Gone with the Wind: Monetary Policy and the Global Financial Cycle

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Trilemma or Dilemma?

▶ How should countries design monetary policy in a financially integrated world?
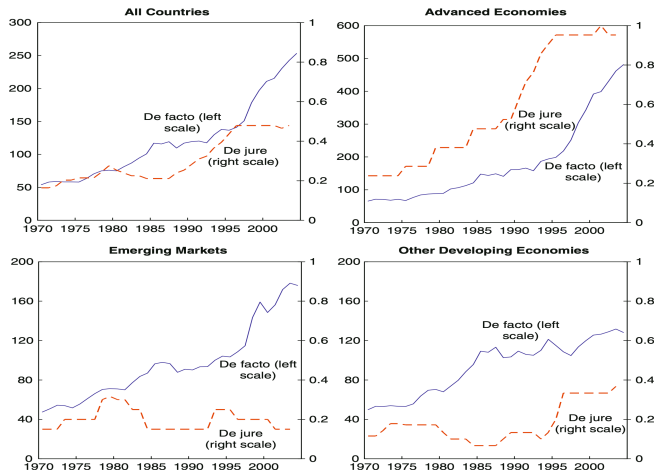

Figure Financial integration indices (Kose et al. 2010)

Trilemma or Dilemma?

▶ How should countries design monetary policy in a financial integrated world?
▶ Convention: **Mundellian Trilemma** (Obstfeld 2015): With free international capital flows, pick only one:
  - (a) Independent monetary policy
  - (b) Exchange rate stability
▶ Recent challenge: **Dilemma** (Rey 2015, 2016; Miranda-Agrippino and Rey 2020): Independent monetary policy only with managed capital account.
  - ∗ Due to global financial cycles
  - ∗ Stance on exchange rate position is irrelevant

This paper

▶ Builds and estimates a small open economy New Keynesian DSGE model to assess the Trilemma vs Dilemma debate.

▶ Reviews evidence for dilemma mainly from reduced-form VARs

▶ Develops a model with financial frictions to:
  * Explore mechanism of foreign monetary policy ("spillovers") shocks affecting the domestic economy.
  * Provide policy analysis: Exchange rate regimes, "leaning against the wind", macroprudential policy.

Main findings

▶ Foreign interest rate increase causes domestic recession and deflation upon impact despite a currency depreciation and boost to exports
▶ Exchange rate regime matters – implies that the trilemma may still hold
  * Foreign interest rate shock has stronger effect for fixed exchange rate regime
  * Floating exchange rate buffers much of the shock
▶ Model estimation: Trade-offs of the Mundellian Trilemma are complicated
▶ Highlight the importance of capital control and macroprudential policies

Related literature

▶ Closest papers: Aoki, Benigno, and Kiyotaki (2020), Gourinchas (2018), and Akinci and Queraltó (2019).

▶ Global financial cycles – "when the Fed sneezes, does the world catch a cold?": Rey (2015, 2016), Miranda-Agrippino and Rey (2020), Dedola, Rivolta, and Stracca (2017), Iacoviello and Navarro (2019), and Cesa-Bianchi, Ferrero, and Rebucci (2018)

▶ Financial crises and the small open economy: Gertler, Gilchrist, and Natalucci (2007), Mendoza (2010), Christiano, Trabandt, and Walentin (2011), and Bianchi (2011)

▶ Financial crises affecting the real economy: Kiyotaki and Moore (1997), Bernanke, Gertler, and Gilchrist (1999), Gertler and Karadi (2011), and Gertler and Kiyotaki (2010, 2015)

Model overview I

▶ Small open economy New Keynesian model with international financial markets
▶ Three types of optimising agents:
   * Workers
   * Bankers: Intermediate deposits from workers and foreigners
   * Firms: Set prices on a staggered basis and produce using labour, capital, and imports
▶ Central bank and fiscal authority:
   * Taylor rule with exchange rate smoothing
   * Macroprudential policy in the form of taxes and subsidies
   * Balanced budget

Model overview II
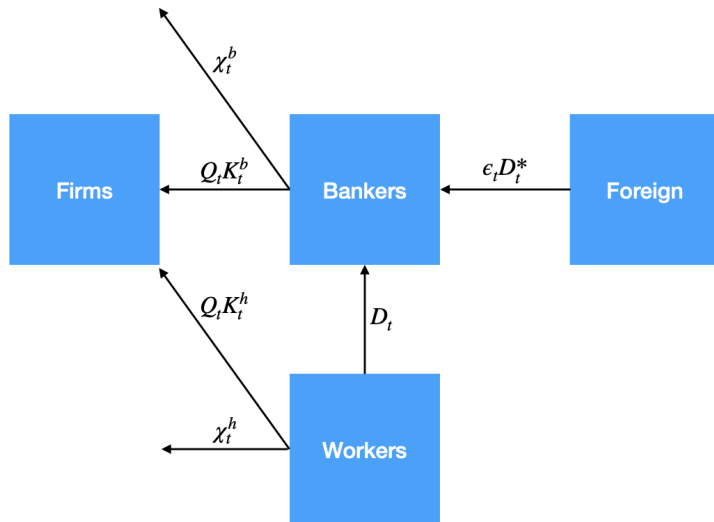
Households

▶ Households are comprised of workers and bankers; share a perfect insurance scheme
▶ Workers supply labour and save in either deposits or equity directly in firms
  * Workers incur a cost in saving in equity, χ_t^h
▶ Deposits earn a nominal return of R_t and equity have a price of Q_t and a net rental rate of z_t^k
▶ No exchange rate risk

Bankers I

▶ Bankers maximise their franchise value by picking quantities of equity, deposits, and foreign deposits.
  * Foreign deposits earn a nominal return of R_t^*
  * This exposes them to exchange rate risk
  * Intermediating foreign deposits incurs a cost of χ_t^b

Table Bank balance sheet

Assets	Liabilities + Equity
Loans $Q_t k_t^b$	Deposits d_t
Management costs χ_t^b	Foreign debt $\epsilon_t d_t^*$
	Net worth n_t

Bankers II

- ▶ $1 - \sigma$: banker's retirement probability
- ▶ γ: Start up funds for new bankers; a fraction of total assets of the collective household
- ▶ Financial friction in line with Gertler and Kiyotaki 2010 is used to limit a banker's ability to raise funds.
    - ∗ θ: absconding proportion
- ▶ Banker earning the spreads allows the breaking of the real UIP condition in this model

Firms

- ▶ Broadly standard
- ▶ Final goods are produced with perfect competition, intermediate good producers are monopolistically competitive:

$$Y_t(i) = A_t \left(\frac{K_{t-1}(i)}{\alpha_K} \right)^{\alpha_K} \left(\frac{M_t(i)}{\alpha_M} \right)^{\alpha_M} \left(\frac{A_t^L L_t(i)}{1 - \alpha_K - \alpha_M} \right)^{1 - \alpha_K - \alpha_M} - A_t^f c_f(i),$$

- ▶ Rotemberg price adjustment costs

FOREX

► Exports are a function of foreign demand

► In the baseline (no estimation), foreign demand, inflation, and interest rates are given by stationary AR(1) processes.

► For estimation, the following VAR structure is used:

$$
\begin{bmatrix} \ln\left(\frac{y_t^*}{y^*}\right) \\ \Pi_t^* - \Pi^* \\ R_t^* - R^* \\ \ln\left(\frac{A_t^L}{A^L}\right) \\ \ln\left(\frac{A_t^I}{A^I}\right) \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} & a_{13} & 0 & 0 \\ a_{21} & a_{22} & a_{23} & a_{24} & \frac{\alpha_K}{1-\alpha_K}a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} & \frac{\alpha_K}{1-\alpha_K}a_{34} \\ 0 & 0 & 0 & \rho_{A^L} & 0 \\ 0 & 0 & 0 & 0 & \rho_{A^I} \end{bmatrix} \begin{bmatrix} \ln\left(\frac{y_{t-1}^*}{y^*}\right) \\ \Pi_{t-1}^* - \Pi^* \\ R_{t-1}^* - R^* \\ \ln\left(\frac{A_{t-1}^L}{A^L}\right) \\ \ln\left(\frac{A_{t-1}^I}{A^I}\right) \end{bmatrix} + \begin{bmatrix} \sigma_{y^*} & 0 & 0 & 0 & 0 \\ c_{21} & \sigma_{\pi^*} & 0 & c_{24} & \frac{\alpha_K}{1-\alpha_K}c_{24} \\ c_{31} & c_{32} & \sigma_{R^*} & c_{34} & \frac{\alpha_K}{1-\alpha_K}c_{34} \\ 0 & 0 & 0 & \sigma_{A^L} & 0 \\ 0 & 0 & 0 & 0 & \sigma_{A^I} \end{bmatrix} \begin{bmatrix} \varepsilon_t^{y^*} \\ \varepsilon_t^{\pi^*} \\ \varepsilon_t^{R^*} \\ \varepsilon_t^{A^L} \\ \varepsilon_t^{A^I} \end{bmatrix}
$$

Fiscal policy and monetary policy

▶ Government runs a balanced budget:

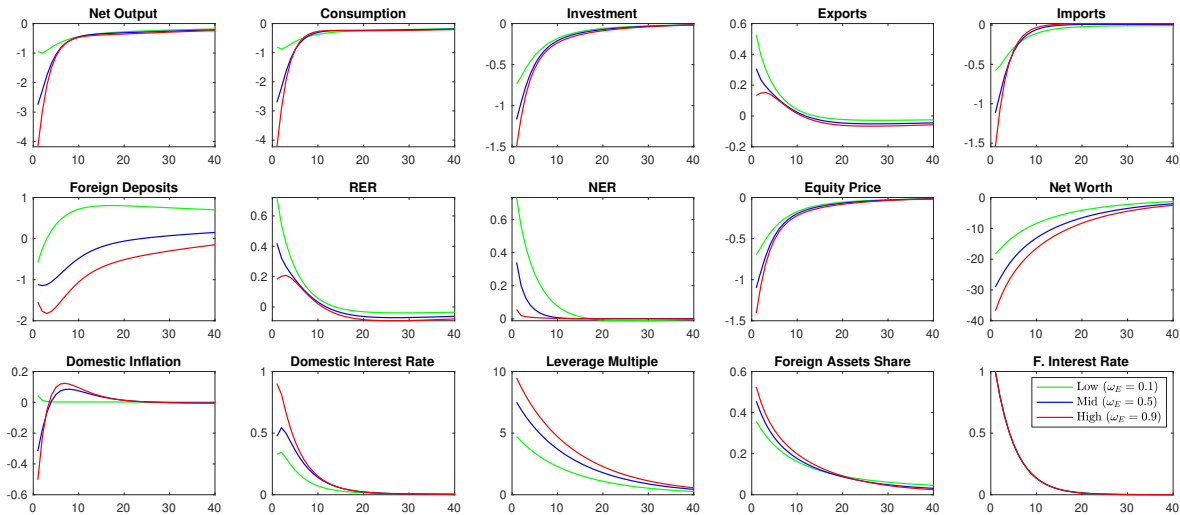$$\tau_t^N N_t = \tau_t^K Q_t K_t^b + \tau_t^{D^*} \epsilon_t D_t^* \tag{1}$$

▶ Central bank operates an inertial Taylor Rule as in Galí and Monacelli (2016):

$$\frac{R_t}{R} = \left(\frac{R_{t-1}}{R}\right)^{\rho_R} \left[\left(\frac{\Pi_t}{\Pi}\right)^{\frac{1-\omega_E}{\omega_E}} \left(\frac{E_t}{E}\right)^{\frac{\omega_E}{1-\omega_E}}\right]^{1-\rho_R} \exp(\varepsilon_t^R), \tag{2}$$
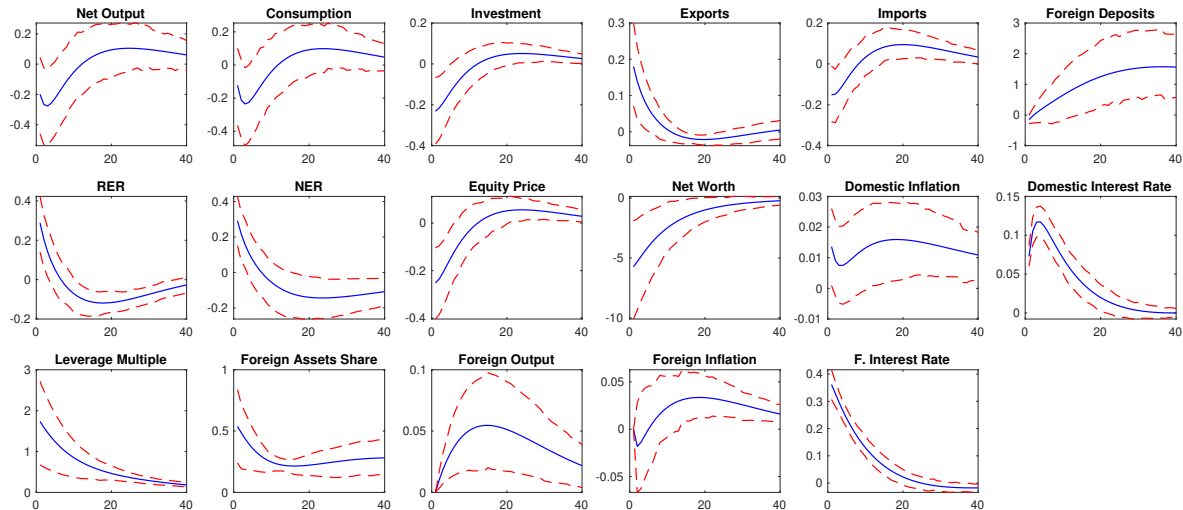
where $\omega_E \in (0, 1)$:
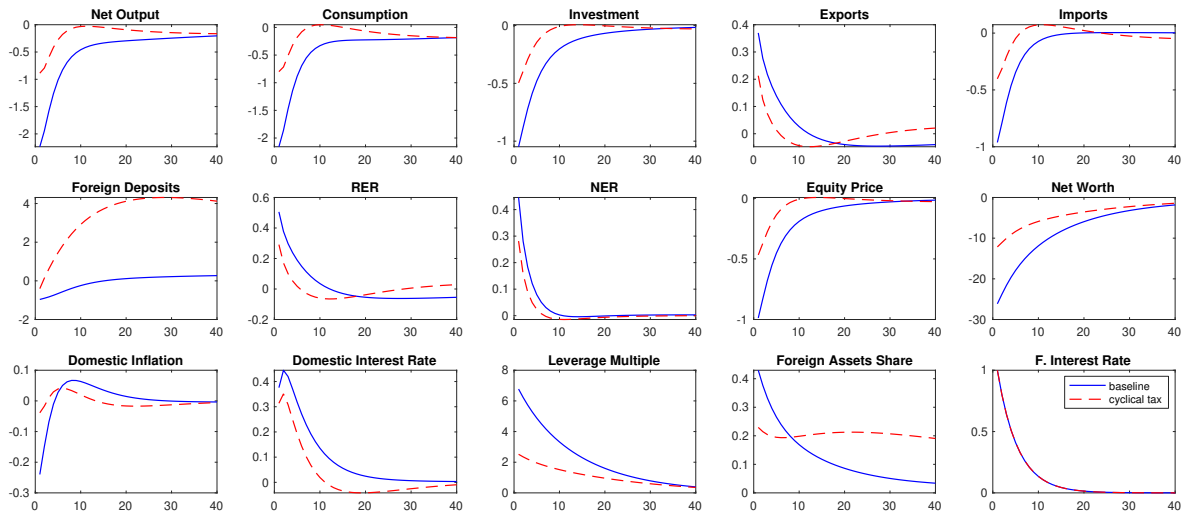 * $\omega_E \to 0$: float
  * $\omega_E \to 1$: peg

Key results: IRFs to R^* shock

Bayesian IRFs to R^* shock

IRFs to R^* shock w/ cyclical tax (τ^{D^*}) policy

Conclusion

▶ An increase in the foreign interest rate – a proxy for the global financial cycle – leads to domestic recession
  * But not higher inflation following empirical evidence from Dedola, Rivolta, and Stracca (2017).
▶ Recession is worsened if the domestic monetary authority aims for a fixed exchange rate regime
  * Suggests that the Mundellian Trilemma remains
  * But even a floating exchange rate is not enough to protect domestic economy from global financial cycles
▶ Strong role for macroprudential policy and capital controls for macro stabilisation (Rey 2015; Blanchard 2017; Miranda-Agrippino and Rey 2020)

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