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Understanding the impact of the global financial shock on the Chilean economy

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Understanding the Impact of the Global Financial Shock on the Chilean Economy

Rodrigo Caputo Juan Pablo Medina Claudio Soto

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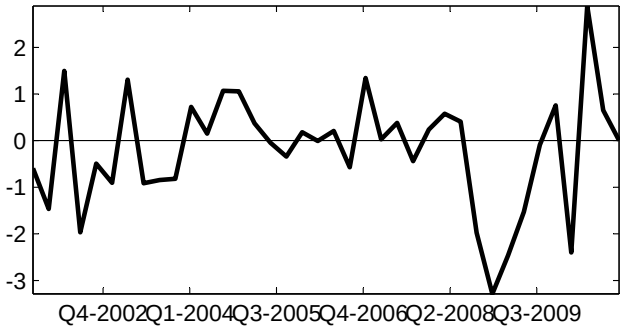
Motivation

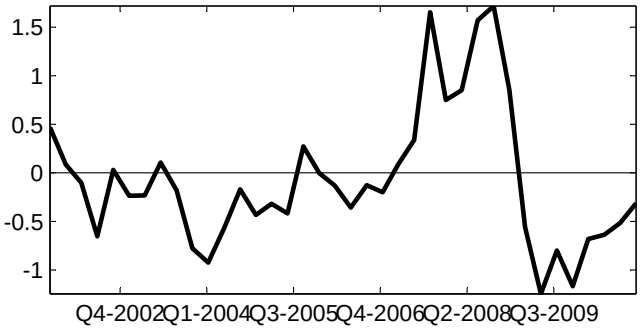
- The 2008-2009 crisis characterized by unparalleled liquidity stress faced by banks
- In practice interest rate spreads reached record levels by October 2008
- In emerging economies
  - Increase in country risk premium (EMBI)
  - Devaluations
  - Inflation above target
  - Output collapse

Chile´s Main Macro Variables

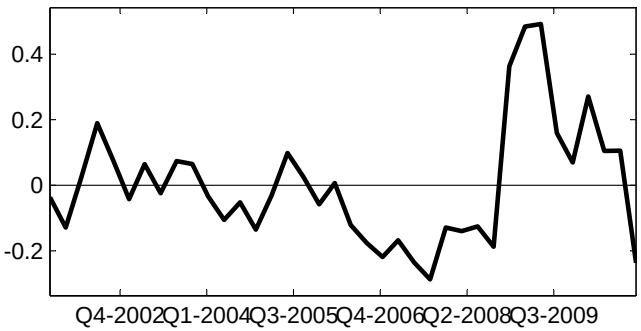
dy_t



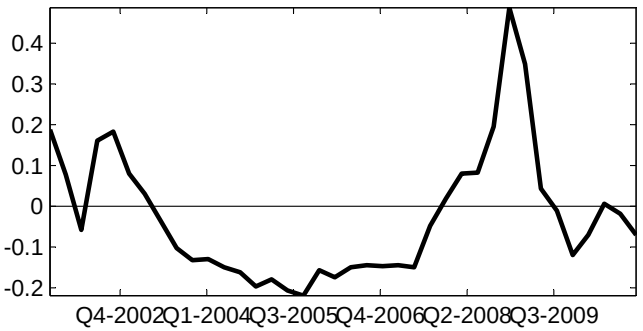
π_t



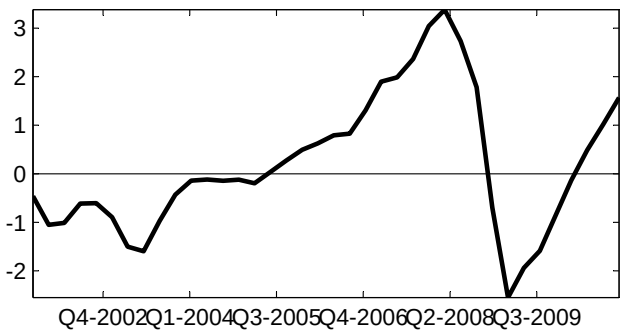
Int. Rate Spread



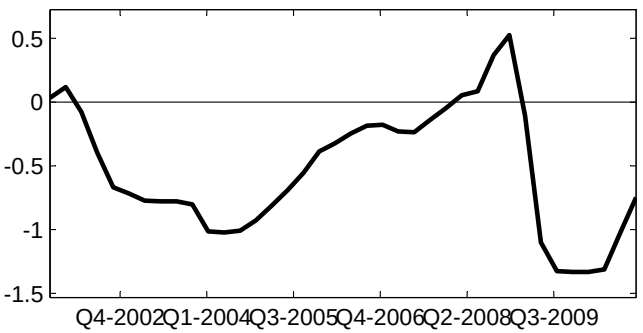
Country Risk Premium



y_t^*



i_t



Goals/Findings of the Paper

- To the assess consequence of the global financial crisis in the Chilean economy
- To encompass the different channels , we estimate a DSGE model for a SOE
- We incorporate:
  - Financial frictions: int. rate spread shocks (Cúrdia and M.Woodford (2010))
  - Incorporate country risk premium shocks
- We conclude that:
  - Spread, county risk premium and foreign output shocks account for 40 to 60% of the predicted decline in output during the crisis
  - Alternative policy rules (more aggressive towards output and to spread) may have mitigated the impact of adverse foreign shocks.

Main Features: SOE DSGE Model

- Two types of goods: home and imported
- Sticky prices and wages
- Indexation
- Imperfect exchange rate passthrough to import prices
- Habits in consumption
- Monetary Policy: Simple Taylor Rule

Financial Shocks

- Consumption depends on the market rate:

$$c_t = \frac{1}{1+h}E_t c_{t+1} + \frac{h}{1+h}c_{t-1} - \frac{1-h}{1+h}\sigma_c(\widetilde{i}_t - E_t\pi_{t+1}) + \frac{1-h}{1+h}(1-\rho_c)\zeta_{c,t}$$

- Market rate may differ from the policy rate:

$$\widetilde{i}_t = i_t + \zeta_{\widetilde{i},t}$$

- The UIP conditions is given by:

$$i_t = i_t^* + E_t\Delta e_{t+1} + \varrho b_t^* + \zeta_{\varphi,t}$$

- Where $\zeta_{\widetilde{i},t}$ and $\zeta_{\varphi,t}$ are assumed to be exogenous AR(1) processes:

$$\zeta_{\widetilde{i},t} = \rho_{\widetilde{i}}\zeta_{\widetilde{i},t-1} + \epsilon_{\widetilde{i},t}$$

$$\zeta_{\varphi,t} = \rho_\varphi\zeta_{\varphi,t-1} + \epsilon_{\varphi,t}$$

M.Policy and Exogenous Shocks

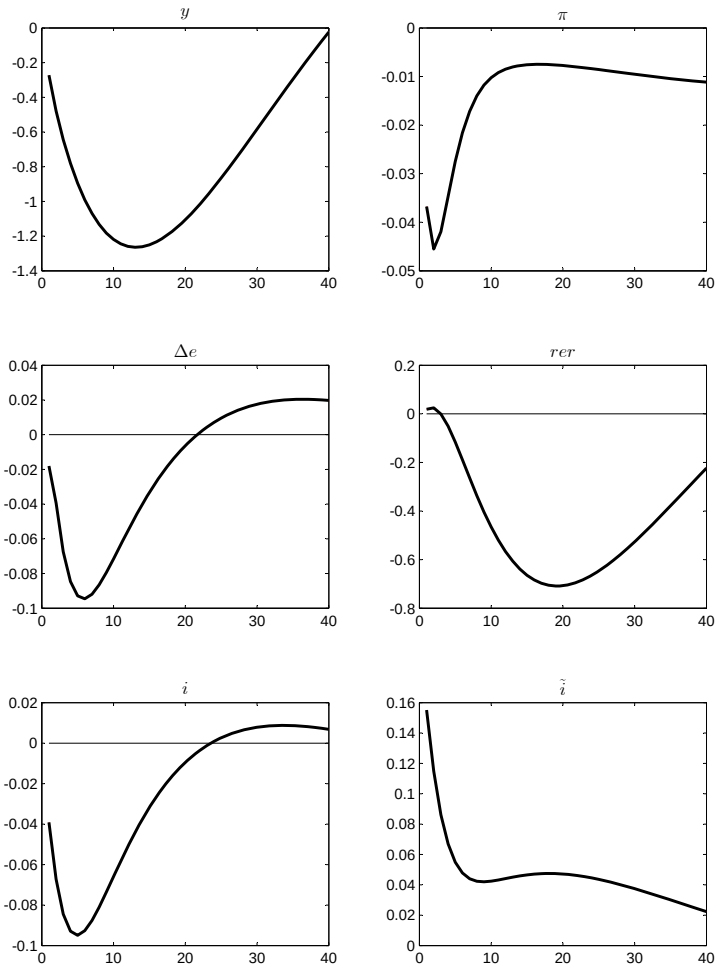
- Monetary Policy is described by:

$$i_t = \psi_i i_{t-1} + (1 - \psi_i) [\psi_\pi \pi_t + \psi_y \Delta y_t] + \epsilon_{i,t}$$

- Models incorporates other shocks:
  - Preference
  - Monetary policy
  - Productivity
  - Foreign output
  - Foreign inflation
  - Foreign interest rate

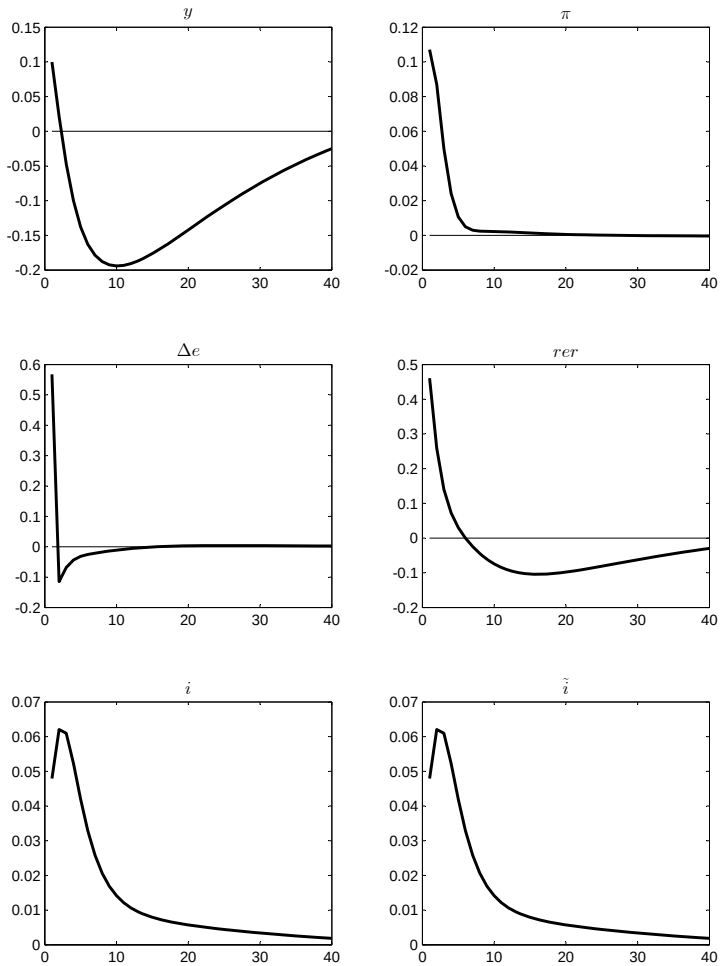
Base Scenario

- Model is estimated using standard Bayesian techniques
- Estimated persistence: $\rho_{\tilde{i}} = 0.93$ and $\rho_{\varphi} = 0.8$
- Responses to spread shock:



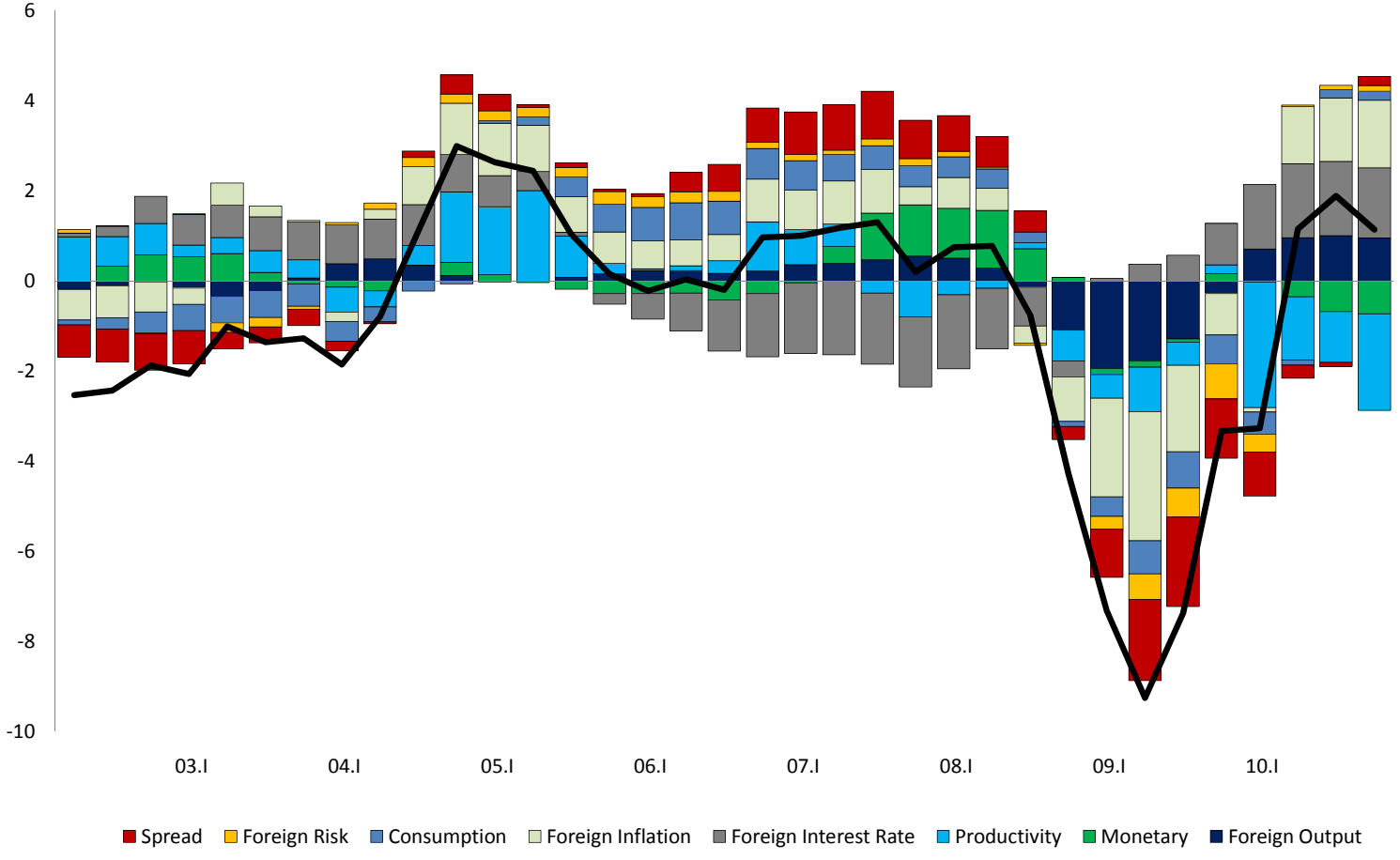
Base Scenario

- Model is estimated using standard Bayesian techniques
- Estimated persistence: $\rho_{\tilde{i}} = 0.93$ and $\rho_{\varphi} = 0.8$
- Responses to country risk shock:



Base Scenario

- In 2009.Q2, 45% of the output decline can be attributed to:
  - Spread shocks (20%)
  - Foreign output (19%)
  - Country risk premium (19%)



Alternative Scenario: Different Degree of Persistence

- Evidence that $\rho_{\tilde{i}}$ and ρ_{φ} have changed (increased) over time
- We consider an alternative scenario:

$$\zeta_{\tilde{i},t} = \zeta^1_{\tilde{i},t} + \zeta^2_{\tilde{i},t} \tag{1}$$

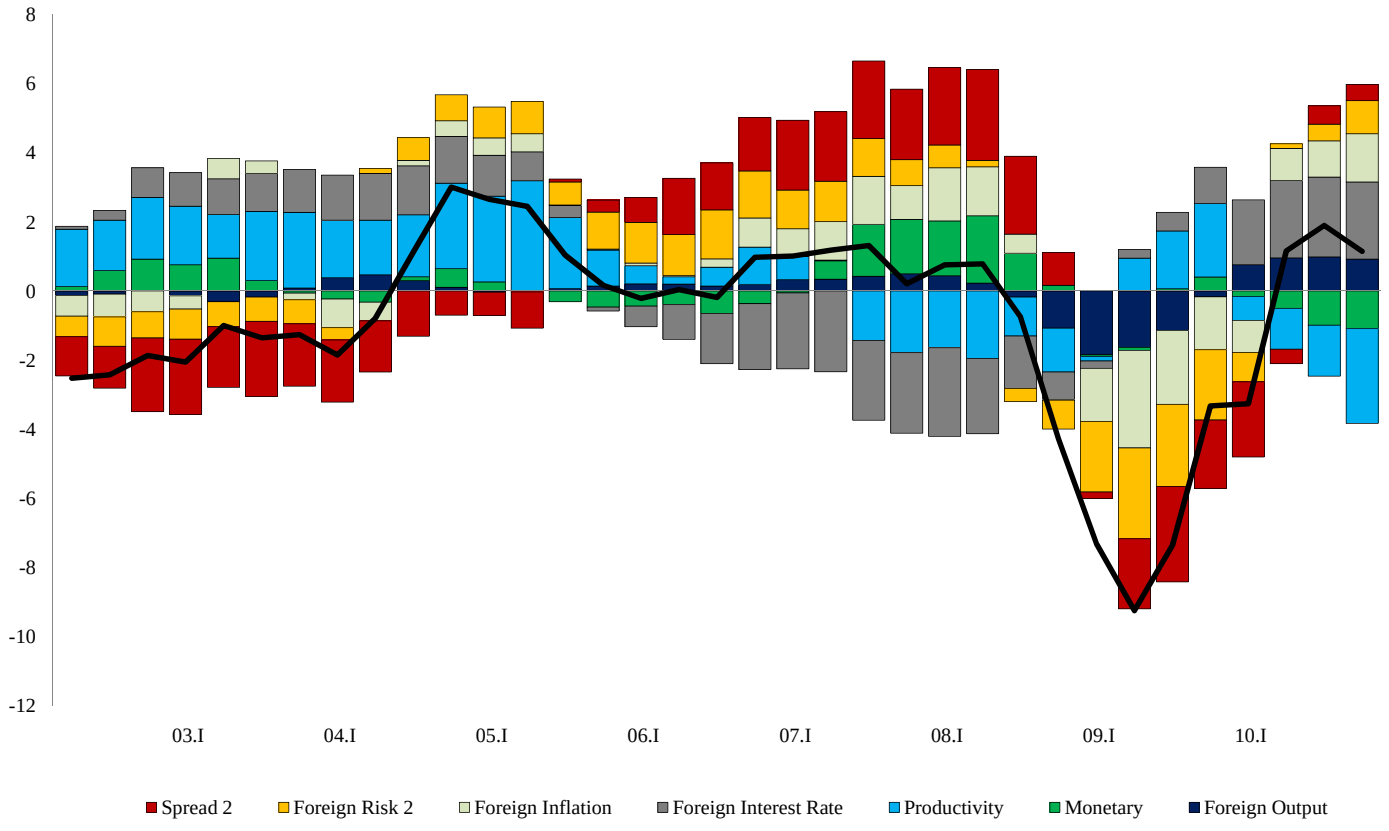
where,

$$\zeta^1_{\tilde{i},t} = 0.1\zeta^1_{\tilde{i},t-1} + \epsilon^1_{\tilde{i},t} \tag{2}$$

$$\zeta^2_{\tilde{i},t} = 0.95\zeta^2_{\tilde{i},t-1} + \epsilon^2_{\tilde{i},t} \tag{3}$$

Alternative Scenario: Different Degree of Persistence

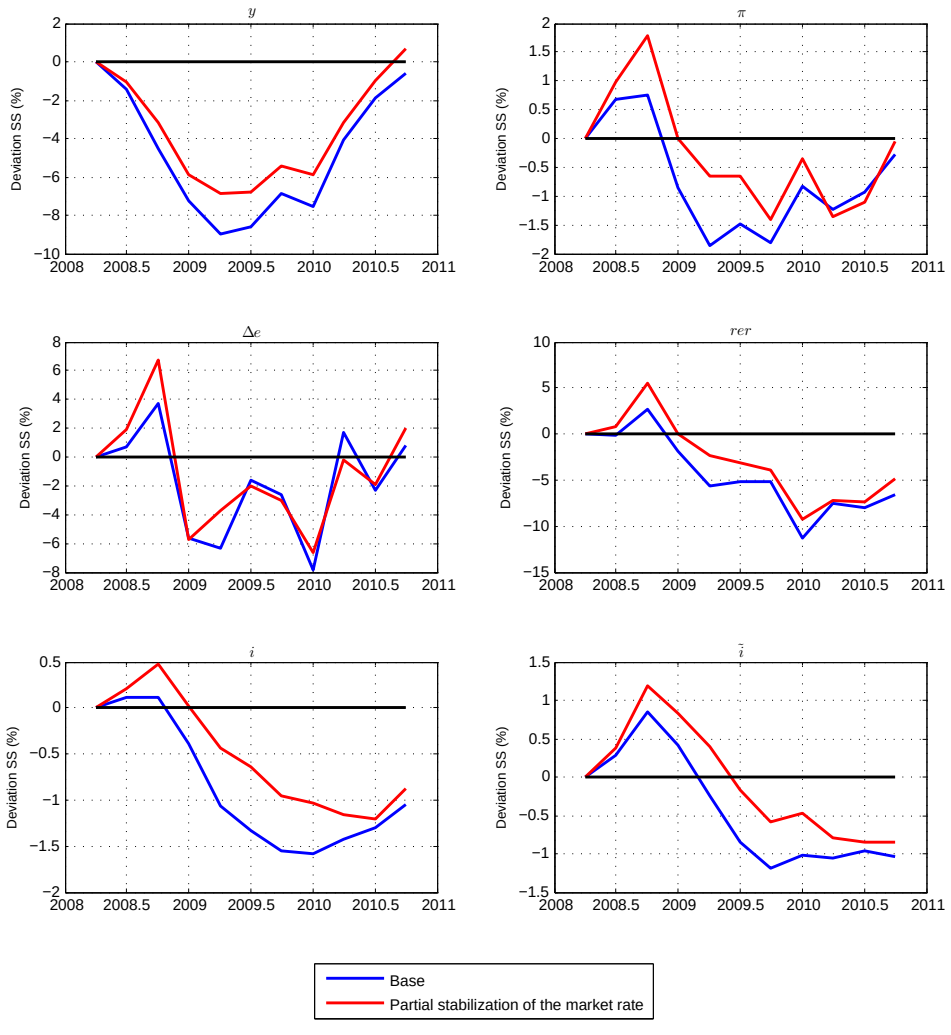
- In this case in 2009.Q2, 60% of the output decline can be attributed to:
  - Spread shocks (18%)
  - Foreign output (17%)
  - Country risk premium (25%)



Mitigating the Effects of Adverse Shocks:

- We assess the impact of reacting systematically to spread (Taylor 2008):

$$i_t = \psi_i i_{t-1} + (1 - \psi_i)\left[\psi_\pi \pi_t + \psi_y \Delta y_t\right] - \psi_i \zeta_{i,t} + \epsilon_{i,t}$$



Conclusions

- We estimate a DSGE model identifying a series of exogenous shocks
- Spread, county risk premium and foreign output shocks, played a major role in explaining the downturn in activity in Chile in 2008 and 2009
- Alternative (credible) rules could have mitigated the impact of adverse shocks
- Alternative rules/Efficiency frontier??
- We use as observables: $\{dy_t, \pi_t, dc_t, i_t, i_t^*, y_t^*, \zeta_{\tilde{i},t}, \zeta_{\varphi,t}\}$
- Model consistent RER, not necessarily in line with the actual one