International Monetary Fund - IMF
Regional Technical Assistance Center
Building Macroeconomic Capacity in East Africa

# Workshop: Taking Cash Management Forward

## Sessions 8 & 9: Taking Cash Management to the Next Level – Where to Go and What is Needed?

Thursday, February 15th, 2018

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## 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.*



## 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

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# 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).**

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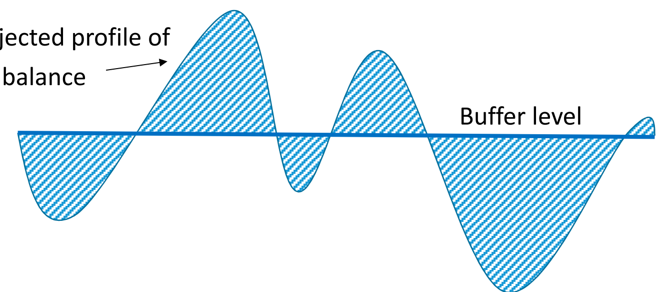
## The definition of a (deficit) budget: Total Expenditures = Total Revenues + Budget Deficit Financing

- 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

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## 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)

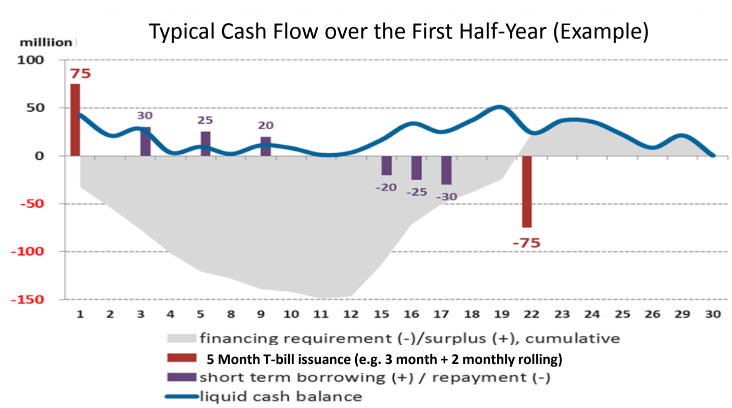
## The Cash Buffer Level – what should it be?

- 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.



## Basic Rough Tuning – To Keep the TSA Balance > 0

(or the buffer level)



## 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 manger 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

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## 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

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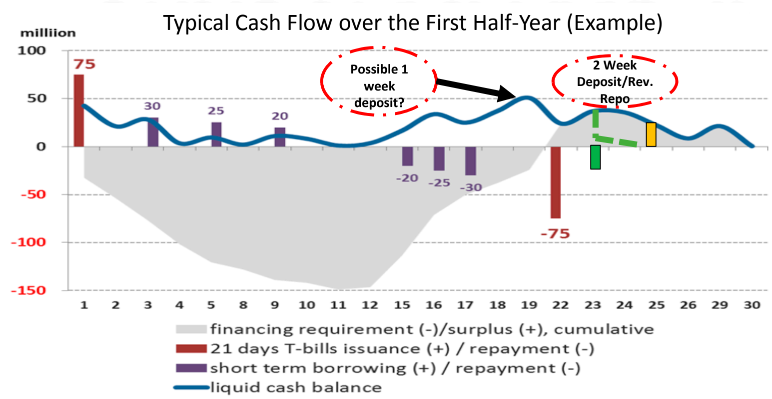
# Fine Tuning Applied to Previous Example

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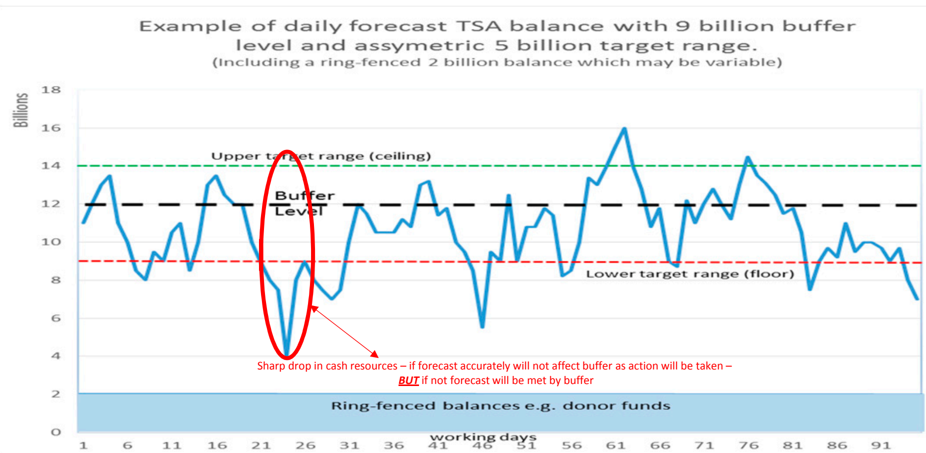
# Fine Tuning Activity in Reality

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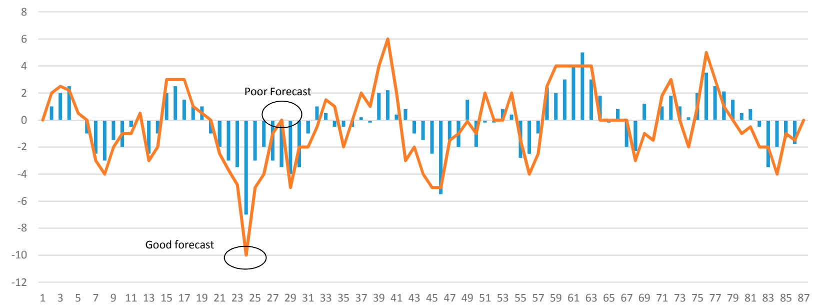
# Calculating the Buffer Level

Inflows/Outflows - Forecast/Actual

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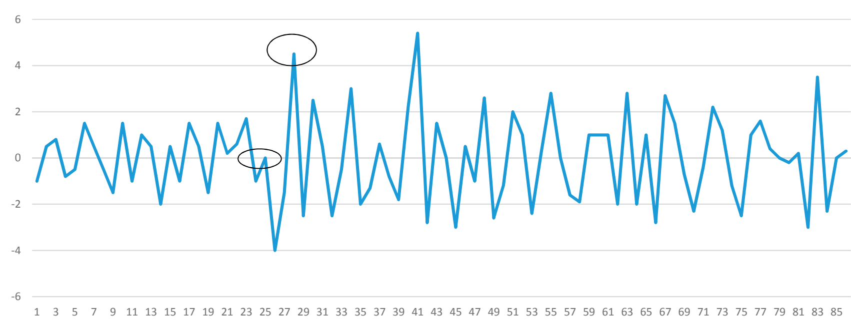
# Forecast Errors – Standard Deviation = 1.838

Forecast errors – Retrospective

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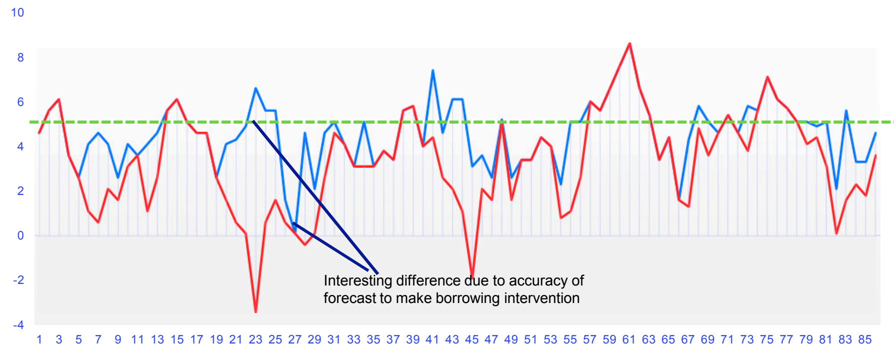
## Effects of Smoothing and Buffer Level

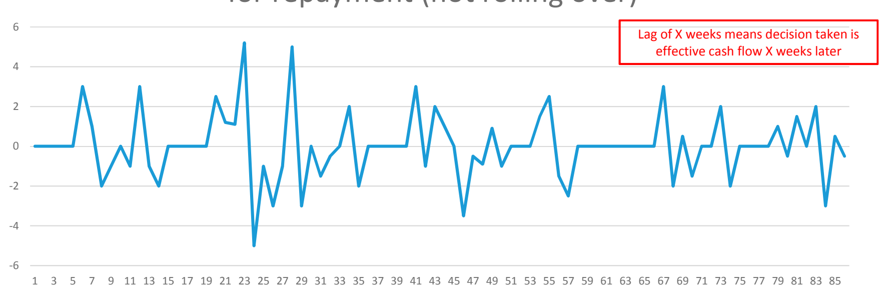
TSA level - Not Smoothed / Smoothed
----- 95% Forecast error buffer level
[= 1.96 * S.D. of forecast errors (N.B. Unsymmetrical)]






## 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)

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## 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 (butcan 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

## Active Cash Management - Relationships

- (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



## Active Cash Management - Relationships

- 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.

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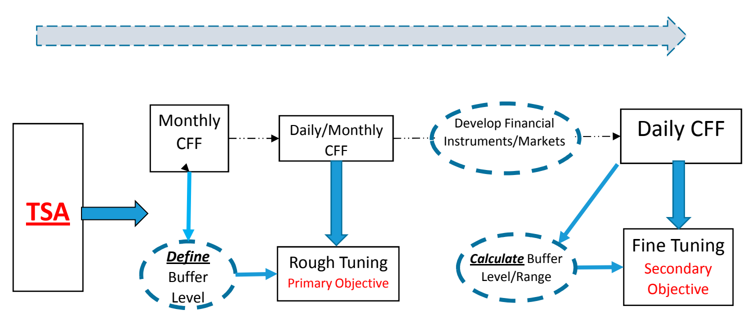
## What is the Necessary Phasing when Moving Beyond the Basics?

**Phased Development of Cash Management**




CFF – Cash Flow Forecast

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## 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 mangers 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

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## What is the Necessary Phasing when Moving Beyond the Basics?

- 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.

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