The Quarterly Japanese Economic Model

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Views expressed in this material are those of the presenter and do not necessarily reflect those of the Bank of Japan.
1. Introduction
Mission of Q-JEM

Quarterly Forecast Exercises

- Comparison of Q-JEM’s forecast with judgmental forecast
  - Reported to the Policy Board
  - *Outlook for Economic Activity and Prices*

Policy Simulations

- Scenario analysis for risk assessment
  - Changes in foreign GDP/exchange rate/oil price

- Assessment of the effectiveness of monetary policy
  - Policy rate change
  - Unconventional monetary policy (Kan et al. 2016, BOJ-WP)
1. Introduction
The (Short-term) Goal and Recent Developments

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<th>Program/Infrastructures</th>
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<td>Applying Dulmage-Mendelsohn Decomposition for solving the model</td>
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<td>Forecasting: 5 min (in 2017 version) ➞ 20 sec (current)</td>
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<td>Simulation: 7 min (in 2017 version) ➞ 2 min (current)</td>
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<th>Transparency/Public access</th>
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<td>Sharing the replication files of the simulations on the website</td>
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<th>Ongoing Works: Transmission Channels for UMPs</th>
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<td>Inflation Targeting, Quantitative and Qualitative Easing, Negative Interest Rate Policy, Yield Curve Control, Overshooting Commitment</td>
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<td>Expectations Formation Mechanism</td>
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Semi-structural model

- High flexibility
- Closely fitting the data
- Not necessarily micro-founded
  - Expectations formation is not model consistent

Model system

- 900 equations and Equation-by-Equation estimation
  - Detailed modeling of GDP expenditure components, financial markets and inflation dynamics
- Error correction mechanism to long-run equilibrium
2. ABCs of Q-JEM
Core features of the Model

Japan Economy

Goods Market
- GDP identity
  \[ \text{Real GDP} = C + I (\text{business & housing})+II + G (\text{counter-cyclical}) + Ex - Im \]
- Phillips curve
  \[ \text{Inflation rate (core CPI)} = \rho \text{ Lagged inflation} + (1 - \rho) \text{LT inflation expectation} + \kappa \text{ Output gap} \]

Financial Market
- Interest rates
  ST: Taylor rule, w/ inertia, w/o ZLB, MT, LT: w/ term premium
  Bank lending rate: w/ credit spread
- Expectations formation
  LT inflation expectation
  \[ = (1 - \lambda) \text{ Lagged expectation} + \lambda \theta_t \text{ Inflation target} + \lambda (1 - \theta_t) \text{ Slow-moving component of inflation} \]
  \[ \theta_t: \text{ credibility} \]