



Bank of Thailand Macroeconometric Model (BOTMM)

Presented at the Workshop on
Economic Models at the Bank of Thailand

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Outline

- Motivation
- Philosophy of a macroeconomic model
- Macroeconomic model at the BOT
 - Roles
 - Structure and linkages
 - Performance and simulations
 - Challenges ahead
- Conclusion
- Issues for discussion

Motivation

- The MPC need an economic model for
 - Assessing economic outlook in the 8 quarters ahead in order to determine the appropriate stance of monetary policy
 - Evaluating the effects of changes in economic factors and policies on the economy

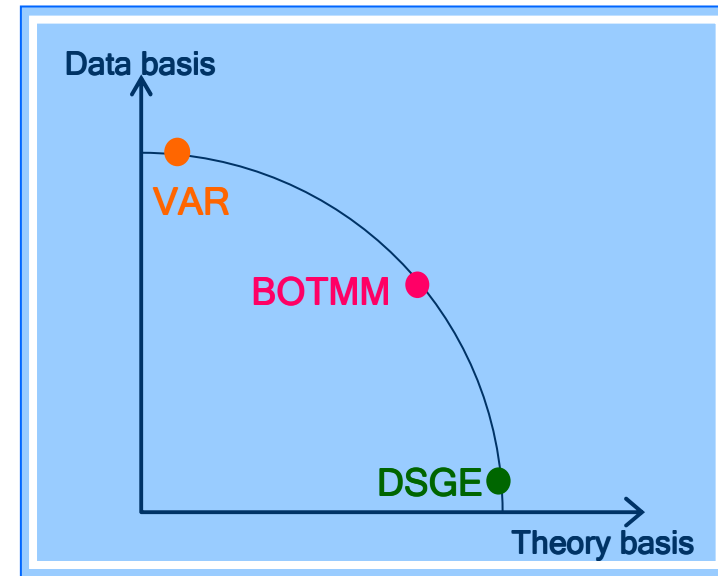
- Why macroeconometric model?
 - Straightforward and easy for public communication
 - Balancing between data and economic theory

Motivation

- Macroeconometric models developed for Thailand from other institutes
 - NESDB, FPO, and TDRI

Philosophy of a macroeconometric model

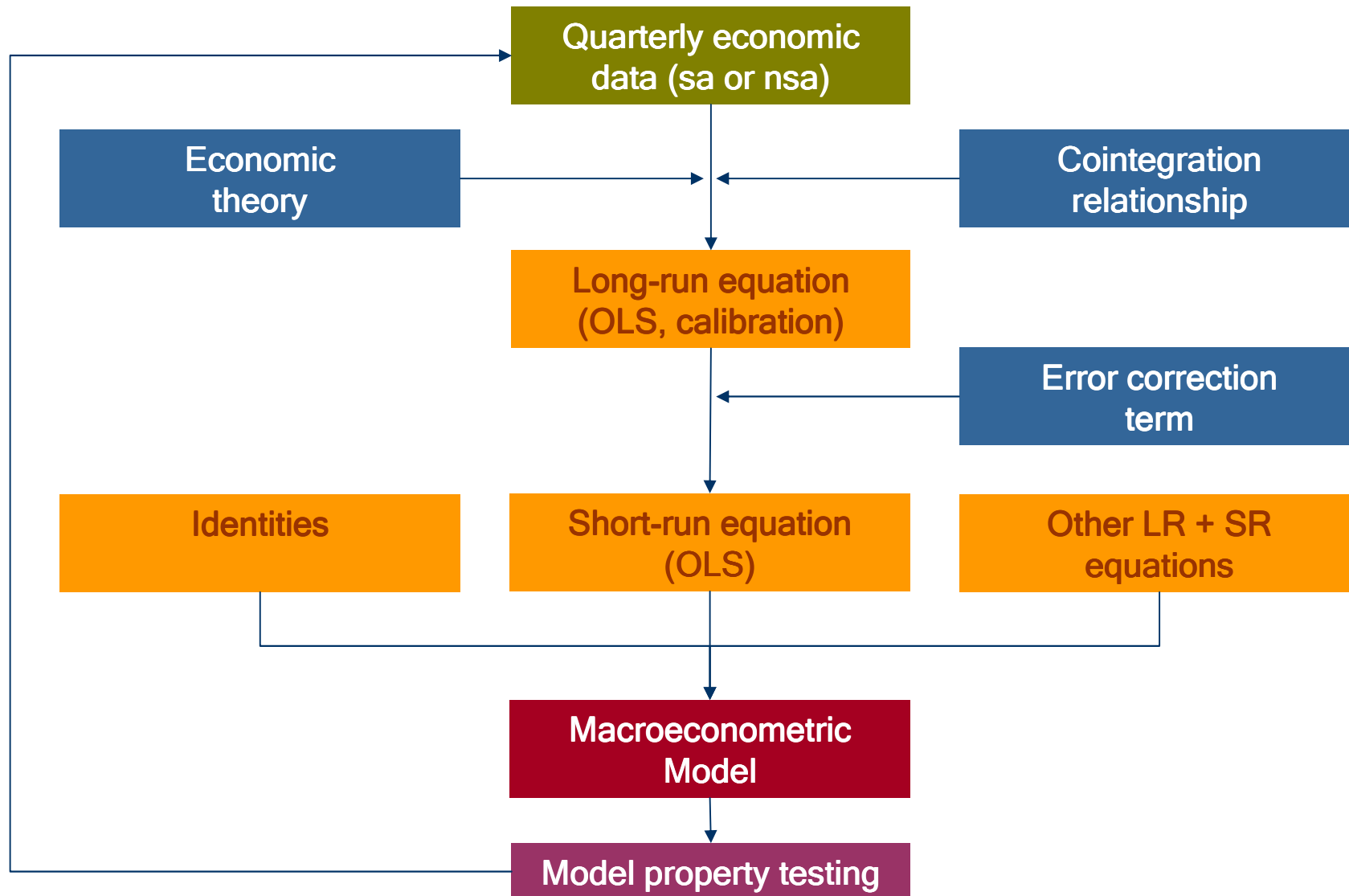
- Balancing between
 - data and economic theory
 - in-sample fitting and out-of-sample forecasting
- Cointegration relationship



Macroeconometric model at the BOT

- Based on quarterly data since 1993Q1
- Designed to capture relationships between key economic variables
- Served as a tool for MPC under the Inflation Targeting monetary policy framework

Steps in building a macroeconomic model



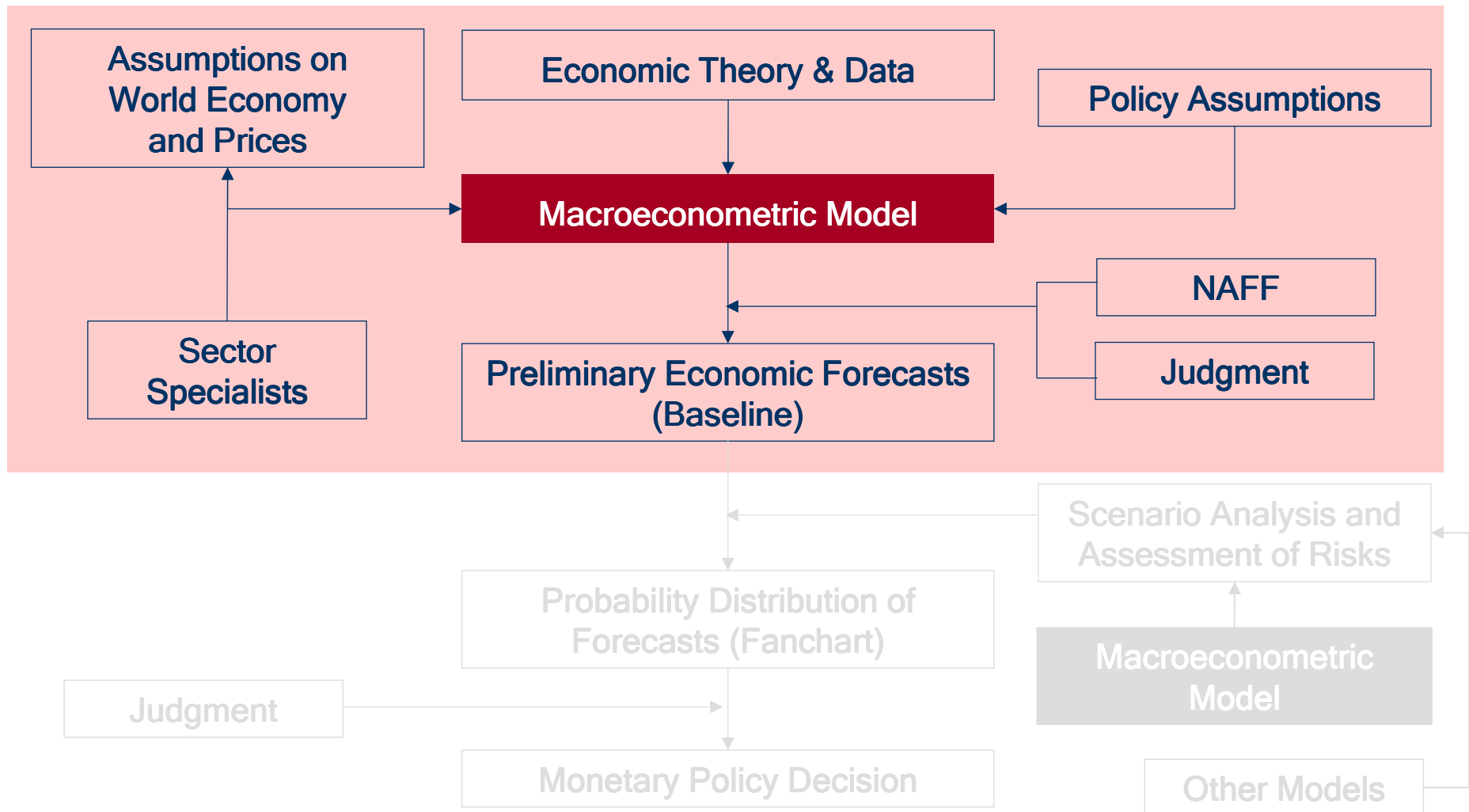
Roles of the macroeconometric model at the BOT

Over the 8 quarters ahead ...

- Baseline forecasting
 - Nowcasting and forecasting
- Policy simulation and scenario analysis

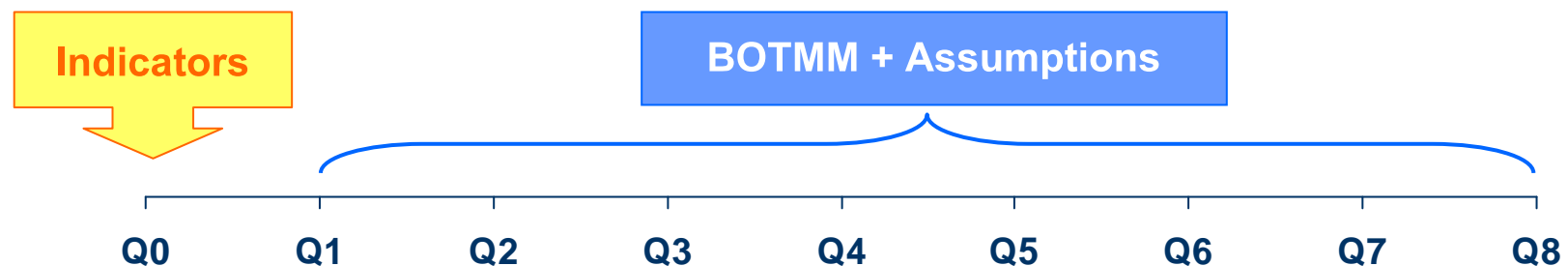
Role in baseline forecasting

Forecasting and monetary policy decision process:



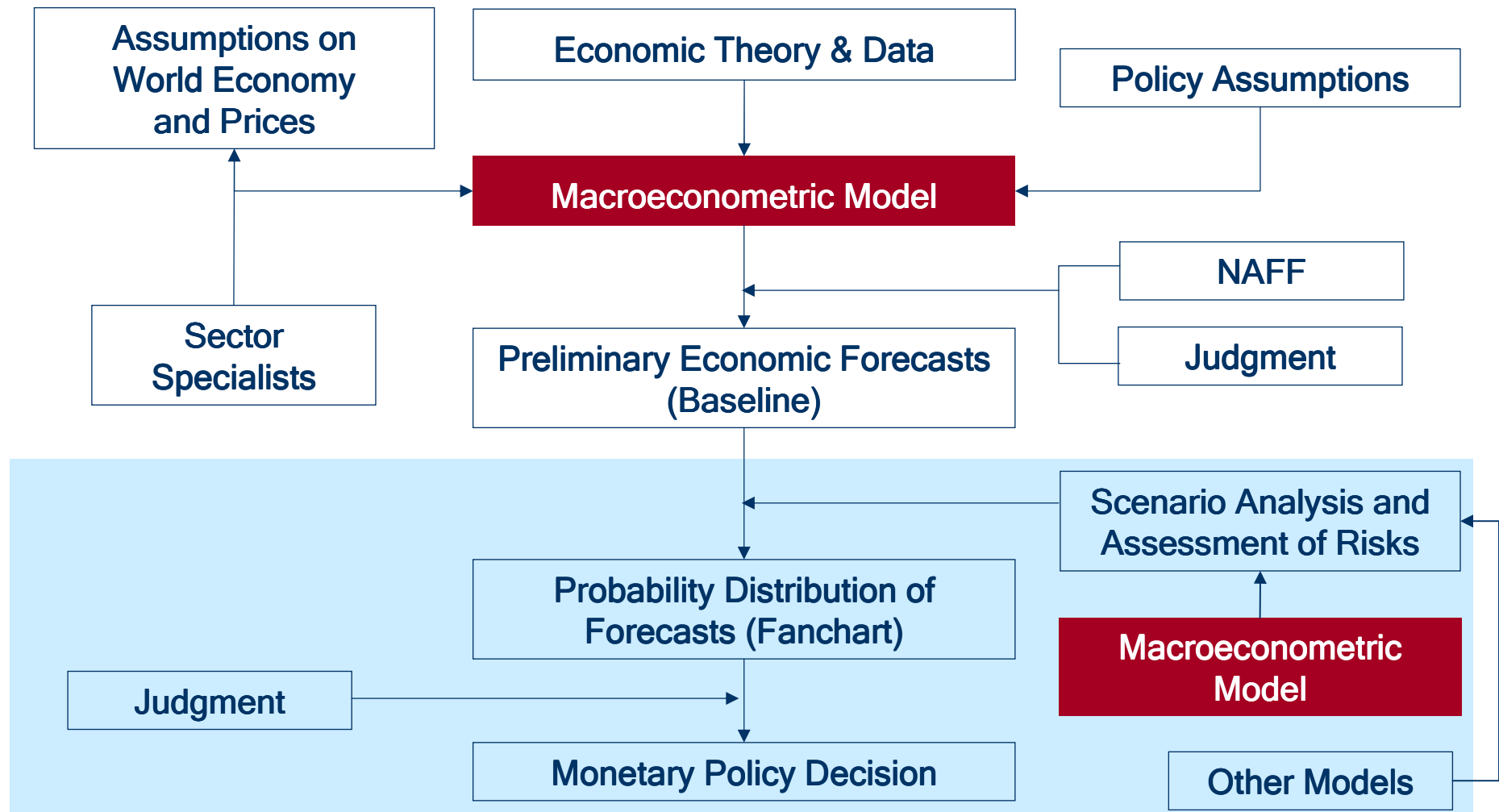
Nowcasting and forecasting

- **Nowcasting (Short-term forecasting for Q0)**
 - judgments are imposed by modellers and sectoral experts, using available real-time economic indicators and other information that cannot be captured by the model (e.g. impact of airport closed down in Nov08)
- **Forecasting (Longer term forecasting for Q1-Q8)**
 - dynamic suggested by the model and assumptions on exogenous variables



Role in policy simulation and scenario analysis

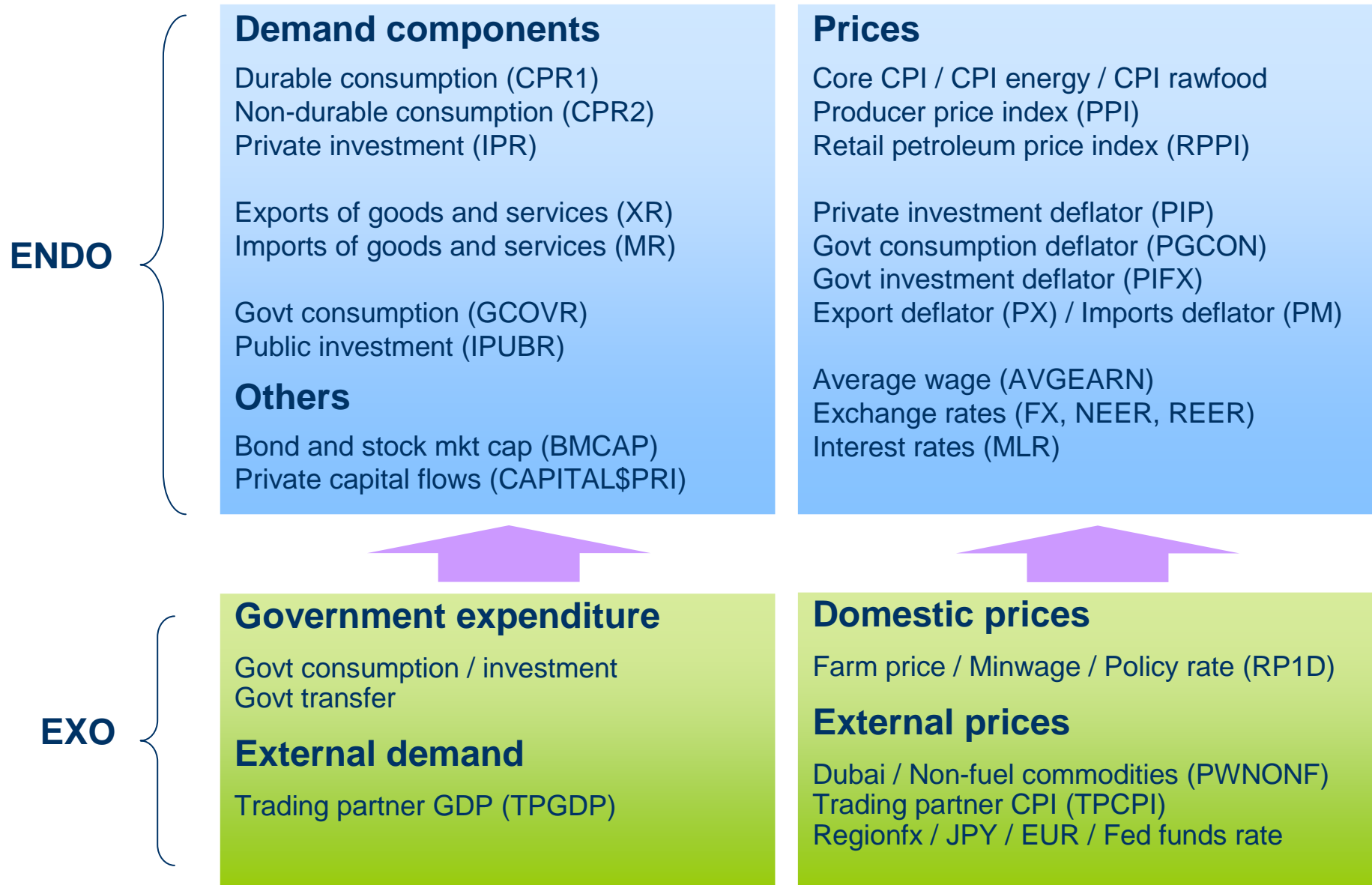
Forecasting and monetary policy decision process:



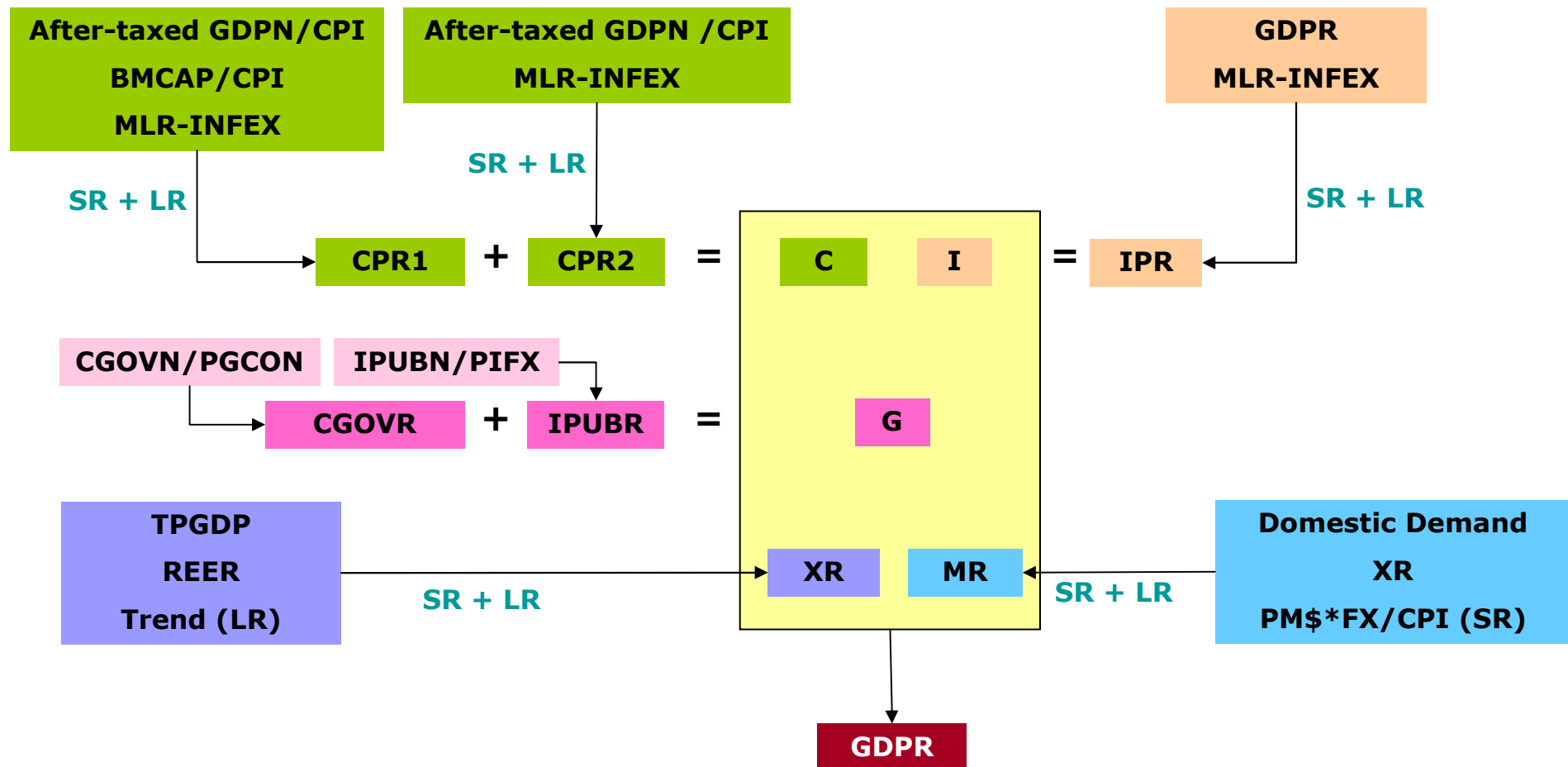
Types of shock

- Policy shock
 - Monetary policy
 - Fiscal expenditure
- Domestic shock
 - Minimum wage
- External shock
 - Dubai oil price
 - Trading partners' GDP growth
 - Fed funds rate

BOTMM main structure

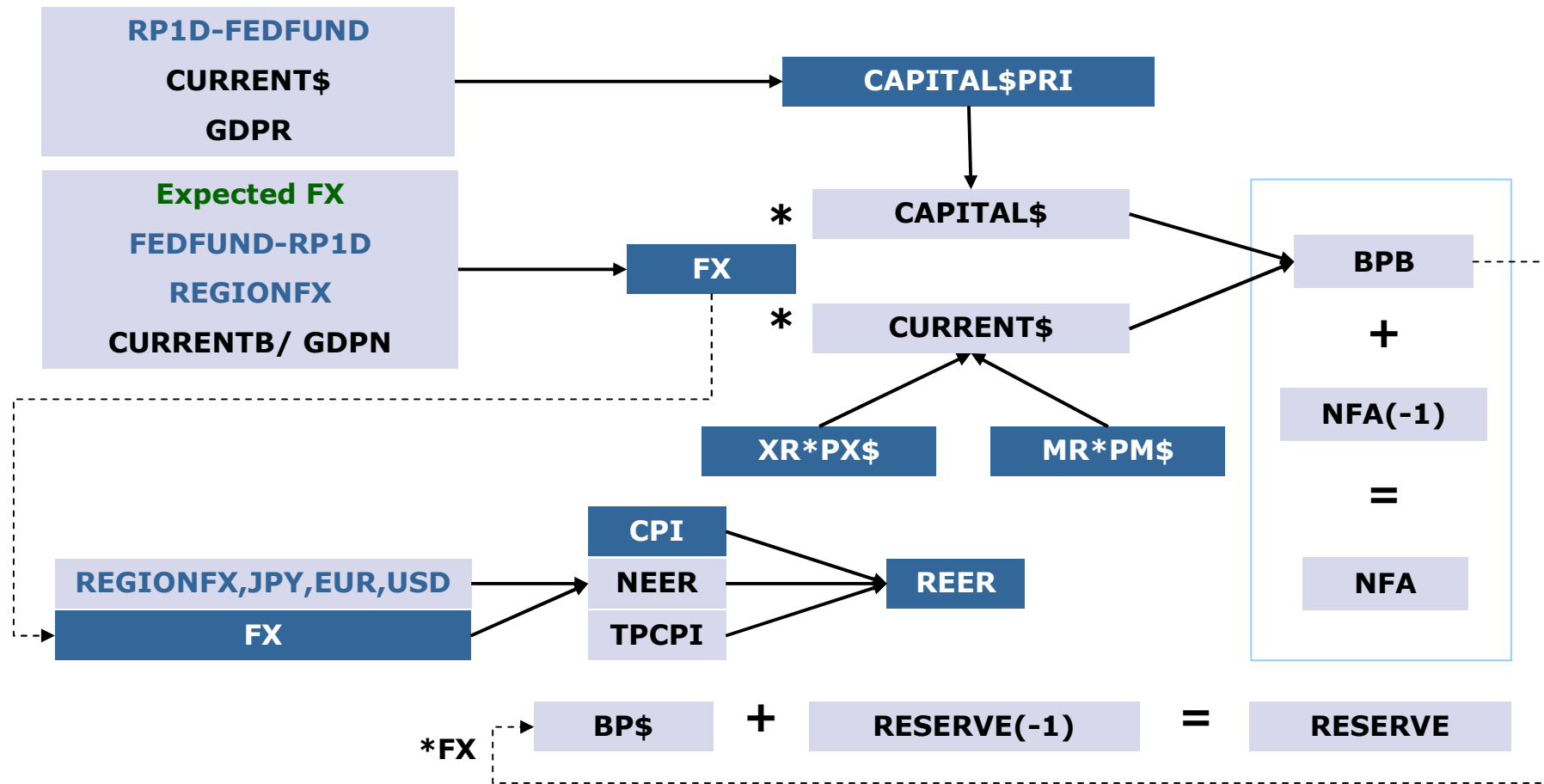


Linkages in real GDP components

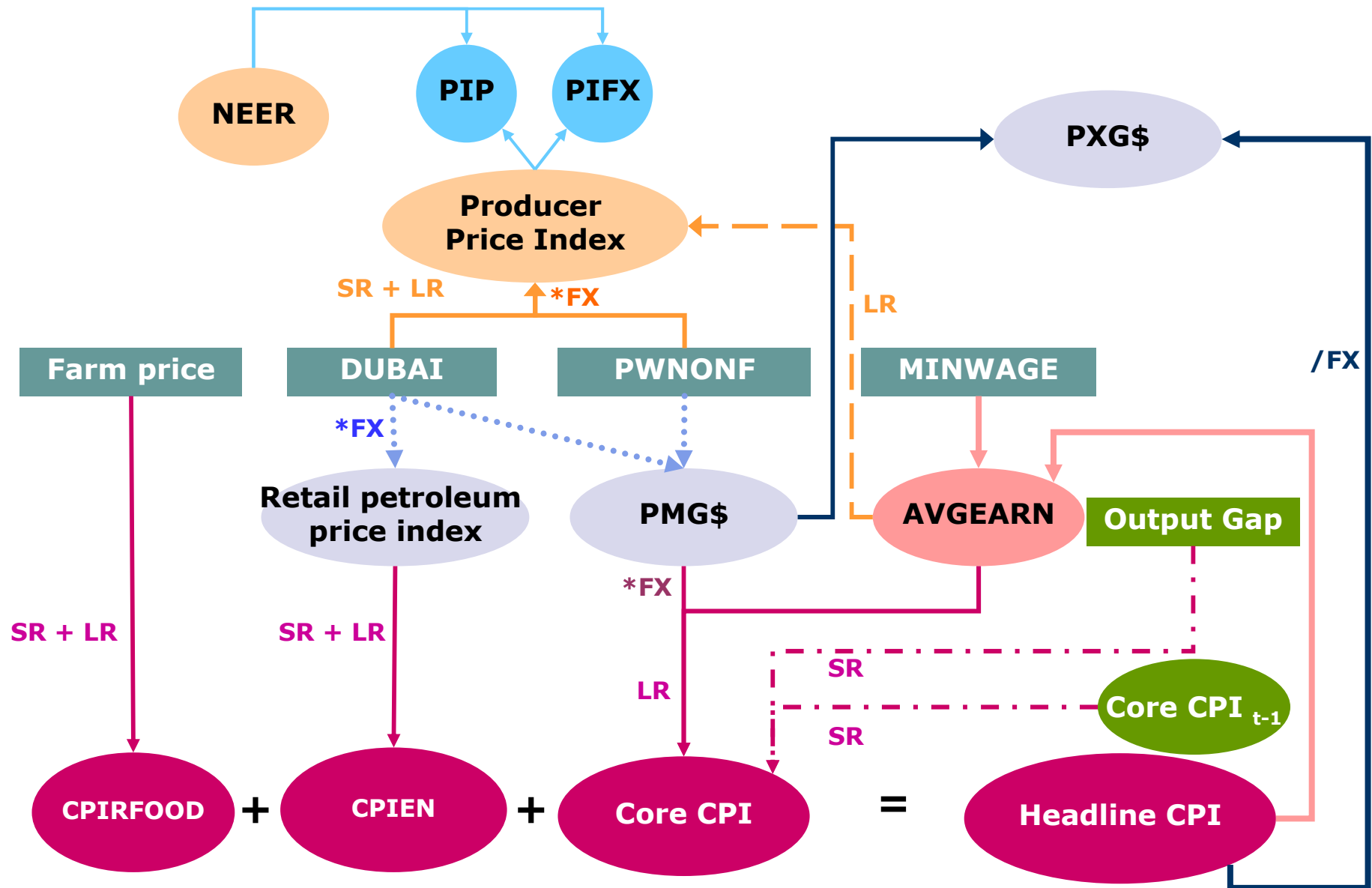


SR = Short Run Equation
LR = Long Run Equation

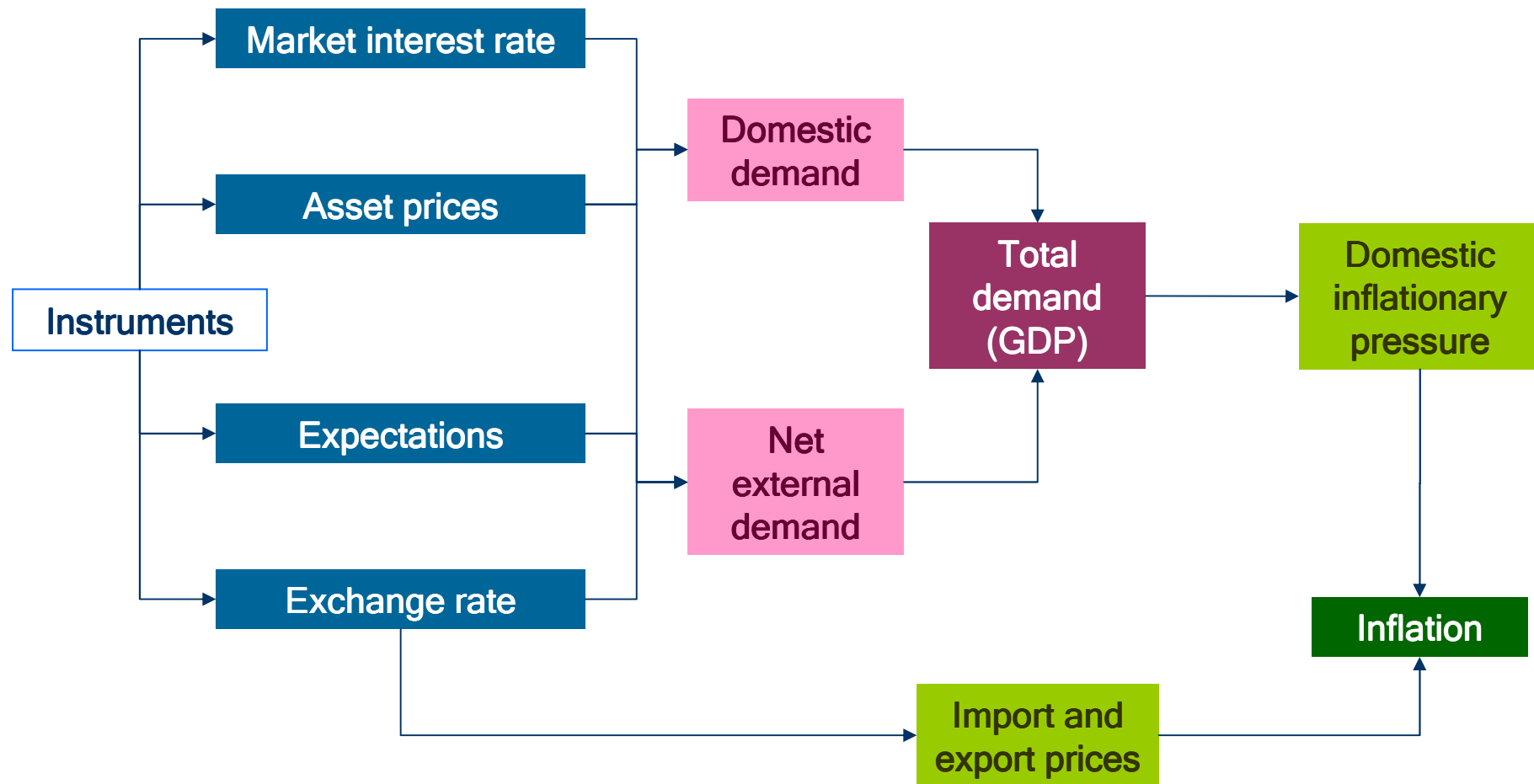
Linkages in external sector



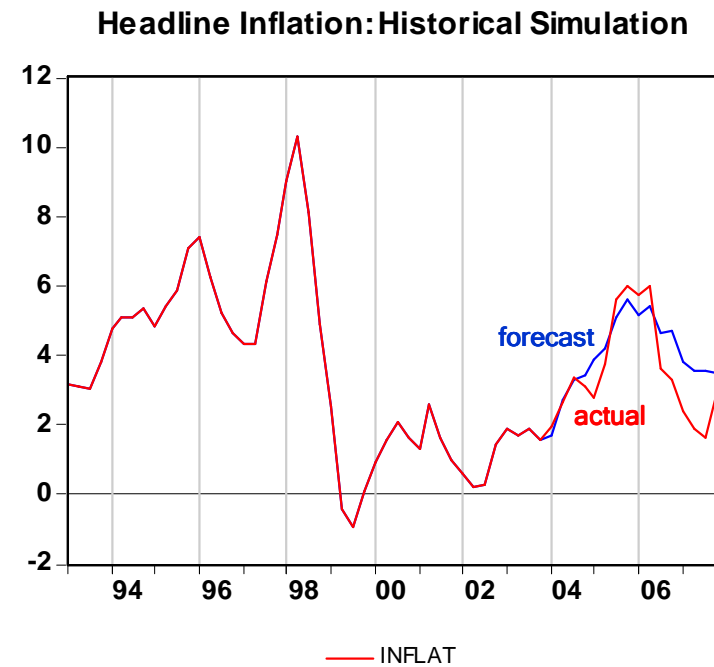
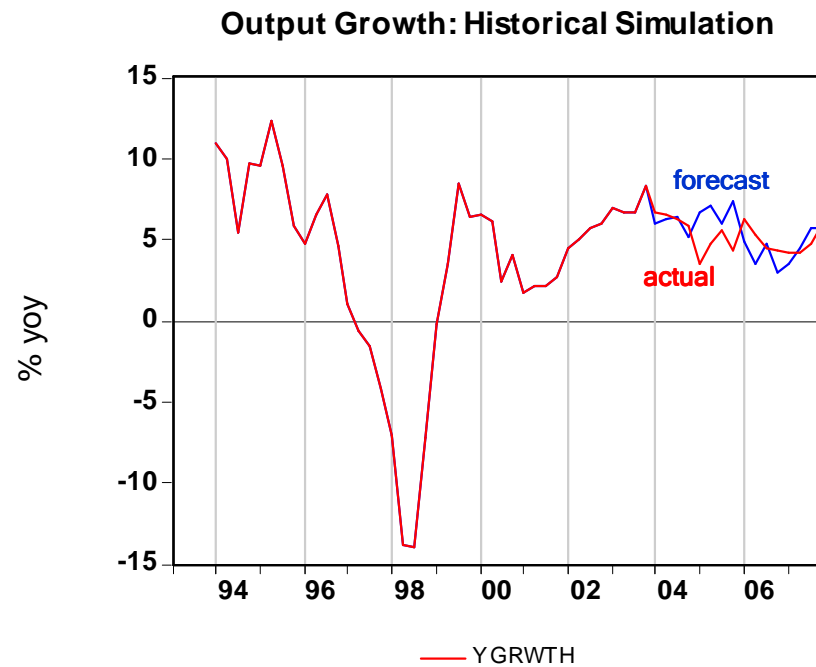
Inflation



Transmission mechanism of monetary policy

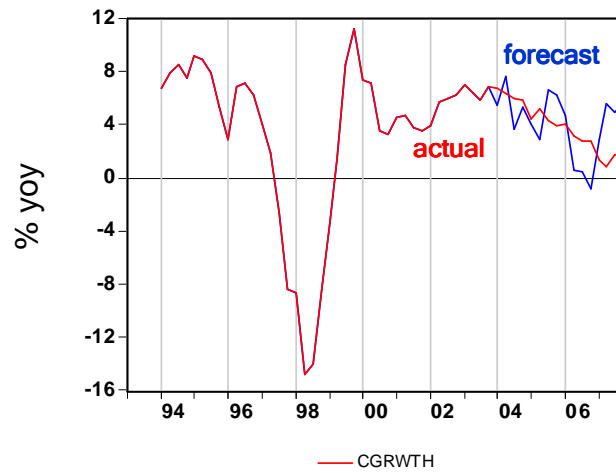


Performance in the in-sample forecast

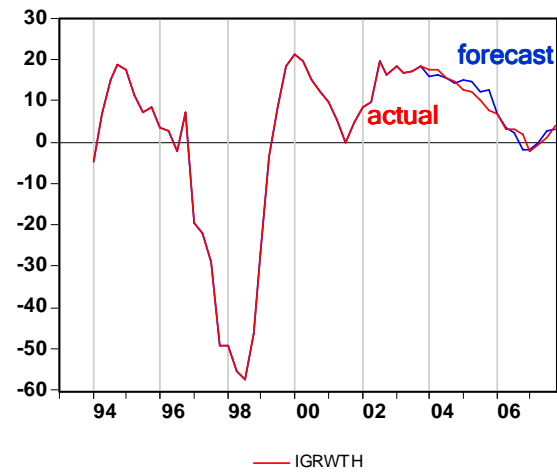


Performance in the in-sample forecast

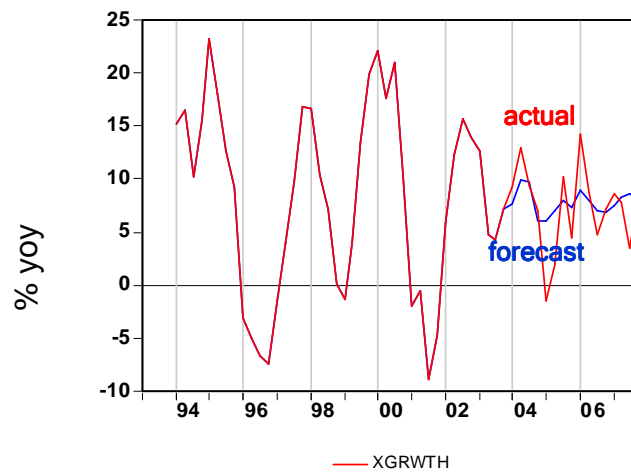
Consumption Growth: Historical Simulation



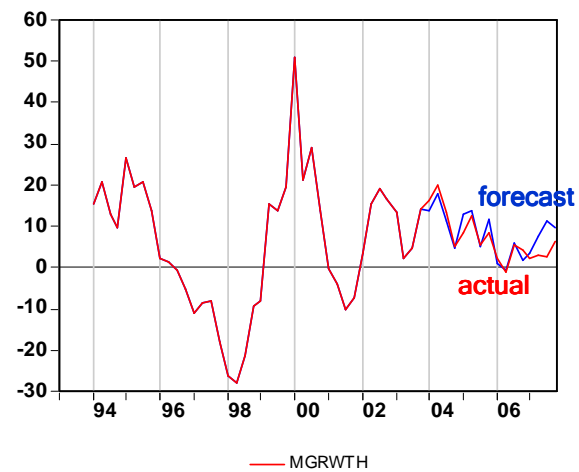
Investment Growth: Historical Simulation



Export Growth: Historical Simulation



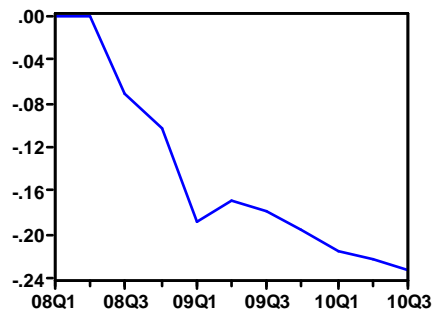
Import Growth: Historical Simulation



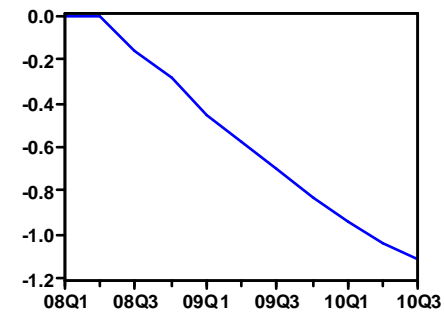
Permanent increase in policy rate by 25 basis points

% of deviation from baseline starting from 2008Q3

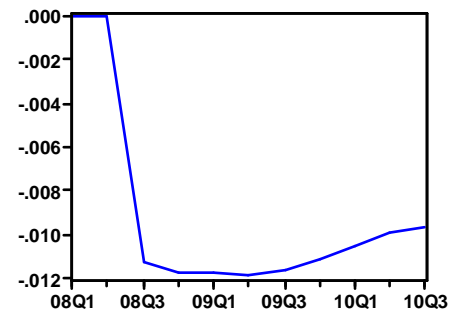
Private consumption



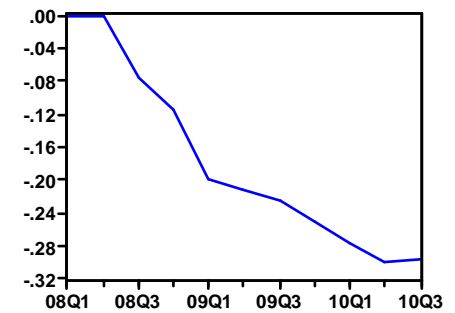
Private investment



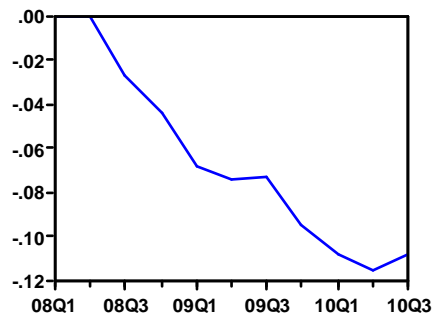
Exports G&S



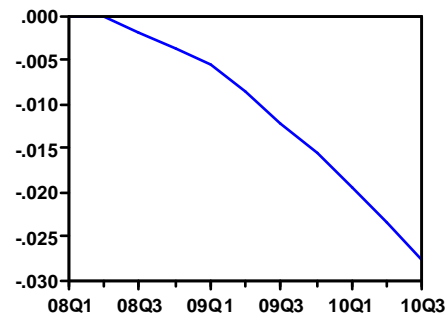
Imports G&S



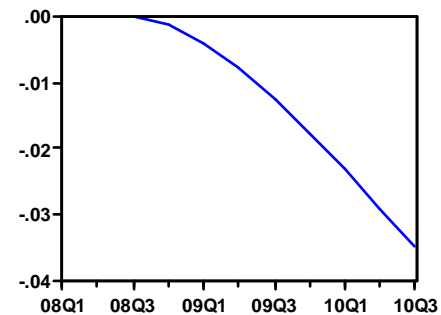
GDP



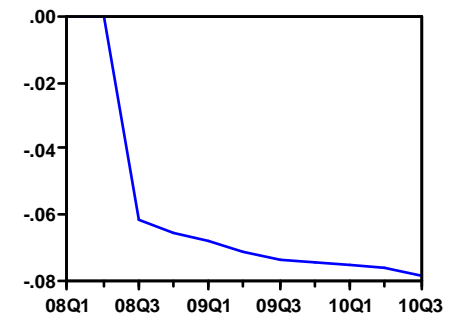
Headline CPI



Core CPI



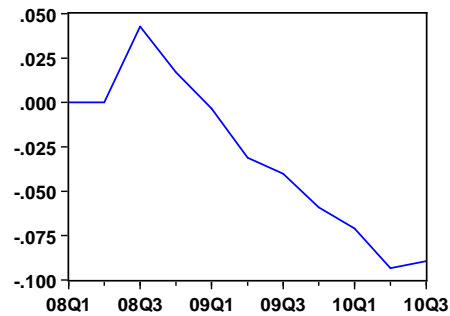
THB/USD



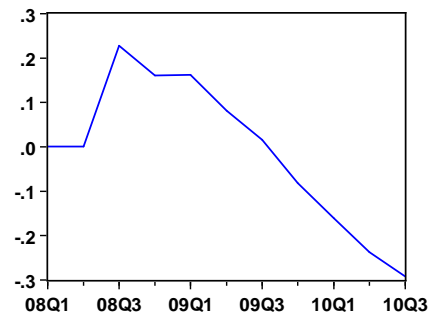
1% Permanent depreciation in THB/USD exchange rate

% of deviation from baseline starting from 2008Q3

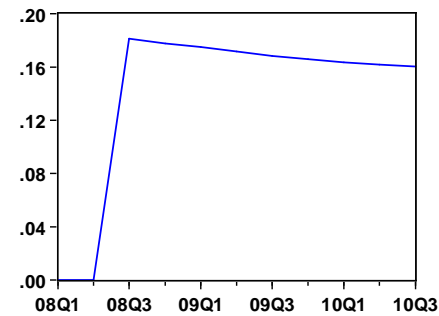
Private consumption



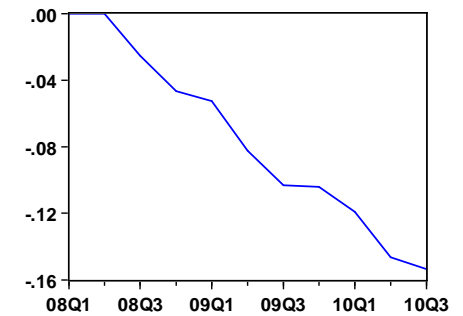
Private investment



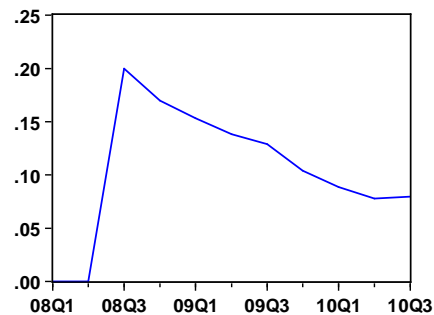
Exports G&S



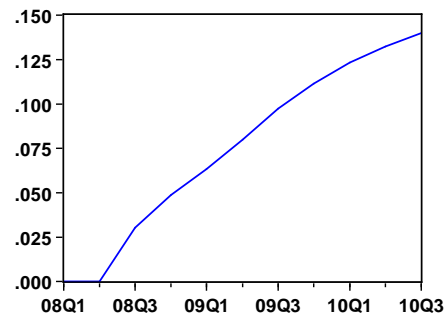
Imports G&S



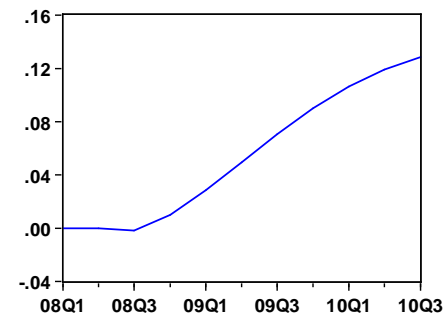
GDP



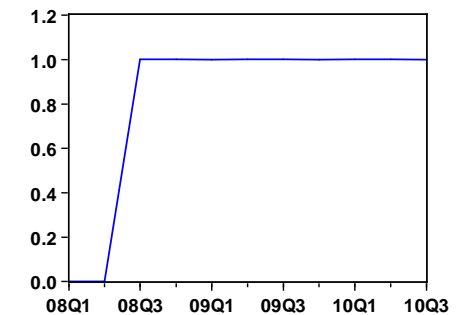
Headline CPI



Core CPI



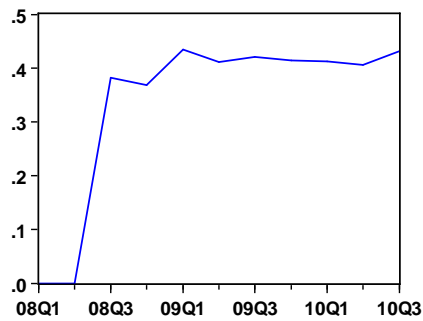
THB/USD



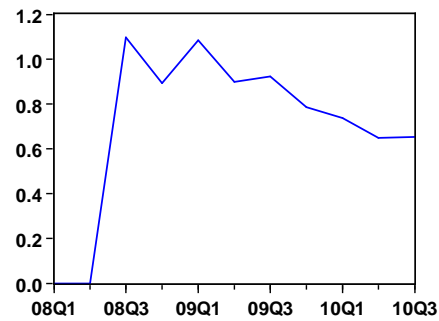
1% Permanent increase in trading partner GDP

% of deviation from baseline starting from 2008Q3

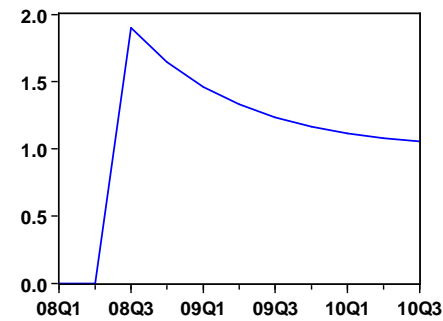
Private consumption



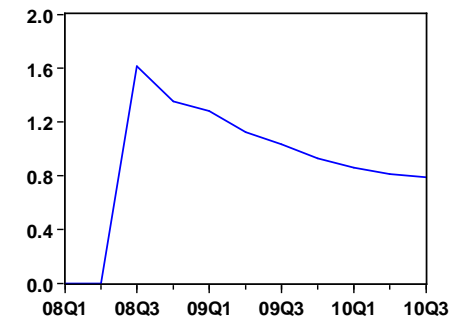
Private investment



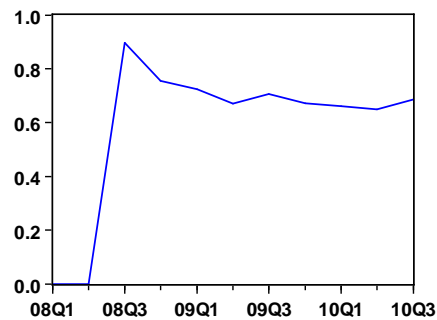
Exports G&S



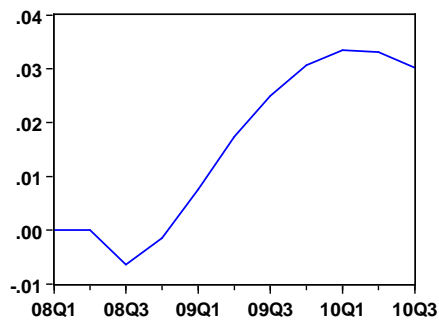
Imports G&S



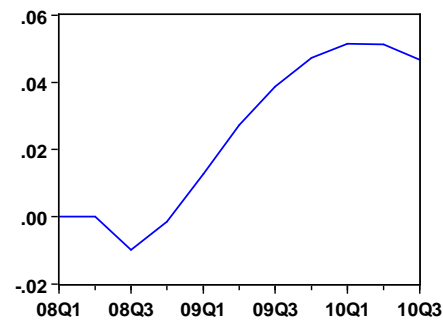
GDP



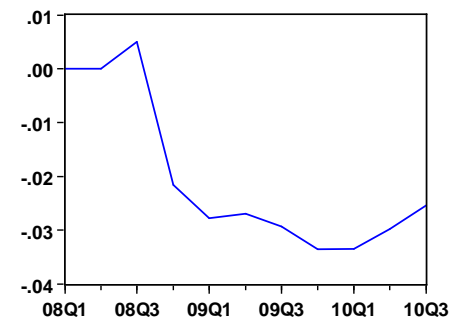
Headline CPI



Core CPI



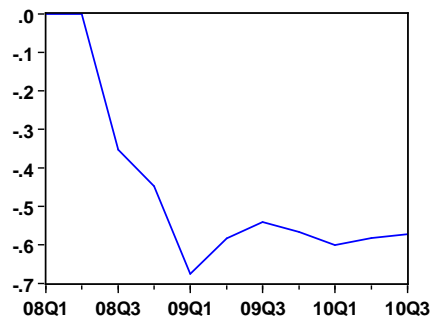
THB/USD



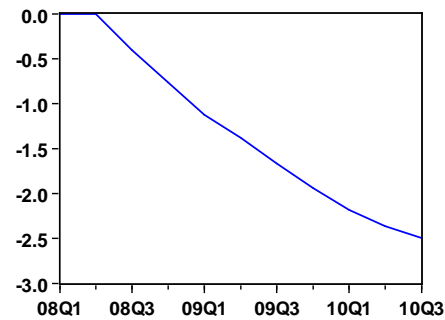
10% Permanent increase in Dubai oil price

% of deviation from baseline starting from 2008Q3

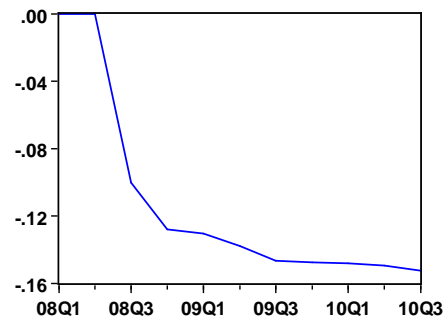
Private consumption



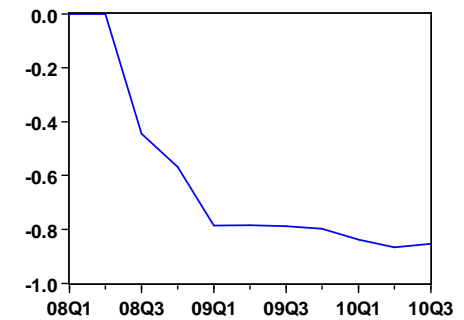
Private investment



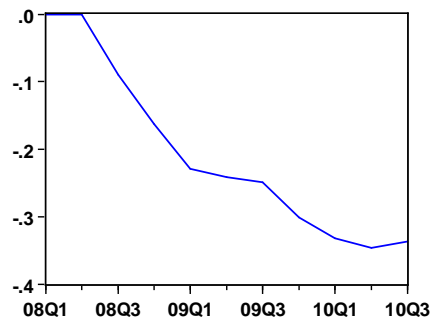
Exports G&S



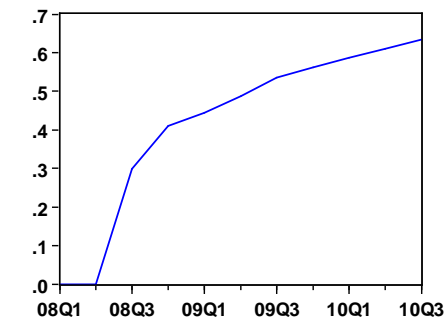
Imports G&S



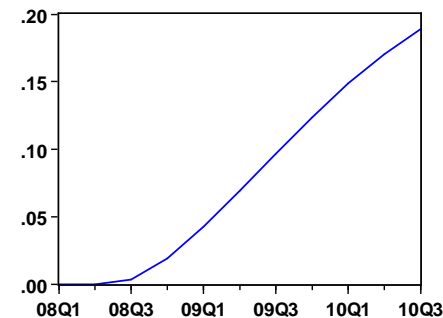
GDP



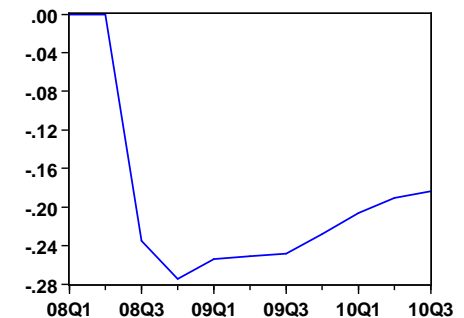
Headline CPI



Core CPI



THB/USD



Simulation results

Result (%YoY difference from baseline)

Shock (+10%)	GDP Growth		Headline inflation		Core inflation	
	Avg of first 4Qs	Avg of last 4Qs	Avg of first 4Qs	Avg of last 4Qs	Avg of first 4Qs	Avg of last 4Qs
RP1D (+0.25)	-0.06	-0.05	-0.01	-0.01	0.00	-0.02
FX (+1%)	0.17	-0.07	0.06	0.06	0.02	0.08
TPGDP (+1%)	0.79	-0.09	0.00	0.03	0.01	0.04
Dubai	-0.19	-0.13	0.43	0.17	0.04	0.11

Conclusion

- Macroeconometric model is straightforward and easy for public communication.
 - Providing components of GDP forecasting and serving the MPC needs for policy making
 - Balancing between data and economic theory
 - For short-term, add judgment from sectoral experts, and for longer term, use model dynamics with judgment

Challenges ahead

- Consideration of other important variables that may be included in the model
 - market interest rates, e.g. bond yield
 - private credit
 - household wealth indicators
 - property price and bank deposits
 - potential GDP measured by production function

Issues for discussion

- How involved should policymakers be in the process of model building and forecast production
- How to balance between data fitting and out-of-sample forecast
 - Role of judgments in building a macroeconomic model
 - Model specification
 - Parameters in long-run equation