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GOVERNMENT CASH MANAGEMENT: GOOD PRACTICE & CAPACITY-BUILDING FRAMEWORK

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Contents

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Acronyms and Abbreviations

BOE	Bank of England
C-bill	central bank bill
CMO	Central Moneymarkets Office
U.K. DMO	U.K. Debt Management Office
ECB	European Central Bank
STA	single treasury account
T-bill	treasury bill

Introduction

The World Bank's regional public debt work programs and the World Bank and International Monetary Fund's joint Public Debt Management and Market Development Program revealed that weak government cash management is a serious problem in most client countries and is a major impediment to public debt management and debt market development. In addition, uncertainty and volatility in a government's cash position translates into uncertain and volatile reserve positions of its banking system. Poor government cash management also causes major difficulties in the central bank's implementation of monetary policy.

In many developing countries, government officials misperceive government cash management as synonymous with budget execution, accounting control, or debt management instead of as a practice that aims to manage the government's cash positions, including their risks, cost-effectively. Officials often neglect the significant adverse impact of inadequate government cash management and the advantages associated with effective government cash management. While much literature is available on debt management, little focuses specifically on government cash management.

This paper provides information about research and analysis pertaining to government cash management practices in selected developed countries (including euro countries,[1] Australia, Canada, and the United Kingdom) and recommends a capacity-building framework for developing countries. Following a discussion of the definition and objectives of government cash management, it presents the common features of an effective government cash management system by analyzing practices in countries with effective government cash management. The paper then discusses the importance of cash management, analyzes common government cash management issues in developing countries, and offers some solutions to those common problems. It concludes by recommending a capacity-building framework for government cash management in developing countries.

What Is Government Cash Management?

Government officials in many developing countries often misunderstand government cash management as being equivalent to budget and accounting control, budget planning and execution, or debt management.[2] In actuality, government cash management is the strategy and associated processes of managing the government's short-term cash flow among various government agencies and between the government and nongovernment sectors. Effective cash management should achieve the following objectives:

1. Refers to countries whose currency is the euro.
2. The critical difference between government cash management and enterprise cash management is that enterprise cash movement does not affect the liquidity of the banking system, whereas government cash management does.

- providing timely funding for the government's expenditures and debt service when needed;
- avoiding the need to keep substantial idle balances in the banking system and their associated implicit and explicit costs through effective timing of expenditure decisions, prompt collection of revenues, and accurate forecasting of cash flows;
- achieving better overall returns by investing idle cash balances;
- alleviating and controlling various risks, such as refinancing, credit, rollover, and market risks.

In short, the overall goal of effective government cash management is to have the right amount of money in the right place at the right time to meet the government's obligations in a cost-efficient way and with manageable risk.

The critical difference between government cash management and budget and accounting control is that the latter is intended primarily to check public budget users' compliance with budget and accounting rules and policies, whereas the intent of government cash management is to manage the government's cash in a cost-effective way that minimizes risk.

The critical difference between government cash management and budget planning and execution is that the latter concerns notional budget appropriations, whereas the former concerns the physical movement and settlement of cash. For example, on January 1, 2005, the government approved a $5 million study project that was expected to be completed in six months (table 1). The payments were divided into three tranches: (a) $1 million following signing of the contract on January 1, 2005; (b) $2 million following delivery of the draft study report on April 1, 2005; and (c) $2 million following delivery of the final report on July 1, 2005. The process of allocating $5 million to the study project is an example of budget appropriation activities, that is, part of the budget planning and execution function. It is not a cash management activity, because the government only made a budget commitment and did not need to set aside $5 million in cash. The three payments, however, involve the physical movement of cash, and are therefore considered part of government cash management activities.

Table 1 **Example of Difference between Government Cash Management and Budget Planning and Execution**

Dates	*Activities*	*Functions*
January 1, 2005	The government approved a $5 million project	Budget appropriation activity: part of the budget planning and execution function
January 1, 2005	The government paid $1 million to the project contractor as commitment payment	Ensuring that there is enough money to meet these payments is a function of government cash management activities
April 1, 2005	The government paid $2 million for the second payment	
July 1, 2005	The government paid $2 million as the final payment	

Source: Author.

The critical difference between government cash management and debt management is the time horizon and the main objectives of the activity. Debt management focuses on managing long-term government debt. A key objective of debt management is to finance the primary fiscal deficit and to service debt service. New debt issuance can be calculated from the following formula:

$$\Delta D_t = D_t - D_{t-1} = D_{t-1}(1+r) + PD_t(-PS_t)\ ,$$

where
ΔD_t = new borrowing requirement,
D_{t-1} = outstanding amount of debt at the end of year t-1,
R = interest rate,
PD = primary fiscal deficit,
PS = primary fiscal surplus,
t = budget balance cycle.[3]

By contrast, government cash management focuses on managing the government's short-term cash and cash balance. To a large extent, cash management is liquidity management.

Table 2 shows a simplified case of the interaction between government debt management and cash management.[4] For the first quarter, the government's payment obligation gaps

3. The symbol *t* usually refers to year. In some countries, the government attempts to balance the budget during a business cycle, such as the so-called Golden Rule adopted by the United Kingdom. In this case, the t refers to the business cycle. Whether t represents one year or one business cycle, governments have imposed some type of limit on ΔDt, usually expressed as a percentage of gross domestic product. For example, the European Union sets ΔDt at 3 percent and the Golden Rule in the United Kingdom sets ΔDt equal to zero.
4. The real situation will be much more complicated, but the mechanism and logic should be similar.

are $25 million on January 1, $20 million on January 10, $30 million on February 20, and $15 million on March 10th. The total obligation gap comes to $90 million. The government planned to borrow $90 million by issuing debt such as government bonds. For better debt management and domestic debt market development, the government is encouraged to announce its issuance calendar in advance. Suppose it runs debt auctions on the 10th of each month and the volume of each debt issuance is $30 million. Given this schedule, the issuance calendar cannot meet the schedule of payment obligations; however, cash management can solve this problem by means of the following operations:

- On January 1, when there is a shortage of $25 million, the cash manager can borrow $25 million by issuing 10-day treasury bills (T-bills) via the ad hoc T-bill program.[5]
- On January 10, the cash manager can borrow $15 million by issuing one-month T-bills under the structured T-bill program.[6]
- On February 10, the government has a $15 million surplus. The cash manager can invest this surplus to earn a return.
- On February 20, there is a $15 million cash shortage. The cash manager can borrow $15 million via the ad hoc T-bill program.

Table 2 **A Simplified Case of the Interaction between Cash Management and Debt Management**

Item	*Total*	*Jan. 1*	*Jan. 10*	*Feb. 10*	*Feb. 10*	*Mar. 10*
Payment obligation gap ($ millions)	90	25	20	0	30	15
Debt issuance ($ millions)	90	0	30	30	0	30
Cash balance ($ millions)	0	-25	-15	15	-15	15
What the cash manager can do	n.a.	Issue 25 10-day ad hoc T-bills	Issue 15 one-month regular T-bills	Invest $15 million cash balance for 10 days	Issue 15 20-day ad hoc T-bills	Issue $15 million regular bills

Source: Author.
Note: n.a. = not applicable.

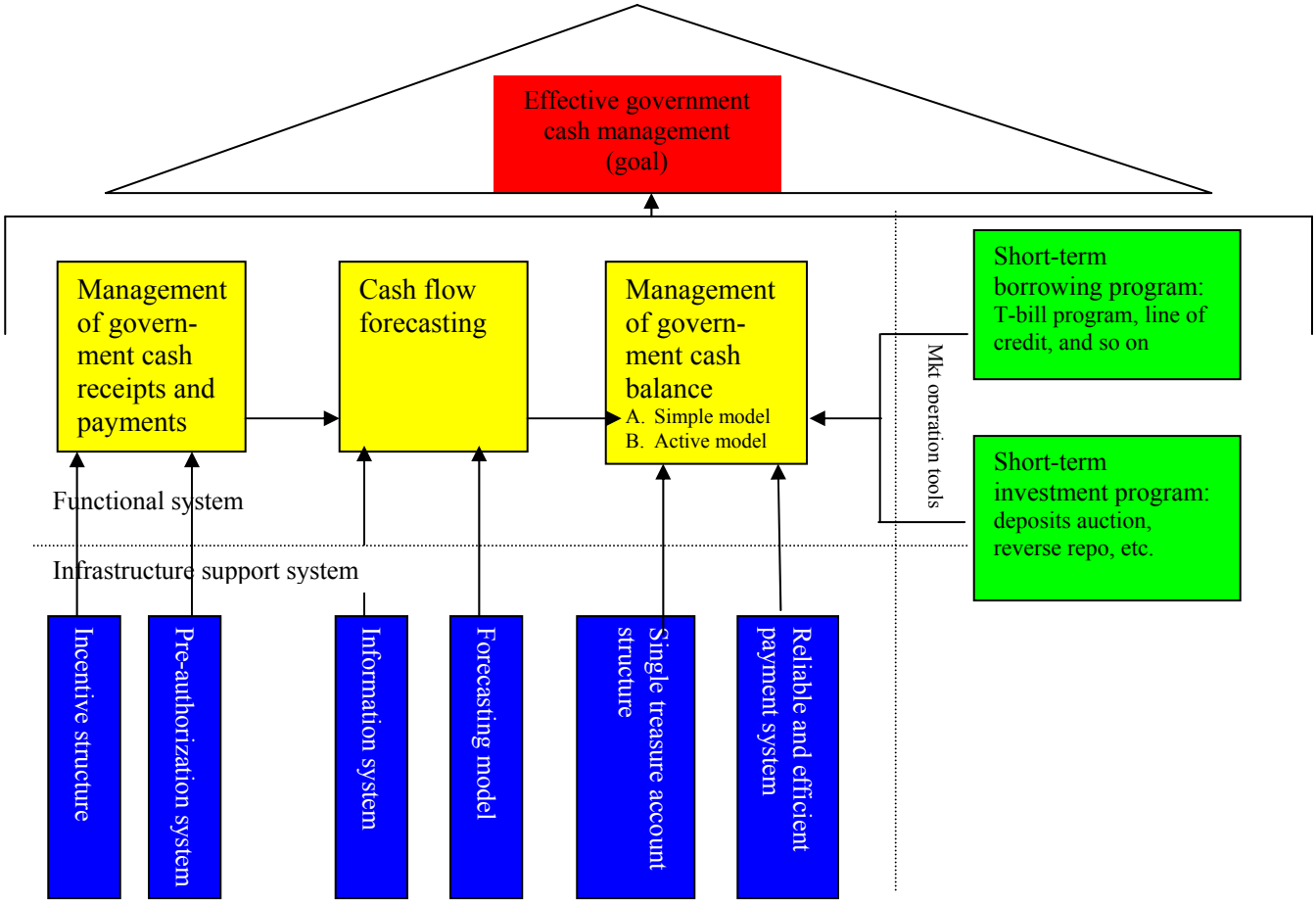
5. This is when instead of being issued regularly, T-bills are issued on an ad hoc basis to meet temporary cash flow needs that cannot be met as conveniently through regular, weekly T-bill auctions. This allows the cash manager to fine-tune the government's cash flow profile with greater precision. These bills would be exactly the same instruments as those sold at the regular T-bill auctions.
6. Structured T-bill programs are also known as regular T-bill programs. T-bills are issued on a regular basis, for example, biweekly, monthly, bimonthly. Usually the government publishes an issue calendar in advance.

What Are the Main Features of Effective Government Cash Management?

Institutional arrangements for securing effective government cash management vary from country to country.[7] Nevertheless, some building blocks of functions, referred to here as functional blocks or functional building blocks, and related infrastructure requirements are common among effective cash management practices. An effective government cash management system includes three functional blocks and six related infrastructure arrangements as described in the following subsections and shown in figure 1.

7. Models for where cash management is hosted differ: within the state treasury, within the ministry of finance, within the state debt office, or within the central bank depending on such factors as culture, size of the economy, skills, and so on. This paper does not take up this topic, which would be better addressed systematically and comprehensively in a separate publication.

Figure 1 **Buildings Blocks of an Effective Government Cash Management System**



Source: Author.

Functional Building Blocks

An effective government cash management system should include three functional building blocks.

Government cash receipt and payment management function

Effective management of government cash receipts (fiscal revenues, debt issuance proceeds, and the like) and payments (such as fiscal expenditures and debt service expenses) is a starting point for effective government cash management. Cash flow management includes effective management of government receipts and payments within the government and between the government and nongovernment sectors, as well as the associated account structure and processes to ensure timely processing and reduce

unnecessary idle balances. Two approaches are usually adopted to strengthen the management of government cash flows: a correct incentive structure and a pre-authorization system.

Government cash flow forecasting function

The second important functional block of effective government cash management is an effective cash forecasting capacity. The cash manager needs to have reliable forecasts of daily cash flows into and out of the government and be able to monitor actual cash flows as they occur.

Most countries of the Organisation for Economic Co-operation and Development have well-developed processes for forecasting and monitoring cash flows across the ministry of finance's accounts at the central bank. Most of them also have real-time information about their governments' cash balances at their central banks. Having up-to-date information toward the end of the day is particularly important to ensure that there is no risk of being overdrawn from the central bank. Typically the central bank will provide updates during the course of the day and the exact position when the retail banking system closes, which would still leave time for wholesale market transactions to square the position.

Two infrastructure arrangements are usually needed for effective government cash forecasting: a good information system for collecting data on government payments and receipts and a model for forecasting future payments and receipts.

Government cash balance management function

The final functional block of effective government cash management is effective management of the government cash balance that various government bodies inevitably hold, which includes investing in vehicles outside the government. Payment and processing lags, forecasting uncertainties, and cash flow volatility mean that governments will inevitably need access to liquidity.

Cash is the simplest form of liquidity, and in less developed financial markets, it is usually the dominant one, but holding cash is costly. If the idle cash is due to excessive borrowing through long-term bond issuance by the government, it will be even more costly, because there will be a negative carry cost. Two models are available for managing the government cash balance: the simple cash balance management model and the active cash balance management model.

Simple cash balance management model. Under this model, the cash manager does not actively invest the cash balance in the financial market, but (a) will generally deposit the balance at the central bank or at commercial banks when there is a surplus,[8] or (b) fund a cash shortage by short-term borrowing programs such as the T-bill program or a line of credit with credential banks. One country that uses the simple cash balance management

8. The ministry of finance should be compensated for such deposits. This will benefit the separation of monetary policy and fiscal policy.

model is Australia, which does little to directly fine-tune its balances, but places structural surpluses with the central bank on longer-term interest rates based on the pre-set agreement between the Ministry of Finance and the central bank.

Active cash balance management model. Active cash balance management, which is aimed at fuller smoothing out of short-term changes in the ministry of finance's balance at the central bank, is much more challenging. In many euro countries, the government usually sets an end-of-day balance target for its single treasury accounts.[9] Cash managers in these countries usually actively invest the excess balance or borrow in the financial markets to reach the balance target. Developed countries have used a number of different fine-tuning models to maintain a stable balance.

The active cash management model has a number of variations, particularly in relation to the decision of maintaining a bias toward a short position (the Netherlands, for example) or toward a long position (for instance, Spain). Appendix 1 provides details about the practice of active cash balance management.

This practice of having specific end-of-day targets has to be backed up by active short-term borrowing and investment operations to ensure that the ministry of finance is able to meet the target. Those operations include regular T-bill programs, ad hoc T-bill programs, ad hoc repo and reverse repo operations, bilateral dealings, and end-of-day arrangements. Appendix 2 describes the United Kingdom's short-term borrowing and investment practices.

Active cash management needs effective coordination between monetary policy and cash management policy. Active cash balance management implies that excess cash positions will be invested in domestic assets, which has the effect of injecting liquidity into the system that the central bank in turn has to mop up.

To effectively manage the government cash balance, two infrastructure arrangements are needed: a single treasury account structure and an accurate and efficient payment system.

Infrastructure Arrangements

To make the three functions of government cash management work effectively, the following six infrastructure arrangements are needed.

Incentive structure

To reduce idle cash, having the right incentives for effective cash management in place through all levels of budget users is extremely important. This will minimize the level of cash balances and create greater certainty around the timing of government cash payments. Such incentives can range from capital charges (a practice that a budget user needs to pay for funds received from the state treasury) to policies that allow budget users

9. For example, the end-of-day balance target is €25 million in the Netherlands and £200 million in the United Kingdom.

to retain the interest saved from reforms that reduce cash requirements as provisions for additional expenditure. Box 1 shows the incentives used in New Zealand and the United Kingdom.

Box 1 **Incentive Practices in New Zealand and the United Kingdom**

In New Zealand, a capital charge is levied on net taxpayers' funds as recorded in departments' audited financial statements for each semiannual and annual reporting period. This encourages departments to minimize their employment of capital. The departments receive interest on deposits at the Debt Management Office. This encourages the departments to transfer idle cash to the Debt Management Office's main account.

The United Kingdom has similar capital charge arrangements. Expenditure planning and control arrangements serve to penalize budget users that draw cash in advance of actual needs. Budget users are, in effect, charged for their notional use of capital. A budget user's agreed expenditure provision is defined in accrual terms and will include an allowance for capital charges, but any unplanned increase in a budget user's working or physical capital will add to the charges, potentially leading to a reduction in the budget user's expenditure on other goods and services.

Pre-authorization system

The use of pre-authorization rather than pre-funding can further reduce the need for a cash balance. When a new project is approved, the government usually does not need to spend the money immediately, nor does it need to fund the project in cash (see the explanation in the section on "What Is Government Cash Management?").

Information system

The function of the information system is to collect and maintain all historical data on payments and receipts and all up-to-date future commitments for government payments and receipts. Such a system provides a means of identifying historical patterns, undertaking monitoring, and forecasting.

Model for forecasting future payments and receipts

A model for forecasting future payments and receipts, coupled with an information system, will provide the necessary infrastructure for effective government cash flow forecasting.

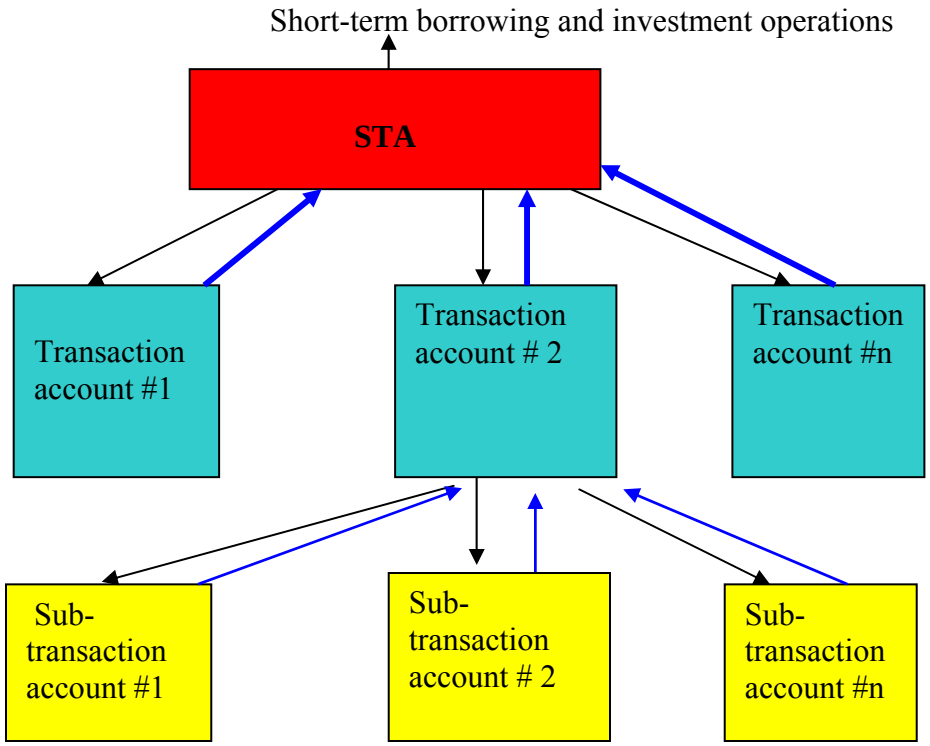
Single treasury account arrangement

A single treasury account (STA) arrangement is the centerpiece of the infrastructure needed for effective government cash management. A consolidated treasury account structure allows for the netting and aggregation of balances and the preparation of

consolidated cash flow forecasting. The highest account in this pyramid is the ministry of finance's account at the central bank. This practice is usually referred to as the STA structure, which appears to be fundamental for effective government cash management. Almost all developed countries use the STA structure,[10] whose obvious advantages include reducing idle cash and alleviating excessive borrowing. The STA also has benefits that go beyond the requirements for effective management of cash balances in that it can reduce credit risk (the government's exposure to the failure of individual banks to honor their obligations).

The underlying principle of the government bank account arrangement is the linkage between government accounts to ensure that the cash balances that remain in various government accounts at the end of a day are channeled to the main central account (the STA), thereby minimizing the government's cash needs. Figure 2 shows the structure of a typical STA.

***Figure 2* Typical STA Structure**



Source: Author.
Note: The black arrows show the cash flow from the STA to various subaccounts at the beginning of the day. The blue arrows show the balance swept to the STA from various subaccounts at the end of the day.

10. For example, France has 9,000 individual transaction accounts for government bodies with the single Ministry of Finance account.

Payment infrastructure

An accurate and efficient payment system, including increased reliance on electronic funds transfer, is essential for taking full advantage of the STA.

Why Is Good Government Cash Management Important?

A government receives cash inflows from various sources, such as taxes, tariffs, profits of state-owned businesses, and debt issuance proceeds. At the same time, it incurs various payments and expenses, such as employees' salaries, public pension payments, debt service, and investment in infrastructure. The importance of managing the timing and volume of these cash inflows and outflows in a cost-efficient manner that minimizes risk may be illustrated by discussing the impact of bad and good cash management.

Impacts of Bad Government Cash Management

One impact of poor government cash management is an inability to accurately project future cash inflows and outflows, which forces the government to build up a large cash balance so that it can meet its obligations in a timely manner. In such circumstances, the government often fails to earn fair returns on its cash balance, which has been financed by borrowing at the market interest rate.

The inability to project cash inflows and outflows accurately also causes large volatility in the government cash balance, which often thwarts the central bank's monetary policy. In many countries, the central bank serves as the fiscal and payment agent for the government and holds the government's current account. Payments that the government makes to and receives from the nongovernment sectors are made through accounts at the central bank. Thus, other things being equal, an increase in the government cash balance means the absorption of liquidity (that is, reserves) from the banking system, while a decrease in the government cash balance means an injection of liquidity into the banking system. Therefore the volatility of the government cash balance directly contributes to volatility in the reserve balance of the banking system. The central bank needs to offset such volatility through its day-to-day monetary operations and to stabilize the liquidity position of the banking system and the money market interest rate. An inability to project the government's future cash flow will make it difficult for the central bank to effectively implement such day-to-day monetary policy.

If the central bank faces difficulty implementing monetary policy, this sometimes forces it to adopt measures or facilities that are useful for dealing with uncertainty in the liquidity position of the banking system in the short run, but these may hinder long-term development of the money market. For example, some central banks choose to adopt a standing accommodation facility whereby they allow banks to deposit their excess liquidity with the central bank at their discretion and to earn interest. While such a facility is often effective in stabilizing the liquidity of the banking system and the money market interest rate (and the exchange rate indirectly), it discourages banks from trading liquidity

among themselves, because they can always deposit the money into the central bank with practically no counterpart risk. The higher the remuneration offered by the central bank on the facility, the stronger the incentive to use the facility rather than the interbank market. This therefore hinders the development of the interbank money market, which is the core of broader debt market development.

In a market where the stabilization of interest and exchange rates is critical, the central bank may be forced to offer competitive market interest rates on the facility. Some central banks also try to proactively manage volatility in banking system liquidity by auctioning central bank bills (C-bills). In either case, interest costs can seriously undermine the capital of the central bank and necessitate its recapitalization by the government, which passes the burden on to the government, and ultimately to taxpayers.

Impacts of Good Government Cash Management

The ability to project future cash inflows and outflows opens up possibilities for the government to manage its cash needs and position much more efficiently. Greater predictability of government cash flows will enable the central bank and the government itself to plan and coordinate monetary policy operations and cash funding activities. It will enable the central bank to proactively counteract volatility in banking system liquidity without relying on an accommodation facility. At the same time, the government can develop borrowing instruments to bridge projected timing gaps between inflows and outflows. With the ability to borrow and pre-fund projected cash needs with such instruments, the government will not only be able to reduce idle cash balances without risking defaulting on its obligations, but it will also be able to smooth out the cash position maintained. Reduced volatility in the government cash balance further facilitates the central bank's monetary policy operations. More broadly, it can reduce the volatility of short-term interest rates and the uncertainty of money markets.

Linking various government accounts and net balances through a single account at the central bank will not only reduce gross balances, but will also improve the visibility of flows—opening up opportunities for active management—and reduce risk, either in terms of exposure to the banking system or financial market movements. Effective government cash management will generate direct savings for the government by minimizing the volume of idle cash held by government bodies and reducing payments in transit or awaiting clearance. This will also help reduce the government's debt interest costs. Effective government cash management will contribute to better monitoring and management of both market and credit risks.[11]

Effective government cash management will support the development of an efficient and liquid government and financial debt market through adequate management of the

11. Market risks are associated with the volatility of financing costs and their impact on the government's future borrowing needs and the refinancing or liquidity risk of its existing debts and payments. Credit risk is related to the exposure the government assumes when leaving cash in the commercial banking sector and when dealing with private sector counterparts.

government's activity in the money market. T-bill programs, buybacks, and repo and reverse repo dealings to raise or place cash all contribute to the attractiveness and liquidity of the debt market and the effective placement of government debt. This will ultimately help lower debt costs and achieve a broader and deeper distribution among ultimate investors. A deeper and more liquid market, coupled with a broader range of instruments, will give the government greater flexibility in managing its financing needs and reducing the borrowing costs associated with less flexible arrangements.

Cash flow management systems that reduce time lags and the number of intermediaries within the government will increase the likelihood that payments are made properly by the required date and that receipts are passed on to the responsible parties without delay. Defining procedures to integrate the government's cash flows and establishing a proper forecasting mechanism can ultimately improve government agencies' attitudes toward "scarce resources" and foster more efficient and responsive behavior in identifying needs and devising solutions to payment problems and related issues. In addition, efficient cash handling and control systems reduce operational risks and the scale of potential mismanagement or fraud.

Effective cash management will also improve the transparency and predictability of debt management and promote benchmark development of the domestic debt market. One best practice of debt management and debt market development is to strengthen the transparency and predictability of debt issuance. Government debt should be issued in a regular manner and the volume distributed around the time horizon as stable as possible. However, if no effective cash management system is in place, the government will be unable to announce its borrowing plans to the market in advance.

Consider, for example, the situation shown in table 3. Debt issuance option A is a best practice of debt management and debt market development; however, in the absence of a cash management function, the government will have to borrow money according in line with option B. Debt issuance option B has many pitfalls. For example, it will lead to irregular timing of borrowing or debt issuance, and therefore much less predictability and transparency for market participants. It will also lead to many series of nonstandardized instruments, thereby impeding benchmark development.

Table 3 **Impact of Cash Management on Debt Management**
($ millions)

Item	*Total*	*Jan. 1*	*Jan. 10*	*Feb. 10*	*Feb. 20*	*Mar. 10*
Obligation gap	90	25	20	0	30	15
Debt issuance A	90	n.a.	30	30	n.a.	30
Debt issuance B	90	25	20	0	30	15

Source: Author.
Note: n.a. = not applicable.

What Are Common Government Cash Management Issues in Developing Countries

The assessment mentioned earlier revealed that weak government cash management is a serious problem in most World Bank client countries and a major impediment to public debt management and debt market development. The following subsections discuss some government cash management issues observed in many developing countries.

Misperception of Cash Management as Equivalent to Accounting Control or Budget Execution

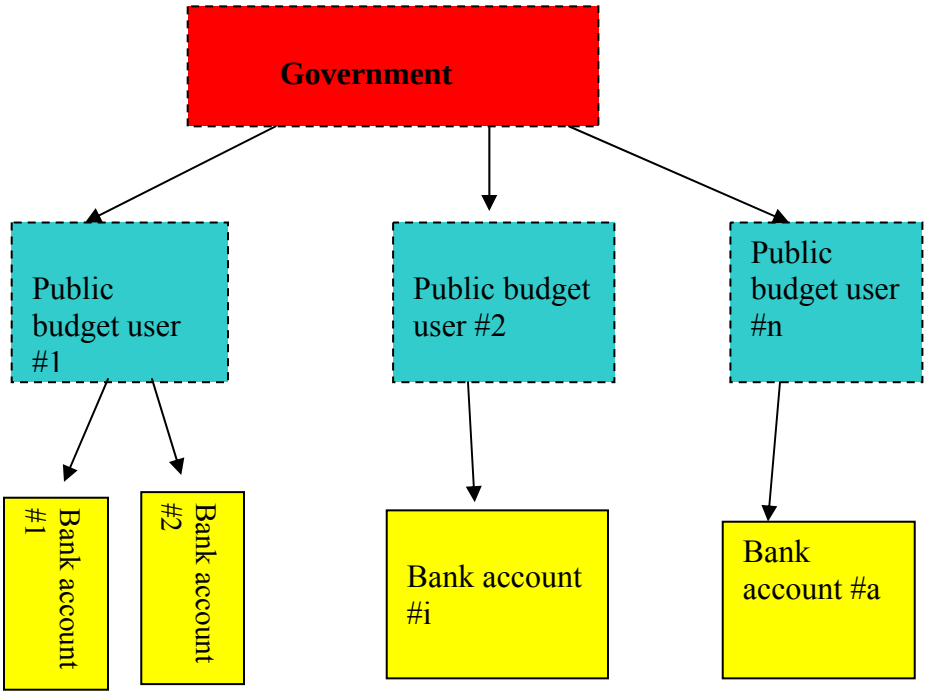
In many developing countries, the treasury was historically responsible for accounting control and budget execution. In these countries, government cash management is primarily characterized as (a) monitoring and controlling expenditures and revenues in relation to budget appropriations, (b) focusing on meeting accounting requirements rather than ensuring effective cash management, (c) ignoring the cash management function or confusing it with budget execution, and (d) linking budget approval to cash flow. For example, in Serbia, the treasury is required to authorize disbursements under appropriation, then to authorize the transfers or payments, and finally to sign off on the financial statements. As a result, projects are usually pre-funded, expenditure planning is undermined, and the cost-effectiveness of spending is likely damaged.

The first step toward solving this problem is to establish the correct concept of cash management. The ministry of finance should distinguish between the functions of cash management and of budget execution and accounting control. Pre-authorization should replace the pre-funding system.

Overly Complex Treasury Account Structure

Many developing countries rigorously exercise expenditure control, but without the goal of minimizing the cost of financing the government's cash requirements. Consequently, government budget users (ministries, agencies) have little control over the cash management process. The need to make small and/or immediate payments using checks or cash normally leads to most budget users maintaining multiple accounts at commercial banks as they seek to exercise greater control over the timing of payments without any concern about the existence of idle balances. This leads to a structure with multiple treasury accounts, whereby the government usually has a main treasury account with the central bank and budget users have their own bank accounts with commercial banks or directly with the central bank. These accounts keep balances overnight and are not linked with the government's main treasury account. This structure can often result in significant costs for the government through lost interest on idle balances and high transaction costs imposed by the commercial banks. Figure 3 shows a typical multiple treasury account structure and box 2 illustrates some cases of this type of structure.

Figure 3 **Typical Complex Treasury Account Structure**



Source: Author.
Note: The arrows represent cash flows.

Box 2 Multiple Treasury Accounts in Georgia and Serbia

An examination of the cash management situation in Georgia highlights the drawbacks of a multiple treasury account structure. Georgia's treasury used to hold as many as 1,700 accounts with the central bank and commercial banks for various revenues and expenditures. The total average balance stood at about GEL30 million to GEL40 million, or about 6 percent of total government budget revenues. Furthermore, these accounts generated no interest and had few linkages with each other for achieving the daily netting of the overall position. To meet cash and budgetary needs, the Ministry of Finance issued about GEL3 million to GEL7 million in T-bills each week at an average interest rate of 40 to 50 percent, which was much higher than the rate for bank deposits quoted in the money market.

Another example is Serbia. A consolidated account for the country's budget, together with separate consolidated treasury accounts for other public entities, such as schools, hospitals, and local authorities and for the Social Insurance Fund and other public bodies and funds, is held at the National Bank of Serbia. There is no single consolidated treasury account for all the public bodies. Apparently, however, the net amounts remaining in the different consolidated accounts are treated, in effect, as one setoff account for interest purposes and the like. Some of the proceeds are invested in commercial banks, but the bulk of the funds is invested in the National Bank of Serbia. The government is prevented from placing deposits with commercial banks because of opposition from the National Bank of Serbia. As of December 31, 2004, the aggregate of the net balances in the different consolidated accounts was SRD39.6 billion. But by March 15, 2005, the amount had increased to SRD49.6 billion, which was greatly in excess of the government's 2005 borrowing requirements. Idle balances amounted to SRD2.73 billion as of December 31, 2004, increasing to SRD4.5 billion by March 15, 2005. Again, this amount was greater than net T-bill funding during 2004, at an average discount rate of around 20 percent. While T-bill costs have fallen recently to around 15 percent, this cost is greatly in excess of the rate of return of 2.55 percent a year earned on deposits at the National Bank of Serbia, which is a compelling reason for the Ministry of Finance to pursue more efficient liquidity management.

To overcome these problems, a degree of centralization is desirable, so that bank balances maintained by various entities can be netted and aggregated at the single treasury account and consolidated cash flow forecasts can be prepared. An STA structure would be a good solution to these problems.

The global trend is toward introducing an STA arrangement. China's Ministry of Finance began the shift toward an STA in 2002, when it consolidated about 5,000 government accounts into an STA and significantly reduced its cash balance requirements. Brazil established a national STA at the central bank in 1988 that includes all government receipts and expenditures, including a subaccount known as the debt management account and the funds of quasi-governmental agencies and public foundations. The establishment of the STA eliminated the need for more than 5,000 government bank accounts, thereby permitting better and more efficient monitoring, control, and reporting of government cash flows. Brazil's treasury earns an interest rate equal to the average return on the central bank's portfolio.

Ideally, any overnight balances at all transaction bank accounts should be moved to the STA. This requires that a sophisticated payment system be in place. Some developing countries' payment systems may not be ready for this arrangement. As a transitional arrangement, the government could allow some budget users to maintain small balances

in their transaction bank accounts. Interest rates for these accounts at private banks should be close to the central bank's repo rate, and budget users should surrender the interest income to the state treasury. This would alleviate incentives for budget users to keep large balances in their transaction accounts.

Fragmented Short-Term Bill Programs

Another issue common to short-term bill programs in developing countries is that both the ministry of finance and the central bank tend to issue their own short-term bills without coordinating with each other. For example, in China, Guatemala, Indonesia, Lebanon, and Serbia, continuous capital inflows over certain relatively long periods have led to excess liquidity in the banking system. The central banks in these countries do not have stocks of government securities to mop up the liquidity. As a result, the central banks issue their own bills as a draining mechanism for their monetary policy operations.

However, the use of similar but different instruments for monetary policy and cash management purposes incurs the risk of market fragmentation and loss of the liquidity and benefits of a larger T-bill market. In most developing countries, the lack of benchmarks is a key problem for domestic debt market development. The fragmentation of short-term T-bill programs often causes many series of small issuances, thereby further hindering benchmark development.

Having the central bank issue its own bills (C-bills) will also cause a potential conflict of interest for the central bank. As the monetary authority, the central bank wants the market to determine the interest rates for its bills, but as the issuer of C-bills, the central bank will tend to minimize costs by artificially reducing the bills' interest rates.[12]

A possible solution to a fragmented short-term bill program is to let the ministry of finance issue additional T-bills as an add-on to normal auctions, but to sterilize the proceeds by holding them in a special account at the central bank. This arrangement would allow the central bank to preserve the option of using monetary policy tools, but would prevent the risk of market fragmentation. However, achievement of the desired outcome is contingent upon the satisfaction of certain conditions, including the transparency to the market of this arrangement and of the amount of each auction and the identicalness of the add-on T-bills and other outstanding T-bills.

In most Organisation for Economic Co-operation and Development countries, such as Australia, Canada, the United Kingdom, the United States, and the euro countries, central banks do not issue their own bills, but buy and sell government securities in the secondary market. Increasingly, developing countries whose central banks used to issue C-bills or certificates of deposit have switched to using T-bills as a monetary policy instrument, for instance, Brazil (box 3), Croatia, and Mexico.

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12. For example, before 2004, Croatia's Ministry of Finance and central bank each issued their own bills. For similar maturity bills, the discount for T-bills was about 8 percent while the discount for C-bills was only 1 percent.

***Box 3* Brazil's Experience with the Central Bank Switch to T-Bills**

Before May 2002, both the National Treasury of Brazil and the central bank issued their own bills. In early 2002, the two entities worked out a plan to facilitate development of the domestic debt market. As of May 2002, the central bank stopped issuing C-bills and started using T-bills as a monetary policy instrument. The treasury issued an equivalent amount of additional T-bills when the outstanding C-bills expired. The proceeds from the issuance of additional T-bills are deposited in a special account in the central bank. These proceeds cannot be used for budget expenditure, but can be used to buy foreign reserves to pay off foreign debts. From May 2002 to July 2004, the number of outstanding T-bills increased from 395 billion to 736 billion while the number of outstanding C-bills decreased from 126 billion to 22 billion.

Artificial Limits to the Demand for T-Bills

Another common issue in emerging economies' T-bill programs is that the requirement for full cash upfront for bidding has limited the demand for T-bills. For example, in Georgia, the National Bank of Georgia currently requires all bidders to put 100 percent of cash upfront for their bids. This has led to unnecessary liquidity pressure on the lari and depressed participants' bidding capacity because of uncertainty about the outcome of the bidding and the high coverage ratio. Any deposit of monies before the settlement date has a genuine cost, and therefore restricts participation. This situation in Georgia and elsewhere could be alleviated by having the central bank consider requiring a smaller percentage of cash upfront, such as 10 or 15 percent, as a deposit for bidding to control the risk of bad faith bids. If bidders fulfill their commitments, their deposits can be counted toward their payments, otherwise, the central bank can forfeit the deposits. With the building of trust between the government and market participants, the government should gradually remove all upfront cash requirements.

Weak Cash Forecasting Capacity

Weak cash forecasting capacity is a common problem in many developing countries. For example, in Guatemala, Serbia, and Ukraine, current monitoring of the budget is restricted to monthly intervals. More accurate monthly cash flow forecasts would benefit central banks in their management of money market liquidity and ministries of finance in tracking potential movements in their surplus balances and potential use of T-bills to reduce the cost of borrowing. Forecasts of one to five days ahead are essential in a well-developed cash management system**,** which takes account of variances in cash flows that occur during the course of each month.

More accurate and frequent cash flow forecasts will depend largely on two factors. The first factor is an advanced cash management information system. The second factor is up-to-date information obtained from different agencies to supplement the application of historical patterns and trends to monthly, quarterly, and annual budget forecasts, which is necessitated because of the volatility of expenditure and revenue flows. Work on

improving these two factors should help strengthen the capacity for cash management forecasting.

Confusion of Cash Management with Debt Management

While integrating cash management with debt management is desirable, this does not mean that the two functions are interchangeable. In a sound financial system, T-bill programs are designed as a tool for cash management, that is, for smoothing out the government's cash profiles, and the maturities of T-bills are therefore usually less than one year. If the government needs longer-term financing to meet its budget deficit, it should use debt management instruments such as government bonds, whose maturity can range from 1 year to 30 years. However, in many emerging economies, governments issue long-term T-bills for meeting the government budget shortage rather than smoothing out the government cash profile. For example, the maturities of T-bills in Lebanon are about three to four years. This reduces the effectiveness of T-bill programs and may increases funding costs, as the government may issue shorter-term bills at a lower cost.

Lack of Incentives for Efficient Cash Management

Many developing countries lack incentives for effective cash management, and as a result are unconcerned about the existence of idle balances or the timing of payments and receipts. Pre-funding rather than pre-authorization is also a common practice. Furthermore, budget users usually retain the interest from the balances. Consequently, unnecessarily high amounts of idle cash are a common phenomenon. Measures such as surrendering interest income to the state treasury and charging penalties for entities that keep high idle cash balances would be helpful for creating the right incentives for budget users to minimize their keeping of idle cash balances.

Difficulties in Hiring and Retaining Skilled Staff

The skills necessary to develop and maintain a cash management operation are similar to those in demand in the private financial sector, which should be viewed as the main comparator for determining job compensation. However, government salaries are usually lower than those the private sector offers, even though other rewards may be associated with working for the government, for example, greater responsibility, closeness to policy making, and better job security. Nevertheless, the pay difference may still make it difficult for the government to successfully recruit and retain qualified staff.

To facilitate the development of a cash and debt management program and to help attract and retain highly competent staff, ministries of finance in developing countries should consider introducing a formal staff training program in this area. Many ministries of finance and debt offices (which in some countries host the cash management function) have established training programs for their staff to ensure they have adequate skills and to provide for career advancement. Such a program would have a regular schedule of short courses in finance, economics, and debt management, supplemented by formal

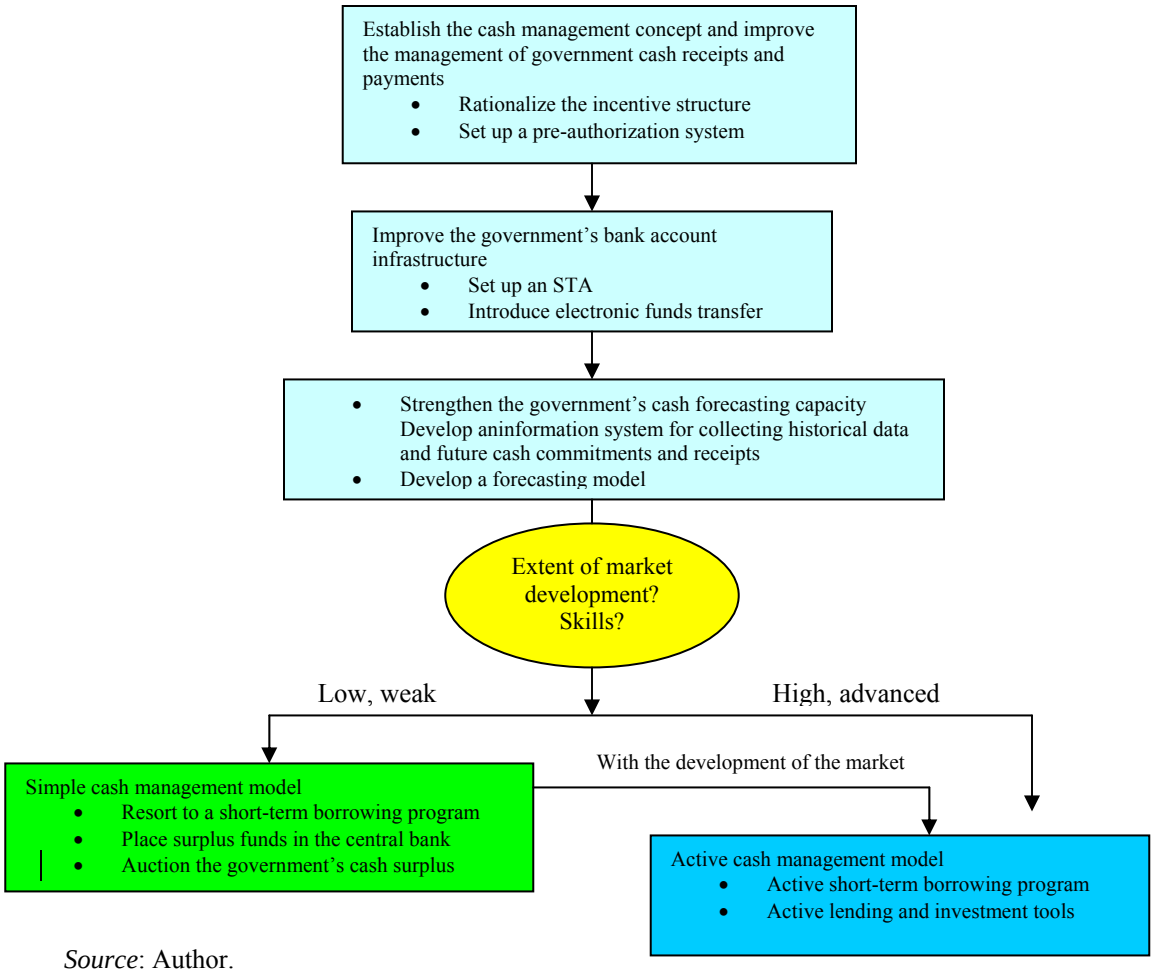
training in universities or institutes. An important part of such programs would be that those staff who have been provided with such training opportunities should be required to remain in the ministry of finance for a fixed period of time following the training.

Small economies usually have a limited number of skilled professionals in the finance area. Their central banks usually have better resources than their ministries of finance. To avoid having the ministry of finance and the central bank competing for the same pool of skilled people, such countries may want to delegate debt management and cash management roles to the central bank as, for example, Denmark, has done.

How Can Government Cash Management Capacity in Developing Countries Be Strengthened?

As indicated in previous sections, developing countries with cash management problems must develop an appropriate framework for strengthening their government cash management capacity. This section attempts to construct such a framework with reference to the benchmark exercise and issues reviewed earlier. Figure 4 provides an overview of a general capacity framework for cash management. Countries are encouraged to adjust the framework based on their particular situation.

Figure 4 **Framework for Building Government Cash Management Capacity**



Source: Author.

The capacity building framework includes the four steps described in the following sections.

Establish the Concept of Cash Management and Strengthen the Management of Government Cash Receipts and Payments

For those countries where cash management is confused with accounting control and budget execution, the first thing they need to do is to establish the concept of cash management and develop government cash management objectives. Cash management is different from budget appropriation and financial control and governments worldwide are increasingly separating the functions of authorization and financial control, that is, the accounting and financial controller functions, from the settlement and physical payment of government cash management transactions.

The second step for strengthening the management of government cash flows is to improve the timing for revenues and expenditures. The following list presents some methods for strengthening the management of government receipts and payments:

- Collect revenues as early as possible and delay payments of expenditures for as long as possible.
- Use pre-authorization in place of pre-funding.
- Match revenues (cash inflows) with expenditures (cash outflows) as much as possible, for example, arrange a major project for when the government has a large cash inflow.
- Introduce incentives for efficient cash management to minimize the level of idle balances and create greater certainty around the timing of payments and receipts.
- Innovate payment and revenue collection methods so that the government can move from checks to greater use of electronic fund transfers.

Introduce a Single Treasury Account Arrangement

In those countries where the government still has many unconsolidated bank accounts with the central bank or commercial banks, governments should gradually introduce an STA arrangement alongside making improvements in the payment infrastructure. They can do so as follows:

- Identify all current, relevant government bank accounts.
- Structure these accounts into a pyramid-style account structure with the STA on top and many levels of subtransaction bank accounts.
- Consolidate the balance in government bank accounts gradually, depending on the stage of development of the information system and the payment infrastructure. Balances in all lower-level transaction bank accounts should be swept to upper-level transaction accounts and finally to the STA. The ideal situation is to have only the STA keep balances overnight.

A good payment infrastructure is a necessary precondition for introducing an STA arrangement. A related topic is where government accounts should be held. There are three views on this subject:

- The STA and all transaction accounts should be held at the central bank.
- The STA and all transaction accounts should be held at commercial banks.
- The STA and some major transaction accounts should be held at the central bank and most transaction accounts should be held at commercial banks, with the STA and transaction accounts being linked electronically.

This paper recommends the third model for most developing countries for two reasons. First, having the STA at the central bank can help reduce credit risk. Second, commercial banks usually have much bigger networks than the central bank.

Strengthen the Government's Capacity for Cash Flow Forecasting

The ability to forecast government cash flow is extremely important for the government cash manager, yet cash forecasting is extremely weak in most developing countries. Strengthening their capacity for cash flow forecasting should be an ongoing project for such countries. To this end, they could take the following steps:

- Build a database to collect historical cash flows.
- Expand the database to collect future cash commitments for all public budget users and receipts.
- Analyze patterns and develop a cash forecasting model.
- Document the implications of public holidays and of payment dates falling on weekends.
- Document information flows and payment lead times.
- Follow up on all significant errors as a matter of routine to try to identify and remedy systemic problems.

Build up Capacity for Cash Management Operations

During the buildup of capacity, the cash manager should develop short-term borrowing tools to maintain the cash balance at the STA. Regarding investment of the surplus (the cash balance), two models may be employed—the simple cash management model and the active cash management model—depending on the level of advancement in the following areas: (a) money markets, (b) financial market skills to execute trades with the debt manager and/or the cash manager, (c) necessary transaction processes and information technology, and (iv) credit risk and operational risk management systems.

For those developing countries that are weak in the aforementioned areas, placing the surplus funds in the central bank may be a solution, that is, the simple cash balance management model. In this case, the central bank may lend those funds through reverse repo so that the government will not maintain too much idle cash. The adjustment to the balance at the STA in this model is rather rough. An alternative option is for the central bank to auction government deposits to commercial banks.

The active cash balance management model is appropriate for when the government has reached an advanced stage of government cash balance management. It requires the following external conditions:

- a well-developed money market,
- a cash manager capable of handling a broad range of short-term borrowing and investing instruments in the financial markets,
- a good risk management framework,
- an efficient local settlement system and related infrastructure.

If cash management is to move from the simple management stage to the active management (fine-tuning) stage in the money market, a number of related issues will need to be addressed. Before moving to active fine-tuning, the government should start borrowing and lending gradually to test systems and build up counterpart relationships. This in turn would be preceded by adequate preparation and discussion with relevant parties. Front office, transaction processing, and operational and credit risk management systems would need to be put in place internally and counterparts would need to be linked through an electronic or telephone network, and all this would need to be at a different scale than that required simply for the issuance of T-bills. The decision on whether to adopt the fine-tuning approach should be based on cost-benefit analysis.

Appendix 1. Active Cash Balance Management

In the United Kingdom, the Debt Management Office is responsible for market borrowing or lending each business day to balance the remaining position on the single treasury account after the sweeping of government accounts. By borrowing and lending in the market, the Debt Management Office needs only a small balance at the Bank of England to cope with changes late in the day. In practice, the Debt Management Office operates by targeting an end-of-day balance at the Bank of England of just £200 million (U.K. DMO 2003d).

The size of the target balances in euro countries varies, although they are generally trying to reduce both the size and volatility of balances. The European Central Bank (ECB) is more concerned about volatility, because variations in the size of individual government balances affect the euro system's aggregate balance sheet. Indeed, at the aggregate level, overnight balances on government deposits with the euro system are the most volatile of the so-called autonomous factors, that is, those items on central bank balance sheets that are related neither to monetary policy operations nor to banks' current account holdings with the central bank.[1] In 2001, the country with the highest volatility of government deposits was Italy, followed by Spain, France, Greece, and Ireland. Note that volatility does not necessarily lead to forecasting errors, because some central banks are able to forecast changes in their government deposits quite accurately despite high volatility.[2]

In Austria, Belgium, Finland, Germany, Luxembourg, the Netherlands, and Portugal, the volatility of overnight balances on government deposits with the central bank is low or close to zero. For example, both Belgium and the Netherlands have agreed to keep their balances in the range of €0 to €50 million, in practice targeting the middle of that range, and the Netherlands has recently announced a target of €25 million. Liquidity effects are therefore negligible. In Ireland, the government stabilizes its balance with the central bank around a target level, and the volatility of government balances is comparatively low.

France's performance has improved enormously in recent years. In 2001, the government's balance at the French central bank fluctuated between €300 million and €1,500 million, but the position has improved progressively, with the target balance reduced to €200 million by May 2002 and €100 million by September 2002. Spain has a target balance of €300 million, but is likely to reduce that. All these numbers are small in relation to the amount of daily government cash flows through the euro markets.

The targets are backed up by agreements with the national central bank on the rate of interest to be paid on the ministry of finance's balances. This will usually allow for

1. Government deposits, totaling €57 billion accounted for about 10 percent of the euro system's liabilities as of the end of March 2002 (ECB 2002).
2. From *Government Activities Affecting Liquidity in the Euro Area*, an ECB publication regularly updated on the bank's Web site (http://www.ecb.int/mopo/implement/liq/html/treas.en.html) as a way of alerting the banking sector to the impact of the autonomous factors on liquidity.

balances up to the target to be remunerated at the ECB's marginal lending rate, that is, the two-week rate at which the ECB lends to individual banks when they are short of liquidity, which in turn is usually 1 percentage point above the rate at which the ECB lends to the banking sector as a whole in its normal operations. In Belgium and the Netherlands, no interest is paid above the target of €50 million. In France, the ECB's lending rate is paid up to €300 million, but the ECB's much lower deposit rate on balances applies above that figure.

Countries with limited incentives to economize on balances face greater problems. In Italy, the liquidity effects of government activities are considerable. No upper limit is applied to the government's deposit balance. The central bank remunerates the balances held by the government on the current account with an interest rate close to market rates. In Greece, there is no upper limit on the amount of deposits that the government can hold with the central bank. Remuneration is close to market rates up to a certain threshold. However, in its efforts to enhance cash management efficiency and reduce the volatility of its deposits, the Greek government has recently started placing funds in the form of term deposits with credit institutions on a more regular basis.

The policy processes that each country uses to meets its target balances are as follows. Both France and the Netherlands prepare daily cash flows at the beginning of the year that extend for the full 12 months ahead, although these projections will be updated periodically. Other countries' forecasts are for shorter periods, although they will need to be consistent with forecasts made for the fiscal position over longer periods. The forecasts typically show a marked seasonal fluctuation associated with the pattern of tax and expenditure flows during the year. The fluctuations are rough-tuned by the sale of T-bills and by other longer-term transactions (term lending and borrowing, especially repo) in the money markets. Fine-tuning is done daily through lending and borrowing, either in the repo or the interbank markets. Some countries will also sell T-bills outside the normal cycle, usually weekly, if they expect a significant cash outflow in, say, the following week, in which case an additional issue of T-bills may be announced on short notice.

Despite their common practices, these countries also have some important and interesting differences in their practices, for example, the extent to which they make use of T-bills varies. Several of the euro countries are trying to build up their stocks of T-bills to secure the benefits of a liquid market.[3] However, the German debt agency makes more use of bank borrowing and sales of longer-dated bonds previously issued or retained on the books of the government, particularly for fine-tuning purposes. Some smaller countries, notably Austria, Ireland, and Portugal, have historically made more use of commercial paper either instead of or alongside T-bills. The sale of commercial paper usually requires some form of syndicate with marketing, underwriting, and operational responsibilities to be put in place. These countries are now facing a difficult choice of whether the costs of building up and maintaining a T-bill market (marketing, primary dealership system) will

3. Italy has historically made much greater use of T-bills than other euro countries as a financing as well as a cash management instrument. The Italian debt directorate is currently trying to lengthen the average maturity of government debt.

be outweighed by its benefits, whether in terms of slightly lower borrowing costs or greater cash management flexibility.

Approaches in relation to biasing longer-term financing and rough-tuning decisions toward a tendency of being long or short on any individual day vary significantly. For example, the French Debt Office tends to issue more government debt than it thinks will be necessary based on its central forecasts. This means that, on average, it will start each day with the expectation that it will be investing surplus funds rather than borrowing to finance a prospective outflow of funds on that day. Overborrowing in this way tends to carry a cost, because of the trading spread between borrowing and lending, but the French Debt Office judges that the amount will be small when measured against the advantages of being long on cash that can be lent easily on short notice and greatly reduces the risk of being overdrawn in the event of unanticipated flows. By contrast, the Dutch agency has a bias toward being short. It notes that the short-term yield curve tends to be upward sloping, reflecting the term premium, and therefore that borrowing overnight is more cost-effective than borrowing for a longer period and lending overnight.[4]

The Spanish treasury deliberately runs a long position to avoid the need to borrow, and its long bias is greater than that of France; however, each month the Spanish treasury auctions its expected balances (that is, overnight reverse repo against government bond collateral). Counterparts bid for a proportion of the expected balances, bidding on a spread against the euro overnight index rate. This approach is more risk averse and carries some cost in that balances are usually lent at a small spread below the euro overnight index rate.

A number of debt offices within the euro area have also reached agreements on borrowing and lending among themselves to add a further element of flexibility.

4. Both the French and Dutch agencies have a performance target whereby their cash management operations of whatever maturity are benchmarked against the average overnight offered rate in the interbank market (the euro overnight index rate). The Dutch debt agency has a program of short-term swaps (the euro overnight index rate against a term rate) to reduce the risk of meeting this target, whereas the French Debt Office does not believe that the additional cost of such swaps would be justified.

Appendix 2. Cash Management Tools in the United Kingdom

The U.K.'s Debt Management Office (U.K. DMO) employs various cash management operation tools, including a regular T-bill program, an ad hoc T-bill program, bilateral dealings, and end-of-day arrangements.

Regular Weekly T-bill Auctions

The U.K. DMO issues T-bills on the last business day of each week, that is, usually on Fridays. It announces the size of the following week's auction and the maturity of bills on offer at the preceding week's auction. These announcements are made on the U.K. DMO's wire service pages.[1]

The U.K. DMO may also issue T-bills to help the Bank of England (BOE) manage the sterling money markets. If requested by the BOE, the U.K. DMO would consider adding an additional amount of bills to a auction, in which case its usual announcements would identify any amount being issued for the BOE.

Participation

Direct bidding by telephone in T-bill auctions is open to the following eligible participants:

- U.K. DMO cash management counterparts, which may make bids on existing direct dealing telephone lines;
- T-bill primary dealers;[2]
- a limited number of wholesale market participants who have established a dealing relationship with the U.K. DMO.

Primary dealers have indicated that, subject to their own due diligence controls, they are willing to bid at auctions on behalf of other parties. Eligible participants may bid in auctions in their own name and/or on behalf of clients. The clients and eligible participants are responsible for agreeing on the payment and custody arrangements for any T-bill holdings acquired in an auction.

Bidding at T-bill auctions

The key features of the T-bill auction process are as follows:

- Auctions are held on a competitive bid yield basis.

1. Reuters/Bridge/ADP, DMO/CASH11, Telerate, 15710 to 15711, Topic 44670 to 44671, Bloomberg, DMO9<GO>.
2. There are nine primary dealers: Barclays Bank plc; Cater Allen International, Ltd.; Credit Lyonnais; Deutsche Bank; Halifax Group Treasury & Wholesale Banking; JP Morgan Securities, Ltd., Royal Bank of Scotland plc; Salomon Brothers International, Ltd.; and UBS Warburg.

- All bids must specify the maturity of bills being bid for and must be made on a percentage money market yield basis. Bids may be made up to three decimal places and must include the nominal amount bid for at each yield.
- Bids must be for a minimum of £500,000 nominal of bills. Above this minimum, bids must be made in multiples of £50,000. There is no limit to the number of bids that each bidder may submit.
- All bids must be received by 11 AM (London time) on the day of the auction.

Processing of bids

On receipt of bids from eligible participants, the U.K. DMO will do as follows:

- Rank bids for each maturity on offer by yield. It will then allot bills to those bids that are at or below the yield deemed by the U.K. DMO to be the highest accepted yield. Bids at the highest accepted yield may only receive a proportion of the nominal amount of bills bid for.
- Reserve the right not to allot the total amount of bills on offer or to cancel any auction (although it would consider this only in exceptional circumstances), and to reject and scale bids. At the cutoff point, the U.K. DMO uses a scaling ratio to calculate and apply to bids at the highest accepted yield. These amounts will be rounded down to the nearest minimum denomination of £25,000. Any residual amount will then be split into tranches of the minimum denomination and allocated to bidders first in order of size of bid (with larger bids taking precedence), and then according to time of bid (with earlier bids based on the time a bid is inputted into the U.K. DMO's auction processing system taking precedence).
- Publish the results of the auction on its wire services pages and on its Web site (http://www.dmo.gov.uk) as soon after 11 AM (London time) as possible. The results set out the amounts applied for and allotted, respectively, at each maturity; the lowest, average, and highest accepted yields; and a weighted average percentage allotted at the highest accepted yield (that is, weighted by the amount of the bid).[3]
- Announce, at the same time, the amounts on offer at each maturity at the next auction, together with an outline of any ad hoc auctions to be held the following week.

Maturity of bills issued

Bills issued at auctions currently mature on the first business day of the week 4 weeks, 13 weeks, 26 weeks, or 52 weeks following the issue date. If T-bills are due to be issued or settled in weeks that include national holidays, the exact maturity of the bills at issue will be adjusted to ensure repayment on the first business day of the relevant week.

Announcements of future auctions

3. For example, two bids are successful at the highest accepted yield and there is £100 million left to allot. If bid X was for £200 million and bid Y was for £1 million, X would receive about 49.8 percent (£99.525m) of its amount and Y would receive 47.5 percent (£0.475 million). The weighted average percentage at the highest accepted yield would be (200*49.7625) + (1*47.5)/201 = about 50 percent.

Following the final auction at the end of each calendar quarter, the U.K. DMO will issue a notice outlining the maturities of T-bills available in each week of the following quarter.

Settlement arrangements

The following are the main feature of the settlement arrangements relating to T-bills:

- The U.K. DMO contacts the successful bidder following the publication of the results of the auction to which its allotments relate. The U.K. DMO confirms the nominal amount of T-bills allotted, the purchase consideration bearing in mind the accepted bids, and the purchaser's settlement instruments. The U.K. DMO will also ask the purchaser for its preferred bill denominations. As noted earlier, the minimum denomination of T-bills at issue is £25,000 nominal.
- An exchange of confirmations follows. T-bill allocations resulting from auctions are settled on the first business day of the following week, which will also be the issue date of the T-bills purchased;
- The BOE must receive a CHAPS payment for the full consideration from a credit institution regulated by the European Economic Area for credit of the U.K. DMO's account at Sort Code 10-18-00 by 1:30 PM (London time) on the settlement date. The purchased T-bills will only be released to, or made available for withdrawal from, the purchaser's account at the Central Moneymarkets Office (CMO) once this payment has been received.
- The T-bills may be split into smaller denominations or reconstituted into larger denominations on request to the BOE, Custodial Services Group, T-Bills Section. Currently, the minimum denomination for such splits is £5,000. To bring splits into line with the minimum denomination at issue, the U.K. DMO increased the minimum split denomination to £25,000 as of January 2, 2002.
- The T-bill transactions can also be settled via Euroclear.

Depository

T-bills can be held in the CMO, which the BOE operates on behalf of the CREST Company. The CMO is the central depositary for T-bills. T-bills may also be held through Euroclear via the relevant specialized depository.

Ad Hoc T-Bill Auctions

In addition to issuing T-bills by way of regular weekly auctions, the U.K. DMO may issue T-bills with maturities of up to approximately 28 days on an ad hoc basis. These are intended to meet temporary cash flow needs that cannot be as conveniently met by means of regular weekly T-bill auctions and allow the U.K. DMO to fine-tune the smoothing of the Exchequer's cash flow profile with greater precision. Therefore these bills are sometimes referred to as cash management bills and the ad hoc T-bill auctions as cash management bill auctions. With the exception of bills with maturities of less than 28 days, these bills are exactly the same instruments as those sold at the weekly auctions.

Nevertheless, there are some important distinctions in the bidding, settlement, and administrative arrangements.

Timetable

The DMO announces its intention to hold ad hoc T-bill auctions at the same time as it announces the size of its weekly T-bill auctions. This announcement gives the day(s) in the following week for which a cash management bill auction is planned and the approximate maturity of the bills to be offered. The exact maturity of the bills and the quantity to be offered are announced on the morning of the auction. Up to two ad hoc auctions could be held per day, although this is not a regular occurrence. Ad hoc auctions will be for same day settlement in sterling, and auctions might be held on successive business days if necessary. The precise details of cash management bill auctions are set out in the U.K. DMO's operational market notice. The U.K. DMO retains the option to hold cash management bill auctions at short notice and envisages the timetable shown in table A2.1

Table A2.1 **Ad Hoc Auction Timetable**

	Timing	
Activity	*Slot 1*	*Slot 2*
Announcement and opening of auction	8:30 AM	10:00 AM
Close of auction	8:45 AM	10:15 AM
Results announced shortly after	9:00 AM	10:30 AM
CHAPS payments in by	1:30 PM	1:30 PM
CREST/CMO movements by	Close	Close

Source: U.K. DMO 2001.

The DMO does not conduct ad hoc auctions in the second slot on gilt (U.K. government bond) auction days or on Monetary Policy Committee decision days.

Bidding

Bidding at ad hoc auctions is by telephone only. Bidding at all ad hoc auctions is on a competitive bid yield basis. Bids must be for a minimum of £5 million at each yield and in £1 million multiples thereafter. Counterparts may submit no more that five bids per maturity on offer in each auction. The U.K. DMO reserves the right not to allot the total amount on offer, although it would consider this only in exceptional circumstances, and to reject and scale bids.

Auctions

Ad hoc T-bill auctions are open to all U.K. DMO cash management counterparts and T-bill primary participants. Each bid submitted at ad hoc T-bill auctions must specify the maturity of bills being bid for, the nominal quantity being bid for, and the money market yield for each quantity expressed up to three decimal places.

Auction results

The U.K. DMO publishes the auction results on its wire service pages within 15 minutes of the close of the auction. At the cutoff point (the highest accepted yield for a T-bill or repo auction and the lowest for a near maturity gilt or reverse repo auction), a scaling ratio will be calculated in the same way as for weekly T-bill auctions and applied to all bids (offers) at the highest (lowest) accepted yield, except that for repo and reverse repo auctions, allocations do not have to be rounded to multiples of £25,000 nominal to reflect the lowest denomination of bills at issue.

The announcement of the results for each auction contain details of the amount allocated and/or accepted, the average accepted yield, and the yield and the scaling factor at the cutoff point (this would be the average weighted scaling factor for ad hoc T-bill auctions).

Settlement

For those counterparts who are successful at any ad hoc auction, in addition to exchanging written or electronic confirmations, the U.K. DMO will confirm the settlement and custody details by telephone after the auction results have been published. In the case of ad hoc T-bill auctions, to aid the shortened settlement process, the U.K. DMO uses its discretion to select a range of suitable bill denominations for successful bidders. Settlement of allocations from ad hoc auctions are for same day value in sterling. CHAPS payments in settlement must therefore be with the BOE, for credit of the DMO at Sort Code 10-8-00, by 1:00 PM on the day of the auction. Allocations arising from T-bill and T-bill repo auctions are credited to successful bidders' nominated accounts at the CMO or its equivalent on the day of the auction providing that settlement has been effected. Near maturity gilt and reverse repo ad hoc auctions are settled through CREST or its equivalent.

Splitting of T-bills

The same arrangements as for T-bills subsequent to the publication of the weekly T-bill auction result apply to ad hoc T-bill auctions.

Ad Hoc Repo and Reverse Repo Auctions

The U.K. DMO may also conduct ad hoc repo or reverse repo auctions as part of its cash management operations. The collateral given and taken in any such operations is likely to be gilts or T-bills. In addition, the U.K. DMO may also hold ad hoc auctions for outright buying of gilts (including strips) with a residual maturity of less than six months. Broadly, the same structure in terms of announcement, bidding, and settlement is used for such operations as for ad hoc T-bill auctions.

Ad hoc repo or reverse repo auctions are open to U.K. DMO cash management counterparts. Bids must be made by telephone. The bidding procedure for ad hoc auctions

will be identical to ad hoc T-bill auctions, except that bids or offers submitted must be expressed to two decimal places and the amount bid for or offered must be expressed on a sterling basis. As with bilateral transactions, variation and initial margining "haircut" arrangements will be applied to ad hoc repo and reverse repo auctions where necessary.

Bilateral Dealing

In addition to various auctions, the U.K. DMO conducts the bulk of its remaining business through bilateral dealings with its cash management counterparts in both outright and repo transactions. The U.K. DMO has developed a meaningful working relationship with its counterparts to foster the provision of liquidity at commercially competitive rates. Dealing could be either for same day or forward settlement.

Repo and reverse repo

Table A2.2 shows the common instruments used for repo and reverse repo.

Table A2.2 **Instruments for repo and reverse repo**

Instrument	*Basis of dealing*
Gilts (delivery-by-value)[a] and general collateral, including strips	Auctions and bilateral
Her Majesty's Treasury bills	Auctions and bilateral
Other currency Her Majesty's Treasury paper	Bilateral
Selected eligible bank bills	Bilateral
Selected highest-rated European government debt (euro)	Bilateral
Highest-rated supranational pound sterling paper	Bilateral
Selected high–quality, short-term debt[b]	Bilateral

Source: U.K. DMO 2001.
a. The operational market notice will specify the specific categories and class type of all delivery-by-value that will be acceptable.
b. Debt instruments issued by high-quality issuers, including superanationals and foreign governments.

The DMO can transact in repo and reverse repo with counterparts for maturities of up to one year.

A right of substitution is not normally expected or given by the U.K. DMO. If substitution rights are given or taken , this will be confirmed at the point of trade. For all reverse repo transactions other than delivery-by-value, the U.K. DMO requires counterparts to identify the collateral being pledged in a timely manner.

The U.K. DMO marks to market its exposures to its repo counterparts and will call margin, if required, on a daily basis. Where initial margin ("haircut") is to be calculated on a repo and a reverse repo transaction, the U.K. DMO follows the calculation methodology set out in the Gilt Repo Code of Best Practice produced by the Stock Lending and Repo Committee.

Outright purchases and sales

Table A2.3 shows the common instruments used for outright purchase and sales by the U.K. DMO.

Table A2.3 **Instruments of Outright Purchase and Sales**

Instrument	*Basis of dealing*
Gilts purchases (< 6 months to maturity)	Auctions and bilateral
Gilts strip purchases (< 6 months to maturity)	Auctions & bilateral
Her Majesty's Treasury bills purchases	Bilateral
Selected eligible bank bills (< 6 months to maturity)	Bilateral
Selected certificates of deposit (< 12 months to maturity)	Bilateral
Selected commercial paper pounds sterling, U.S. dollars (< 12 months to maturity)	Bilateral
Selected bank bills (< 6 months to maturity)	Bilateral
Selected high–quality, short-term debt[a] (< 12 months to maturity)	Bilateral

Source: U.K. DMO 2001.
a. Debt instruments issued by high-quality issuers, including superanationals and foreign governments.

All purchases are subject to the U.K. DMO's internal credit limits. Before the deal is committed, the U.K. DMO confirms that the accepting bank name or names do not breach internal limits. If the U.K. DMO sells eligible bills, it is not deemed to have endorsed the bills.

Cash loans

The U.K. DMO may also seek to borrow on an unsecured basis from its counterparts on a bilateral basis.

Currency swaps

The U.K. DMO may use short-term currency swaps, forward rate agreements, and interest rate futures to manage foreign currency and interest rate exposures. All foreign currency exposures are hedged back into sterling.

Settlement

Unless otherwise specified, all bilateral transactions with the U.K. DMO are settled on the trade date and in sterling. The U.K. DMO is prepared to transact in the instruments listed previously as long as settlement can take place in CREST (including CMO) or its equivalent, Clearstream, or Euroclear, and according to the U.K. DMO's settlement requirements and timetable.

End-of-Day Arrangements

On occasion, sizable unanticipated cash inflows and outflows may occur too late in the day for their impact to be smoothed by bilateral dealing in the money markets. To deal with this, arrangements have been put in place with the BOE and settlement banks to cope with late changes to the forecast without negatively affecting the market.

Before the new framework was put in place in April 2000, the Ways and Means Overdraft Facility permitted a large degree of discretion as to the timing of market borrowing by the central government. Essentially, this meant that the Exchequer's actual daily cash flow outturn was catered for through the BOE's money market operations and its late lending arrangements with the settlement banks. The Ways and Means Overdraft Facility at BOE ceased under the new system.

The current end-of-day arrangements prevent the Exchequer from becoming overdrawn at the BOE when it suffers late and unexpected swings in the cash position that the U.K. DMO cannot rectify during the dealing day. In circumstances where the Exchequer has a cash surplus, the surplus is taken into the BOE's settlement bank late repo facility at 4:20 PM. The additional refinancing is provided by the BOE at a nonpenal rate of interest. An Exchequer cash deficit can be offset by bilateral borrowing from a number of settlement banks through a special end-of-day transfer arrangement.

In those rare circumstances where unanticipated changes to the forecast are not fully accommodated in the usual end-of-day arrangements, and to provide for changes arising from the overnight sweeping of accounts flowing into the U.K. Notional Loan Fund, the U.K. DMO holds a balance of £200 million at the BOE as a further source of operational flexibility. The treasury also has a program to improve both the forecasting and monitoring of daily cash flows.

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