Where Are We So Far?

- We have seen that consolidating government cash resources into an effective TSA structure provides efficiency for budget execution transactions.
- It also allows the cash managers to know what the total extent of the government cash resources are at the moment.
- We know that cash managers and MDAs need to make cash flow forecasts as accurately as possible for the year ahead which takes a lot of effort.
- But what is all this for?
Public Cash Management – A Reminder of its Definition

**Concise Definition**
The objective of public cash management is to have the right amount of money in the right place at the right time to meet obligations in the most cost-effective way.

- This definition can be broken into two main components:
  - The **primary** objective of cash management is to ensure at all times that budget expenditure payments can be met when they are required by the government spending units – provided that the spending units can forecast these requirements ahead of the payment due time with reasonable accuracy. I.e. Public policy should be implemented as envisaged in the legally-approved Appropriation Act without cash constraints or expenditure arrears.
  - The **secondary** objective of cash management is to manage temporary cash shortages and surpluses efficiently – such that cash borrowing costs are minimised; and returns on cash surpluses are maximised subject to effective risk management. I.e. Government-held cash derives from the taxpayer and there is a duty to manage it efficiently at all times.

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If these objectives are met, who benefits?

- **MDAs/Spending Units** – they can make expenditures as needed to provide their services and functions efficiently
  - It is vital that the CMU/MoF regularly explains to MDAs that the work they put into providing good cash flow forecasts is for their benefit – not that of the MoF!
- **Suppliers/Vendors to Government**
  - they can be assured that they will be paid when invoices are due
- **The Government Financial Position**
  - Without expenditure arrears, the government can be assured of paying the right price
  - It can make a market return on its temporary cash surpluses and only borrow the amount it needs for the short time it is necessary
- **The Central Bank**
  - Effective active cash management operations can reduce the impact government cash flows have on the monetary system
How Do We Meet These Objectives?

• Having an effective TSA with consolidated cash resources lets you know the amount you have currently
• Having *monthly* cash forecasts lets you know roughly how those cash resources held in the TSA will move throughout the fiscal year as
  • revenues flow in;
  • planned expenditures are paid out as needed;
  • and budget deficit financing and debt servicing transactions are made
  • *through* the TSA structure.

How Do We Meet These Objectives?

• To meet the primary objective, short-term cash deficits must be filled by borrowing even if this is for more than, and longer than, necessary (assuming budget execution is fixed)
• To meet the secondary objective
  • This borrowing must only be for the required amount and the necessary period
  • Temporary cash surpluses should be invested to provide an adequate return
• All borrowing for cash management purposes must mature before the fiscal year-end in order to avoid adding to the debt/GDP ratio and deficit limit imposed by the budget
How Do We Meet These Objectives?

• There are three principal connected techniques used to perform active cash management operations in order to meet the main objectives.
  • 1. An optimal cash buffer level in the TSA
    • Forecast errors / unforecastable contingencies can be absorbed
  • 2. Rough tuning to ensure the primary objective is met
    • Short-term borrowing to meet all projected expenditures
  • 3. Fine tuning to ensure the secondary objective is met
    • Efficient use of cash resources through precise borrowing and investment

• They all rely on an effective TSA structure and reasonable/good cash flow forecasting accuracy

TSA alone is not enough for effective cash management; both cash flow forecasting and active cash management are also needed

Cash flow forecasting asks:
• During each period, how much cash do we have coming in and going out?
• At the end of each period, how much cash do we have at hand before active cash management operations?

Active Cash Management asks:
• What actions do we take to ensure that we have the right amount of cash at hand?

Cash buffer is for:
• Absorbing cash flow forecasting errors, and
• refinancing risk – if necessary

The size of cash buffer depends on:
• the volatility of daily cash flows and the ability to forecast these cash flows
• the scope to manage unanticipated fluctuations - how quickly T-bills can be issued
• any safety nets available (e.g., overdrafts, credit lines)

Within these parameters, the cash buffer should be minimised to reduce holding costs – it can be zero (e.g. Sweden).
The definition of a (deficit) budget: Total Expenditures = Total Revenues + Budget Deficit Financing

- Zero-sum game: Credible (deficit) budget => Opening TSA balance = Closing TSA balance (since all these budget financial flows pass through the TSA)

- Projected profile of TSA balance

- Use active cash management operations to reduce profile to buffer level – realign budget plans if feasible, borrowing to replenish shortfalls and investing surpluses

Active Cash Management Through Budget Control

- The most financially efficient means of smoothing the projected cash flow profile is to readjust the planned cash flows through the TSA if at all possible.

- This can be achieved by:
  - Moving planned expenditures to periods of cash surplus
  - Altering revenue collection patterns to periods of cash shortage
  - Designing debt servicing timing to match the cash profile
  - Arranging debt issuance for deficit financing at periods of cash shortage

- **BUT** – These actions must be performed only on discretionary flows and fully agreed by all stakeholders
  - Otherwise they completely defeat the primary objective of cash management
The Cash Buffer Level – what should it be?

• There is no right answer to this puzzle!
• There are many ways to devise an appropriate level – some simple and some extremely complex
  • Certain countries which have had credit perception problems in the past will keep a cash buffer of sufficient size to meet its debt servicing needs for a specified period
  • Others will keep a level sufficient to meet a failed bond auction
  • These levels are often well published so that creditors and rating agencies are convinced of an enhanced credit standing
  • Others maintain sufficient cash buffer to meet the full expenditures of the government for a certain future / average period – 1 month say – in order to ensure no expenditure arrears are incurred

The Cash Buffer Level – what should it be?

• The overriding need is for the buffer to be sufficient to absorb cash needs which are not accurately forecast ahead
  • But no greater – since an unnecessarily large buffer is an expensive waste of idle resources (the buffer cash is often not, or poorly, remunerated at the central bank)
• More complex methodologies consist of calculations based on variables such as:
  • Volatility of cash flow forecasts
  • Volatility of forecast errors
  • Time required to go to the market for borrowings such as T bills
  • The depth and liquidity of the market
The Cash Buffer Level – what should it be?

• Considerations to understand here include:
  • The larger the volatility of cash flows, generally the more difficult they are to forecast accurately and will require a greater buffer
  • The larger the volatility of forecast errors, the larger the buffer required
    • This is the most important variable for fine tuning since only these errors need to be fully absorbed by the buffer cash – all accurately forecast movements can be accommodated through active cash management transactions, however volatile
  • The longer it takes to access the usual borrowing channels, the greater the buffer should be
    • Unanticipated payments cannot be delayed for a long time without difficulty
  • The more liquid and deep the borrowing market, the less the required buffer cash
  • If pre-arranged credit lines are accessible, the buffer can be reduced

The Cash Buffer Level – what should it be?

• The example of Sweden provides a good perspective
  • Sweden, very unusually, maintains a target buffer cash level of zero because:
    • Its daily cash flow forecasts are very accurate and therefore the volatility of the forecast errors is very low
    • It needs only a short notice period to enter the T bill market with market participants not being unduly concerned by sudden needs for borrowing
    • The T bill market is deep and liquid enough for the government to borrow substantial amounts of short-term cash without difficulty and without impacting the rate structure unduly
    • The central bank understands that monetary policy is not significantly affected by such needs (see later)
The Cash Buffer Level – what should it be?

• Conversely, countries where cash flow forecasting is highly inaccurate and granular (e.g. monthly) and/or access to credit and short-term debt is greatly restricted should, in theory, maintain very large cash buffer levels in order to meet the primary objective of cash management
  • This, of course, would be very expensive for countries that probably can afford it the least.
  • So it does not happen!

• Only when cash flow forecasting has become sufficiently accurate and the debt and credit markets are at least reasonably developed can a realistic buffer cash reserve be maintained.
Prerequisites for Adequate Rough Tuning

• Cash flow forecasts should be on a monthly basis (at least). This allows reasonably short-term borrowing to be achieved – 1 month T bills
• Forecasting should be reasonably accurate. If it is not, it can become extremely costly to perform active cash management operations! The danger is that the cash manager might be
  • borrowing unnecessarily, or (perhaps worse)
  • investing potential cash surpluses when they are, in fact, required
  • It is a value judgment to be made by the Cash Management Committee when forecasts are sufficiently accurate to allow active cash management transactions to take place – even for rough tuning

Prerequisites for Adequate Rough Tuning

• If forecasting is performed on a monthly basis, the cash managers need to borrow cash at the start of the month in order to meet all expenditure plans through the month since their timing is unknown
• Access to credit or debt markets should be sufficient to meet the largest anticipated cumulative monthly cash shortages
  • The shorter the forecasting base – e.g. weekly – the less bulk credit is likely to be required
• Therefore, a functioning short-term T bill market or access to bank credit is needed before rough tuning is effective
  • Many developing countries find it very difficult to separate cash management activities from debt management instruments for this reason
Fine Tuning Applied to Previous Example

Typical Cash Flow over the First Half-Year (Example)

Fine Tuning Activity in Reality

Example of daily forecast TSA balance with 9 billion buffer level and asymmetric 5 billion target range. (Including a ring-fenced 2 billion balance which may be variable)

Sharp drop in cash resources – if forecast accurately will not affect buffer as action will be taken – BUT if not forecast will be met by buffer
Calculating the Buffer Level

Inflows/Outflows - Forecast/Actual

Forecast Errors – Standard Deviation = 1.838

Forecast errors – Retrospective
Effects of Smoothing and Buffer Level

TSA level - Not Smoothed / Smoothed

95% Forecast error buffer level

\[ = 1.96 \times \text{S.D. of forecast errors (N.B. Unsymmetrical)} \]

Interesting difference due to accuracy of forecast to make borrowing intervention

Net Borrowing for Forecast Smoothing – 2 week lag for borrowing/1 week lag for repayments

Net Borrowing – 2 week lag for T bills / 1 week lag for repayment (not rolling over)

Lag of X weeks means decision taken is effective cash flow X weeks later
Fine Tuning Instruments

- **Short-term Borrowing**
  - T bills
    - Most liquid and cost effective for government
  - Repos
    - If market well developed, can be used for very short-term (days)
- **Bank loans**
  - Rarely used for active management if T bill market is developed (Expensive)
  - However, often used for contingent credit lines to replace buffer (but can mean expensive Commitment Fees)
- **Private Placements**
  - Used when markets are undeveloped or at difficult times (e.g. year-end)

Fine Tuning Instruments

- **Short-Term Investments**
  - Reverse repos
    - The instrument of choice when repo markets are well developed
    - Highly liquid
    - Negotiable maturity
    - Secured against credit risk for government
  - Bank deposits
    - Usually lower return than repos
    - Need to be collateralised to avoid credit risk (State-Owned Banks?)
    - Often need to run deposit auctions for transparency
  - **Short-term Government Securities**
    - Useful if maturing before or same time as required investment
    - Otherwise, interest rate and liquidity risks must be managed
Fine Tuning Instruments

- Other Investment Instruments
  - FX deposits or government T bills if there is a need to maintain FX cash
  - Money Market Funds
    - Were used extensively before the crisis – now regarded as having liquidity and credit risks
  - Corporate notes, bonds, CDs
    - Usually regarded as too high risk for very short-term investments
    - Credit, interest rate, and liquidity risks involved
  - Central Bank deposits
    - Can be useful but often not competitive; and term deposits usually unavailable
    - Cancels the benefits of monetary smoothing (see later)

Active Cash Management - Relationships

- Cash managers need good relationships with the:
  1. Financial Markets
  2. Debt Management Office
  3. Central Bank

- (1) Cash managers actively use financial markets to borrow and invest short-term cash.
- Borrowing needs to be in highly liquid markets – preferably T bills but repos and bank loans (even central bank) are possible
- Markets must expect little notice of borrowings (unlike for debt management) but cash forecasts should provide some prior knowledge of requirements if disseminated
Active Cash Management - Relationships

- Borrowings should be between the yield curve areas used by the central bank for OMOs – very s-t – and DMO – longer term. Typically, 2 weeks to 6 month T bills.
- These markets need to be separately developed and informed since they will not be subject to central bank authority (OMOs) or debt management strict calendar scheduling.
- Where markets allow, internationally preferred instrument for short-term cash investment is repo
  - Cash managers should be proactive in developing the repo markets – in coordination with the Central Bank
- Good relationships with commercial banks are important to obtain the best rates for sizeable deposits and credit lines

Active Cash Management - Relationships

- (2) Cash management and debt management should be closely coordinated.
  - They use the same GS market and contact same participants
    - Market development and market research should be coordinated
  - Debt flows are large part of cash flow forecasts
    - Should be the most reliable forecasts – but problems with donors/aid disbursements
  - Debt management can be used to smooth cash mismatches where feasible
    - In developed GS markets, auctions/issuance can often be timed to coincide with periods of temporary cash shortage
    - However, this is often an area of tension between debt and cash managers where GS market development needs are important
• (3) There are many areas where cash management and central bank activities coincide
  • Government banking arrangements - TSA
  • Cash flow forecasts should be provided to central bank to assist monetary policy operations (without fine tuning operations – discussed below)
  • Cash buffer level should be discussed with central bank to ensure that it is consistent with monetary policy stance and remunerated fairly
  • Central bank is usually the fiscal agent for T bill issuance and assists in market development
  • Can use overlapping area of yield curve with same instruments – T bills for OMOs
  • Both normally use, and must develop, the repo markets

• However, it is vital that financial markets understand that fiscal and monetary policy operations are separate and independent of each other
  • Short-term borrowings for cash management must be publicised as such to be seen as separate from OMOs (e.g. US Treasury “Cash Management Bills”)
  • Investment of short-term government cash surpluses must be seen to be independent of monetary policy actions which determine interest rate levels
Active Cash Management and Monetary Policy

• Active cash management fine tuning operations can greatly assist implementation of monetary policy. Maintaining a stable buffer level in the TSA at the central bank means that, under a credible budget and monetary equilibrium:
  • Government borrowing from the money markets drains the excess liquidity which has been added to the system by higher government expenditures than revenues
  • Government investments inject cash to the banking system when it is short supply due to higher government revenue collection than expenditure payments.
  • Each for the necessary amount and period if forecasts are reasonably accurate
• Therefore, under good active cash management, the government’s financial activities – often the largest in the country – can provide significant stability to monetary conditions in the financial system no matter how volatile they are.

What is the Necessary Phasing when Moving Beyond the Basics?

Phased Development of Cash Management

[CFT – Cash Flow Forecast]
What is the Necessary Phasing when Moving Beyond the Basics?

• As discussed before, the crucial element to have in place is
  • Reasonable cash flow forecasting accuracy

• Rough tuning operations rely on borrowing during projected periods of cash shortage. This means that:
  • Cash managers must have access to the T bill market or bank credit lines
  • They must actively develop the T bill market in coordination with the DMO
  • They must have authority to borrow on behalf of the government

• For these reasons, it is vital that cash managers have the support of senior management at the MoF which is usually supplied by
  • A high-level Cash Management Committee often chaired by the PS

What is the Necessary Phasing when Moving Beyond the Basics?

• In order to fully meet the primary objective under rough tuning operations, it is necessary first to have a well-defined cash buffer since:
  • The buffer level defines the period and amount which needs to be borrowed, and
  • Short-term borrowings under rough tuning will not cover forecast errors

• This requires
  • Either a broad definition e.g. covering debt servicing for 3 months
  • Or an good understanding of the likely forecast error volatility
  • A procedure for reviewing the definition/calculation regularly
What is the Necessary Phasing when Moving Beyond the Basics?

• Before moving to fine tuning, the cash managers need to have a finer basis for their cash flow forecasts
  • This should be on a daily basis for at least the following month, and weekly for the rest of the quarter, and monthly to year end, and
  • There needs to be substantial confidence in the forecast accuracy to ensure that financial transactions are not made in error and the buffer is minimised
• The borrowing and investing instruments need to be carefully selected and controlled
  • Risks should be well understood and analysed – market, liquidity, credit
  • Markets should be developed to reduce risks
  • Markets should understand the reasons that government is using them

• The buffer level is more important under fine tuning since it will define the daily transactions made for borrowing and investing
  • It should be calculated on a statistical basis utilizing the cash flow forecast error volatility
  • This requires a significant historical data record for analysis
• Strict procedures and regulations need to be enacted to control fine tuning financial decisions and transactions
• Only once these factors are in place will it be suitable for the government to move to active cash management through fine tuning operations.
Thank you!