Targeting the Cash Balance: the Cash Buffer

PEMPAL Treasury Community of Practice

Cash Management Thematic Group Meeting

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Outline

- The Cash Buffer
  - What it is and why we need it
- Determining the buffer
  - The importance of forecasting
  - The transaction buffer and the precautionary (safety) buffer
- International examples
- The buffer and other surpluses

Why do we need a Cash Buffer?

- What is the Cash Buffer?
  - "The minimum level of cash balances to be sure of meeting day to day cash requirements, at all times, under all circumstances, taking into account the availability of other liquid resources"
- Why do we need it?
  - To meet day to day volatility
  - To cope with forecasting errors
  - To tide over times of financial stress or crisis

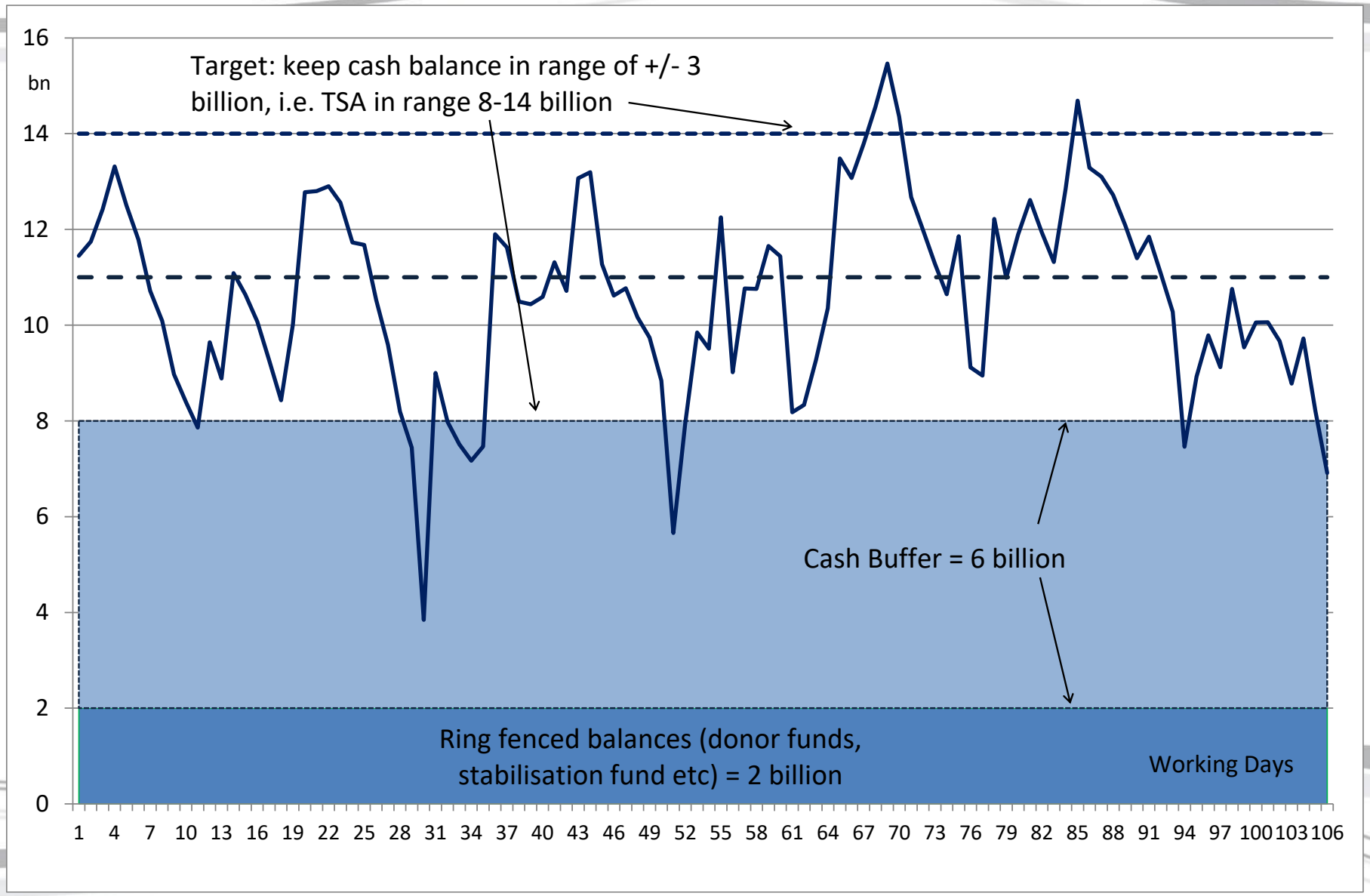
New Risks

- Need for cash buffers long understood: but the Financial Crisis drew attention to
  - Risk that domestic markets (not only FX markets) can dry up
    - Liquidity risk; activity in the interbank (especially) and repo markets fell
  - Several countries increased their cash buffer (esp in Europe)
  - Recognised importance of a "financing continuity plan"
    - Cash buffers are part but only part of this
- Note: cash buffer is separate from structural surpluses
  - Cash managers control cash or investments needed in the short-term [less than 3 months?]
  - Any excess should be managed separately – see later
  - May still be cost-effective to borrow to manage cash volatility (and wider benefits to money market)

Cash Flows and Cash Balances

- Effective cash management requires managing both flows and balances
- Cash flow management asks…
  - During each period, how much cash do we have coming in and going out?
  - How can we smooth the flows, at the same time meeting our cash balance target?
- Cash balance management asks…
  - What actions do we take to ensure that we have the right amount of cash at hand?
  - How do we put temporary surpluses to good use?
- Governments need access to liquidity – implies some cash balances
  - We need to identify the minimum

Identifying the Cash Buffer



What Determines the Cash Buffer?

1. The volatility of daily cash flows
2. The ability to forecast those cash flows and respond to the forecasts
   - Standard deviation of errors in the forecast will [should] be much less than standard deviation of outturn
   - How far can we smooth flows even if we forecast them perfectly
3. The scope to manage unanticipated fluctuations and the timescale over which they can be managed
   - How soon can additional Tbills be issued?
4. Safety nets
   - Cash buffer; or other cash reserve funds
   - Emergency credit facilities
   - End of day borrowing from commercial banks
   - Short-term borrowing from central bank, where it is available

- Note: a large cash buffer is expensive (cost of carry); but if there are limited safety nets available, cost of carry is less important than maintaining the minimum buffer

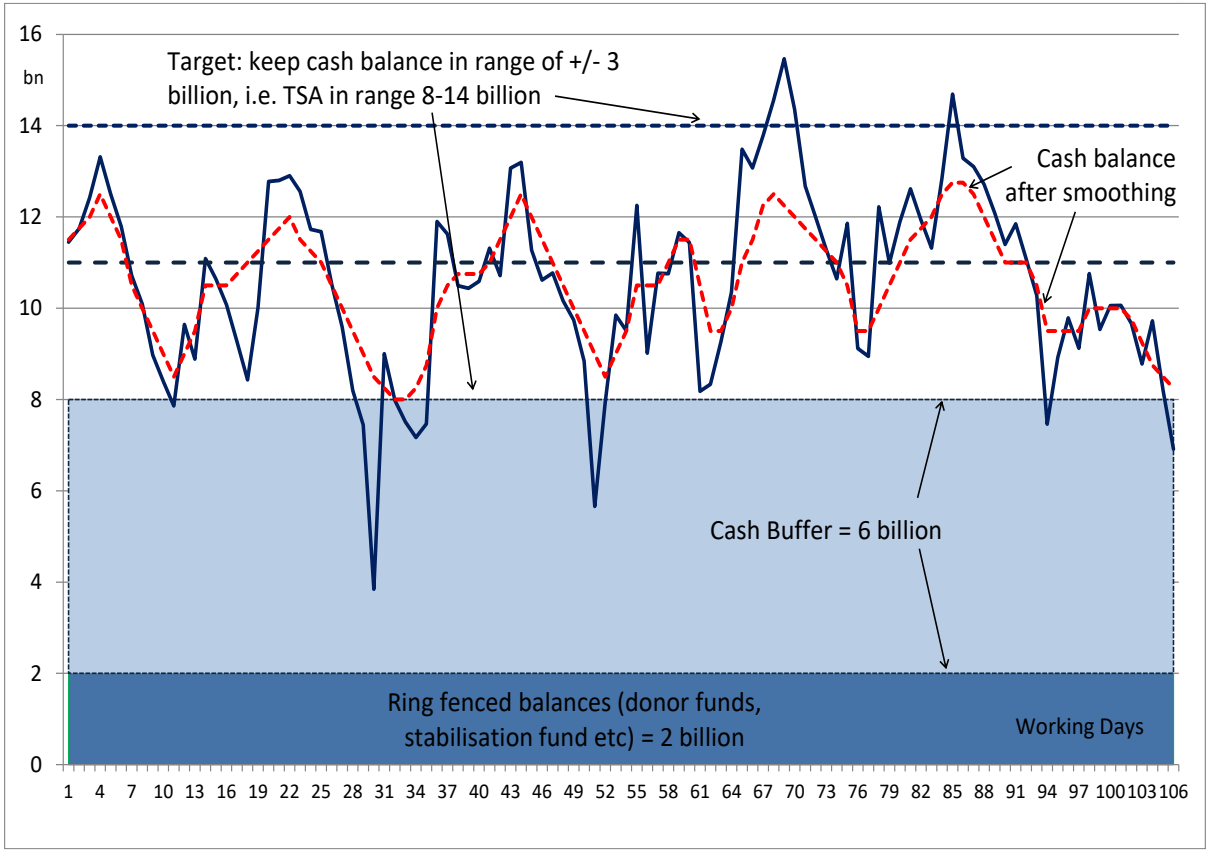
The Usefulness of Historical Volatility

- If historical daily volatility is known, able to calculate relationship between size of buffer and chance that cash will always be sufficient.
  - Example: buffer to give e.g. 99% confidence level that balance will not fall below zero over a month.* But:
    - Underlying distributions, of flows or forecast errors are not normal
    - Expect negative serial correlation (errors offset within the month – tax receipts or transfer payments may be delayed by a day, but still happen)
    - Is there a way of dealing with the residual 1%? Do we worry about black swans?
- Possible to develop probabilistic models relating the optimal cash balance to the interest rate differentials (on overdraft or funding rate compared to the rate on cash balances). Measures cost of caution. But again assumes:
  - Normally distributed errors
  - Overdraft borrowing is available and acceptable

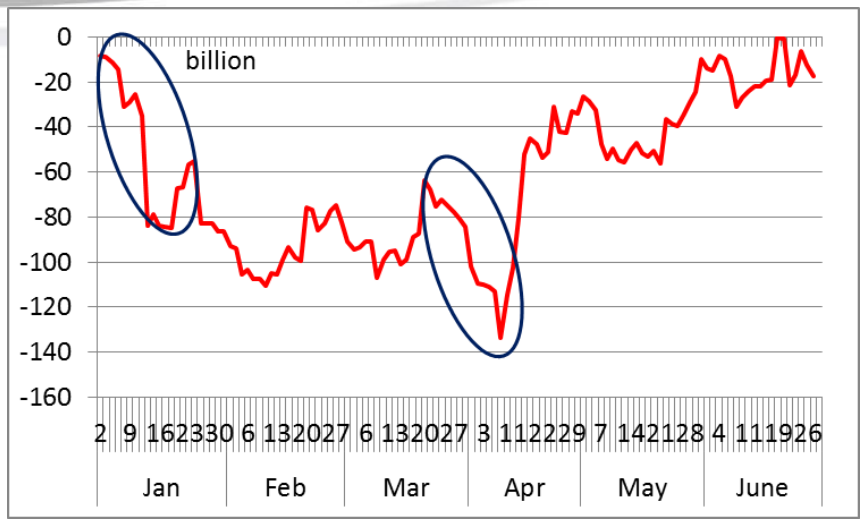
* Multiply daily standard deviation (StDev) by [square route of number of days in month]*[value of normal distribution at a 2% confidence level (1% for each tail)] = StDev*(22^0.5)*2.33 = StDev*11

The Value of Forecasting

- With a good forecast possible to plan a smoothing strategy
  - Borrowing (Tbills) and investment
- If forecasts are "perfect" and Tbill market sufficiently liquid no need for any cash buffer
- The better the forecasts, the less the buffer

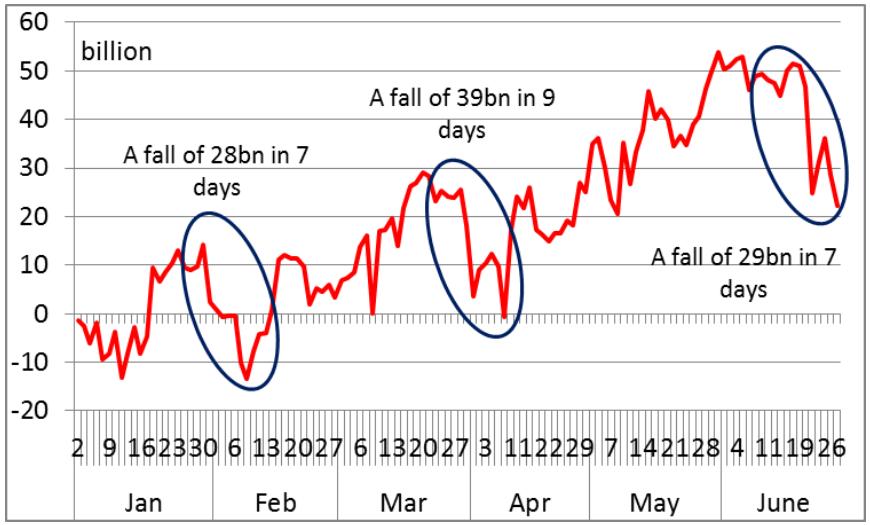


Example: Importance of Forecasts



Actual cumulative cash flow: fall of 80 billion in a short period

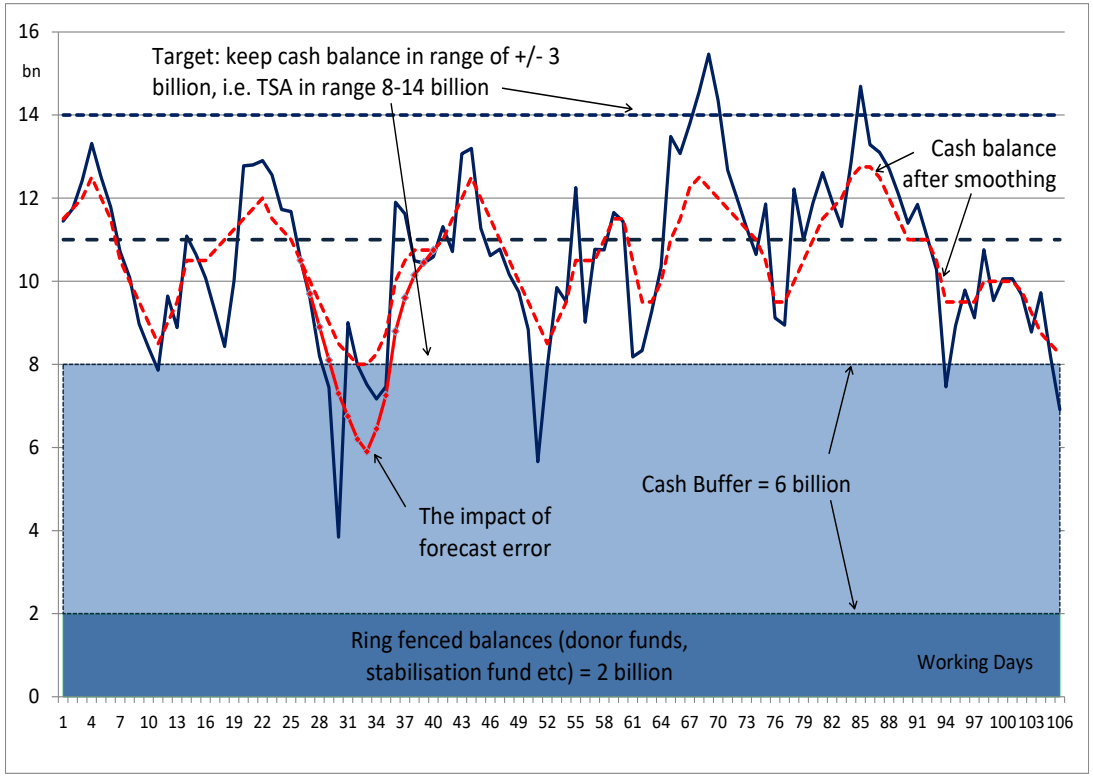
Cash flow forecasts: accumulated error in a short period suggests that 30 billion would be sufficient



Note: if it is not possible to respond to forecasts, then underlying volatility remains relevant – if Tbills issued weekly, likely still to be volatility within the week (unless repo is available)

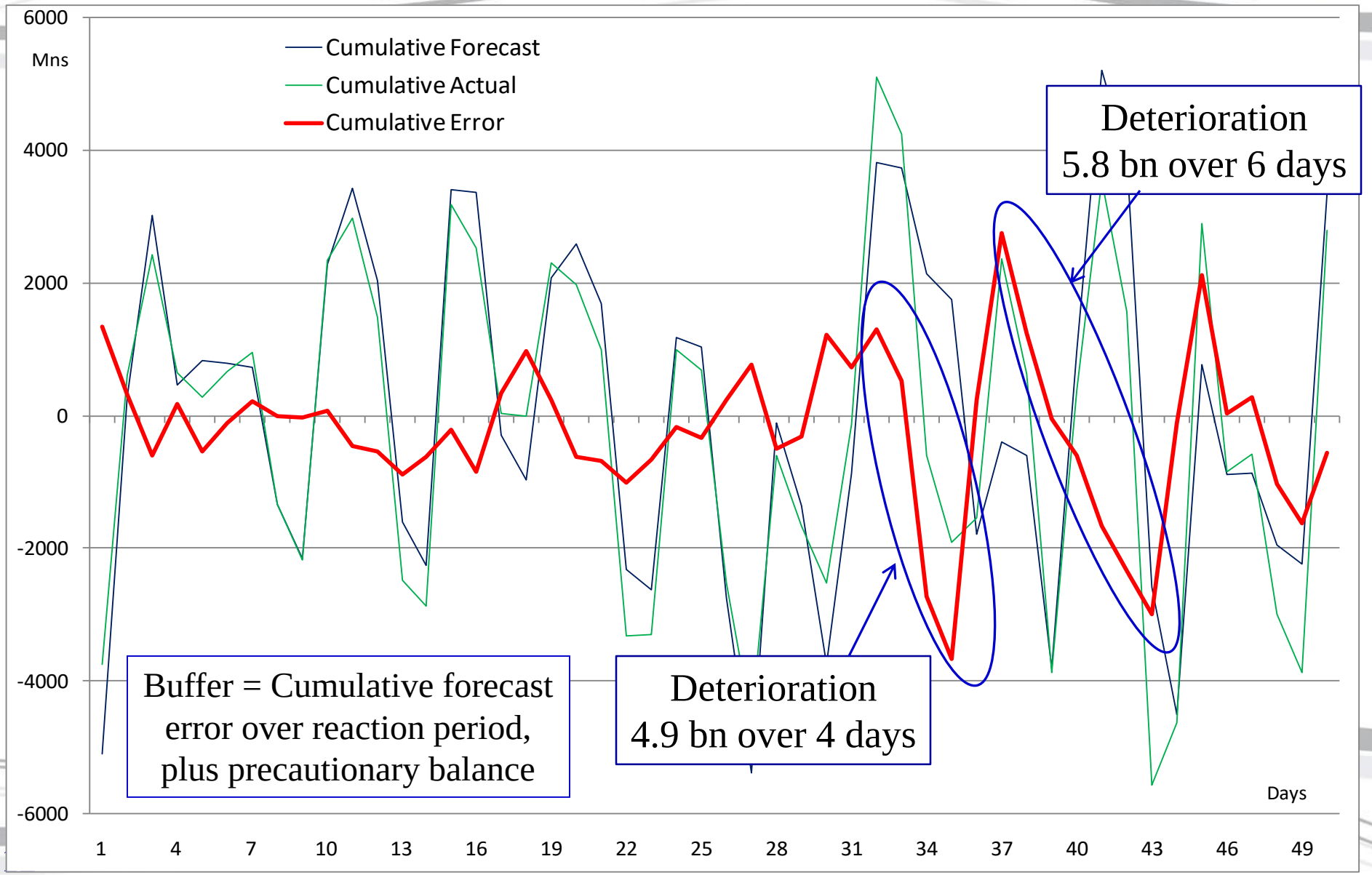
Impact of Forecast Errors

- Standard deviation of the errors in the forecast << standard deviation of the outturn
  - but they will not be zero
  - It is the cumulative error that is important
- Identify: the maximum unanticipated fall in the cash balance over any period where intervention is no longer practical
  - In this context, the timescale over which unanticipated fluctuations can be managed is important.
  - In countries that issue Tbills regularly that is probably between 1-2 weeks

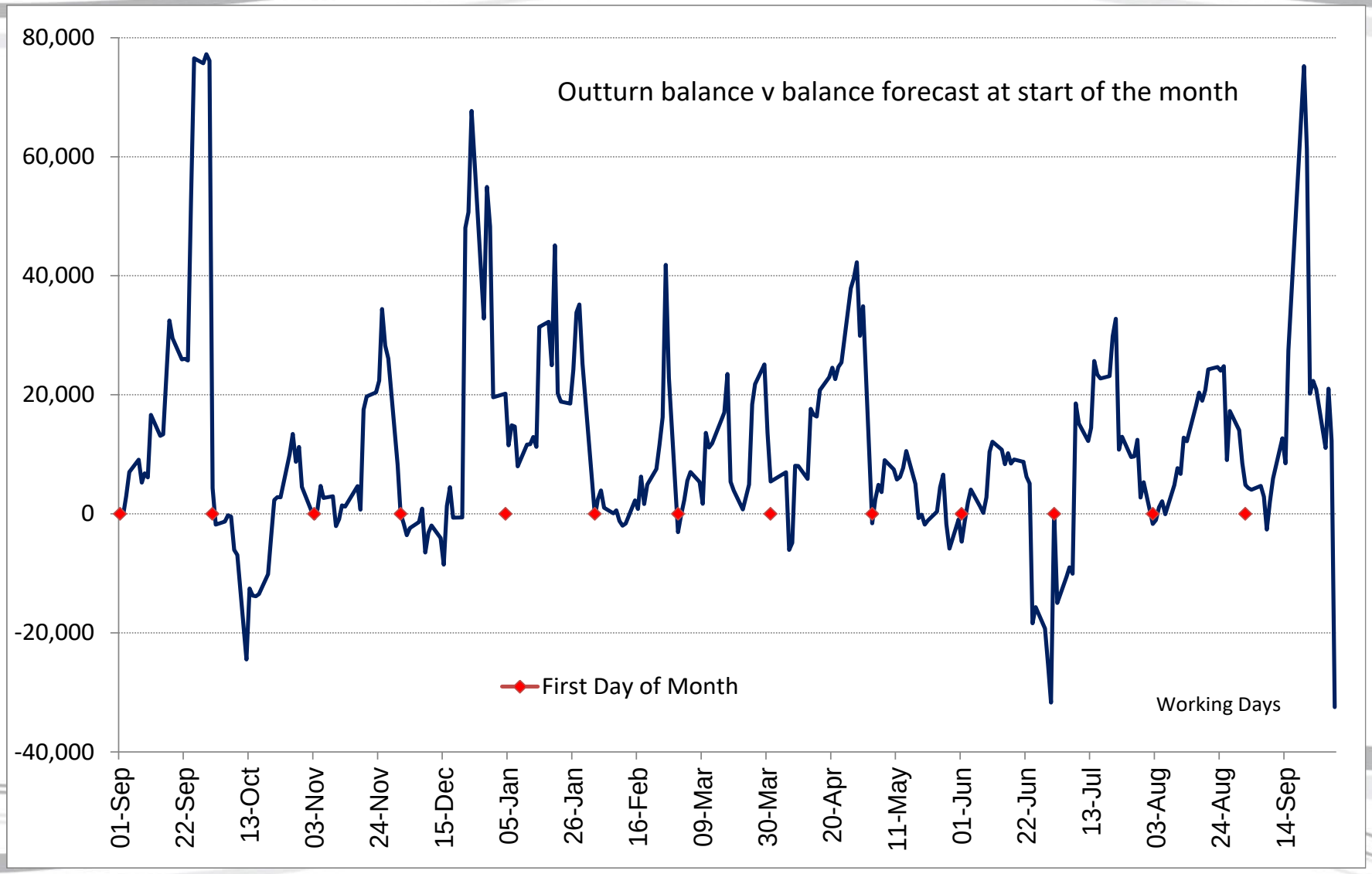


Concept of transactions buffer

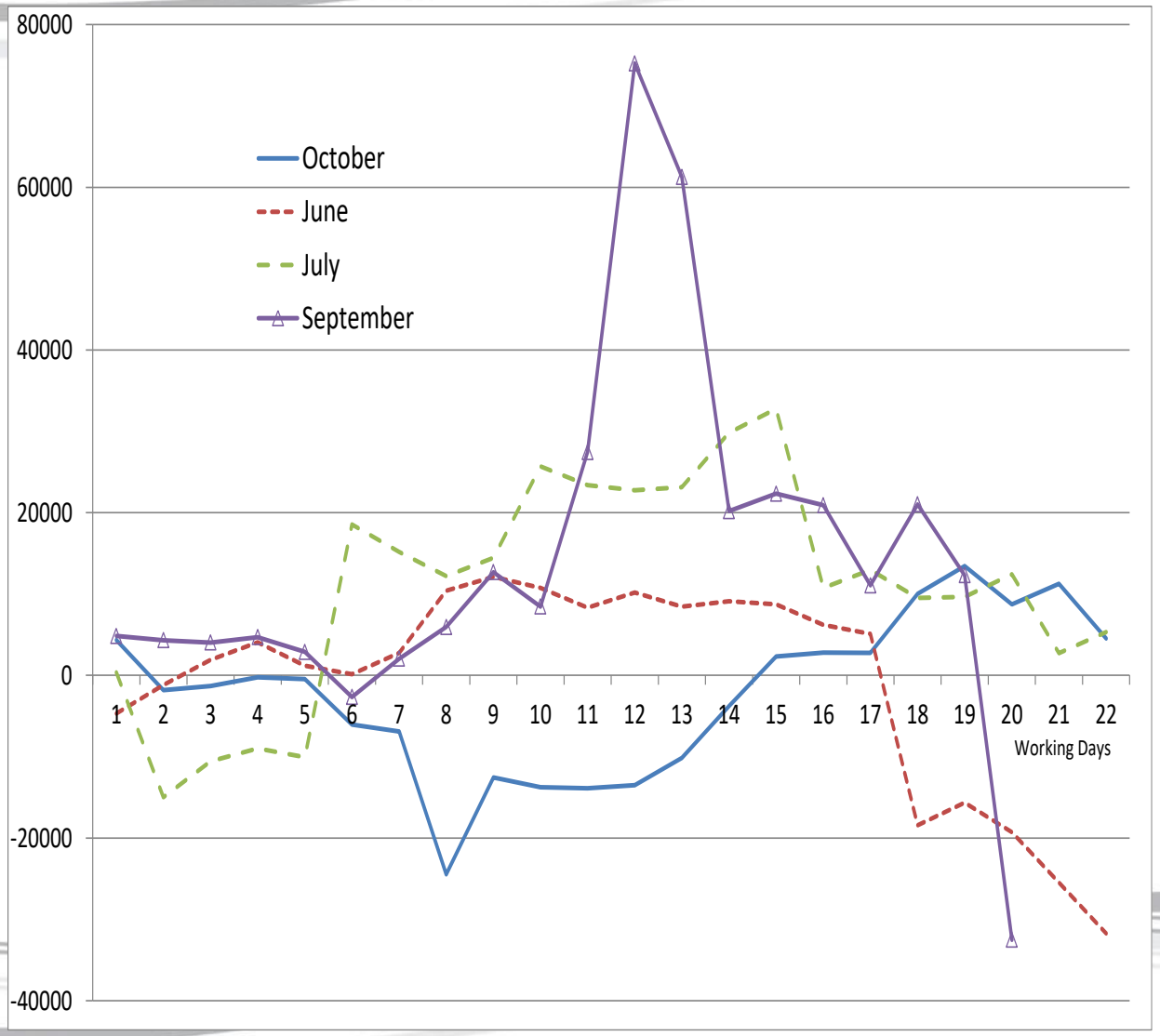
Transaction Buffer: Illustration



Other Example...



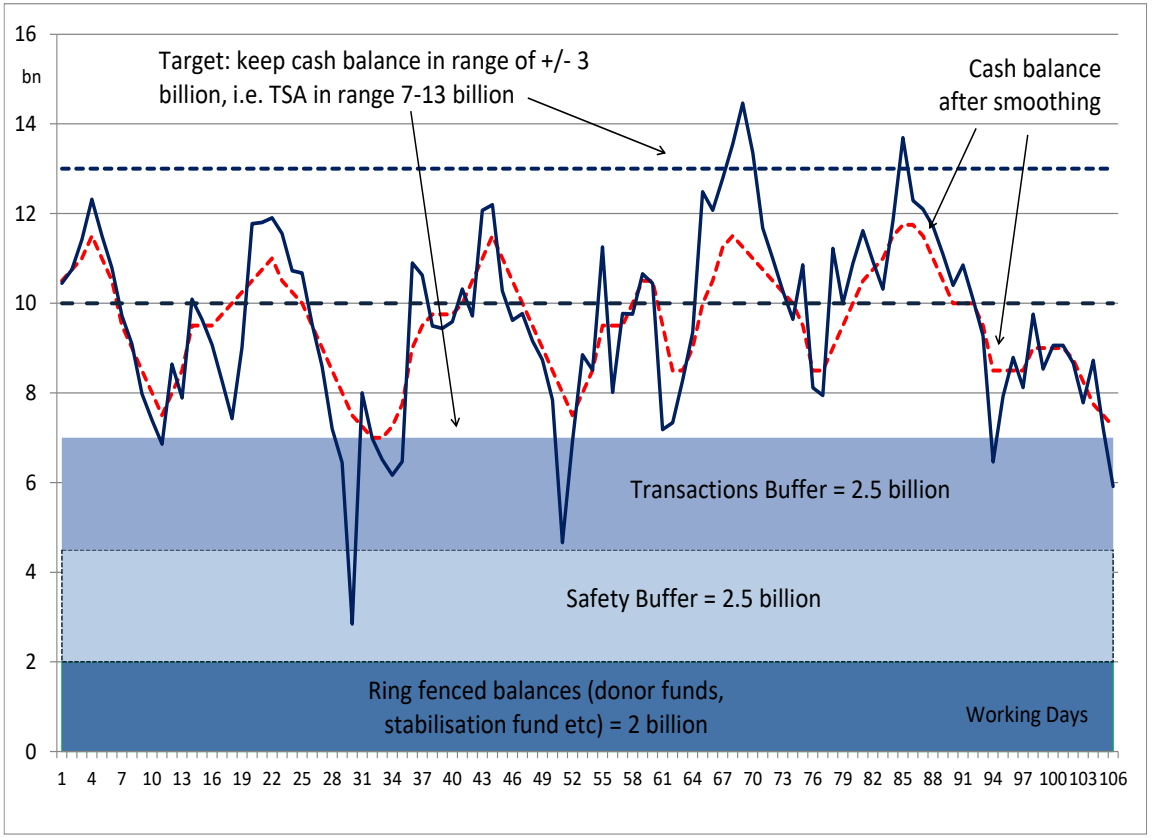
Focus on Cumulative Errors



- October: cumulative negative error at start of month – 29,000 over 7 days.
- June: at end of month, cumulative error 37,000 over 5 days. But linked with rescheduled bond sale. To the extent that decision was made earlier, no problem.
- September v. volatile. Positive error mid month, linked with bond auctions and a tax receipt, reversed itself, then deterioration 30,000 at end month
- Suggests minimum balance c.30-40,000 [plus reserve] – needs more analysis

Safety Buffer

- Options
  - Maximum amount of financing needed if the capital market was disrupted for [1-2] months and no bond issuance could take place in that month
  - Some countries allow explicitly for a failed government securities auction
- Transactions and safety tranches have some parallels in motives traditionally identified for holding cash, i.e. the transactions and precautionary motives



Cash Buffers in Practice

- Several northern European countries operate with cash balances in the central bank << 0.1% annual central government expenditure
  - But they have liquid money markets, sophisticated active cash management. Some plan to be long of cash and on-lend only when position is secure
  - Drying up of liquidity in financial crisis led some to be more cautious
- Some other approaches – the importance of signalling prudence:
  - Target balance calculated as a safety reserve in event of adverse market conditions – market closure or higher costs
    - depends on expected time to return to normality
  - Maintaining balances at least as great as the debt redemptions due in the following month, implicitly allowing for a failed auction
  - To guarantee budget execution or debt service for [X] months
  - In Italy used to be (until 2011) a legal requirement for balances to exceed €10 billion – the peak of cumulative net outflows reached in any period
- But the buffer has an opportunity cost – there is a trade-off with caution

World Bank Survey* - 1

- Benefits of a buffer generally recognised (11 responses)
  - But motives vary
  - Different emphasis as between transactions/volatility and financial stress
  - Some countries (Hungary, Uruguay) quoted need to support debt management operations – e.g. buy-backs – or to reduce refinancing risk
  - Different views about telling the market
- The target
  - Often expressed as months of financing – whether regular flows or specific lumpy flows (redemptions, auctions)
- Some countries have no formal buffer
  - May be because either too much cash or easy access to cash (Chile, Poland, Colombia) or not enough cash (Kenya, Nigeria)
- All countries have some safety nets (borrowing from central bank and/or overnight from commercial banks)

** WB Capital Markets Group: Peer Group Dialogue – May 2014*

World Bank Survey - 2

- Uruguay – a different approach
  - Deficit + amortization for 12 months (=4% of GDP)
  - Based on probability that market is "closed"
    - "closed" = EMBI+ 20%>trend; or Uruguay paying 200bps>EMBI+
    - Focus on external borrowing only – not clear why

- Some questions arising from the survey
  - Where do the rules of thumb come from – are they arbitrary?
    - Why 3 months or 12 months of debt servicing – why not 6 months?
    - In responding countries the financial crisis did not lead to an increase (unlike Europe)
  - Are balances for refinancing operations part of the buffer? Suggest manage separately
  - Does there need to be a separate FX buffer?

Investing the Buffer

- Normal presumption is that the buffer is held in the Central Bank
  - Part of the Treasury Single Account – as seems to be the case from the survey
  - Avoids any credit or liquidity risk
  - If cash managed actively to keep TSA close to the buffer, no adverse implications for monetary policy
  - Should be remunerated at risk-free market rate (close to the policy rate) – reflects opportunity cost and to give the right incentives
- There are other options
  - Deposits with commercial banks; but beware of
    - credit risk unless collateralized (or as reverse repo)
    - liquidity risk unless very short term (breaking term deposits incurs a penalty)
  - Money market funds – but claimed liquidity may be a chimera
  - Credit lines – may evaporate at times of financial stress
- Such options may be more appropriate for a cash reserve fund over and above the buffer (next slide)

Handling the Structural Surplus

- Sums above the cash buffers, not part of management of daily fluctuation, should be managed separately (or used to repay debt)
  - Structural cash reserve, stabilization fund, sovereign wealth fund
- Cash managers have responsibility only for short-term investments that are part of the cash flow smoothing process
  - Mostly deposits or repos with a maturity < 3-months
- Management of structural surplus subject to different criteria, with different managers and a different governance framework
  - Own objectives, asset allocation (linked to balance sheet objectives), performance reporting etc
- May still invest part of surplus in relatively short-term assets
  - Especially if money market is thin or volatile
  - Comprises a reserve source of liquidity if cash management problems
  - Examples: UK 3G 3-month cash fund; Peru's market liquidity fund

Some (General) Conclusions

- Cash buffers just one part of the ”financing continuity plan”
- Need to consider:
  - Underlying volatility
  - Ability to forecast and take advantage of the forecast
  - Ability to react
  - Safety nets
- Distinguish between a transactions buffer; and a safety or precautionary buffer
- Avoid formulaic approaches: identify the drivers and consider the opportunity cost
- Are there signalling advantages from telling the market?

Thank You!