (Canada) Ltd., Shorcan Brokers Ltd. and Tullett & Tokyo Forex (Canada).

RG Term Deposit rates compared
(Source: Bank of Canada)



RG Term Deposit rate differentials
(Source: Bank of Canada)

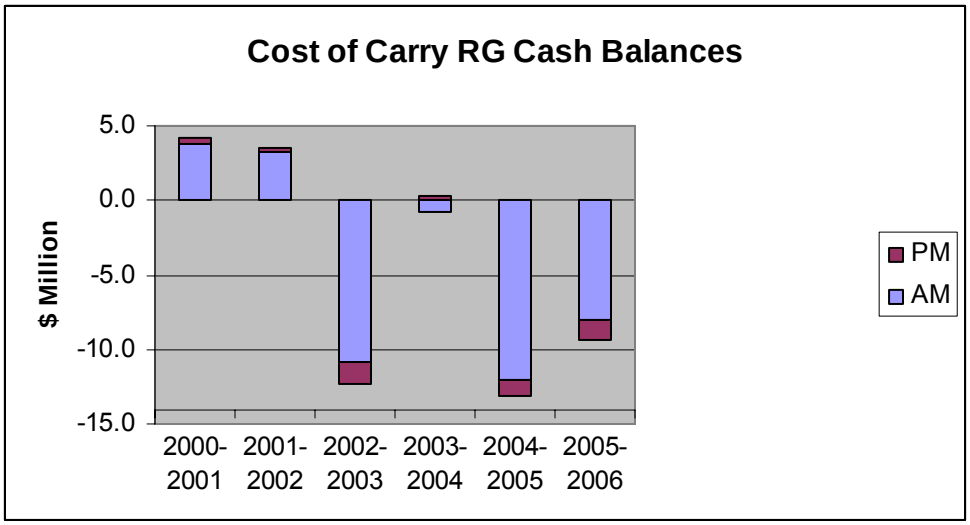


However, a closer examination of a sequence of 24 quarters in the above chart shows that the yield differential in basis points is generally more favourable since 2003 in the afternoon auction. This is likely explained in part by the fact that part of the morning auction is collateralized so that market participants do factor in the added cost of collateral in the amount they are willing to bid. Informal discussions would lead us to believe that in current market conditions participants structure their bids on the

assumption that the uncollateralized portion should pay about 7 or 8 basis points above the collateralized portion, although their capital models would call for a higher spread. We believe this issue merits further study, as discussed in Section 8.3. Many factors can explain this apparent advantage of afternoon yields over morning yields. Morning term deposits can be for periods of more than one day, whereas afternoon term deposits are strictly overnight. This, depending on the shape of the short term yield curve can work both ways; also the cost of collateral will be factored into the collateralized portion of the bids for the morning auction, resulting in a reduction in the yields paid to the RG for its balances. Finally, the market conditions in the afternoon are generally more illiquid so that participants who need to neutralize their positions in LVTS may be willing to pay slightly higher yields to the RG.

In any event, as the cash balances auctioned in the afternoon are much smaller, they are not the main drivers of the (generally) negative cost of carry. Factors outside the control of the treasury managers affect the cost of carry, primarily the shape of the yield curve. However, the treasury managers indicated that their main focus is to work on keeping balances at the reasonable minimum, which is at a level that minimizes cost of carry while meeting the "sufficient balance objective".

As shown on the graphs below, Cost of Carry for 2005-2006 was $9.4 million, of which only $1.4 million was accounted for by the afternoon auction. The improvement over the previous fiscal year was achieved during an environment of relatively stable yield differentials, which leads us to believe that treasury managers are succeeding in keeping lower balances and/or in maintaining excessive balances for shorter periods of time. More granular analysis would be required to flesh out this point.



Source: Bank of Canada

6.2.5. Risk

Collateral arrangements were introduced to mitigate the credit risk tied to the deposit of cash balances with counterparties. Another mitigating factor has been the reduction in concentration, as evidenced by the fact that the top 10 LVTS participants now receive 74.3% of auctioned deposits, whereas their share was 98.5% in 2001-2002, prior to the enlargement of participation in conjunction with the collateralized auction.

The table below shows that on months of high balances, the proportion of collateralized balances tends to be larger, which is logical, as all participants with uncollateralized balances would aim at maximizing usage of their uncollateralized lines prior to using their collateralized. We observe that the percentage of the auction deposits that is collateralized is at its highest in the months of March 2003, March 2004 and March 2005. In Section 8.3.1, we suggest consideration be given to relieving pressure on collateral, at least in months of high balances, by expanding uncollateralized limits.

Extract from Receiver General Deposit Reports						
	Daily Averages					
	AM Auction		PM Auction			
Month	Uncollateralized Balances	Collateralized Balances	Uncollateralized Balances	Total Uncollateralized	Total Balances	Percentage Collateralized
Sep-02	2,649	1,241	683	3,332	4,573	27.1%
Oct-02	1,695	1,939	707	2,402	4,341	44.7%
Nov-02	2,256	5,022	856	3,112	8,134	61.7%
Dec-02	1,381	1,187	942	2,323	3,510	33.8%
Jan-03	1,966	1,709	700	2,666	4,375	39.1%
Feb-03	2,221	3,854	660	2,881	6,735	57.2%
Mar-03	2,574	10,245	690	3,264	13,509	75.8%
Avg.sep 02-03	2,028	2,492	758	2,786	5,278	43.9%
Apr-03	2,189	8,018	574	2,763	10,781	74.4%
May-03	2,564	9,925	620	3,184	13,109	75.7%
Jun-03	1,754	3,057	716	2,470	5,527	55.3%
Jul-03	2,059	1,748	609	2,668	4,416	39.6%
Aug-03	2,401	3,397	709	3,110	6,507	52.2%
Sep-03	2,126	2,343	644	2,770	5,113	45.8%
Oct-03	2,115	2,542	706	2,821	5,363	47.4%
Nov-03	2,607	5,417	741	3,348	8,765	61.8%
Dec-03	1,787	1,289	622	2,409	3,698	34.9%
Jan-04	2,393	4,878	532	2,925	7,803	62.5%
Feb-04	2,676	4,984	698	3,374	8,358	59.6%
Mar-04	2,683	11,292	593	3,276	14,568	77.5%
Avg.03-04	2,280	4,908	647	2,927	7,834	57.2%
Apr-04	2,081	7,107	839	2,920	10,027	70.9%
May-04	2,820	10,425	665	3,485	13,910	74.9%
Jun-04	1,549	978	502	2,051	3,029	32.3%
Jul-04	2,128	1,858	656	2,784	4,642	40.0%
Aug-04	2,468	4,764	703	3,171	7,935	60.0%
Sep-04	1,928	1,596	704	2,632	4,228	37.7%
Oct-04	2,987	5,068	843	3,830	8,898	57.0%
Nov-04	3,240	9,374	640	3,880	13,254	70.7%
Dec-04	1,796	1,667	658	2,454	4,121	40.5%
Jan-05	2,128	1,350	635	2,763	4,113	32.8%
Feb-05	2,805	3,052	590	3,395	6,447	47.3%
Mar-05	3,028	13,395	1,129	4,157	17,552	76.3%
Avg.04-05	2,413	5,053	714	3,127	8,180	53.4%
Apr-05	2,438	6,500	708	3,146	9,646	67.4%
May-05	2,887	7,330	800	3,687	11,017	66.5%
Jun-05	1,911	1,053	641	2,552	3,605	29.2%
Jul-05	1,586	654	802	2,388	3,042	21.5%
Aug-05	2,420	1,821	614	3,034	4,855	37.5%
Sep-05	1,819	1,073	718	2,537	3,610	29.7%
Oct-05	1,210	862	642	1,852	2,714	31.8%
Nov-05	1,733	613	766	2,499	3,112	19.7%
Dec-05	1,748	420	870	2,618	3,038	13.8%
Jan-06	1,862	785	918	2,780	3,565	22.0%
Feb-06	1,947	835	1,117	3,064	3,899	21.4%
Mar-06	3,151	10,100	717	3,868	13,968	72.3%
Avg.05-06	2,059	2,671	776	2,835	5,506	36.1%
					Average 02-06	48.8%
Source: Bank of Canada					High 02-06	77.5%
					Low 02-06	13.8%

It is important to point out that, prior to the introduction of the morning auction in September 2002, RG balances held at financial institutions were totally uncollateralized and averaged $9 billion (1999-2000), $10.2 billion (2000-2001) and $7.9 billion (2001-2002).

Under this attribute, we can initially conclude that the introduction of the collateralized framework has certainly met its objective and has aligned the RG programs with the leading practices promoted by the Basel Committee. However, while some feel international credit markets are still focused on reducing credit exposures, we found many sources who claim this direction has reached a turning point, with concern being expressed that too much return is being sacrificed for limited additional risk protection. Accordingly, we believe that now would be an appropriate time to revisit the opportunity of relaxing some aspects of the collateralized/uncollateralized framework to improve participation, improve yields obtained by the RG and reduce pressure on the general collateral markets. This view was reinforced during our interview with another sovereign government who accepts uncollateralized investments, while seeking the appropriate trade-off between credit quality and additional yield.

The issue of relaxing further the collateral requirements requires striking a balance between added risk and benefits obtained through the collection of higher yields. It was mentioned in our interviews that there appears to be mounting evidence in the global markets that central banks, among others, are looking for more yield. This implies that changes in risk/return trade-offs are being evaluated by other sovereigns as well. In separate discussions with individuals involved in the corporate lending market, we were informed that credit conditions have eased considerably in recent months. Investment grade credits are being granted unsecured lines of credit by banks with minimal covenant requirements, sometimes even for extended terms. According to market practitioners within the swap markets, the shift toward seeking security through collateralization provisions in ISDA agreements that began in the mid-1990's has pretty well run its course. Market participants generally have long-since established the methods by which they recognize the credit worthiness of their counterparties by requiring fewer covenant and collateral protections from those most highly-rated.

During our discussions, concern was expressed by some AAA-rated entities that the Terms and Conditions governing the morning auction of RG balances treat AAA securities the same as AA. The rules do not reflect the fact that higher credit quality securities could provide an additional source of valuable collateral in the system if the margin requirements were better aligned to their real credit risk. This would be especially true if the RG rules were modified to allow for the acceptance of such securities as foreign-issued bonds denominated in Canadian dollars ("Maple Bonds") as eligible collateral (see Section 6.2.6 below). We recommend taking this step as part of our conclusions in Section 8.3.

A number of AAA-rated foreign banks issue Maple Bonds. We are informed that, year-to-date, this class of bonds has represented about one-third of corporate issuance in Canada. Some dealers contend that on a long-term basis, Maple Bonds could make up to 20-25% of the corporate debt market. Scotia Capital has already created an index to track performance of this growing sector. The Scotia Capital Maple Bond Index contains 55 government, quasi-government and corporate issues, with a total market value of approximately $20 billion Canadian.

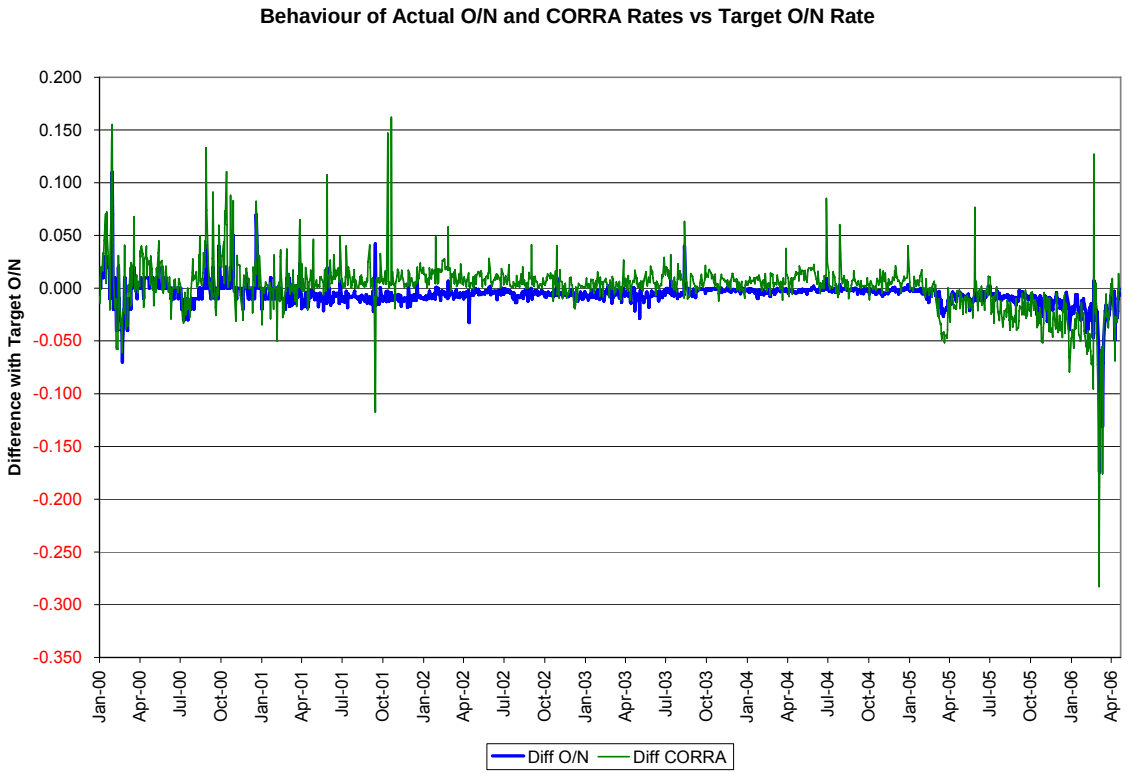
6.2.6. Collateral implications

While all current participants in the auctions state that the system generally works well, they did identify one major concern which is negatively affecting the return earned on RG balances. It was unanimous that the above-mentioned pressure on collateral is creating problems.

It should be clear that the shortage of eligible collateral for RG purposes is a situation that has been growing over recent years. A global trend to seek collateral coverage for a wide variety of transactions has been underway for some time. The Canadian market, in addition to demand for collateral from such systems as LVTS, CDSX (securities settlements) and CLS (overnight liquidity), is affected by exploding volumes in the listed and OTC derivatives markets (both fixed income and, more recently, equities), foreign investors who do not lend collateral back to the domestic market, and a declining supply of federal debt obligations. The situation is compounded at times when the RG balances inflate due to seasonal pressures. The fact that the interviews took place in late March and early April ensured that this issue was fresh in the interviewees' minds. Furthermore, the chart below shows that participants in the RG Term Deposit Auctions overwhelmingly use Government of Canada Securities as collateral pledged in the system against their share of RG deposits.

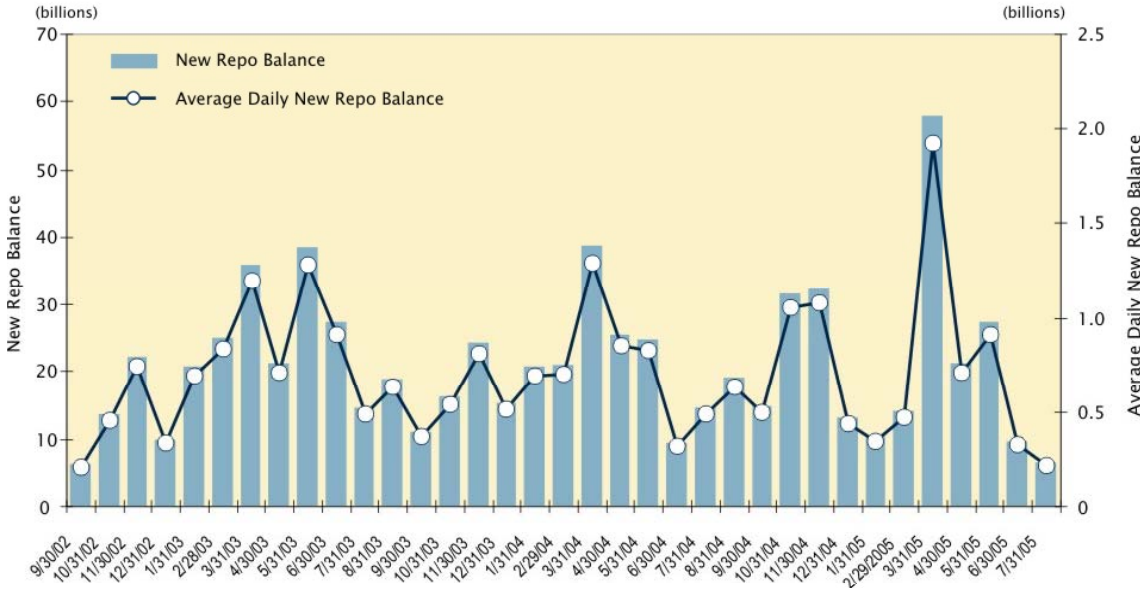
Furthermore, there seems to be a general consensus from this group that participation and returns for the RG would improve if the pressure created by a shortage of eligible collateral in the Canadian markets were lessened. The following three charts confirm that there is indeed pressure building on collateral. From the first chart we observe the build up of rate pressure in March of 2006 which was identified by each and every participant as a time of stress on the system.

This first chart highlights the period of concern cited unanimously by our interviewees and illustrates the market conditions that led to the actions that the Bank had to take in its role to reinforce the target rate and which was previously discussed at the end of section 6.1. The ensuing tightening of LVTS target balances indeed had an impact on the market for general collateral. These actions supported some participants' views that the roles of the Bank as manager of the RG Cash Management program and monetary policy authority of the Bank have the potential to sometimes unintentionally send mixed signals to the markets. It is implied that the pressure on collateral, exacerbated by the cash management activities, can, in fact, affect the level at which the overnight rate trades, and hence to a certain extent monetary policy implementation.



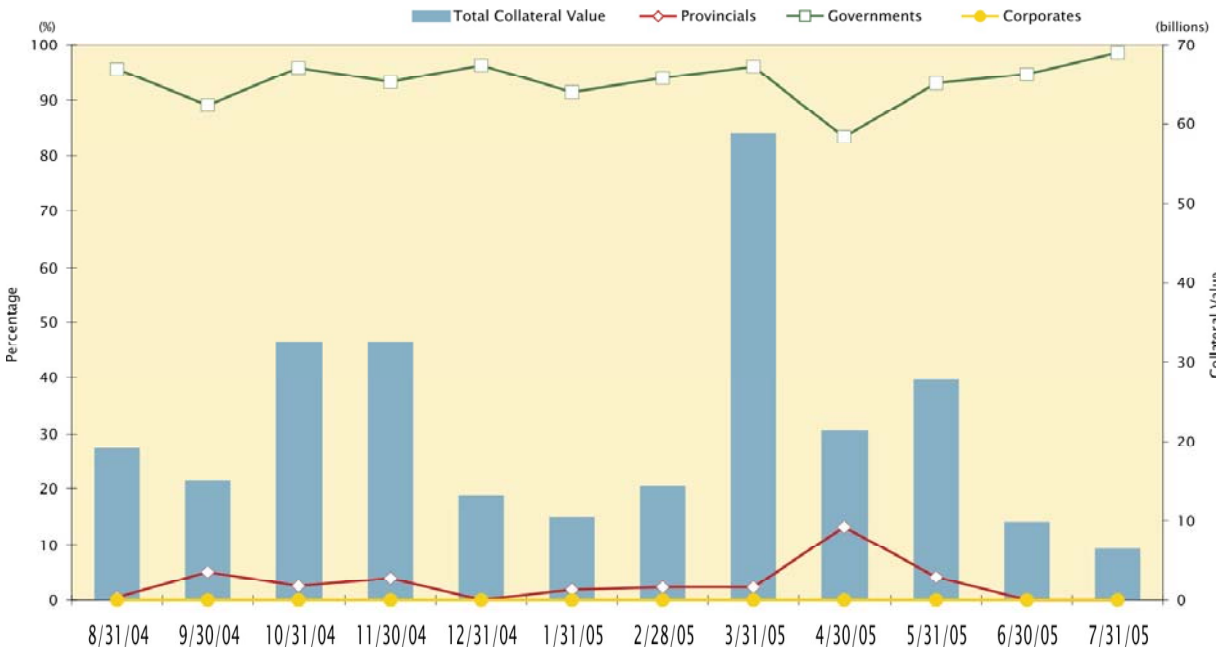
Source: –Bank of Canada

The following chart illustrates the growth of seasonal peaks in Repo balances tied to the RG morning auction. It shows that the mobilization of collateral pledged by participants in the collateralized part of the auction typically reaches its highest levels in March every year.



Source: RBC Dexia

There were a variety of suggestions to ease some of the pressure and these are set out below in section 6.1.9.

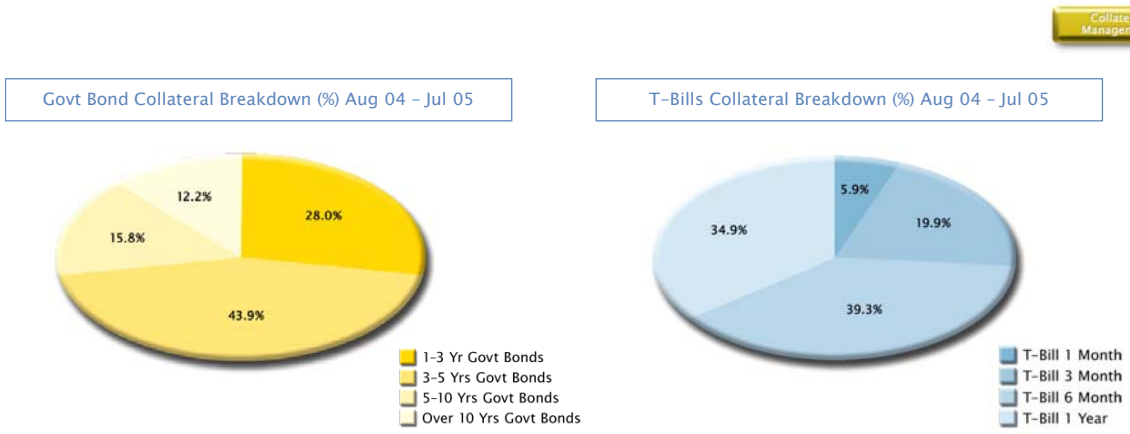


Source: RBC Dexia

The graph above illustrates that general collateral pledged consists overwhelmingly of Government of Canada Bonds and bonds issued by Crown Corporations benefiting from the Canada guarantee. Roughly 91% of collateral pledged between August 2004 and January 2005 were Government of Canada or Government of Canada Guaranteed bonds (including Canada Mortgage Bonds – which accounted for 48% of total collateral over the period) and 9% were Treasury Bills. Most participants consider General Collateral ("GC") to be Government debt only because their use of collateral from other parties would conflict with the desire to use the required capital (implied by margin requirements) in direct business dealings with customers. Some even exclude Crowns (with the exception of Canada Mortgage Bonds) from their definition of GC because of the higher margin requirement in the RG collateral rules.

The Collateral Margin requirements imposed in the Terms and Conditions Governing the RG Term Deposit Auction are either identical to or more stringent than those margin requirements prescribed by LVTS rules and by Rule 100 of the Investment Dealers Association ("IDA"). The table in Appendix 1 lists those instances where RG rules are stricter than one or the other of LVTS and IDA. As explained further in Section 8.3.1, this is one factor among several cited by interviewees that contributes to pressure on collateral.

Sometimes, IDA requirements are more onerous than RG requirements, as in the case of Government of Canada issued collateral maturing in more than 3 years. This could explain some form of collateral arbitrage whereby participants favour using more of their Government of Canada Bond inventory maturing in more than 3 years, for LVTS and RG collateral purposes and using shorter dated bonds for general market purposes.



- 91% of collateral accepted in the past year were government bonds and 9% were t-bills
- Nearly 45% of government bonds were 3-5 year bonds
- About 40% of t-bills were 6-month t-bills

Breakdown of Government of Canada Collateral pledged for RG Term Deposits by type and Tenor

Source: RBC Dexia

6.2.7. Framework issues - custodian arrangements

All participants indicated a general level of satisfaction with the service provided by RBC Dexia, although there were suggestions for improvement in addition to the shortcoming discussed in section 6.2.8 below. First, several market participants commented on the requirement to settle with RBC Dexia earlier in the day than with all other market participants. This causes participants to scramble to arrange substitution of collateral if it is not possible to locate securities that are expected to be delivered from others. Both RBC Dexia and the market participants stated that they spend a considerable amount of time and effort to track down some deliveries. Second, some interviewees indicated that RBC Dexia has trouble pricing some issues. Such delays in pricing create uncertainty about how much needs to be posted. As well, it was pointed out that their threshold for demanding additional margin due to overnight price changes was lower than general market convention. Finally, one participant suggested that RBC Dexia's charges could be simplified, rather than itemized for each different type of service or transaction performed. All of these issues are identified as minor in nature on their own, but create discomfort for participants which could be reduced by some seemingly easy alterations to practice.

While there were no major complaints about the overall level of RBC Dexia's charges, it should be noted that the minimum range of costs passed on to the RG in pricing of deposits was 3 to 5 basis points. The other general point made about the overall arrangement was that any issue that complicates the posting of collateral simply adds to the overall pressure felt in the marketplace concerning collateral.

In our conclusions below in section 8.3.2, we recommend a regular review of custodial arrangements as part of a periodic tendering of that service, not as a criticism of RBC Dexia, but as good practice to ensure the delivery of the optimum result for the RG.

6.2.8. Coupon payment during term of deposit

All market participants cited the fact that the RBC Dexia system does not handle coupons during the term of a deposit in a manner consistent with market practice. RBC Dexia explained that their system, which was built specifically to handle the unique needs of the RG auction process, was designed under the presumption that deposits would be strictly overnight, rather than for longer terms. Thus, no ability to deal with coupons was included. A systems change will be required if there is to be consistency with the market's practice of the custodian taking in the coupon payment and paying the overnight repo rate to the borrower who pledges such securities.

One consequence of this shortcoming is that significant volumes of otherwise acceptable collateral cannot be used for RG deposits any time a term deposit straddles a big coupon date. One example provided was an RG auction term which spanned the March 15 coupon date for Canada Mortgage Bond issues by two days. The claim is that the yield on this particular RG deposit was 10 basis points less than the previous day's overnight rate, simply because the Canada Mortgage Bond collateral could not be used. Whether or not the 10 basis point difference is a regular phenomenon, we would recommend to Finance and the Bank that this possibility should be researched further, looking at auction data available for days leading up to such large Canada coupon dates. In addition, the cost of such a change to the RBC Dexia system should be investigated to determine whether a change is warranted. See Section 8.3.2 recommendation.

Additional questions were posed to the LVTS participants with respect to the afternoon auction:

6.2.9. Consideration of an afternoon collateralized auction

There was unanimous opinion from the participants that an initiative to collateralize the afternoon auction would inflame the situation with respect to collateral and its effect upon the rates that would be earned by the RG. Further, it was suggested that such a move would increase operational risk for all involved, as defaults and fails would likely increase.

When asked about the possibility, RBC Dexia offered that such an auction would have to be completed by 1:00 p.m. in order to leave time for system inputs and settlement. This requirement is not compatible with the fact that the Bank's treasury managers are only in a position sometime after about 3:30 p.m. to determine the amount that can be auctioned in the afternoon.

While some thought has been given to the potential of pre-pledging securities, which appears to be the only practical way to have a collateralized afternoon auction, such an approach should only be entertained as a possibility if concurrent steps were taken to address the expressed concern about general collateral pressure.

If no steps were taken to expand the list of eligible collateral for the morning auction, one could consider the use of specific additional forms of collateral which would only be allowed in order to facilitate the introduction of a secured, pre-pledged afternoon auction.

6.2.10. Is current timing of the uncollateralized afternoon auction appropriate?

Some participants felt the current timing was fine, while others thought moving it somewhat later would have advantages for all concerned, as other activities are often being pushed later in the afternoon, such as the CDSX closing. Some interviewees

suggested that moving the close of the afternoon auction to later in the day, even by a small amount (say, from 4:15 p.m. to 4:30 p.m.), would relieve some pressures created by dealing with multiple settlement systems. Such a change might perceptibly ease some pressure for participants. We recommend this possibility be assessed for net benefit from the RG's point of view.

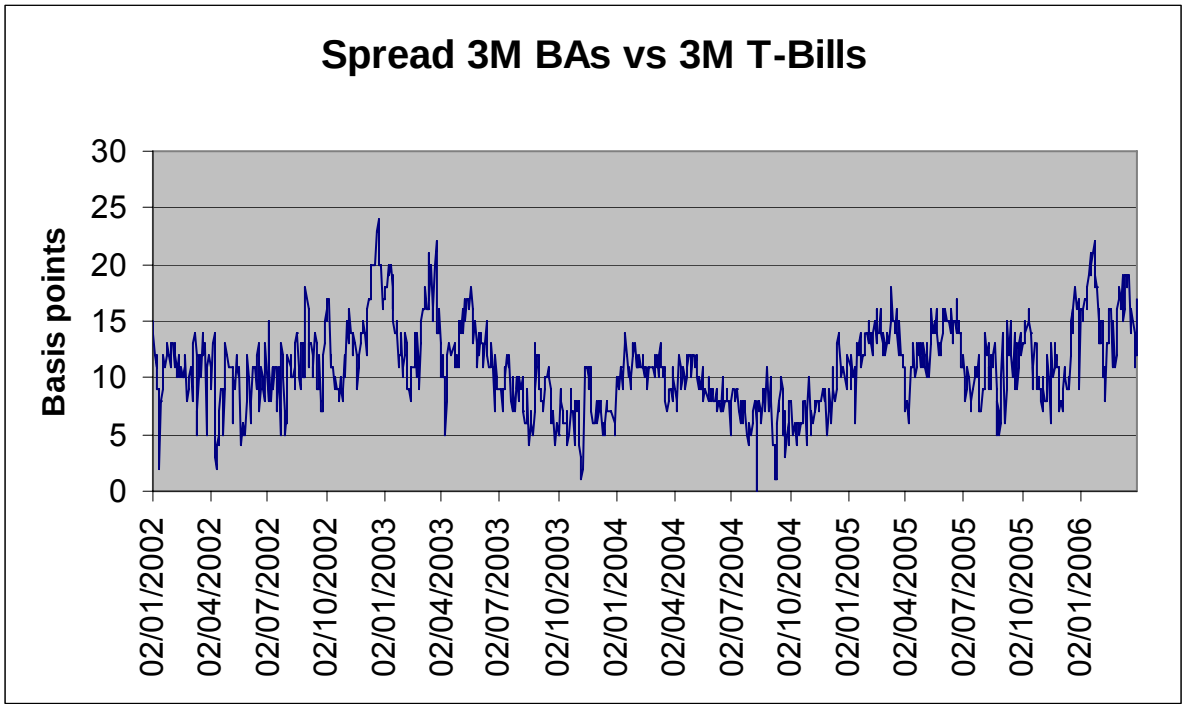
6.3. Treasury Bills

Treasury Bills are a major component of the Government of Canada's debt management program whose major objective is to raise stable, low-cost funding for the Government. As discussed above in section 4.5, treasury managers utilize Treasury Bills for a second purpose which is as a cash management tool. They decide the size of bi-weekly issuance, within the overall debt issuance plan and within boundaries which can be accommodated by the market, to help smooth the peaks in projected RG balances. The treasury managers also decide on the amount of Treasury Bills that the Bank should acquire for its own balance sheet at each biweekly auction.

6.3.1. Stability and cost of funding

Our emphasis in evaluating the Treasury Bill program has been from a cash management tool perspective. Nevertheless, we have carried out a high level comparative analysis of the cost of funding obtained, by looking at the relationship in the secondary market between Treasury Bill rates and bankers acceptances ("BAs"),

The chart below shows that if we use three month BA's as a benchmark, that Treasury Bills deliver a similar and quite consistent spread over the period. We observe that the spread in favour of Treasury Bill funding has been relatively stable over the time period examined, with a standard deviation of 4 basis points.



Average:	11	
High:	24	23/12/02
Low:	0	10/08/04
Standard deviation:	4	

Source: Bank of Canada

Other attributes that we have looked at in evaluating the Treasury Bill program, from the RG cash management perspective, are the framework, participation rate and coverage, transparency and findings drawn from our interview process.

6.3.2. Framework

The Standard Terms for Auctions of Government of Canada Treasury Bills and the Terms of Participation in Auctions for Government Securities, published by Finance and the Bank govern the process of the auctions; outline in detail the rules governing participation, procedures for tenders, bidding limits and delivery and settlement procedures. These rules are well known and, overall, market participants are satisfied with the current regime of Treasury Bill issuance, but did suggest some improvements. For instance, there appears to be some appetite for a one-month Treasury bill, whereas we found no clear consensus either in favour or against maintenance of the one-year maturity.

In the four countries whose debt managers were interviewed, Treasury Bill issuance is managed by the central debt management office, and, with the exception of Australia, the issuance is weekly. The UK issues 1, 3 and 6-month treasury bills and the US issues terms of 4, 13 and 26 week bills, however both countries no longer issue one-year bills. New Zealand, like Canada, issues 3, 6 and 12-month bills. Australia no longer issues bills.

Overall, market participants are satisfied with the current regime of Treasury Bill issuance but suggested some improvements. For instance, there appears to be some appetite for a one-month Treasury bill, whereas we found no clear consensus either in favour or against maintenance of the one-year maturity. These and other suggestions pertaining to the Treasury Bill program are discussed in Section 8.2.1.

6.3.3. Participation

Participation rates at the auctions are closely monitored and Finance and the Bank have introduced a number of reforms over the last few years to improve participation and lower the Government's cost of funds. One initiative achieved in 2004-2005 was a significant reduction in the turnaround time between the deadline for bidding and the announcement of results, from a maximum of 10 minutes to a "best efforts basis" which in practice has achieved average turnaround times of less than 3 minutes for bill auctions. "The reduction in turnaround time has helped reduce market risk for market participants and has improved the efficiency of the auction process."[19] This view was confirmed by Primary Dealers during our interview process.

A review of the framework[20] for distributing the Government's debt securities was undertaken in the fall of 2004 and led to the overall conclusion that the current system was working relatively well. Auctions were consistently well covered and well bid.

[19] Department of Finance Canada – Debt Management Report, 2004-2005 p.7

[20] Department of Finance Canada, Bank of Canada, Changes to the Government of Canada Debt Distribution Framework, August 2005

However there was one lingering concern that participation was becoming too concentrated, even if this did not seem to reduce the competitiveness of bidding. In order to alleviate this concentration issue and to promote wider participation, a few modest changes were introduced. Bidding limits for customers of Government Securities Distributors ("GSDs") were increased. Dealers' performance at buyback operations and at auctions of non-fungible cash management bills is now taken into account in evaluating PD status and bidding limits. Automated Trading Systems ("ATSs") can now become participants if they meet all qualifications. Furthermore, minimum bidding obligations were reduced for Primary Dealers ("PDs") while requirements were introduced to oblige all GSDs to participate at least periodically in auctions.

We observe from the following table that coverage levels at the Treasury Bill and Cash Management Bill auctions have been relatively stable over the four year period examined and that the reduction of tails in the case of Treasury Bills indicates more competitive bidding is occurring. Consequently, the changes brought forward by Finance and the Bank of Canada appear to have had a positive impact.

Performance at Auctions

	Coverage (Ratio)					Tail (Basis Points)				
	2001–02	2002–03	2003–04	2004–05	4-yr avg.	2001–02	2002–03	2003–04	2004–05	4-yr avg.
Treasury bills										
3-month	2.0	2.2	2.2	2.1	2.1	1.3	0.6	0.5	0.5	0.7
6-month	2.2	2.3	2.2	2.1	2.2	0.8	0.7	0.5	0.5	0.6
12-month	2.0	2.1	2.1	2.0	2.0	0.9	0.7	0.7	0.6	0.7
CMBs	1.9	2.0	2.0	2.4	2.1	1.4	1.4	1.4	1.7	1.5

Source: Finance, Debt Management Report 2004-2005 and Bank of Canada

6.3.4. Transparency and change in amount from auction to auction

Treasury Bill call for tenders and auction details are released in a predictable and consistent manner according to a pre-announced calendar. The overall plan for the coming fiscal year is announced in advance by Finance in its Debt Management Strategy publication. "Based on plans for attaining the 60-per-cent target for the fixed-rate portion of the debt, the stock of treasury bills is expected to increase by around $6 billion to a range of $135 billion to $140 billion by the end of 2006-2007."[21]

One area where market participants wish for more transparency and predictability is in the size of auctions. They clearly are opposed to large or unpredictable fluctuations in size in consecutive Treasury Bill auctions, to ensure their ability to manage balance sheets and make orderly markets. There is some variation in the suggested range that would be acceptable. The preferred ranges went from a low of ±10% to a high of ±25%. One market participant suggested a 10% limit on the auction-to-auction allowable decrease in tender size (or simply, a minimum auction size of $10 billion), with no limit on the upside growth in consecutive auctions. This concern about the downside can be attributed to, among other things, a desire from customers for dependable supply, many of whom like to operate with a set portfolio mix, particularly those running money market funds. In general, one gets the impression that all respondents could accommodate more change on the upside if for no other reasons than to provide additional collateral to the system and because they see good demand for high quality Government paper. This appears to be inconsistent with the approach preferred by the treasury managers at the Bank, where flexibility on the downside would be advantageous. Nonetheless, the

[21] Finance Canada, Debt Management Strategy 2006-2007, p24

current practices of the treasury managers fall within the broader ranges suggested by market participants and we would recommend no alteration to those practices is needed at this time.

Market participants have a great deal of confidence in the Bank's ability to carry out its role in the markets. Interviewees are of the opinion that smoother transitions from auction to auction lead to more orderly markets and more confidence in the Bank's ability to control changing conditions. Both customers and market participants plan their actions based on the Bank's announced intentions.

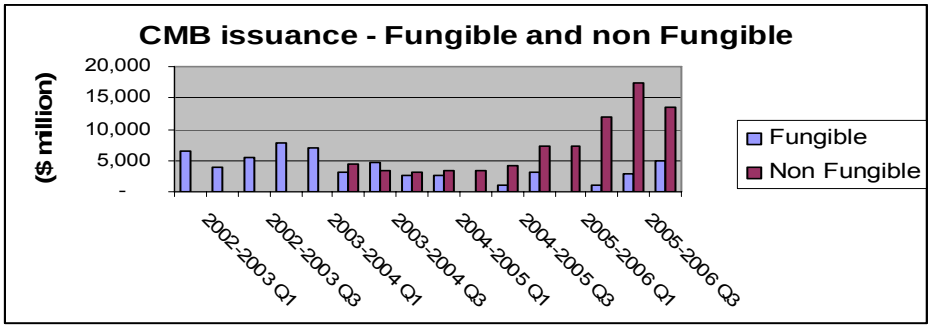
One additional element identified as a reason for keeping a steady, reliable supply of issuance is the market's need for consistency between Treasury Bill rate spreads and other market rates (Overnight, swap rates, BAs). Sharp changes in the supply can cause related disruptions for market makers.

6.4. Cash Management Bills

As mentioned in section 4.6, the main purpose of Cash Management Bills is to give treasury managers additional flexibility, in order to smooth the peaks in balances, by being able to raise funds closer to the day when such funds are needed. Fungible CMBs, whose maturity date coincides with that of an existing Treasury Bill, also provide liquidity to the Treasury Bill market. Non-fungible CMBs provide even greater flexibility to treasury managers, as they are not constrained by any calendar other than the term of the projected needs for funds.

6.4.1. Analysis of issuance trends

We have analyzed the issuance and trends relating to CMBs over the last five years. As we had already seen from the table in section 4.5, the yearly issuance of CMBs has been constantly rising since 2000-2001 when it was $9.0 billion until 2004-2005 when it reached $24.9 billion. The up-dated figures for 2005-2006 demonstrate an acceleration of usage of CMBs with $58.9 billion issued. Consequently, treasury managers are making dynamic use of this instrument to manage balances. Furthermore, the two charts below indicate a pronounced shift in favour of non-fungible CMBs.



Source: Bank of Canada

Other attributes that we considered in evaluating the CMB program are the framework, participation rate and coverage both for fungible and non-fungible CMBs, and transparency. We also added a discussion pertaining to cost of funds/carry and findings drawn from our interview process.

6.4.2. Framework

CMB issuance is governed by the Standard Terms for Auctions of Government of Canada Treasury Bills and by the Terms of Participation in Auctions published by Finance and the Bank. This document sets out the rules governing participation, procedures for tenders, bidding limits and delivery and settlement procedures for both fungible and non-fungible CMBs. These rules are well understood by market participants.

Minimum and maximum bidding requirements have been suspended since September 2004 for the non-fungible type of CMBs. Furthermore, in light of rule changes made in December 2005, participation is not compulsory for PDs in non-fungibles, as this very short term instrument appeals mostly to the buy and hold segment of the market. In the following sections, we look further at participation levels in both types and at market participant views.

6.4.3. Participation

With a coverage ratio averaging 2.1 over the 4 years from 2001-2002 to 2004-2005, (see chart above in Section 6.3.3) CMB auctions are relatively well covered, meaning that there are generally more bids than the amount allotted. We have analyzed in more detail the coverage and tails relating to the non-fungible and fungible issue types over the last few years, based on the following chart. Both auctions are well covered, but coverage of the fungible type of CMB issues is more consistent and stable. In the case of the tails (defined as the difference between the highest accepted yield and the average yield of the auction), they are much more volatile for the non-fungible CMBs. This is as expected, since the rules of participation do not make PD and GSD participation mandatory for non-fungible CMBs as it would be for fungible CMBs or Treasury Bills. This is also why the treasury managers do not view that tails are as meaningful an indicator for the non-fungible category as it would be for the others.

	Participation measures: April 2002 to April 2006			
	Coverage		Tails	
	Fungible	Non-fungible	Fungible	Non-fungible
Average	2.01	1.32	2.70	1.47
Max	2.36	2.85	5.01	4.65
Min	1.46	0.36	1.60	-
Standard deviation	0.22	0.65	0.70	1.16

Source: Bank of Canada

Most market participants stated that CMBs find their way into client (investor) accounts, although there are certain accounts that only buy fungible issues that are already on their approved lists. This general end-user acceptance explains why CMBs have been a successful tool for the treasury managers in filling cash needs for short periods. However, as outlined in Section 6.2.8 below, the zero to 100% bidding rules for non-fungibles make it improbable that dealers will pre-sell such issues, as the uncertainty of allocation means they are unlikely to be willing to take the risk of ending up short.

CMBs also have limited use as cash management tools on dealers' own balance sheets. They are sometimes used to top up collateral or as a trading play, but 1-year Treasury bills which can typically be swapped to floating (from overnight to 30 days in this case) at 2 basis points provide a much more reliable source of collateral.

6.4.4. Transparency

Call for tenders ("CFTs") for CMBs can be released on any business day for next day settlement, typically at 10:00 a.m., but also at 4:00 p.m. on a contingency basis (twice in the last year) for next day auction and settlement.

If a CMB needed to be auctioned on the same day as a Treasury Bill auction or a switch buyback, the CMB auction would be scheduled at 9:15 a.m., in place of the RG morning term deposit auction, with any excess funds being pushed to the afternoon auction.[22]

All auction results are available on CARS and on the Bank's web site. In general, market participants indicated that they would prefer a longer pre-announcement period.

6.4.5. Cost of funds, cost of carry

In our survey of foreign sovereigns' comparable cash management programs, we observed the US experience with similar Cash Management Bills. According to a recent Report to the US Secretary of Treasury, Cash Management Bills are a useful cash management tool allowing treasury managers to raise funds outside their regular borrowing schedule. The report pointed out that this added flexibility came at a cost. To measure this cost, they calculated the yield differential between CMBs and outstanding bills of similar maturity on the secondary market. It would be instructive to be able to do the same analysis as was done by the GAO for US CMBs. While care should be taken not to over interpret results, the US felt it was worth spending significant effort studying CMBs and this statistic, among other aspects. See further discussion on this point in Section 8.2.2)

This information is not tracked by the treasury managers for a number of reasons. Generally, CMBs are issued for very short periods, typically 30 days or less and the ability to get good market information on short dated Treasury bills is challenging, as trading becomes relatively thin for bills close to maturity. Moreover, treasury managers put more priority in trying to reduce the number of days between raising funds and the date when these funds are needed, since this is viewed as a more important driver of the overall net cost of funds.

The table below indicates the average life to maturity of both types of CMBs.

CMBs	Days to maturity	
	Fungible	Non-Fungible
Average	24	11
Max	49	48
Min	6	2

Source: Bank of Canada

We agree with the treasury managers' contention that minimizing the length of time for which excess balances are held is foremost in the order of priorities. However, we believe that there would be some benefit in measuring the yield differential between CMBs and outstanding Treasury Bills of similar maturity. The very shortest CMBs could well be benchmarked against the overnight rate. See Section 8.2.2 following.

[22] A cash management bill for same day delivery would only be scheduled on a bill auction date in the event that RG balances were low, hence skipping an a.m. auction would not be an issue.

6.4.6. Is there room for increased frequency and size?

Opinion on this subject ranges widely. We support the opinion of most participants who think there would be some market for additional CMBs in client accounts as well as for those seeking additional collateral. However, some expressed concern that increased CMBs could lead to less issuance of the regular Treasury Bill tenors. A regular supply of Treasury Bills is preferred, as Treasury Bills give dealers more flexibility in selling to clients as well as being useful in managing their own balance sheets and collateral positions. The fact that CMBs are no longer pre-announced by several days means they can disrupt positions held in the short end of the curve. Several market participants suggested that a regular 1-month bill tranche would be more useful to them. We review this option in Section 8.2.1 following.

6.4.7. Fungible versus non-fungible

The vast majority of dealers prefer fungible CMBs, given their superior marketability. Those without customers interested in non-fungibles are less concerned, as they are not required to bid at non-fungible CMB auctions and simply do not do so.

There is an obvious advantage to the use of non-fungibles in managing the short term cash needs of the RG. We review this issue in Section 8.2.2 following.

It would be informative to analyze the yield differential between longer-dated CMBs and Treasury Bills of equivalent life to maturity, as was done by the GAO for U.S. CMBs.

6.4.8. Zero to 100% bidding rules for non-fungibles

Whereas Primary Dealers and other Government Securities Distributors must limit their bids respectively to 25% and 10% of the total auction size in the case of fungible CMBs, the rule which has applied since September 2004 to non-fungible CMBs is that both PDs and GSDs can bid for up to 100% of the auction size. The rule for auctions of non-fungible CMBs also exempts participants from minimum participation requirements. The rationale behind the September 2004 change was to give more flexibility to market participants to express either a limited or strong interest for any given auction of non-fungible CMBs and to participate accordingly.

However, one consequence of the provision to allow participants to bid for the entire auction amount is that market participants become reluctant to pre-sell such issues and distribute them as When Issued ("WI") because they would risk ending up short the securities, resulting in delivery failure or having to significantly "pay up" in the secondary market. There is also some sentiment that this leeway can be perceived to at least provide the opportunity to manipulate or squeeze the market, something the Bank has been working to eliminate. Despite their indications in previous Consultation rounds, most of those interviewed now state that they would prefer bidding limits in the 25 to 35% range.

6.4.9. Could the market accommodate a same-day CFT, auction and settlement?

Most participants think this is feasible, but place a range of caveats, such as the following:

- Only non-fungibles should be offered, as there would be a risk of adversely affecting markets for fungible issues and related market pricing

- The market will price in the timing concession; the risk is that a low level of participation will significantly increase the rate paid by the RG
- Any form of short-notice activity in the market is perceived to be inconsistent with the overall desire for transparency in the borrowing programs – However, this statement is somewhat inconsistent itself, since the short notice would be similar to that of the p.m. auction amount, or even CMB tenders.

All respondents prefer previous day announcement. However, were a same-day auction to proceed, a range of CFT announcement times was suggested from as early as 8 a.m. to as late as 10 a.m., most aiming for approximately a 10:30 a.m. auction which would allow sufficient time to neutralize positions taken, as well as to arrange for settlement.

6.5. Cash Management Buybacks

The main objective of the Cash Management Buyback program is to reduce the high level of balances needed to redeem large upcoming maturities of Government bonds with less than one and a half years to maturity and to smooth the variations in Treasury Bill auction sizes that would otherwise be needed to pre-fund these large maturities.

To build our evaluation of the CMBB program we reviewed its results against both its aforementioned objective as well as the following attributes: framework, participation, transparency, and cost savings.

The CMBB program has been effective in reducing the magnitude of large pending maturities and has been relatively stable over the last three years in terms of volume repurchased:

Year	# of auctions	Repurchased amount ($billions)
2002-2003	22	12.4
2003-2004	22	15.7
2004-2005	21	12.9

Source: Bank of Canada

6.5.1. Framework

CMBBs are governed by the Standard terms for offers to purchase government of Canada marketable bonds.

6.5.2. Transparency

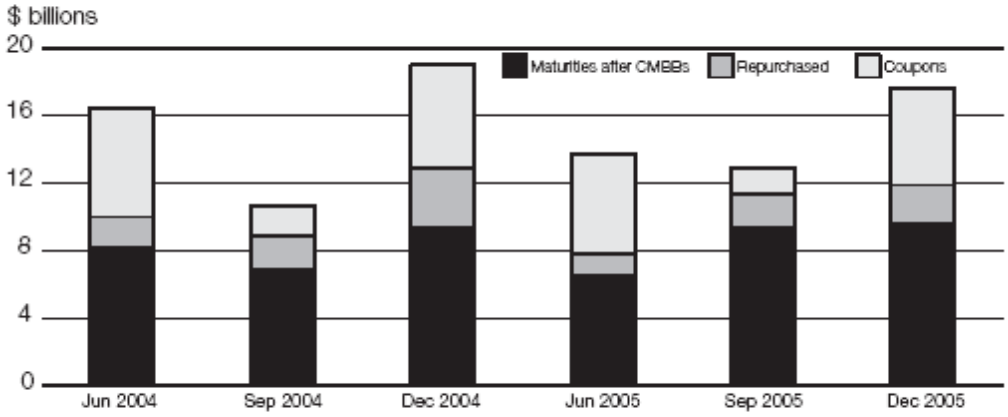
Cash buyback CFTs are announced at 11:30 a.m., a week prior to their auction. CMBB operations are held at 11:15 a.m. on Tuesdays following most biweekly Treasury Bill auctions. Results are released on a best efforts basis, no later than 10 minutes after the auction. All auction results are available on the CARS system and on the Bank's web site immediately after their release.

A uniform comment by market participants about this program is that they find it difficult to predict what issues and what prices will be accepted, if any. It is claimed that bonds

offered “at market” are often not purchased by the Bank, acting on behalf of Department of Finance.
Almost contemporaneous to our interview round, the Bank issued a note[23], on April 7 2006, entitled Details on Bond Buyback Operations. The note outlines the Bank’s approach to valuation and purchase decisions, based on an internally developed zero-coupon curve model. Future feedback should be sought from the market to see if this note removes the stated concerns.

In the same note, the Bank reiterates the definition of eligible bonds and reconfirms the repurchase threshold of $4 billion, i.e. the threshold below which the government will not reduce the outstanding amounts of bonds maturing on one maturity date. The rationale for this threshold is that, based on market consultations, this is deemed to be the minimum level necessary to ensure sufficient liquidity and to attenuate the risk of excessive pressures on the repo markets (which could happen if too much of an issue is in the hands of a very small number of market participants).

Impact of CMBB Operations
on the Government’s Large Payments
As of March 31, 2005



Note: June, September and December 2005 maturities continued to be part of the CMBB program in the 2005-06 fiscal year.
Source: Bank of Canada.

We observe from the chart above that the CMBB program effectively met its primary objective of helping to reduce risk through significant reduction of peaks in the level of balances needed to redeem maturities, hence allowing treasury managers to smooth the variations in Treasury Bill issuance levels from auction to auction. The program may or may not generate savings in short term funding costs depending on the shape of the yield curve, yet there is still value obtained through meeting the important objective of risk reduction.

6.5.3. Other relevant interview findings about CMBBs

The possibility of a Bill buyback program in addition to switch buybacks was suggested in conjunction with a Treasury Bill auction. See Section 8.2.3 below.

[23] http://www.bankofcanada.ca/en/auction/bond_back_070406.pdf

The final point raised about the program was that its success has made a number of issues become quite “technical” in nature, as the supply within the market has been diminished by stripping, etc.

7. International Perspective

To conduct our evaluation of the RG Cash management programs, it was essential that we explore government cash management practices of some comparable sovereign states as they could provide valuable insights on potentially better tools to manage short term funding and cash balances. We had in depth interviews with the treasury managers of Australia, New Zealand, United Kingdom and the United States. The first two countries share with Canada a situation of budgetary surpluses and shrinking debt. As for the United States, the enormous size of its economy and its close links with Canada as our major economic partner made it critical to analyze its practices.

Please note that the guides used in our interviews, which were all conducted via teleconference during March and April, can be found as Addendum 3. Please refer to Appendix 2 for detailed fact sheets derived from our interviews and analysis of each of the four countries' public documents and websites.

7.1. Institutional arrangements and framework

In all four countries surveyed, cash management of government flows is the responsibility of either a centralized debt management office ("DMO") or a department of Treasury (USA) which reports to the Treasury (Finance) Department. In all cases, the role of the central bank is to implement monetary policy. In all four countries, the government maintains its bank account, where all balances are swept at the end of the day, into the government's account at the central bank. In two cases (Australia and New Zealand) the central bank invests the balances left at the end of the day. In the UK, surplus cash is invested by the DMO and/or cash shortfalls are raised, in a range of money market instruments transacted with market counterparts while any unexpected late flows across government accounts are absorbed by the remunerated balance held at the central bank; while, in the US, excess funds are (1) auctioned, (2) placed with commercial depositaries at the Federal Funds rate less 25 basis points, or (3) (with the recent inception of a pilot program) invested through reverse repurchase transactions,.

All consulted countries value transparency and therefore pursue debt issuance and cash management strategies that aim at being open, transparent and predictable.

7.2. Forecasting of balances

The UK DMO recognises that the forecast of cash balances plays an integral role in its active management of Exchequer net cash needs, enabling "active" forward looking dealing strategies to be undertaken. This allows the future profile of cash balances to be smoothed without undermining the efficient functioning of the sterling money market. The DMO receives from HM Treasury's Exchequer cashflow forecasting team regularly updated forecasts of the cash flows into and out of central government, as well as up-to-date monitoring of actual cash flows as they occur

In the USA, Treasury cash managers collect and disburse federal funds at the agencies' request. For their part, agencies must give Treasury five business days notice for disbursements of US$500 million or more, and two business days for disbursements between US$50 million to US$500 million[24]. According to our interviewees, increased availability of electronic funds transfer and automation has significantly improved cash balance forecasts.

[24] The requirements can be found at the following web site http://www.fms.treas.gov/tfm/vol1/v1p6c850.pdf

7.3. Investment of cash balances

The UK affects the bulk of its cash management operations through bilateral market operations with DMO counterparties. and by the issuance of Treasury bills. It is active in both the repo and reverse repo markets. We have seen that USA is the only country among those interviewed utilizing an auction for term deposits similar to that of the RG. This auction is called the Term Investment Option ("TIO") program (for further details please consult Appendix I). It complements the other pre-existing approach, the Treasury Tax and Loan system, whereby deposit taking institutions pay Fed Funds minus 25 basis points. The TIO functions as a term deposit auction, announced one day prior and for terms between 2-days and several weeks. The US started a reverse repo ("reverses") pilot program at the end of March 2006. In the pilot the U.S. Treasury effectively purchases Treasury securities overnight under a reverse repurchase agreement. Funds are invested through the pilot program on almost a daily basis. The primary objectives of the pilot are to assess the impact of investing funds through reverses on the Treasury Department's internal systems and processes, and to explore the benefits of using reverses to expand the Treasury's investment capacity and increase the return on invested funds.

However, none of the other countries has a regular, daily (or twice daily for that matter) auction of term deposits as in Canada. In Australia and New Zealand, excess cash balances are placed by the debt management office with their respective central banks at the close of the day. The central banks then in turn lend part or all of these balances in the repo markets (subject to the need to augment or decrease end of day settlement balances in their large value payment system).

7.4. Treasury bill *(or equivalent government security)* issuance-debt buy backs

All four countries can issue treasury bills. Australia has not issued treasury bills (called treasury notes in their country) in recent years since its excess balances deposited at the central bank have proven sufficient to fund short term cash needs of the government. It could however issue treasury notes of maturities ranging from any number of days up to 6 months. The USA, and UK issue a one-month bill in addition to 3-month and 6-month bills. New Zealand regularly issues 3-month and 6-month bills and, until recently, 1-year bills; in addition, bills with non-standard and typically shorter maturities are issued on an ad hoc, but infrequent, basis. UK could theoretically issue a one-year T-Bill, but has not to date.

The US experience with introduction of the 4-week treasury bill merits attention. The 4-week bill was added to the regular auction schedule in 2001 leading to lower issuance of cash management bills. According to the US Government Accountability Office, this led to a lower borrowing cost in the following year. We would recommend that this idea be further analyzed, and weighted against comments from some domestic market participants who were receptive to a 1-month bill, conditional upon the non-cannibalization of existing volumes in the 3-month and 6-month treasury bills – views were more mixed on the importance of the one year.

All four countries have the authority to do buybacks, but few do. UK repurchases Gilts under 6 months; NZ formerly repurchased bonds under six months, but that activity has effectively ceased, as interest on the part of the market has not been forthcoming.

7.5. Participation

Participants tendering for bills are domestic or global banks, called registered or primary dealers as the case may be. In some countries, other investors can participate directly in treasury bill auctions,

such as insurance companies and pension funds. For those Debt management offices active on the secondary markets, participants purchasing deposits will generally be banks and institutional investors. The UK DMO is the only one in our sample that buys back T-Bills from market participants on a bilateral basis. The UK can also repo/reverse repo bills individually or as part of a basket of eligible collateral bilaterally with market counterparties.

7.6. Risk and collateral considerations

The US government is not allowed by law to lend public money unsecured. There is however a vast array of collateral eligible, ranging from Federally issued debt securities to asset backed securities issued by financial institutions in the private sector.

The UK primarily invests balances bilaterally with market counterparts. As limits on the amount and tenor of unsecured lending are expressed in nominal terms, the ratio of unsecured to secured lending can vary significantly over time.. The collateral accepted is UK Government securities as well as debt securities issued by Euro zone sovereigns.

In the case of Australia, investments on the open markets are done by the central bank. In Australia, the central bank accepts a wide range of securities through the repo markets, ranging from commonwealth bonds to bank issued paper.

In the case of New Zealand, the DMO does some investment before the end of the day, but end of day balances are all swept at the central bank. When investing cash directly, the DMO will invest in foreign markets hedged with a FX Swap. This approach enables NZDMO to invest in a much wider range of high-grade credits than are available in the domestic market. It also avoids interfering on price setting in the domestic market. Collateral required is calculated in NZD but posted in USD at a foreign depository. Collateral accepted is ordinarily cash, although cash equivalents have been used from time to time in the past.

It would be worthwhile to investigate further the merits of the above alternative practices that could be transplanted into the Canadian context: 1) Broaden the acceptable collateral list; 2) Increase the amount of dealings on an unsecured basis and on a bilateral, open market basis; and 3) Accept cash or cash equivalents of other sovereigns as collateral.

7.7. Performance

The UK cash management process is measured formally by attempting to look at value added compared to an assumed “passive management” default benchmark. This benchmark is not made public. Deviations from the benchmark are permitted, subject to credit, interest rate and liquidity risk limits, to smooth the profile of expected daily net cash needs on the basis of the forecast provided. The DMO has been testing this approach since June 2005 and it is still in development. All the details of this system are beyond the scope of this project, but further review may provide great insight into what could be regarded as a true “performance measurement” which would parallel what might be done in an investment management function in the private sector.

In our Australian interview, there was but a brief mention of performance measurement in the current situation, as much of the discussion focussed on their plans for their “Future Fund” which is outlined below in Section 7.8. They have not issued treasury bills since 2003 and soon expect to have no net debt. As a result, discussion of performance measures compared to Canada is not meaningful.

The New Zealanders’ thoughts in this area start with the statement that performance measurement is difficult; it is hard to answer what is an appropriate benchmark. They are conscious of not wanting to “cherry pick” easy activities or “game” the assessment framework to look good. They do look at a

suite of indicators, such as funding costs, where they review the spreads between the swap curve and government curve as well as between bank bills and treasury bills. They try to frame their thinking in an ALM (asset/liability management context), in that the liabilities fund various assets, implying a cost of carry that can be positive or negative. The assets can take the form of loans to various government agencies(including to the central bank to fund foreign exchange reserves), cash, investments (of excess cash balances or as hedges of outstanding debt), or in theory a notional loan to the government to fund government activities.

Our US respondents indicated that they look at a variety of indicators such as ratios on auctions, participation, cash forecasting relative to past record and performance targets, spread between term auction rates, repo rates, and TT&L rates, and differences between projected and actual borrowing needs (the differences between announced and actual borrowing needs are also tracked and reported by market participants).

7.8. Current or planned developments

The most notable planned development is in Australia where, given the impending "no net debt" condition, they are embarking upon the establishment of a so-called "Future Fund". This will be a classic balanced asset fund, invested in a mix of equities, debt, and properties, with a long term balanced fund objective. It will be managed by a new agency of the government, with its own board of directors. It will outsource the investment management to private sector managers. The fund will be seeded with A$18 billion of government cash.

As mentioned in Section 7.3, the US initiated a reverse repo pilot program at the end of March 2006. The pilot is scheduled to last for up to one year. It would likely be valuable to follow-up with them in future to hear their assessment of its success and the pros and cons of various aspects of their program.

8. Recommendations and Suggestions for Improvement

8.1. Forecasting and the Role of the Bank

As outlined above in Section 6.1, the forecasting ability of the treasury managers has continued to improve in recent years. This improvement is attributed to a combination of factors. First, the managers have developed a series of forecasting tools which, as experience and available data grow, produce more and more reliable estimates. Second, the process of reporting expected disbursements by Government departments has become increasingly automated. In Section 6.1 it was outlined that PWGSC is currently engaged in a two-year project to further automate their payments process.

A review of the Treasury Management Daily Report of RG Cash Flows and Balances confirms statements given in our discussions with Finance and Bank of Canada officials that there appear to be many influences beyond the control of the treasury managers which result in augmented cash balances, particularly near fiscal year-end. It is recognized that the levels are higher around March, but this is something that is done for reasons outside the scope of this evaluation.

8.2. Short term funding programs

8.2.1. Treasury Bills

As a suggestion for improvement, we can report that interest was expressed by some participants in a regularly auctioned 1-month Treasury Bill. This could be a useful additional tool for the treasury managers to help further smooth balances and help reduce fluctuations in the size of consecutive auctions. This fluctuation from auction to auction was a sensitive point with a number of participants who would wish to see less volatility between auctions. Our assessment is that a 1-month Treasury Bill could regularly replace some of the longer-dated issuance without upsetting the market (similar to the practices of several of the foreign sovereigns interviewed). A side benefit to the Government in a normal, positively sloped yield curve environment would be a slight reduction in cost of funds. Conversely, there was absolutely no agreement among interviewees on the need for, or otherwise, of a 12-month tranche. Clearly, further consultation beyond these current interviews would be required to flesh out the optimal mix of Treasury Bill tranches, both from the perspective of the Government and of market participants. Any major change should be announced well in advance as the desire for transparency is high.

8.2.2. Cash Management Bills

While there is a certain amount of implied lobby for change to this program, the treasury managers correctly identify that the program is successful, in that offerings are taken up by the market, while providing critical flexibility to the management of RG cash. While there should be encouragement to use fungible issues whenever possible, we support the continued use of non-fungibles to match expected cash flows.

As to the question of 0/100% bidding limits, we observe that the participants are divided in terms of contentment with the arrangement. Thus, if the process is successful for the treasury managers, which we understand it is, we do not recommend any changes.

As mentioned previously, we recommend consideration of tracking the difference between rates on CMBs and Treasury Bills of equivalent remaining tenor outstanding in the market, as was done in the US. It is understood that the information gained does not give the entire picture of relative costs, as CMBs produce lower borrowing costs due to the shorter time they are outstanding. However, the information gained can give insight into whether the market does price in a premium for CMBs and whether any trends can be identified related to timing and size.

The interviewees offered points on the following general topics:

- Consider offering more issues with longer dates. In our opinion, however, this does not fit with the basic objective of the CMB program.
- Several interviewees expressed the importance of fungibility in slightly different ways. However, once again we recognize this would force a trade-off with the flexibility required by the treasury managers to effectively manage RG balances and their cost of carry.
- More transparency desired in the tender and issuance process; would prefer more lead time between when a CMB is announced and auctioned. However, such a trade-off would constrain the necessary flexibility required by the RG, since treasury managers often do not know the correct size or even if a CMB will be needed almost right up until the last possible day or even just hours before a CFT release.

8.2.3. Cash Management Bond Buybacks

With respect to the Cash Management Bond Buybacks, the program has been effective in smoothing cash balances in advance of upcoming maturities. This is an area where participants have expressed their wish for more transparency. They wish to better understand the pricing rationale of the Bank and Finance as well as the issues and sizes that are targeted.

A Bill buyback program should also be considered to help manage cash. This idea has merit in the context that supply of bonds for the CMBB program is said to be shrinking and it would be sensible to give the treasury managers as many tools as possible to manage cash and maturity requirements effectively. As mentioned above in Section 6.5, the idea of a Bill buyback program has merit as a further alternative to manage large future cash requirements in advance.

8.2.4. Reverse RG Auction

Our interview query about the possibility of conducting Reverse RG Auctions received some favourable feedback from market participants, particularly institutions that hold cash in reserve. This auction would be held at the same time as current afternoon auctions on days when the RG found itself in an unanticipated deficit position. The market participants would offer their balances to the RG in response to a reverse CFT. In our view, this would be a useful tool to help the RG to significantly reduce its target of minimum balances.

Market participants generally felt such a reverse auction could be managed. Comments received on this topic can be summarized as follows:

- While one interviewee indicated reluctance or inability to deal later in the afternoon, others did not object to the 4:15 p.m. time suggested in the interview question.

- It would be a very good additional tool to help market participants neutralize their balances at the end of the day.
- The size that could be handled by the market is estimated by some market participants to be between $0.5 and 1 billion.
- It could have unintended consequences on Government rates as banks will not want to risk over lending and becoming short cash at the close.
- One participant mentioned that this would be acceptable only if such assets are zero risk-weighted for BIS purposes.
- Looking outside the current participants in the RG auctions could prove fruitful. At least two major investors that we interviewed indicated that they could be interested in providing money "late" in the day, if only there were a way for them to deal directly with the RG. Both tend to be naturally long cash at the end of the day, barring negative surprises.

Further thought would be required by all potential participants to determine if such an auction could be managed. We feel the RG could be put at risk of having to borrow from the Bank as a last resort if no bidders respond.

8.3. RG Term Deposit Auctions and Cash Management

8.3.1. Collateral Pressure

The issue that warrants a high level of scrutiny based on our interview findings and study of the available data is the mounting pressure on collateral availability, which has a likely unfavourable impact on the yields earned by the RG on its term deposits. It should be noted from some of the foreign sovereign interviews that this pressure is not unique to the Canadian markets.

There appears to be some contradiction about the amount of pressure claimed by market participants, as the Dexia statistics show very little sources of collateral other than Government of Canada securities are used. However, there are reasons for the participants' assertions that are worth considering. As previously mentioned, most participants think of General Collateral ("GC") as being government debt only. Some even exclude Crowns (with the exception of Canada Mortgage Bonds) from their definition of GC because of the higher margin requirement in the RG collateral rules. They certainly evidenced dissatisfaction with the margin rules for the RG auctions in general. However, the most reasoned explanation was that their use of collateral from other parties for RG purposes would conflict with the desire to use the required capital in direct business dealings with customers.

We think this strongly expressed concern by market participants is something that must be recognized in any future action taken in the management of the RG balances.

Several ways exist to relieve collateral pressure. Further study beyond the scope of this evaluation is required to assess the relative importance of each. The possibilities identified are summarized as follows:

The first method would be to revisit the size of the uncollateralized lines granted to participants, which have not kept pace with the sizeable growth in capitalization of these institutions since 2002. An alternative to a blanket increase in these lines would be to increase the lines only at times when the total RG balances in the morning auction exceed certain thresholds (say, $10 or 20 billion, or both). This relief could, without significant credit risk profile amendment, mean a few additional basis points of yield for the RG term deposits.

Secondly, we would recommend the expansion of the list of eligible collateral to include a range of securities classes with excellent credit ratings.

The list of potential additional sources of collateral includes the following:

- Asset-backed securities (There is reportedly in excess of $80 billion of highly rated collateral of this type in Canada)
- Bonds issued by foreign entities in Canadian currency ("Maple Bonds")
- Canada Mortgage Bond or NHA MBS issues of less than current minimum size limit of $75 million
- Longer-dated provincial securities (> 10 years)
- Some system of pledging $U.S. securities, either in Canada or, if lodged in the U.S., pledged to the FED, who would then pass on a guarantee to the RG through the Bank of Canada
- Custody banks should evolve to taking cash (as is done in the U.S.) rather than just collateral. This could relieve pressure for participants who have a technical fail at the end of the day because they did not receive the securities that they were planning to on-lend to the system. This is an idea that would merit further discussion of feasibility with those concerned

Further, the internal limits on exposures to particular sectors and industries could be liberalized without diminishing overall quality of a collateral package. As well, several interviewees identified that the margin requirements or "haircuts" on some securities were too high and inconsistent with market convention (See Section 6.2.6 and Appendix 1). To explore this issue further would, in our opinion, be beneficial as it could alleviate collateral pressures and translate to better yields earned by the Receiver General on its deposits. As a minimum, we recommend steps be taken to examine and ideally to eliminate inconsistency among these margin requirements wherever possible. In addition, removing the differentiation between Government of Canada direct issuance and the securities of its Guarantees would be useful in this context.

A different approach to taking some of the pressure off collateral is to move to some other form of investment of the RG balances, which is reviewed in detail below in Section 8.3.4.

A final alternative is to find some method to lower the balances, particularly in the months requiring the advance build up of large balances (March for sure, May and November to some extent) or to remove those balances from play in some way (see section 8.1 above). As pointed out in Daryl Merrett's "Primer on the Federal Government's Daily Cash Balances" May and November could become a bigger issue some time in the future if long term interest rates rise and long Canada's have to be issued with bigger coupons.

It is our recommendation that some combination of the above steps be taken.

8.3.2. Custody of Collateral: Suggestions for Improving the Framework and Scheduling Issues

Whereas market participants generally rated the Dexia services as adequate, they all expressed the view that the Dexia system should be brought in line with market conventions and the systems used on the repo markets in terms of accepting as collateral securities with a coupon detachment midway through a pledge. We recommend that the cost of such a change to the RBC Dexia system that was developed for the RG should be investigated to determine whether a change is warranted.

Other minor suggestions were made to improve the Dexia service from the point of view of the RG's counterparties. These included moving cut-off times for delivery/receipt of collateral to the market norm of 4 p.m. and increasing the threshold for margin calls. We recommend a regular review of custodial arrangements as part of a periodic tendering of that service, not as a criticism of RBC Dexia, but as good practice to ensure the delivery of the optimum result for the RG.

Furthermore, it was suggested by some interviewed market participants that it would be a sound practice to put custodianship up for tender every 2 or 3 years.

8.3.3. Collateralization of Afternoon Auction

Relative to the idea of introducing a collateralized Term Deposit Auction in the afternoon, several constraints came to light under preliminary analysis. According to participant views, this would induce an amount of operational risk that is not warranted at this particular period of the day, when they are the most at risk of technical fails. These constraints should be carefully reviewed before making further progress in that direction.

An alternative that has been suggested to make collateralization possible in the afternoon is the concept of pre-posting collateral. Given the concern for pressure on the availability of collateral for the morning auction, it is highly likely that there would be strong resistance to a system that would require excess collateral. Alternatively, a move to collateralize the afternoon auction could consider the use of specific additional forms of collateral just for a potential secured afternoon auction.

It is our recommendation that consideration of a collateralized p.m. auction be deferred at least until steps have been taken to address the aforementioned operational and collateral concerns.

8.3.4. Alternative Investments for RG Balances

Our discussions and analysis generated several ideas about alternative ways to invest excess balances. There is first the notion of increasing uncollateralized access, second, the opportunity of widening the array of potential investments by accepting high quality paper of other quality issuers, either domestic or foreign. In addition, certain institutions would be willing to offer tailored investment vehicles which offer both liquidity and better returns than overnight money. There was even the suggestion that the RG could outsource the investment of part of its excess balances to an outside manager, if not manage a money market portfolio internally. All these ideas involve trade-offs on the risk return spectrum and would involve the weighting of potential benefits against the marginal increase in risk.

The basic, and obvious, alternative one might expect to be suggested, is to expand the amount of uncollateralized term deposits allowed to current market participants. The first requirement in evaluating risk return trade-off in this alternative is to identify the return difference available. In this regard, it would be useful to analyze the difference in return between uncollateralized and collateralized balances in the morning auctions. As mentioned previously, informal discussions would lead us to believe that, in current market conditions, participants in the morning auction structure their bids on the assumption that the uncollateralized portion should pay about 7 or 8 basis points above the collateralized portion, although their capital models would generally call for a higher spread. The implication is that they believe there should be an even wider spread if market conditions would permit it. Another source of evidence is to look at actual historical spreads between, for example, BA's and Treasury Bills to give a sense of what the market considers the correct spread to be for these relative credits. Over the past year, the 1-month BA/Treasury Bill spread has averaged 39 basis points, while during the

last 4 months, the spread has been about 23 basis points. Given the yield curve being quite flat at present, this term is likely indicative. We believe this issue merits further study to understand what opportunity costs could be captured to enhance government revenues. One would also need to assess the second element, that of quantifying the very limited risk inherent in investments of very short durations, typically for one day to one week, with counterparties whom the government is generally well aware of in terms of their financial position.

It was also suggested to permit different forms of uncollateralized debt (high quality bank paper or commercial paper) to be purchased and to add high quality credits to the list of participants. At least one AAA credit active in the Canadian market is very interested in becoming eligible to bid for RG funds. This borrower's posted 30 day rates over the past year have averaged about 3 basis points below one month CDOR (Canadian Dollar Offered Rate) the recognized benchmark index for bankers' acceptances. The implication is that a step up in credit quality in this case would also offer a higher return. It would seem advisable to seek out such borrowers and extend uncollateralized auction limits at least equivalent to other senior participants, if they were to seek direct participation in the auctions. One minor impediment to adding new participants is the requirement to use CARS, which has functionalities unique to the RG auction.

8.3.5. Alternative Investment Approach for RG Balances

An alternative to the auctioning of balances, which was suggested by at least one market participant in addition to other investors, would be to outsource the investment of some portion of RG cash to an investment manager or other financial intermediary. The funds would be managed according to a policy framework that would deliver high quality, additional protection in the form of diversification, returns consistent with terms further out the yield curve and cashability on a reasonable basis.

While it is impossible to predict whether an arrangement could be structured to meet the needs (such as size, timing and call features) of the RG without considerable further research into the capabilities of potential managers, the marketplace does have a good number of very capable managers. In the table below, the results of over 40 such managers, as measured by SEI, demonstrate that, under longer term market conditions, there could be a worthwhile yield advantage to placing some funds into such a program. The following table also demonstrates what one would expect intuitively, that the maximum advantage is to be gained when the yield curve has a positive slope, while there is little difference in a flat yield curve environment. The advantage is demonstrated over a five year time frame which includes and dominates the narrower advantage of the recent years with their quite flat curve. Over the past five years, a first quartile performing fund could have produced a gross 25 basis points per annum average advantage. And, it is during such positively sloped periods that the RG's cost of carry is the most expensive.

	Periods Ending March 31, 2006			
	1 year	2 years	3 years	5 years
RG a.m. returns	2.87%	2.53%	2.60%	2.76%
SEI median money market fund	2.91%	2.62%	2.74%	2.96%
SEI Quartile 1	2.97%	2.66%	2.82%	3.02%
SEI median value added	0.04%	0.09%	0.14%	0.20%
SEI Q1 value added	0.10%	0.13%	0.22%	0.26%

While the universe of funds included in the above table includes investment grade securities ranging to a minimum credit quality of R-1 (Low), there are funds offered in the marketplace which restrict themselves to higher quality securities. For example, one of the top quartile managers, in addition to offering the investment grade fund included in the above table, offers alternative funds limited to such higher quality investments. The first such alternative invests in short term Government of Canada securities or those guaranteed by the Government ("Canadas"); the second invests in instruments with a minimum R-1 (Mid) rating ("Banks"); while the third invests in instruments with a minimum R-1 (Low) rating ("Investment grades"). We reviewed the results they publish for their funds. Once again, maximum advantage is gained over periods with a positively sloped yield curve, but each pool shows professionally managed assets deliver results better than a recognized benchmark (Scotia Capital 30-Day T-Bill Index). The benchmark, itself, would be expected to show advantage over fully collateralized overnight investments. The point to be made is that fund managers and funds exist in the marketplace that have the potential to add return for the RG at a variety of high credit quality profiles.

Under yet another alternative, one AAA institution offers a vehicle in the marketplace with a rate guaranteed to match 30 day Bankers Acceptances. Some further direct discussion would be required to determine to what size such an offer would extend.

Finally, another approach employed by one foreign sovereign (see Section 7.3 above) is to invest in the debt of other foreign sovereigns, with a collateralized FX contract to achieve domestic currency exposure. It is likely that using this method for a portion of the RG balances would reduce the pressure on domestic collateral somewhat. This is an approach well worth pursuing.

While the suggestion that there be consideration given to setting up a fund management capability, either within the Bank or some form of financial authority, seems a complex possibility, it should be noted that such a capability exists within the financial authorities of at least two provinces.

These alternatives to the established auction process may not be considered necessary or practical in months where expected balances are small. However, we feel a managed approach is well worth consideration for a core portion of the RG funds in months where expected average balances are high. This possibility would necessitate a minor modification to the policy of balance minimization for the odd days during such months where balances drop temporarily. On such days, CMB borrowings could be used to avoid unwinding investments that are in position for the longer term objective of reducing the cost of carry for the month. It would be necessary to adopt this approach in order to gain the measure of callability that would work both for the RG and for the fund managers. Many of them do provide same day cashability, as long as it is not a constant in and out pattern, if the timing is reasonably early in the day and amount is not too much for the size of their fund. This aspect would require considerable discussion and negotiation with the managers.

We recommend further review of these alternatives.

8.3.6. Risk/Return Considerations

While these alternative investments would be a departure from Canada's distinctive auction process of handling surplus balances, it would not be inconsistent with the practices of several of the other sovereigns interviewed (see Section 7.3 and Appendix 2). Moving to such a different process would require additional study beyond the scope

of this particular project, but offers the possibility of providing better returns on a portion of the RG balances at the same time as easing some of the aforementioned pressure on collateral in the capital markets. In effect, one could envision a core of the RG balances, callable on demand, but invested in assets with a term characteristic where yields more closely match those associated with the term of funding, thus removing most of the cost of carry on this portion of the assets. To repeat, many money market fund managers do provide same day cashability, as long as it is not a constant in and out pattern, if the timing is reasonably early in the day and amount is not too much for the size of their fund. This aspect would require considerable discussion and negotiation with the managers.

The assessment of these alternatives depends upon the method of evaluating the trade-off between risk and return. In looking at credit risk, one method would be to use a capital model to assess the additional capital, or notional amount at risk, required to own the asset earning the higher return. Banks and other regulated financial institutions are required by regulation to set aside capital when they invest in assets that are not "risk free". Many institutions have their own internal capital models that assess required capital in more detail than that employed in a regulatory structure. Such internal capital models are structured using statistical data on losses suffered in defaults. Data can be obtained from institutions' own internal experience as well as from statistics published by the various rating agencies showing loss experience for various credit rating categories and asset types. To such required capital, an institution applies a desired rate of return on capital in order to determine the spread required in excess of the available risk free rate.

In the case of the RG balances, it would be possible to establish a regimen, if such does not already exist, to follow in determining such required spreads. (A current basis is implied by the haircuts required in posting collateral, although our respondents stated the amounts are too high compared to other standards. See Appendix 1). This would provide a framework for assessing the relative merits of any program designed to earn higher returns from taking additional risk. Some additional research would also be required to establish the return differentials expected from some investment programs, as they involve more than a simple purchase of assets with a different credit rating. For example, a diversified investment fund will have lower risk expectations than a single investment with the same credit rating requirement.

An additional consideration in choosing a process that takes measured risk, as opposed to a program that attempts to remove risk no matter what return cost is involved, is the understanding that outside observers would have of any potential future loss. The RG program has taken steps toward a minimal risk posture in the recent past. Almost all of the alternative methods discussed herein could reverse that direction if the risk/return evaluation calls for it.

8.4. Foreign Sovereign Practices

In looking at four major international comparators, we found that Canada is probably the most advanced in terms of auctioning deposits to market participants. Nonetheless, as stated previously, there are issues with the processes of the auction that bear consideration for possible improvement. In particular, consideration of some of the external investment alternatives employed by foreign sovereigns could provide valuable guidelines for any such activity by the RG.

Some of the most useful findings from the other sovereigns are particularly in the area of performance evaluation approaches, where the shared view is that there is not one unique measure to capture the performance of a complex Government cash management program. Their approaches encompass ideas ranging from a set of concurrent indicators, used in an ALM type approach, to a benchmarking

model that attempts to measure performance much as a private-sector manager would be evaluated. We recommend investigating such approaches in greater detail.

In addition, the successful use of 1-month bill issuance by most sovereigns leads us to recommend further consideration be given to the previous suggestions regarding this option.

8.5. Summary

The interview process with respect to the Term Deposit Auctions included Primary Dealers, LVTS participants, other capital markets issuers and investors, foreign sovereign debt/cash management operations, officials from Finance, the Bank and PWGSC, as well as the custodian, RBC Dexia. The basic conclusion one can draw from those interviews, from background material provided by and discussions with Bank of Canada and Department of Finance personnel, and from the experience of the project team is that the deposit auction system works well for the Receiver General.

Thus, we conclude overall, that the RG Cash Management Program meets its primary objective which is to ensure that the Government always has sufficient cash on hand to meet its obligations, while not maintaining excessively large and unproductive balances in order to minimize the net cost of funds. Nonetheless, there are issues with the processes of the auction that bear consideration for possible improvement in the overall result achievable.

The treasury managers responsible for the day-to-day operations of the RG Cash Management Program face a challenging environment with respect to forecasting, but are continually improving their estimation process. This forecasting challenge is particularly evident in March every year, where large flows and irregular disbursement patterns are difficult to translate into an expected daily cash position.

We believe that the framework for operating the RG Cash Management Program is effective. A complexity that deserves attention is that a few market participants feel they get mixed signals from time to time, because of the dual roles of the Bank of Canada: acting as fiscal agent in its duties as manager of the RG program, and simultaneously responsible as an institution for the conduct of Monetary Policy. Clearly the separation of the two functions is working when the treasury management activities are so independent as to occasionally require offsetting activity in managing the overnight Target Rate. This lack of understanding by some could perhaps be addressed through even more communication to market participants about the separation between those in the treasury manager role and those who carry out monetary policy-related operations.

The measures introduced, further to extensive market consultation, to gradually improve participation and promote more aggressive bidding in the RG Term Deposit Auctions have been generally well received by participants and have proven their effectiveness. The exceptions to this favourable reception are comments made about the collateral limitations and constrained size of uncollateralized lines of credit. In addition, from the point of view of the Government, the collateralization-related changes have resulted in some additional cost of carry in the interest of reducing risk. This additional cost may be more than was originally anticipated or even what could be reasonably justified, due to the subsequent effect on rates earned on portion of RG deposits which are required to be collateralized, as well as the added price pressures on general collateral which have been exacerbated to some extent by the requirement. Consideration of the collateral pressure issues is warranted, although some additional study is required with respect to the alternatives for expanding eligible collateral as well as suggested alternative investment vehicles and processes that have been presented in the document.

We would like to acknowledge the cooperation and contribution of the representatives of the various interviewee organizations in the capital markets, many of whom went out of their way to

accommodate us within their hectic trading schedules. Similarly, the representatives of the various foreign sovereigns were generous with their time and information. Most of all, we appreciate the efforts of the representatives of the Bank and Finance, who provided a wealth of information, extra work in producing analytical data, and constructive feedback.

Appendices

Appendix 1 – Comparison of Margin Requirements on Collateral

Comparison of selected Margin requirements[25]			
Collateral Type	**RG**	**LVTS**	**IDA**
Securities issued by the GOC	1.0%(0 - 1Y) 1.0% (1 – 3Y 1.5% (3 – 5Y) 2.0% (5-10.5Y) 2.5% (> 10.5Y)	1.0%(0 - 1Y) 1.0% (1 – 3Y 1.5% (3 – 5Y) 2.0% (5-10Y) 2.5% (> 10Y)	1.0%(0 - 1Y) 1.0% (1 – 3Y 2.0% (3 – 7Y) 4.0% (7-11Y) 4.0% (> 11Y)
Securities guaranteed by GOC including Canada Mortgage bonds	1.5%(0 - 1Y) 2.0% (1 – 3Y 2.5% (3 – 5Y) 3.0% (5-10.5Y) 3.5% (> 10.5Y)	1.5%(0 - 1Y) 2.0% (1 – 3Y 2.5% (3 – 5Y) 3.0% (5-10Y) 3.5% (> 10Y)	Same as GOC issued bonds above
Securities issued by a provincial government	Over 10.5Y: not eligible	Over 10 Y: 4.5%	Over 7 Y: 5%
Securities of agents of or guaranteed by a province	Over 10Y: not eligible	Over 10Y: 5.5%	Over 7 Y: 5%
Maple bonds	Not eligible	Not eligible	Same as GOC bonds as long as issuer is AAA
Bankers Acceptances, BDN, Commercial paper and short term municipal paper Rated A-1High or R-1 Mid	Up to one year: 7.5%	Up to one year: 7.5%	BAs and debentures issued by Canadian chartered banks: 2% (0- 1 Y) Over 1 Y: same as corporate bonds
Municipal bonds AAA	Same as AA	4.0(0 - 1Y) 4.0% (1 – 3Y 5.0% (3 – 5Y) 5.5% (5-10Y) 6.0% (> 10Y)	3.0% (0 - 1Y) 5.0% (1 – 3Y 5.0% (3 – 5Y) 5.0% (5-10Y) 5.0% (> 10Y)
Municipal bonds AA	7.5% (0 - 1Y) 7.5% (1 – 3Y) 8.5% (3 – 5Y) 9.0% (5-10.5Y) > 10.5Y not eligible	7.5% (0 - 1Y) 7.5% (1 – 3Y) 8.5% (3 – 5Y) 9.0% (5 -10Y) 10.0% (> 10Y)	Same as AAA
Municipal Bonds A	12.0% (0 - 1Y) 12.0% (1 – 3Y) 13.0% (3 – 5Y) 13.5% (5 -0.5Y) > 10.5Y not eligible	12.0% (0 - 1Y) 12.0% (1 – 3Y 13.0% (3 – 5Y) 13.5% (5 -10Y) 15.0% (> 10Y	Same as AAA
Corporate bonds	Same as municipal	Same as municipal	3.0% (0 - 1Y) 6.0% (1 – 3Y 7.0% (3 – 5Y) 10.0% (5-10Y) 10.0% (> 10Y)
Note: For all, margin requirements for terms of less than one year are adjusted by term divided by 365.			

Appendix 2 – Facts and Findings – International Comparators

[25] Sources: RG: Terms and Conditions Governing the Morning Auction of RG Cash Balances, Sept 2002; LVTS: Bank of Canada – Terms and Conditions for the Expanded Bank of Canada Collateral List Effective Nov 2001; IDA: Current Regulation 100.

Australia

- Australia established the Australian Office of Financial Management ("AOFM"), a department of Treasury responsible for debt management as well as cash management
- The central bank, the Reserve Bank of Australia ("RBA") is responsible for deciding and implementing monetary policy.
- Context of shrinking debt in Australia; sole purpose of Treasury bonds issuance is to support the futures markets and provide benchmarks (3Y and 10Y) for the yield curve.
- With respect to cash management, AOFM's primary objective in managing the Official Public Account ("OPA") is the same as that of the RG in Canada: "...to ensure that the Government is able to meet its financial obligations when they fall due."[26]
- In recent years, AOFM has also faced challenges with the volatility of its daily receipts and payments.
- AOFM can use private banks for intra-day transactions but all balances in private banks are swept back into AOFM's account at the RBA at the end of each day.
- Excess cash balances are invested with RBA at the overnight rate for daily deposits or in longer term deposits at the applicable risk free rate.
- The RBA[27] invests the funds (subject to the net payment systems balances – see below) on the repo markets, taking as collateral Commonwealth of Australia bonds, Australian states debt, A$ denominated debt issued by selected sovereigns and supranationals, as well as bank bills and CD's issued by banks licensed to do business in Australia.
- In a manner similar to the RG Auction Deposits, if the Exchange settlement balances (equivalent to LVTS settlement balances in Canada) are expected to fall under the target, the RBA will announce an intention (at 9:30 am) to buy securities. Conversely, if ES balances are expected to rise, the RBA will announce its intention to sell securities.
- Margin rates for all repos is 2%
- AOFM does not currently invest balances in the capital markets, all goes to the central bank
- AOFM uses its excess balances for short term funding purposes; despite having the ability to issue short term Treasury notes (any number of days to maturity up to 6 months), it has not done so since October 2003.
- In case of large "surprises" AOFM can liquidate term deposits held at the RBA, at market rates (the Overnight index swap rates set the curve for term deposits).
- Volatility of the government's daily receipts and payments has increased over the recent years; peak to through in 2004-2005 was around A$29 billion (compared with A$21 billion in 2002-2003)

New Initiatives

- Plans are underway to create an asset fund called the "Future fund" which will be managed by a separate agency of Government with its own Board of Directors;
- The Board of Directors will be expected to hire outside professional firms to manage the investment portfolio assets
- The funds will be invested in a balanced fund of assets, including equities, bonds, properties, etc.
- This fund will be capitalized by transferring some of the very large cash balances accumulated at the RBA as well as superannuation contributions for Australian citizens; initial amount will be circa A$18 billion

[26] http://www.aofm.gov.au/content/publications/reports/AnnualReports/2004-2005/index.asp (page 21 - Operations and performance)

[27] http://www.rba.gov.au/DomesticMarketOperations/

- This will be, of course, a notable departure in terms of where this fund sits on the risk/return spectrum.

Measures of performance

- In 2004-2005, the AOFM introduced the concept of a 91 day rolling average for the closing Official Public Account ("OPA") amount; the OPA is the equivalent of the CRF account at the Bank of Canada; it is the core bank account maintained at the RBA for Australian Government cash management; target for the OPA was set as a range of A$700 million to A$1,100 million with a target of A$900 million with an ultimate Ministerial limit of A$1,500 million.
- Performance is now assessed against these targets and limits: in 2004-2005, the average cash balance remained within the operating bands an fell by A$204 million over the course of the year, to around A$805 million as at 30 June 2005

- AOFM is tracking the contribution of each major component of its portfolio to the overall change in total debt service costs: Term deposits are one major component seen as contributing to reduce debt service costs; the actual changes are compared with estimates of changes that would have occurred on a set Benchmark portfolio.
- The performance of AFOM is assessed against these limits and target; OPA remained within limits in 2004-2005 and averaged A$805M.
- A securities lending facility was introduced by AOFM in 2004 which works through repo agreements between the RBA and market participants; the RBA operates the facility on behalf of AOFM; this facility is not used frequently as it is designed to be a lender of last resort; pricing is set in such a way that market participants have an incentive to first try to borrow securities from other sources in the market.
- Credit risk on this market and the swaps market are mitigated through collateral agreements with swap and repo counterparties.
- Types of collateral accepted are Australian Government debt, Australian states debt, A$ denominated debt issued by selected sovereigns and supra-nationals (all rated AAA), bank bills and CDs rated at least P-1 (short) or A3 (long) – all securities to be lodged in Austraclear.
- Margin rate applied for all repos is a unique rate set at 2%.

New Zealand

- The New Zealand Debt Management Office ("NZDMO") was created in 1988.
- NZDMO reports to the Ministry of Finance and is headed by the Treasurer
- The Reserve Bank of New Zealand acts as agent for the NZDMO for administering the auction process.
- According to its website[28] and to our interview findings, NZDMO is responsible for
  - ✓ developing and maintaining a portfolio management framework that promotes the government's debt management objectives;
  - ✓ financing the government's gross borrowing requirement, managing assets required to meet interest and principal payments and settling and accounting for all debt transactions;
  - ✓ managing the six principal types of risk - market, credit, liquidity, funding, operational, and concentration - in a manner consistent with the government's fiscal strategy and NZDMO's internal policies;
  - ✓ disbursing cash to government departments and facilitating departmental cash management.
- NZDMO can issue treasury bills with maturities out to 1 year. It regularly issues NZD 200 million of treasury bills each week, comprising 3-month, 6-month, and 1-year

[28] http://www.nzdmo.govt.nz/aboutnzdmo/#organisation

bills. The issuance volume and maturity composition may vary. In recent months, issuance of the 1-year bill has been suspended, with NZD 150 million allocated to the 3-month bill and NZD 50 million to the 6-month bill.

- T-Bills are not providing any net new funding but are rather issued to help smooth cash balances and to provide a good source of collateral for banks.
- New Zealand does not need a bond program for the purpose of funding at the moment, given a sustained strong fiscal environment. NZDMO has maintained a bond programme, however, to ensure a steady, if modest, supply of new securities to the market. The resulting excess cash is used to pre-fund part of future years' borrowing requirements. Other actions, such as funding foreign exchange reserves from domestic debt that is swapped to a foreign currency exposure, also help to support domestic issuance volumes.
- Seasonal Treasury Bills are issued on an ad hoc basis with maturities of typically 1 week to 4 weeks to fund shortfalls when it is cheaper than other alternatives.
- The main participants in their auctions are Registered Bidders – they do not have a system of Primary Dealers per se, however 6 to 8 major participants make markets regularly.
- To smooth balances throughout the year, NZDMO stagger maturities of their bond issues; bond issues are auctioned once per month in the 2 year tenor and in the longer tenors (9-12 years).
- NZDMO typically does not reopen a bond, once it has achieved benchmark volume. although this is possible and from time to time desirable from a portfolio management standpoint (e.g., to fund a loan to a government agency).
- Investment of excess cash balances : The end of day balance is transferred to the Reserve Bank of New Zealand ("RBNZ"), which then invests it through open market operations
- Prior to end of day, the DMO can invest its cash, which it does by investing outside of the domestic market in the securities of foreign sovereigns or supranationals, combined with a FX swap to neutralize foreign currency exposure. This approach enables NZDMO to invest in a much wider range of high-grade credits than are available in the domestic market. It also avoids disrupting or being perceived as disrupting domestic markets.
- To reduce credit risk, FX swaps are subject to master credit support agreements.
- Collateral is posted unilaterally by their counterparties – they accept cash and cash equivalents that can be lodged in certain foreign countries (i.e. Fed in New York).
- There is pressure on domestic collateral in their market. The volume of government securities has been static. At the same time, banks' balance sheets have grown and, with that, their need to hold government securities to collateralise payment system flows and satisfy prudential requirements has increased.
- With respect to performance measurement, NZDMO does not rely on a unique indicator such as cost of funds, but rather look at a series of indicators such as:
  - ✓ spread between the government curve and the swap curve
  - ✓ spread between the government curve and the bank bill curve
- Main framework for measuring performance is ability to meet their ALM targets - loans to government agencies (including to the central bank to fund foreign exchange reserves), cash, and investments are NZDMO's assets, and its borrowings are its liabilities: asset liability matching must be done within certain limits and targets as if they were a bank.

United Kingdom

- As stated on its website[29], "The UK Debt Management Office ("DMO") was established on 1 April 1998. The DMO's brief is to carry out the Government's debt management policy of minimizing financing costs over the long term, taking account of risk, and to manage the aggregate cash needs of the Exchequer in the most cost-

[29] http://www.dmo.gov.uk/bginfo/f1dmo.htm

effective way, in both cases consistently with the objectives of monetary and any wider policy considerations". Before 2000, cash management was carried out by the Bank of England.

- There is a clear separation between the DMO and the Bank of England ("BOE"), the former being an executive agency of HM Treasury responsible for advice and implementation of the government's debt management and cash management strategy; the latter being the independent entity responsible for monetary policy and its implementation.
- The cash management objective of the DMO was redefined in 2005, to introduce the concept of risk appetite. To the former objective of minimizing the cost of offsetting the government net cash flows over time, is now added the constraint of operating within a risk appetite approved by the Ministers.
- The risk appetite defined by the DMO[30] comprises a set of four risk limits: liquidity risk, interest rate risk, foreign exchange risk and credit risk.
- The DMO runs regularly scheduled auctions of T-Bills, weekly for the 1 and 3 month tenors and monthly for the 6 month tenor; they could theoretically issue 1 year T-Bills but have not done so.
- It should be noted that the BOE issues its own euro-denominated bills which are not an obligation of the Government If so requested by the Bank of England, the DMO may also issue additional Treasury bills to assist the Bank in its management of the sterling money markets. These would be separately identified in DMO announcements.)
- T-Bills are primarily purchased by domestic banks and foreign banks doing business in the UK as collateral in the Bank of England's open market operations, in RTGS and for inclusion in the main traded class of gilt DBV for repo transactions– according to our interviewee the pool of eligible collateral has generally been sufficiently large in the UK to avoid any persistent concerns regarding collateral pressure as experienced in Canada.
- At the DMO, the cash managers are very active and make extensive use of the cashflow forecast provided to them by the Treasury; should they forecast excess balances they can do a number of things:
  - ✓ (with 5 day prior notice) buy back some of their previously issued T-Bills, Gilts or Gilt strips with less than 6 months to maturity;
  - ✓ (with 5 day prior notice) reduce or increase the amount of T-Bills issued to the market at the next weekly or monthly scheduled T-Bill tender;
  - ✓ invest in certificates of deposit and commercial paper of selected issuers;
  - ✓ invest or borrow on a secured or unsecured basis through bi-lateral transactions with its market counterparts;
  - ✓ invest in fx-denominated money market and debt instruments with less than 12 months to maturity that are fully swapped into sterling.
- The DMO does some uncollateralized lending, subject to maximum tenors and maximum credit lines.
- In pursuance of its cash management objectives, the DMO is very active in bilateral market operations with its counterparties across a range of instruments including repo, reverse repo and unsecured lending.
- Limits for unsecured lending are set in relation to the government's credit risk appetite and overall counterparty exposure and do not vary directly with the overall size of the net cash position. Hence the ratio of collateralized to uncollateralized lending can vary significantly through time.
- This activity all takes place in a framework of "quantified risk appetite", where overall limits are placed on interest rate and liquidity risk, in addition to credit.
- The DMO does not issue the equivalent of CMBs**.**

[30] Further details can be found in Chapter 5 of the United Kingdom DMO Annual Review 2004-2005, published in July 2005

Performance Measurement

- They do attempt to measure performance by looking at value-added compared with a passive cash management default scenario (the actual benchmark is not published); active cash management uses the forecasts of daily spending and revenue flows provided by the Treasury, in addition to information about other known future cash flows, to smooth the expected cash flow profile over time. Longer dated flows are constrained by credit and interest rate risk limits while liquidity limits govern the amount of expected cash flow that is left to be placed or raised on a same-day basis; this is a system that perhaps bears more detailed study.
- They have been testing this approach since 2005, but will need to review impact on the money market's liquidity and short term interest rate volatility of the Bank of England money market reforms being implemented this summer.

United States

- The U.S. Department of Treasury ("USDT") is responsible to finance the U.S. Government's borrowing needs at the lowest cost over time[31].
- The Federal Reserve Bank of New York acts as fiscal agent to implement monetary policy and holds the Government's bank account.
- There are 4 types of short dated paper issuance of which 3 are regular (4,13 and 26 week) The fourth type are CMBs which have terms from 1 to 14 days
- They re-open issues when the maturities match that of an outstanding issue.
- CMBs are generally issued with two days notice and often have a one day settlement cycle.
- Volume of CMB issuance went down drastically after USDT added a 4 week T-Bill to its regular auction schedule in 2001.
- Main participants in the auctions are Primary Dealers, banks, insurance companies, foreign banks, pension funds and other institutional investors, although most volume (75%) goes through the Primary Dealers.
- Any one participant cannot bid for more than 35% of the auction.
- To reduce volatility of cash balances the USDT emphasizes quality and accuracy of forecast – it has helped significantly that many of the receipts and disbursements have been moved to electronic systems - Strict advance notice requirements for Federal agencies with large expenditures - Standard deviation of forecast error in balances has dropped from $1B to $ ½B since 1997.
- Downside surprises lead first to use excess balances and then, if insufficient, to CMB issuance – in case of emergency, they could even do a same day CMB if announced by 2 p.m. (this has not yet been necessary so was never really tested in a live market environment).
- USDT is not allowed to borrow from the Fed – in a contingency situation, they would recall some of the balances held with banks under the Treasury Tax and Loan Accounts ("TT&L").
- While Canada was the only G7 central Government in 1999 to directly auction its balances to market participants[32], it has now been joined by at least the US Treasury which now auctions deposits through a competitive auction process through its Term Investment Option ("TIO") program introduced in 2002 primarily to enhance the returns that it was getting from the, still existing, TT&L program where Treasury earns

[31] GAO Report to the Secretary of the Treasury – Debt Management – Treasury has refined its use of cash management bills but should explore options that may reduce cost further – March 2006

[32] BOC: Proposed revisions to the rules pertaining to auctions of Receiver General term deposits, Discussion Paper, 18 July 2000, page 6

Fed Funds minus 25 basis points for its deposits with participating commercial banks.[33].

- Under the TIO program, the Auction is announced one day in advance and bids are invited from participants with terms of 2 days to several weeks.
- All TIO deposits are done fully collateralized (this is a statutory requirement).
- There is an extensive list of acceptable collateral[34], divided in nine categories ranging from US Treasury issued securities at the top all the way to asset backed securities issued by the private sector.
- USDT has begun a reverse repo pilot program during the last few weeks.
- There is mounting pressure on collateral as observed by USDT in the rates they get for their securities – primary driver of this pressure is the demand linked to the derivatives universe.
- Performance measurement: There is not a unique indicator, but several, each of which has its limitations – those USDT managers are tracking and upon which they are evaluated would be the following:
  - Auction size, coverage ratio, tails
  - Differential between CMB yields and yields of equivalent Treasuries (sometimes difficult to find for very short tenors)
  - Degree of meeting financing needs – stability of balances
  - Liquidity – measure of activity in the secondary market
  - Percentage of total balances invested in the TIO and repo programs
  - Feedback from the market place

[33] Debt Management – Treasury has refined its use of Cash management Bills but should explore options that may reduce cost further – GAO March 2006

[34] www.publicdebt.treas.gov/gsr/gsrcltrl.htm

Addendum 1 - Bibliography

	Title/Document	Date
Bank of Canada		
	Department of Finance, Bank of Canada, Canada Investment and Savings, Treasury Management Governance Framework	October 2003
	Bank of Canada, Donna Howard, A Primer on the implementation of monetary policy in the LVTS Environment	1998, updated 2005
	Terms and conditions governing the morning auction of Receiver General Cash Balances	September 4, 2002
	A Primer on the Federal Government's Daily Cash Balances - Daryl Merrett	March 2005
	Using Cash Balances as Business Indicators for Treasury Management Operations – Daryl Merrett	April 19, 2005
	Temporary measures to reinforce the target for the overnight rate	March 9, 2006
	Finance Canada Memorandum: 2004-2005 Performance of Receiver General Balances	2004-2005
	Department of Finance Canada – Debt Management Report	2004-2005
	Department of Finance Canada, Bank of Canada, Changes to the Government of Canada Debt Distribution Framework	August 2005
	Finance Canada, Debt Management Strategy	2006-2007
	RG: Terms and Conditions Governing the Morning Auction of RG Cash Balances	September 2002
	Bank of Canada – Terms and Conditions for the Expanded Bank of Canada Collateral List	November 2001
	Bank of Canada – Proposed revisions to the rules pertaining to auctions of Receiver General term deposits, Discussion Paper	July 18, 2000
Other		
	OECD Working Party on Debt Management – Cash Management in OECD Countries – working document	October 2005
	United Kingdom DMO Annual Review 2004-2005	July 2005
	GAO Report to the Secretary of the Treasury – Debt Management	March 2006

Addendum 2 - List of interviewees

Unless otherwise noted, all interviews were conducted in person at the offices of the interviewee. A small number of interviews were held via teleconference.

In order to protect the privacy of the individuals involved in the interview process, we have not included their names herein.

DEALERS AND LVTS PARTICIPANTS

RBC Dominion Securities
BMO – Nesbitt Burns
CIBC Wood Gundy
Merrill Lynch Canada
National Bank of Canada
Bank of Nova Scotia

ISSUERS

GE Capital

INVESTORS

TD Asset Management
Manulife

SOVEREIGNS

Australian Office of Financial Management *(via teleconference)*
New Zealand Debt Management Office *(via teleconference)*
UK Debt Management Office *(via teleconference)*
U.S. Department of Treasury *(via teleconference)*

OTHER

PWGSC
RBC Dexia

Addendum 3 - Interview Guides

▪ Primary dealers and LVTS participants

Preamble – Scope and purpose of our work – Anonymity of individual responses

As part of their yearly Treasury Evaluation Program, Finance Canada and the Bank of Canada have decided to evaluate the Receiver General Cash Management program in terms of its effectiveness, transparency, participation and competition, risk returns and impact on markets. The core objectives of cash management are to ensure that the Government has sufficient cash available at all times to meet its operating requirements while maintaining effective, low-cost borrowing through the Government's Treasury Bill and Bond programs and Cash Management Bill issuance.

During the interview, we will also discuss recent initiatives such as the Cash Management Bond Buyback program and the collateralized framework for deposit auctions.

Responses and comments of participants will be rolled up before presentation of results to Finance Canada and the Bank of Canada and will not be attributed to individuals or firms.

RG Term Deposit Auctions

The collateralized framework for the morning auction of cash balances has been in place since September 2002, and we would like to understand from your perspective, how this has been working.

1. Have you actively participated in the collateralized portion of the auctions?
2. If yes, what is your view on how this has gone?
3. Have the arrangements with the custodian RT/RBC Dexia worked well?
4. There continues to be questions about accepting securities that have a coupon payment due during the term. For other similar type transactions, do you accept securities that have a coupon payment due and if yes, how does the coupon payment get handled?
5. If the government has excess cash balances for a longer term period (i.e. several weeks), do you think there is a different way these funds should be invested. If yes, how?
6. Are there any suggestions you would put forth to improve this framework?

There is a second auction in the afternoon, which remains uncollateralized and we would like your comments in a few areas on this.

1. If the government were to consider extending the risk framework to a collateralized afternoon auction, what points would you raise and how would you respond?

In consideration of the cut-off times for government flows, is the time of the afternoon auction appropriate? If not, would you suggest a different time?

Cash Management Bills

1. Over the past two years, the government has made greater use of Cash Management Bills to fund short-term needs. Do you find this an attractive investment or cash management tool?
2. Is there still room for increased frequency and size of CMBs?
3. Fungible vs. non-fungible CMBs – what are your views and preferences?
4. The bidding rules have been modified on non-fungible bills to allow for the capability to allow bidding to range from zero to the full amount. Has this been well received by your organization? Please explain?
5. Previously a CMB could be announced, auctioned and settled on a same-day basis. Do you think this is feasible to reintroduce and if yes, how late can the Call for Tender, auction and delivery occur, and how large could such CMBs be?
6. Are there any other suggestions with regards to use of the Cash Management Bills?

Cash Management Buyback Program

7. The Cash Management Buyback Program is focused on reducing the size of upcoming maturities, and thereby reducing the need to build cash balances. Are there any areas where this program could be more effective?

Treasury Bills

8. The Treasury Bill program is used to manage cash balances. Is there a limit to the amount of flexibility in terms of change in amount issued from previous issue or the amount maturing?
9. Are there any suggestions you would put forth for the Treasury Bill program?

General Questions

10. Currently, the only outlay for investing RG excess cash balances is through the deposit auction program. Are there any suggestions as to other ways to invest excess cash balances?
11. Conversely, if at day's end government balances were short, instead of the standard p.m. auction taking place at 4:15, could the Government hold a p.m. "reverse auction" to borrow funds from the market instead? What would be the maximum size for such a borrowing?
12. Any other ideas for improvements to the overall cash management framework?

2 - Questions for Borrowers/Investors

RG Term Deposit Auctions

1. The collateralized framework for the morning auction of cash balances has been in place since September 2002, and we would like to understand from your perspective, how this has been working.
2. Are you familiar with the RG auctions of cash balances?
3. Have you ever considered participation in these auctions?
4. Would you be interested in both uncollateralized and collateralized access?
5. If not interested, could you explain?

Cash Management Bills

Over the past two years, the government has made greater use of Cash Management Bills to fund short-term needs. What are you views on the use of Cash Management Bills?

Is there still room for increased frequency and size of CMBs?

Cash Management Buyback Program

6. The Cash Management Buyback Program is focused on reducing the size of upcoming maturities, and thereby reducing the need to build cash balances. Are you aware of this program and have you made use of it?
7. Are there any areas where this program could be more effective?

Treasury Bills

8. The Treasury Bill program is used to manage cash balances. Is there a limit to the amount of flexibility in terms of change in amount issued from previous issue or the amount maturing?
9. Are there any suggestions you would put forth for the Treasury Bill program?

General Questions

10. Currently, the only outlay for investing RG excess cash balances is through the deposit auction program. Are there any suggestions as to other ways to invest excess cash balances?
11. Conversely, if at day's end government balances were short, instead of the standard p.m. auction taking place at 4:15, could the Government hold a p.m. "reverse auction" to borrow funds from the market instead? What would be the maximum size for such a borrowing?
12. Any other ideas for improvements to the overall cash management framework?

3 - Questions for Sovereigns

1. Your short dated paper issuance – what types? What terms?
2. Who are the main participants?
3. Links to your RTGS (large payments systems)?
4. How do you handle large “surprises” in cash balances?
5. Do you invest most of your surplus balances in the market? How? What balances do you typically maintain at the central bank (order of magnitude)?
6. Are you active on secondary markets in your treasury cash management role?
7. If you deal directly with market participants, how is this done? Auction, intervention on the secondary markets – please specify which markets -, allocation formula, other?
8. When dealing with market participants, how do you manage/mitigate credit risk? Do you have any uncollateralized cash balances?
9. What type of collateral do you accept? What are the corresponding margin rates (“haircuts”)? Are these rates consistent with requirements of your RTGS?
10. Do you accept collateral in other currencies?
11. Do you accept as collateral securities issued by foreign issuers (domestic or foreign currency)? If so, is this limited to selected sovereign states and how do you deal with the added legal risks that this may create?
12. Program performance evaluation – what type of indicators do you track.

4- Questions for PWGSC

1. We understand your role with respect to Receiver General Cash balances is to issue and collect payments, set up and administer arrangements with financial institutions for all collection and payments of Government funds.
2. What are the process and interactions with the Bank of Canada?
3. Please describe the account pyramid structure that your manage (i.e. sweep accounts, concentrator banks, etc.)?
4. What is your role with respect to cash flow projections?
5. What are your performance yardsticks?
6. Any ideas to improve the whole process?

5 - Questions for RBC Dexia

1. Please walk us through the various steps of the morning auction
2. What are the time constraints?
3. Could a same day afternoon auction be envisioned? How late and what would be the constraints to settle the securities transactions?
4. What are the types of collateral favoured by participants among the eligible types?
5. Cost (and evolution thereof) of various types of collateral that is pledged?
6. What is the average term of pledges?
7. Is there much participant demand for lodging collateral on a standing basis? What would you see as their opportunity cost of doing so?
8. Currently, to be eligible for RG sale and repurchase agreements, a security must not mature, pay a coupon, or be about to undergo a corporate action during the term of such RG repo. This could be considered by some participants to be a significant constraint on the pool of eligible securities? How would you view the partial lifting of this restriction by allowing pledging securities that pay a coupon during the term of the RG repo? Would there be administrative and technical constraints? Would you see legal constraints under the standard repo agreements?
9. Any ideas to improve the whole process?

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