Cash Flow Forecasting and Cash Balance Management
DPI-10

Cash forecasting and cash management - Background
What is cash management?

• The strategy and associated processes for managing cost-effective the government’s short-term cash flows and cash balances both within government, and between government and other sectors
• Effective cash management is having the “right (amount of) money in the right place at the right time”
  – “right place” is usually a Treasury Single Account (TSA)
  – “right time” means cash managers produce accurate projections of fund movements into/out of TSA.
  – “right (amount of) money” means cash managers raise sufficient cash from various sources (particularly T-bills) in times of predicted cash shortage, and efficiently utilize (invest) cash resources in times of surplus

Cash management, debt management, and budget execution

• Cash Management (CM) and Debt Management (DeM)
  – CM is about in-year cash flow fluctuations
  – DeM focuses on planning and meeting multi-annual financing requirements
• Cash management is distinct from budget execution
  – Budget execution is about ensuring that the budget is managed consistently within agreed financial limits
  – Cash management is about ensuring that the government has the liquidity to execute its payments; it requires planning ahead
• Cutting planned expenditure because of a lack of cash is cash rationing, not cash management
Objectives of cash management

Ensuring cash is available to meet commitments

Overriding objective – other objectives must be subject to it

- Economising on cash within government
  - Saving costs
  - Reducing risk
- Managing efficiently the government’s aggregate short-term cash flow
  - Both cash deficits and cash surpluses
- In such a way as also to benefit
  - Debt management
  - Monetary policy
  - Financial markets (market liquidity and infrastructure)

Taking account of policy interactions

Source: Williams (Oxford Policy Management, 2009)
Approaches to cash management

**Passive approach**
- Monitoring cash balances, maintaining cash buffer to handle both volatility and unanticipated outflows
- If necessary restraining / slowing expenditures or delaying bill payments
  - cash “rationing” not cash management; good cash management avoids need for cash rationing

**Active approach**
- Trying to smooth weekly or daily cash flow by more active borrowing and lending in money market
- Allows lower average cash buffer – with benefits to other policies
- Gives tools to protect expenditure plans from cash flow volatility

OECD, many middle-income and several lower-income countries moving toward more active approach

Sound international practice - 1

1. Processing of government transactions with few handling steps – reliance on electronic transactions, centralised systems
   - Differences between countries in degree to which the payments process is centralised within the Treasury / central bank or relies on commercial banking system
2. Treasury Single Account (TSA): all Government cash balances aggregated in a single account
3. Internal systems to forecast daily government flows of receipts and payments
   - To ensure budgeted expenditure is smoothly financed
   - To devise strategies for smoothing the cash flow profile, minimising idle cash balances and reducing borrowing costs
   - To contribute to monetary policy (liquidity) implementation
   - Good forecasts rely heavily on those in spending units and tax departments closest to cash flow
4. Agreements between MoF/Treasury and Bank/Central Bank on information flows & respective responsibilities
   - Flow of information from MoF on government’s expected cash flows and balances held at banks/central bank
   - Flow of information to MoF on government’s actual balance at the bank (in close to real time)
   - Remuneration of accounts – preferably at market rate

5. Close interaction between government debt and cash management

6. Use of Treasury Bills (and repo and reverse repo) to help manage balances and timing mismatches

7. Efficient payments infrastructure

In the absence of effective cash management...

- Short-term surplus funds sit idle
  - costly for the government

- Bank’s liquidity management becomes more difficult
  - complicating monetary policy implementation and possibly compromising financial stability

- SNG’s debt program and overall debt structure are compromised
  - adding to the cost and risk of debt
  - arrears are accumulated or there is out-right default on obligations
  - negatively affecting the government’s creditworthiness

- Cash rationing by cutting down on planned expenditures
  - CM ensures government has liquidity to execute payments and does not resort to cash rationing
Effective CM requires both cash forecasting and cash management

**Sources of cash**
- Tax receipts
- Investment income
- Asset sales
- Debt issuance
- Other cash inflows

**Uses of cash**
- Primary expenditure
- Asset purchases
- Debt service
- Other cash outflows

Cash Buffer depends on:
The volatility of daily cash flows; the ability to forecast those cash flows; the scope to manage unanticipated fluctuations and the timescale over which they can be managed (e.g. how soon can additional TBills be issued?); and safety nets available (e.g. credit lines from commercial banks)

• Cash flow forecasting asks...
  - During each period, how much cash do we have coming in and going out?
  - As at the end of each period, how much cash do we have at hand?

• Cash balance management asks...
  - What actions do we take to ensure that we have the right amount of cash at hand?

Typical Phases of Development

• **Phase 1: Treasury Single Account**
  - integration of government accounts
  - sweeping of overnight balances into single MoF account at central bank (or more generally the banking system; remunerated)

• **Phase 2: Forecasting capability**
  - the development of a capability within MoF to monitor and forecast flows in and out of government – i.e. changes in MoF balances

• **Phase 3: Rough tuning**
  - the issue of Treasury bills (or other bills)
  - issuance pattern designed to offset liquidity impact of net daily cash flows, i.e. to smooth the change in MoF’s balances
  - some management of structural surpluses

• **Phase 4: Fine tuning**
  - more active policies, drawing on a wider range of instruments or institutional options, to smooth more fully MoF’s balances
  - *Not a priority for emerging market countries – focus on phase 1-3*
The TSA...

- **Aggregates all Government cash balances in a single account**
  - May be a set of linked accounts (or sub-ledger accounts)
  - Usually in the Central Bank
- Allows Treasury to minimise the volume of idle balances with consequent cost savings
- Can work with variety of payments systems
  - Payments approvals centralised in MoF/Treasury or dispersed to spending agencies
  - Processing of payments centralised within the MoF, Treasury or Central Bank, or dispersed to the banking sector
  - Hybrid
- But: any balances left with the banking system should be swept overnight back into the TSA
- Also need banking systems and account structures that can net transactions and aggregate balances into TSA

Cash Flow Forecasting: the Aim

- Objective is to anticipate cash needs of government
- Forecasts needed of total net cash flow (hence also cash balance)
  - Receipts and payments (above the line); and
  - Financing transactions (below the line) - debt redemptions, new borrowing, also (exceptional) assets sales
  - Focus is domestic currency
    - May need to identify FX, donor flows separately (depends on TSA structure)
- Forecast information is needed for some period ahead
  - Timing of future peaks and troughs must be identified to make decisions about the maturity of required borrowing or lending
- Ideally
  - Daily (if necessary weekly) some 3 months ahead
  - Rolled forward regularly (weekly)
Making Forecasting Work in Practice

- Forecasting relies heavily on those in spending units and tax departments closest to cash flows
  - Important that Spending Units and Tax Departments cooperate
  - Carrots and Sticks
    - Reward good forecasting: greater delegated authority, easier authorised transfer of funds from one use to another, roll-over of unused appropriations, etc.
    - Financial penalties for poor forecasting. Ensure there is no incentive to hoard cash
- Daily monitoring
  - Monitor actual transactions across TSA; outturn for the day must be known no later than following morning
  - Analyse experience: e.g. do forecast errors imply timing changes within the month or changes in the level of activity?
- Personal contacts
  - Cash forecasters in Treasury must have direct contact with opposite numbers in major spending units and tax departments
- Concentrate on major inflows and outflows
- Emphasis on history and experience
  - Not fancy econometrics for the sake of it

Reducing cash balance: case of Japan

- In 2005, Japanese government embarked on a series of measures to compress its cash balance
- Very simple but effective: reduction of timing mismatch between cash receipts and disbursements
  - Match the dates of the payments to SNs for ordinary tax-sharing arrangement and the receipts of tax and pension premium (April 4, June 2, September 4, November 2 for FY2006)
  - Match the payment dates of grants to national universities to the receipts of tax and pension premium (April 4, July 4, October 4, January 9 for FY2006)
  - Issuance dates of 2-year JGBs are matched to pension benefits payment dates (15th of each month)
  - Active use of 2-month finance bills
- Compressed the cash balance from JPY 8.3 trillion (FY2004) to JPY 4.6 trillion (FY2006)
  - Assuming the balance (JPY 3.7 trillion) would be otherwise financed by long-term bonds, cost saving of JPY 67 billion (Source: Takano, Finance, Nov. 2007, MOF website)
Who does what?

- Various national models – no “right” approach – but emerging good practice
- Spending units and tax departments – provide above the line data
- In MoF/Treasury/Debt Management Unit identify:
  - Who aggregates ‘above the line’ forecasts; and takes responsibility for the projection of the total
  - Who adds ‘below the line’ transactions – often the debt managers
  - Who makes decisions about investment of surpluses or issuance of TBills to manage cash flow - increasingly integrated with debt management unit
- Central bank – provides banking services and information flows
- Good practice guidance
  - Identify who is responsible for what – others should not second guess
  - Establish coordination structures where necessary – eg with central bank on respective money market operations
  - Single focus for final compilation and decision making
  - Often a regular [weekly] meetings of those responsible in MoF to review forecast updates, decide on investment / issuance policies, establish risk parameters

Operational DeM/CM coordination

- Day-to-day coordination requirements include:
  - Linkage of issuance dates with redemption dates, to maximise the opportunities for investors to roll over into a new issue
  - Maturity dates chosen to avoid weeks, and especially days, of heavy cash outflow (e.g. salary payments): instead target days of cash inflow (the due date for tax payments)
  - Debt managers can mitigate the cash management problems that potentially arise when large bonds mature
  - Also debt managers can correct repo market distortions or disruptions
- As interaction with the market develops, integration of debt and cash management functions becomes especially important.
  - In time, through active management of the short-term cash position, the combined function will be better placed to weaken the link between the timing of cash flows and bond issuance
    - Allows pattern of bond sales to be announced in advance
    - Ensures that the government presents a consistent face to the market
Cash management instruments

Borrowing
- Treasury bill usually main instrument in moving towards more active cash management
  - TBill has different roles as instrument of
    - debt management
    - cash management
    - monetary policy
  - Emphasis on shorter-term (e.g. 1 month) bills for cash management
- Repo usually used for fine tuning – but requires liquid market

Lending
- (Reverse) repo preferred instrument if market sufficiently liquid
  - Secured and flexible
- Many countries use
  - Lend at market rates – term or overnight
  - Competitive process (by tender if no transparent prices)
  - But must be collateralised – reduce credit risk
- Consider (remunerated) deposits with central bank if important to underpin monetary policy stance

Cash balance targets

Allocating cash into 2-3 tiers of sub-portfolios according to different liquidity needs

- Operating cash balance
  - Balance changes frequently
  - Liquidity is primary concern
  - Shorter investment horizon (overnight)
- Reserve cash balance
  - Balance rarely changes, serves as buffer
  - Possibility to seek higher returns by extending Investment horizon (overnight/monthly)
  - Tier can be reduced if reliable forecasting and short-term funding sources available
- Semi-permanent cash balance
  - No foreseeable need for liquidation
  - Suitable for seeking higher returns by extending investment horizon (monthly/short-term index)
SNs portfolio – U.S. and Japan

U.S. States and Local Governments (2010 Q1)

- Cash
- Deposits
- MMF
- Repos
- Open market paper
- Treasury securities
- Agency/GSE
- Municipal securities
- Corporate and foreign bonds
- Mortgages
- Equities
- Mutual funds

Source: Flow of Funds Account, Federal Reserve

Japanese Prefectures, Designated Cities and other Local Governments (2010 Q1)

- Deposit
- Repos
- Loans
- JGB
- LGU bonds
- Public corporation securities
- Equities

Source: Flow of Funds Account, Bank of Japan

Cash forecasting and cash management, and SN-DeMPA
The DeMPA scoring methodology (DPI 10) emphasizes...

- the effectiveness of forecasting the aggregate level of cash balances in government bank accounts

<table>
<thead>
<tr>
<th>Forecast Type</th>
<th>Frequency</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Quarterly forecasts of monthly balances</td>
<td>C</td>
<td>Reasonable + reliable</td>
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<tr>
<td>Monthly forecasts of weekly balances</td>
<td>B</td>
<td></td>
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<tr>
<td>Rolling 30-day forecasts of overnight balances</td>
<td>A</td>
<td></td>
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- Decision of a proper cash balance (liquidity buffer), and effectiveness of managing this cash balance (including the integration with any domestic borrowing program, if required)

<table>
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<th>Action Description</th>
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<td>SNG decides range of cash balance, takes actions to keep the cash balance within the determined range. Any investments of cash is in line with credit risks</td>
<td>C</td>
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<tr>
<td>Keep cash balance within determined range on a monthly basis.</td>
<td>B</td>
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<tr>
<td>Cash balance kept in range on a two-weekly basis</td>
<td>A on weekly basis</td>
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SNG decides range of cash balance, takes actions to keep the cash balance within the determined range. Any investments of cash is in line with credit risks. Keep cash balance within determined range on a monthly basis. Cash balance kept in range on a two-weekly basis... on weekly basis.