OUTLINE

- Overview
- Forecasting system in the Bank of Mongolia
- Forecasting methodology
- Economic statistics for forecasting
- Dissemination of forecasting
- Challenges for forecasting
OVERVIEW

- The main objective of the Bank of Mongolia is focused at sustaining price stability.
  - For price stability the key indicator is inflation, measured by consumer prices index.
- Monetary policy-making is founded on a lot of theoretical assumptions and models, which needs to be verified using concrete statistical information.
- The information requirement covers the activities and behaviours of all economic agents within the economy, in the form of:
  - Bank and non-bank financial information
  - External sector developments (i.e. BOP statistics)
  - Fiscal sector statistics
  - The real economy (i.e. GDP, perceptions of real sector).
- Time series statistical data is importance in the exploration of the linkages economic activities and construction of forecast.
- The financial and external sector statistics are generated by the banks activities and NSO provide all other statistics not compiled by the bank.
FORECASTING AND POLICY ANALYSIS SYSTEM

New data released

Initial conditions assessment *(assumptions)*

Forecasting process

Report to the director of the MPRD

Policy proposal

MPC meeting

Public communication/Press release

Next round of the policy process
FORECASTING PROCESS

Data update

Consistency of Macroeconomic in model

Short-term forecast

Precondition (Foreign and domestic)

World economic outlook
Foreign price, trade, investment

Domestic demand, output gap, real rate, fiscal expenditure

Medium term forecast

Policy analysis, projection

Short-term forecast

Expert judgement
OVERVIEW OF MACROECONOMIC FORECASTING

Base forecasting for the short and medium term:

- **Short term**: (Q1-Q4) – estimated monthly
  - Inflation
  - GDP

- **Medium term**: (Y1- Y3) – estimated quarterly

Economic forecasts predict the course of the aggregate economy and concentrate on variables such as GDP and inflation.
GDP forecasting

There are two equivalent approaches to forecast the GDP in the short term.

- **Supply side**
  GDP forecasts based on the production approach.

- **Demand side**
  GDP forecasts based on the expenditure approach.
GDP FORECASTING (SUPPLY SIDE)

- GDP forecast, by classification of economic activities, which includes:

<table>
<thead>
<tr>
<th>GDP, by production</th>
<th>6. Wholesale and retail trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>7. Transportation and storage</td>
</tr>
<tr>
<td>Non-Mining</td>
<td>8. Information and communication</td>
</tr>
<tr>
<td>2. Agriculture</td>
<td>9. Other services</td>
</tr>
<tr>
<td>4. Electricity, gas and water</td>
<td></td>
</tr>
<tr>
<td>5. Construction</td>
<td></td>
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</tbody>
</table>

Estimate representative indicator

Estimate production of sectors

Total GDP
GDP forecasting (Supply side)

- Industrial Price Index
- Loan
- Exchange rate
- GDP per capita
- Balance of payment projection
- Budget projection
- GDP forecast (Supply side)

- IPI- China
- Construction import
- Construction work and service
- Manufacturing-GDP
- Service-GDP
- Mining-GDP

- Construction-GDP

- Government Program projection
<table>
<thead>
<tr>
<th>Branch</th>
<th>Representative indicators</th>
<th>Frequency of Data</th>
</tr>
</thead>
</table>
| Agriculture                   | - Livestock  
                              - Crop                | Quarterly  
                               Semi-annually   |
| Mining and quarrying          | - Mining industrial index,  
                              - Quantity of production quarrying | Monthly            |
| Transporta      
 ion and storage     | - Freight turnover  
                              - Service import    | Monthly            |
| Net taxes on production       | Tax on domestic and import production        | Monthly            |
GDP forecasting (demand side)

- GDP forecasting based on national accounts data:
  - Private consumption
  - Government expenditures
  - Investment
  - Export
  - Import

Estimate representative indicator

Estimate composition of demand

Total GDP
## GDP FORECASTING (DEMAND SIDE)

<table>
<thead>
<tr>
<th>Composition of GDP</th>
<th>Representative indicators</th>
<th>Methods</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private consumption</td>
<td>- Import of consumer goods&lt;br&gt;- Consumer loan</td>
<td>- Seasonal adjustment&lt;br&gt;Cointegration&lt;br&gt;- Vector autoregression</td>
<td>Monthly</td>
</tr>
<tr>
<td>Government expenditures</td>
<td>- Fiscal projection&lt;br&gt;- Current expenditure&lt;br&gt;- Capital expenditure</td>
<td></td>
<td>Quarterly</td>
</tr>
<tr>
<td>Investment</td>
<td>- Government domestic investment projection&lt;br&gt;- FDI projection&lt;br&gt;- Import of manufacturing products</td>
<td>- VAR</td>
<td>Monthly&lt;br&gt;Quarterly</td>
</tr>
<tr>
<td>Net export</td>
<td>- Balance of payment projection</td>
<td></td>
<td>Quarterly</td>
</tr>
</tbody>
</table>
Medium Term Forecasting

- Medium term forecasts predict the course of the aggregate economy and concentrate on variables such as GDP and inflation.

- Small inflation model of Mongolia consists of ten estimated equations
  - Total demand - IS curve
  - Price – Phillips curve
  - Purchasing power parity
  - Real money demand and supply
  - Terms of trade

- Each group contains approximately 15 time series. All series are transformed to achieve stationary time series.
MEDIUM TERM FORECASTING

A large number of macroeconomic data series have been applied to the model. The data set is grouped in ten categories, which are

- Monetary aggregates
- Interest rates
- Exchange rates
- PPP
- Commodity price index
- Fiscal expenditure
- Fuel price inflation
- Food price inflation
- Public wage
- Output gap
- Terms of trade
**FORECASTING METHODOLOGIES**

- We use following econometric modelling and methodologies for macroeconomic forecasting.

<table>
<thead>
<tr>
<th>SHORT TERM</th>
<th>MEDIUM TERM</th>
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<tbody>
<tr>
<td>BVAR</td>
<td>SIMOM</td>
</tr>
<tr>
<td>SVAR</td>
<td>GAP</td>
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<tr>
<td>SARIMA</td>
<td>DSGE</td>
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<tr>
<td>FINANCIAL PROGRAMMING</td>
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</tbody>
</table>
SHORT TERM STATISTICS FOR MACROECONOMIC FORECASTING

The following short-term economic key indicators used for forecasting:

- Consumer Price Index - Monthly
- Industrial Production Index - Quarterly
- Trade Turnover - Monthly
- Wages - Quarterly
**DISSEMINATION OF MACROECONOMIC FORECASTING**

- The monetary policy decision made by the MPC is disclosed to the public by holding a press conference. During the press conference, the Governors of Bank of Mongolia provide an explanation of their decision based on current situation and future forecasting.

- **Monetary Policy Guideline**
  - The forecasted inflation rate and GDP growth are set and included in the Monetary Policy Guidelines, each year.

- **Inflation report**
  - We are preparing quarterly inflation report which includes the inflation forecast.
THE USERS OF MACROECONOMIC FORECASTING

- Forecasting are critical to policy decision making because they provide the best information about future demand and therefore inflationary pressures on an economy.

- Macroeconomic forecasting are used in a wide range of areas, including:
  - Policy analysis
    - Forecasting are often used to develop and monitor macro-economic policies
  - Economic Research
## CHALLENGES FOR FORECASTING

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Disaggregation</th>
<th>Absent of some leading indicator data</th>
</tr>
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</table>
| - Some data produced with a lag of three months while monetary policy requires more frequent (monthly) and timely data to guide policy decisions.  
  - GDP  
  - Wage  
  - Short quarterly GDP series for macroeconomic modelling. | - Disaggregation and coverage of national accounts data.  
  - Gross capital formation | - Labor market data  
  - Unit Labor Cost  
  - Productivity  
  - Producer price index |

- The data come with a three-month lag; forcing analysts to fill in the gaps using proxies. Forecasting is made difficult without timely & reliable data.
- Unreliable or absent some leading indicator data at high frequency means that often central bank forecasts will have errors.
THANK YOU FOR YOUR ATTENTION