Presentation Layout

- Background to BSL’s Monetary Policy
- Background to Liquidity Forecasting
- The Liquidity Forecasting Framework and Current Status
- Challenges and the Way Forward
Bank of Sierra Leone’s monetary policy stance is that of maintaining price stability i.e. maintaining a low, preferably single digit inflation.

The Bank employs a Reserve Money targeting strategy given the link between Reserve Money and Inflation.

\[ R (m) = Ms, \quad l = f (Ms...) \]

- \( R \) = reserve money,
- \( m \) = multiplier,
- \( Ms \) = money supply,
- \( l \) = inflation
Back ground to BSL’s Monetary Policy

- Inflation is the ultimate target of monetary policy with money supply being the intermediate target and reserve money the operating target.

- The reserve money target can be attained through the use of a series of instruments i.e. direct and indirect instruments.
Background to BSL’s Monetary Policy

Direct instruments include credit ceilings, directed credits and interest rate controls whilst, indirect instruments include open-market operations, reserve requirement ratios, central bank’s lending rate.
Back ground to BSL’s Monetary Policy

- Global move towards market-based instruments
- Use of indirect instruments are considered as the international best practice,
- Bank of Sierra Leone has also adopted the use of these indirect instruments particularly open market type operations e.g. government securities auctions.
Background to BSL’s Monetary Policy

Monetary Policy → Operational Target → Intermediate Target → Ultimate Target

(OMO) (Reserve Money) (Money Supply) (Inflation)

• BSL can only maintain control over the supply of reserves and hence achieve its stated policy objective by developing a liquidity forecasting framework.

• Involves creating an information set, which enables BSL to influence liquidity conditions.
Government cash flows, for example, have a large impact on the liquidity supply and may lead to excess liquidity in the system with inflationary consequences, which may not be in line with current monetary policy.

In such cases the Central Bank may decide to sell/ increase its parcel of securities for sale in order to sterilise the excess liquidity.
Background to Liquidity Forecasting

- To meet its monetary policy objectives the Bank will depend on the liquidity forecasts, to determine if there is a liquidity shortage in which case the Bank’s policy would be expansionary by retirement of existing securities.

- In the case of excess liquidity, monetary policy would be contractionary through the issuing of new securities.
Background to Liquidity Forecasting

- In such circumstances, sound liquidity management decisions are based on liquidity forecasts and this helps to keep liquidity at a level consistent with an acceptable rate of inflation.
Background to Liquidity Forecasting

- **Objectives**
- Identifying the determinants for short-run fluctuations in liquidity demand and supply.
- Enabling the central bank to determine how much liquidity it should add or withdraw from the system through the buying and selling of government securities such as Treasury Bills and Treasury Bearer Bonds.
- The reduction of volatility and uncertainties thereby reducing liquidity management costs.
- Enabling the Bank to help achieve the macroeconomic objectives of monetary and economic policies.
Background to Liquidity Forecasting

- Ideally the liquidity forecasts should be done on a daily basis, but as the project is still in its infancy liquidity forecasts are done weekly in line with the weekly government security auctions undertaken by the Bank.

- However, the Bank will move towards daily liquidity forecasts after the forecasting process has been fine tuned, in order to facilitate the adoption of daily Repos and Reverse Repos by Bank of Sierra Leone.
The forecasting process involves distributing the quarterly Reserve Money target over the weeks of the quarter to obtain a weekly Reserve Money target. Forecasts are conducted taking into account the flows and the weekly reserve money target.

The forecasts should then indicate the level of liquidity in order to determine the direction of the Bank’s monetary policy.
The Liquidity Forecasting Framework
and Current Status

The functions of the Liquidity Forecasting Unit include the following:

- Obtain data for developing forecasts and actual data for conducting error analysis.
- Coordinating inputs from data sources.
- Forecasting future liquidity requirements.
- Assessing forecasting errors and suggesting measures by which variations between forecasts and actuals could be minimised.
- Witness securities auction and offer input into decision as to parcel sizes for next auction.
- Monitor the consistency of the forecasted components.
- Maintaining the liquidity database.
The Liquidity Forecasting Framework and Current Status

The Liquidity Forecasting framework is derived from the Central Bank balance sheet.

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Foreign Assets</td>
<td>Currency in Circulation</td>
</tr>
<tr>
<td>Net Position of the Government</td>
<td>Bank Reserves</td>
</tr>
<tr>
<td>Lending to Banks/Open Market operations</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
The Liquidity Forecasting Framework and Current Status

- **Mode of Operation**
- A template in MS Excel has been developed in collaboration with a Monetary Operations Advisor from the IMF and this provides a framework within which projected changes in the main items of the Central Bank’s balance sheet could be analysed.
- The framework should predict changes in Bank reserves
  
  Bank Reserves = Initial reserves + Change in Foreign currency transactions + change in Net Position of Govt + Change in bank lending/OMO - Change in Currency in Circulation
  
  Excess reserves = Bank reserves – required reserves – reserve money growth target
The Liquidity Forecasting Framework and Current Status

- In the short run the Central Bank only has control over bank lending and open market operations, which can be used for monetary policy purposes.
- The other variables are referred to as the autonomous liquidity position and are clearly indicated on the template.
- To determine whether an economy needs more or less liquidity the Central Bank needs to have sufficient information on the autonomous liquidity position.
- The Central Bank would then be in a position to determine whether there would be an excess supply or demand for liquidity based on its liquidity target, if it does not intervene.
- With this in mind, the Central Bank can implement policies to achieve the desired liquidity position.
The Liquidity Forecasting Framework and Current Status

Forecast Techniques
- No econometric technique involved

Approaches
- Actual data
- Historical patterns as to the timing of flows or seasonal patterns
- Weekly historical used to replicate weekly forecasts
- Develop a scale factor which is applied to weekly historical data
The Liquidity Forecasting Framework and Current Status

- Scale factor = current year forecast / previous year actual
- E.g. year x-1 = 100, year x = 105
- Scale factor = 1.05
- Apply scale factor to actual data from the previous year to generate forecasts for coming year.

E.g. week     scale factor year x-1   year x

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>1.05</td>
<td>10</td>
<td>10.5</td>
</tr>
<tr>
<td>2</td>
<td>1.05</td>
<td>5</td>
<td>5.25</td>
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</table>
The Liquidity Forecasting Framework and Current Status

<table>
<thead>
<tr>
<th>Week ending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Liquidity Balance</td>
</tr>
<tr>
<td>Income Tax</td>
</tr>
<tr>
<td>Company Tax</td>
</tr>
<tr>
<td>Paye Tax</td>
</tr>
<tr>
<td>Customs and Excise</td>
</tr>
<tr>
<td>Mines</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>TOTAL REVENUE</td>
</tr>
<tr>
<td>Salaries/Allowances</td>
</tr>
<tr>
<td>Goods and Services - Domestic</td>
</tr>
<tr>
<td>Interest - Treasury Bearer Bonds</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>TOTAL EXPENSES</td>
</tr>
<tr>
<td>Net Gov't Expenditure</td>
</tr>
</tbody>
</table>
The Liquidity Forecasting Framework and Current Status

BSL and Bank Operations
Treasury Bills
Maturities (+)
Treasury Bonds
Maturities (+)
Total Maturities
Net BSL Purchase of Bills and Bonds

Net Foreign currency transactions – Auction
Other
Change in Currency through commercial banks
less change in currency through tellers
Total Change in Currency and vault cash

Forecast Change in bank reserves before BSL operations
The Liquidity Forecasting Framework and Current Status

Forecast bank reserves before BSL Operations
  Less: Required Bank Reserves
Forecast excess reserves before BSL Operation

Suggested BSL actions
  Primary Market
    Treasury Bills issued at discount
    Treasury Bonds issue
  Secondary market
    OMOs
    Other
Forecast Excess Reserves
Reserve money Growth target
Undesired excess reserves
The Liquidity Forecasting Framework and Current Status

The specific functions of the various data-providing Units are as follows:

1. The *International Finance Department* supplies actual data on transactions at the foreign exchange auction, and contributes to the provision of forecasts of quarterly amounts for the Foreign Exchange Auction.

2. The *Banking Department* provides actual data on government securities and forecasts of interest due on securities as well data on maturities.

3. The *Ministry of Finance* in collaboration with the *Public Finance Section of the Research Department* supplies data on actual government revenue and expenditure figures as well generating forecasts of revenue and expenditure.

4. The *Monetary Analysis Section of the Research Department* supplies actual and forecast data on Currency in Circulation and status of commercial bank reserves.
The Liquidity Forecasting Framework and Current Status

- Liquidity forecasts are generated on a quarterly basis, to coincide with the monetary programme produced by the Banking Department of the Bank of Sierra Leone.
- Forecasting conducted as a rolling process under which every new piece of information is promptly incorporated.
- The various data sources are responsible for providing the necessary data to be entered into the template developed in MS Excel.
- Forecasting is undertaken using the software and/or informed judgement based on trends in the relevant historical time series data.
- Error analysis of the variance between actuals and forecasts- is performed daily with a view to enhancing the accuracy of the forecasts and improving the forecasting techniques.
- However, given the institutional bottlenecks and imperfections of the payments systems, there are lags in the receipt of data.
The Liquidity Forecasting Framework and Current Status

The Current Status

- The framework and a manual of operations have been developed
- Forecasts have been developed for Q1, 2008
- Quarterly forecasts have been broken down into weekly forecasts
- The Unit attends weekly security auctions with forecasts for the coming week
- Error analysis is an on going activity carried out with the receipt of additional data and after the weekly auctions
Challenges and the Way Forward

Challenges

- Government revenues and expenditures remain difficult to forecast due to poor information on expected payments/receipts, and irregular government payment cycles
- Lag in obtaining the commercial bank cash balances may result in the Unit not having the current banks’ liquidity positions
- Quality of information received which forms the basis of the forecasts
Challenges and the Way Forward

The Way Forward

- With assistance from the consultant, further modifications of the framework has been done and this will be reviewed during the next visit of the consultant.

- Relationship has been established with the Budget Bureau, MoF to supply details of their cash budget framework which may help predict govt. expenditures.

- The Unit is experimenting with using a two week lag on cash and the current DMB’s balance at BSL to act as a proxy for the latest DMB balances (assumption here is that there are no significant changes in cash over a two week period).
PAYE Actuals vs Forecasts

![Graph showing PAYE Actuals vs Forecasts for the year 2007. The graph compares actual payments with forecasts, showing fluctuations over weeks ending from 5/1/2007 to 21/12/2007.](image-url)
Customs & Excise Actuals vs Forecasts

![Graph showing Customs & Excise Actuals vs Forecasts with dates from 5/1/2007 to 21/12/2007]

- Forecasts 2007
- Actuals 2007
Salaries Actuals vs Forecasts

![Graph showing Salaries Actuals vs Forecasts for the year 2007.](image)
Goods & Services Actuals vs Forecasts
Framework Error

Forecast reserves using actual data G
Actual Reserves H B+C
THANK YOU