Crisis, contagion and international policy spillovers under foreign ownership of banks

Michał Brzoza-Brzezina, Marcin Kolasa and Krzysztof Makarski

Narodowy Bank Polski & Warsaw School of Economics

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Plan of the Presentation

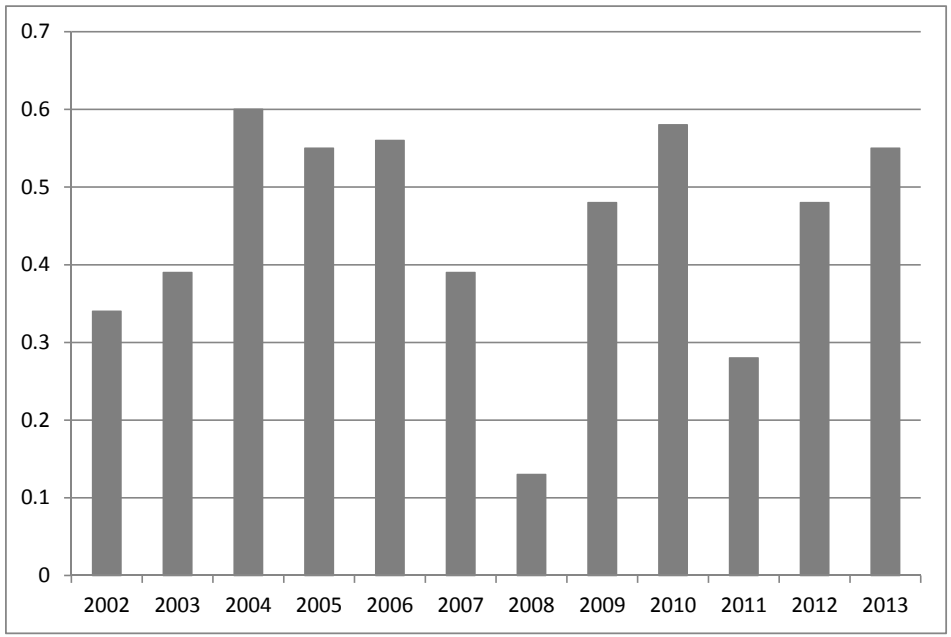
Motivation (1)

- Widespread foreign ownership (FO) of banks:
  - in 51/124 countries more than 2/3 assets under foreign control (Cihak et al 2012)
  - in Poland over 60%
- Empirical evidence strongly confirms the role of FO in transmitting shocks internationally:
  - Popov & Udell (2012): during fin. crisis supply of credit reflects balance sheet conditions of foreign parent bank
  - Cull & Martinez Peira (2013) and Haas & Lelyveld (2014): during fin. crisis foreign owned banks cut credit much more than domestic banks
  - Feyen et al (2014): credit growth depends on cross-border funding shocks

Motivation (2)

- Polish supervisory authorities prevented an outflow of bank capital (dividend payout) in 2008 ...
- ... and introduced a rule linking dividend payout to capital position

Figure : Distributed profits of the Polish banking sector (share of total)



Questions & literature

- Many policy relevant questions:
  - how does foreign bank ownership contribute to transmission of shocks?
  - how does it affect monetary/ macroprudential policy in open economies?
  - how can macroprudential/ regulatory policy cope with these effects?
- But no formal/ structural treatment of foreign ownership in the literature
- Closest:
  - Dedola & Lombardo (2012): financial institutions operate cross-border and amplify shocks
  - Kollmann (2013): global bank increases spillovers
  - Kamber & Thoenissen (2013): banks lend to foreign enterprises
- Our contribution:
  - formal treatment of foreign ownership
  - discussion of macropru/ regulatory policy in this context

Plan of the Presentation

Model

- Two economies
- Standard households and production sector
- Real and nominal rigidities (sticky prices & wages, habits, inv. adj. cost)
- Parent banks owned by foreign households distribute net worth to domestic and foreign branches
- Branches collect deposits from HH and grant loans to firms
- Face moral hazard problem as in Gertler & Karadi (2011)
- Monetary policy - Taylor rule
- Macroprudential policy - capital injections, capital restrictions

Households

- Maximize

$$\mathbb{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t \left[\frac{(c_t(\iota) - hc_{t-1})^{1-\sigma_c}}{1-\sigma_c} - A_n \frac{l_t(\iota)^{1+\sigma_n}}{1+\sigma_n} \right] \right\}$$

  subject to the budget constraint

$$P_t c_t(\iota) + D_t(\iota) + T(\iota) = W_t(\iota) l_t(\iota) + R_{t-1} D_{t-1}(\iota) + \Pi_t(\iota)$$

- Wages sticky a la Calvo

Production

- Final good producer - aggregate domestic and imported goods

$$y_t = \left((1-\eta)^{\frac{1}{\phi}} y_{F,t}^{\frac{\phi-1}{\phi}} + \eta^{\frac{1}{\phi}} y_{H,t}^{\frac{\phi-1}{\phi}}\right)^{\frac{\phi}{\phi-1}}$$

- Retail goods producers - purchase wholesale goods, brand and sell to domestic and export market

$$y_{H,t}(i) + \frac{1-\omega}{\omega} y^*_{H,t}(i) = y_{m,t}(i)$$

- Capital goods producers - produce capital subject to investment adjustment costs

$$k_t = (1-\delta)\xi_t k_{t-1} + \left(1 - S\left(\frac{i_t}{i_{t-1}}\right)\right) i_t$$

Wholesale goods producers

- Perfectly competitive, produce according to

$$y_{w,t} = z_t(\xi_t k_{t-1})^{\alpha} l_t^{1-\alpha}$$

- Finance capital stock with loans from banks

$$k_t = s_t$$

- Earn zero profits. Return on capital (paid out to banks)

$$R_{k,t+1} = \frac{\alpha P_{m,t+1} \frac{y_{m,t+1}}{\xi_{t+1} k_t} + (1-\delta) P_{k,t+1}}{P_{k,t}} \xi_{t+1}$$

Bank branch (domestic)

- Collect domestic and foreign deposits
- Use them and net worth to grant loans
- Subject to moral hazard problem - can divert fraction λ of assets. Maximize:

$$\tilde{V}_t = \mathcal{E}_t \max E_t \left\{ \beta^* \Lambda^*_{t,t+1} \mathcal{E}^{-1}_{t+1} \left[R_{k,t+1} P_{k,t} s_t - R_t D_{H,t} - \rho R^*_t \mathcal{E}_{t+1} D_{F,t} \right] \right\}$$

subject to balance sheet:

$$P_{k,t} s_t = N_t + N_{g,t} + D_{H,t} + \mathcal{E}_t D_{F,t}$$

and incentive compatibility constraint

$$\tilde{V}_t \geq \lambda P_{k,t} s_t$$

Parent banks

- Collect and redistribute net worth between domestic and foreign branch every period.
- Pay adjustment cost and maximize profits:

$$E_0\Bigg\{\sum_{t=0}^{\infty}(\beta^*)^{t+1}\Lambda^*_{0,t+1}\Bigg[\omega\mathcal{E}_{t+1}^{-1}\Big((R_{k,t+1}-R_t)\phi_t(N_t+N_{g,t})+R_t(N_t+N_{g,t})\Big)$$
$$+(1-\omega)\Big((R^*_{k,t+1}-R^*_t)\phi^*_t(N^*_t+N^*_{g,t})+R^*_t(N^*_t+N^*_{g,t})\Big)\Bigg]$$
$$-\sum_{t=0}^{\infty}(\beta^*)^t\Lambda^*_{0,t}\left[\omega\mathcal{E}_t^{-1}\Phi\left(\frac{N_t}{\tilde{N}_t}\right)N_t\right]\Bigg\}$$

- subject to

$$\omega\mathcal{E}_t^{-1}\tilde{N}_t+(1-\omega)\tilde{N}^*_t=\omega\mathcal{E}_t^{-1}N_t+(1-\omega)N^*_t$$

- the laws of motion for net worth (here domestic branch)

$$\tilde{N}_{t+1}=\theta\left[(R_{k,t+1}P_{k,t}s_t-R_tD_{H,t}-\rho R^*_t\mathcal{E}_{t+1}D_{F,t}\right](N_t+N_{g,t})$$

- and incentive compatibility constraints.

Policy

- Monetary policy - Taylor rule

$$\frac{R_t}{R} = \left(\frac{R_{t-1}}{R}\right)^{\gamma_R} \left[\left(\frac{\pi_t}{\pi}\right)^{\gamma_\pi} \left(\frac{y_t}{y}\right)^{\gamma_y}\right]^{1-\gamma_R} e^{\varepsilon_{R,t}} \tag{1}$$

- Macroprudential policy - capital injections (capital buffer)

$$N_{g,t} = N_{g,t}\left(N_{g,t-1}, F_t, (E_t R_{k,t+1} - R_t), \varepsilon_{N_{g,t}}\right)$$

- Macroprudential policy - restriction on net worth transfer

$$\kappa_{N,t} = \kappa_{N,t}\left(\kappa_{N,t-1}, (E_t R_{k,t+1} - R_t), \varepsilon_{\kappa_{N,t}}\right)$$

where $\kappa_{N,t}$ parametrizes the penalty function
$\Phi(N_t/\tilde{N}_t) = \kappa_{N,t}(N_t/\tilde{N}_t - 1)^2/2$.

Calibration

- Home and foreign economies calibrated symmetrically
- Structural parameters based on literature (Gertler & Karadi 2011, Christoffel et al 2008)
- Difference: size and openness reflects Poland vs. euro area (home is small - 3.2% and open - home bias 72%)
- Penalty function curvature:
  - run stochastic simulations with technology shock (match output volatility and correlation in PL and EA)
  - κ_n set to match standard deviation of dividend payout ratio in the Polish banking sector

Plan of the Presentation

Simulations

1. How does foreign ownership modify transmission of macroeconomic shocks?
2. How does foreign ownership modify transmission of policy?
3. Did regulatory policy prevent the transmission of banking crisis to Poland?

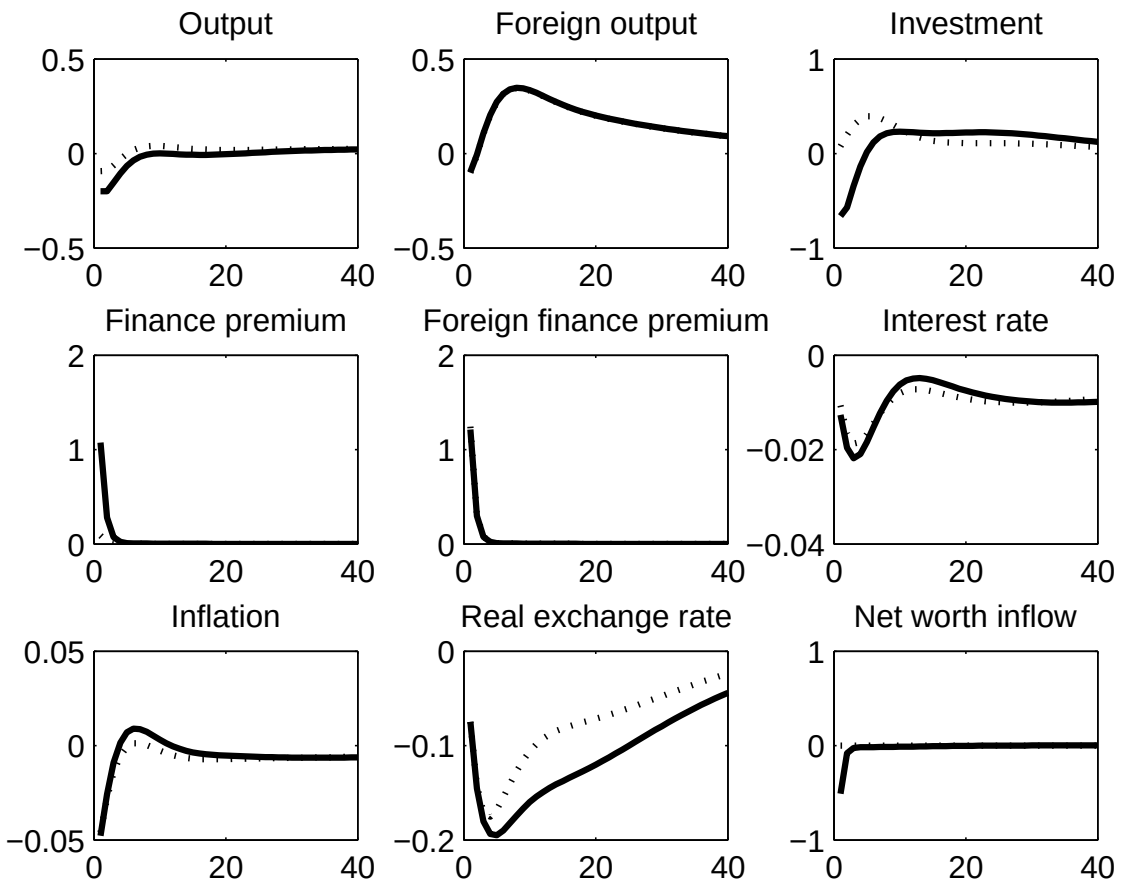
Capital flows

- What determines the direction of capital transfers?
- Under simplifying assumptions (static problem, no penalty etc.) the parent bank's problem solves as:

$$E_t\left\{\Lambda^*_{t,t+1}\frac{\mathcal{E}_t}{\mathcal{E}_{t+1}}\left[R_{k,t+1}-\frac{\phi_t-1}{\phi_t}R_t\right]\right\}=E_t\left\{\Lambda^*_{t,t+1}\left[R^*_{k,t+1}-\frac{\phi_t-1}{\phi_t}R^*_t\right]\right\}$$

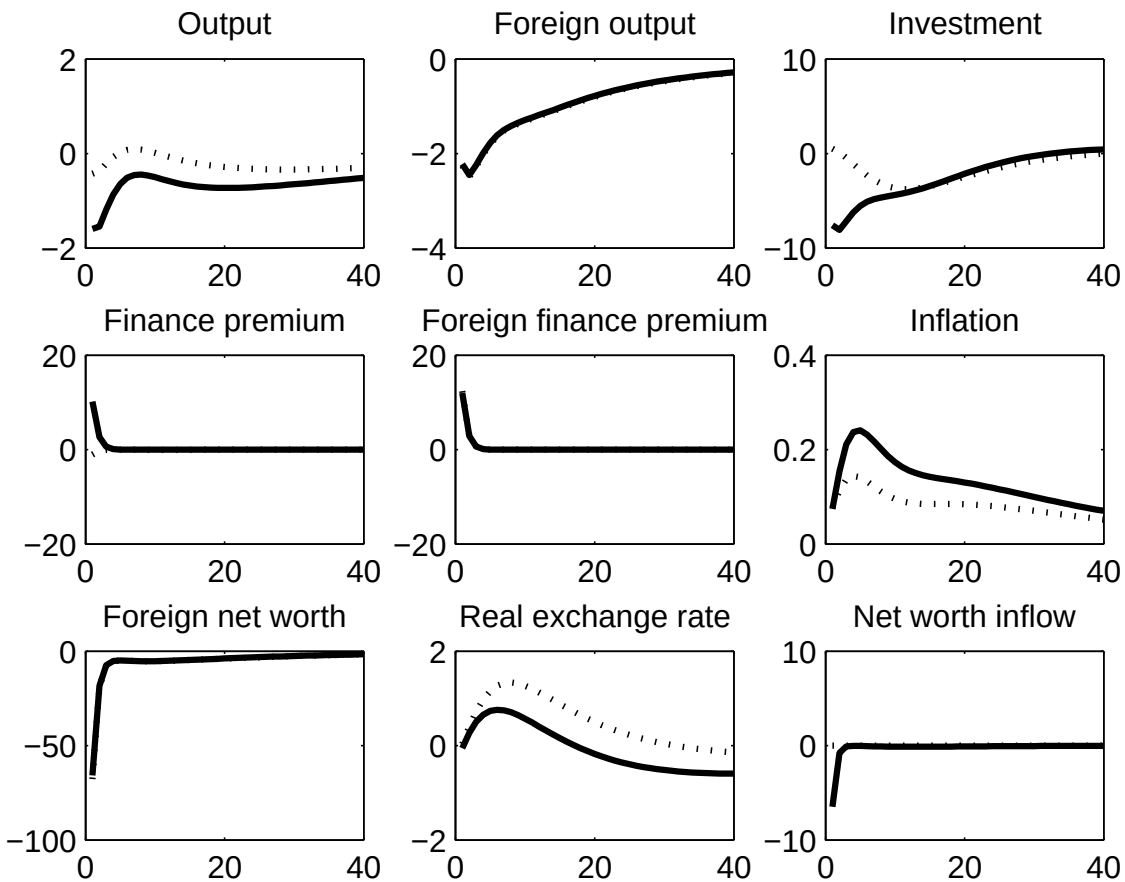
- Parent bank transfers net worth to equalize effective finance premia between domestic and foreign branch

Transmission of foreign productivity shock



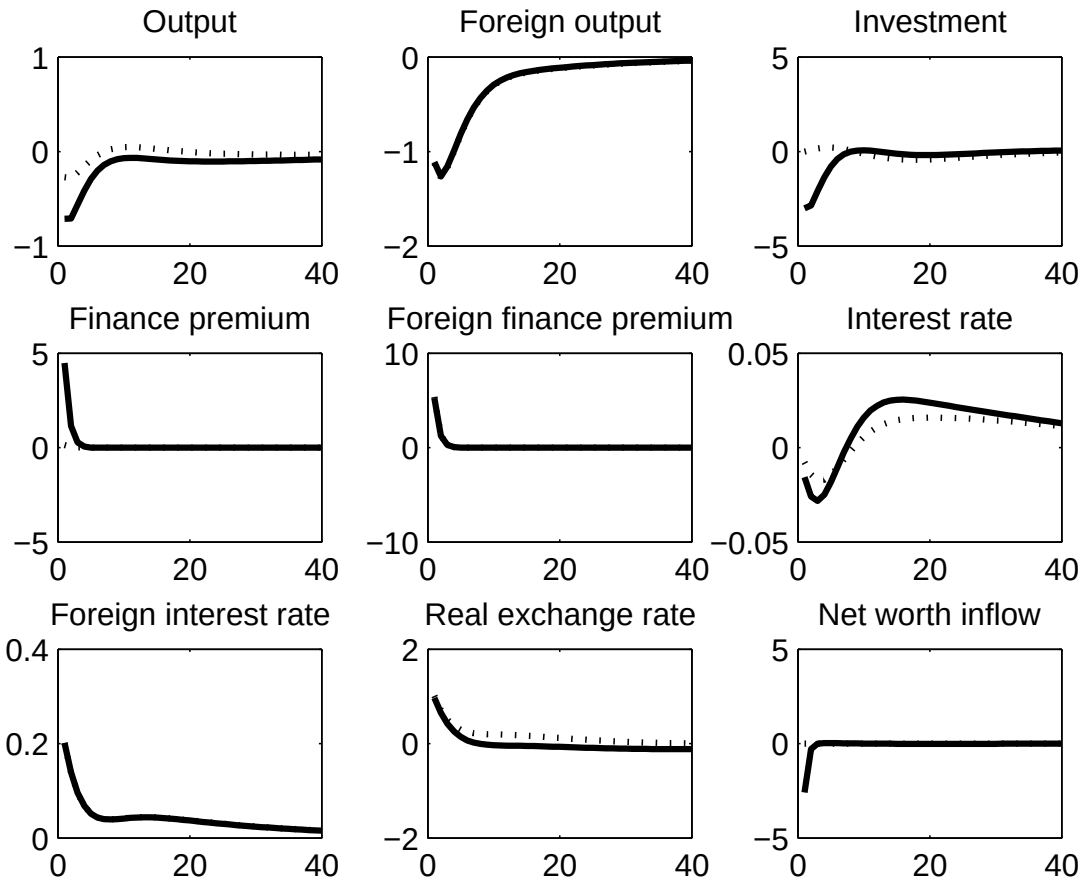
solid: with foreign ownership; dashed - without

Transmission of foreign capital quality shock



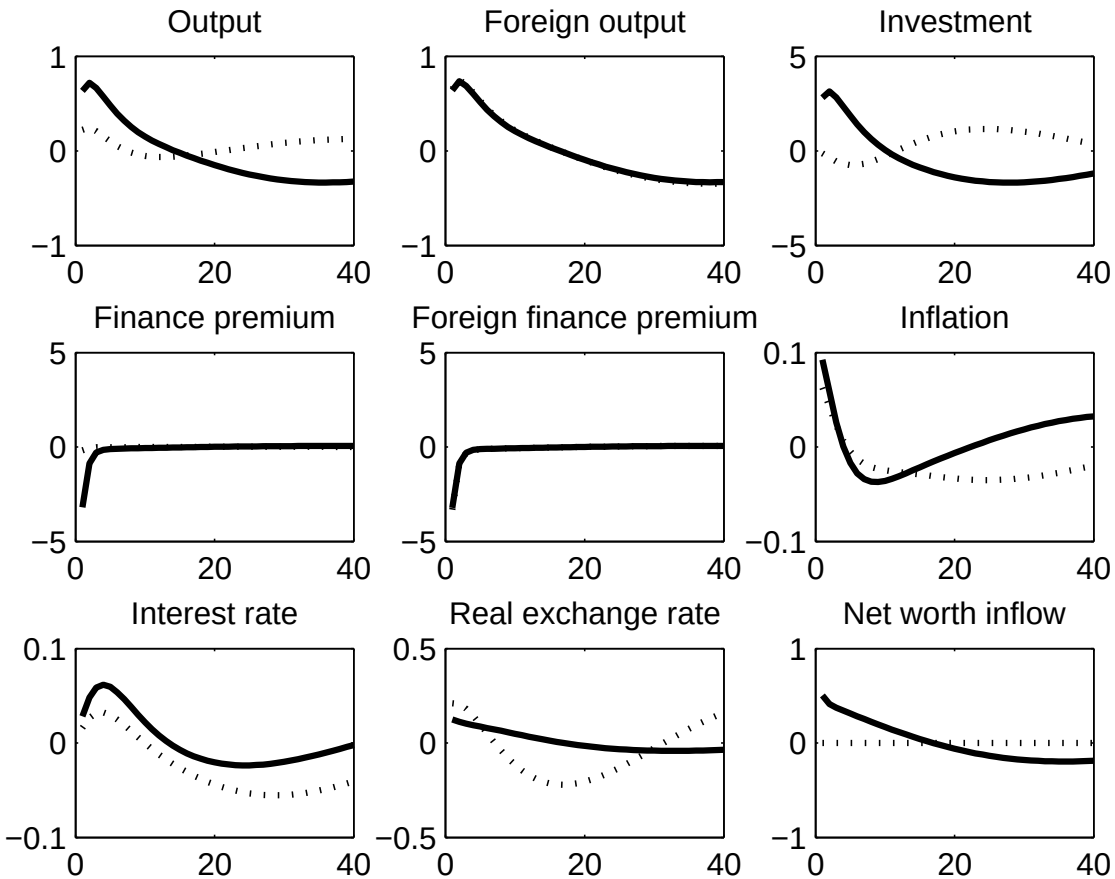
solid: with foreign ownership; dashed - without

Transmission of foreign monetary policy



solid: with foreign ownership; dashed - without

Transmission of foreign macroprudential (capital injection) policy



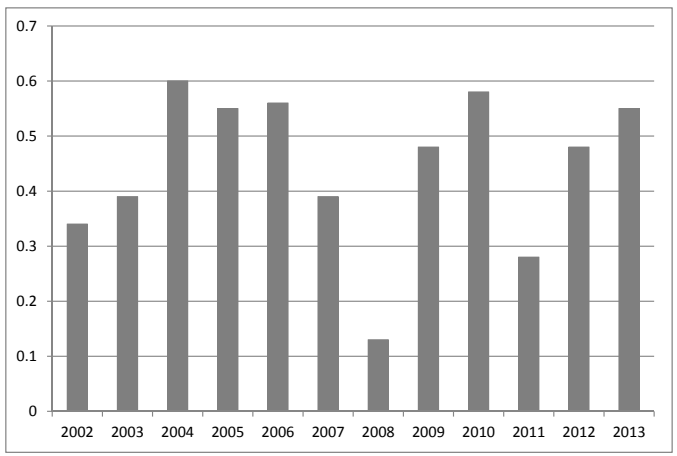
solid: with foreign ownership; dashed - without

Transmission of macroeconomic shocks and policy - conclusions

- Foreign ownership can amplify substantially the transmission of financial shocks...
- and of foreign policy.

Crisis scenario

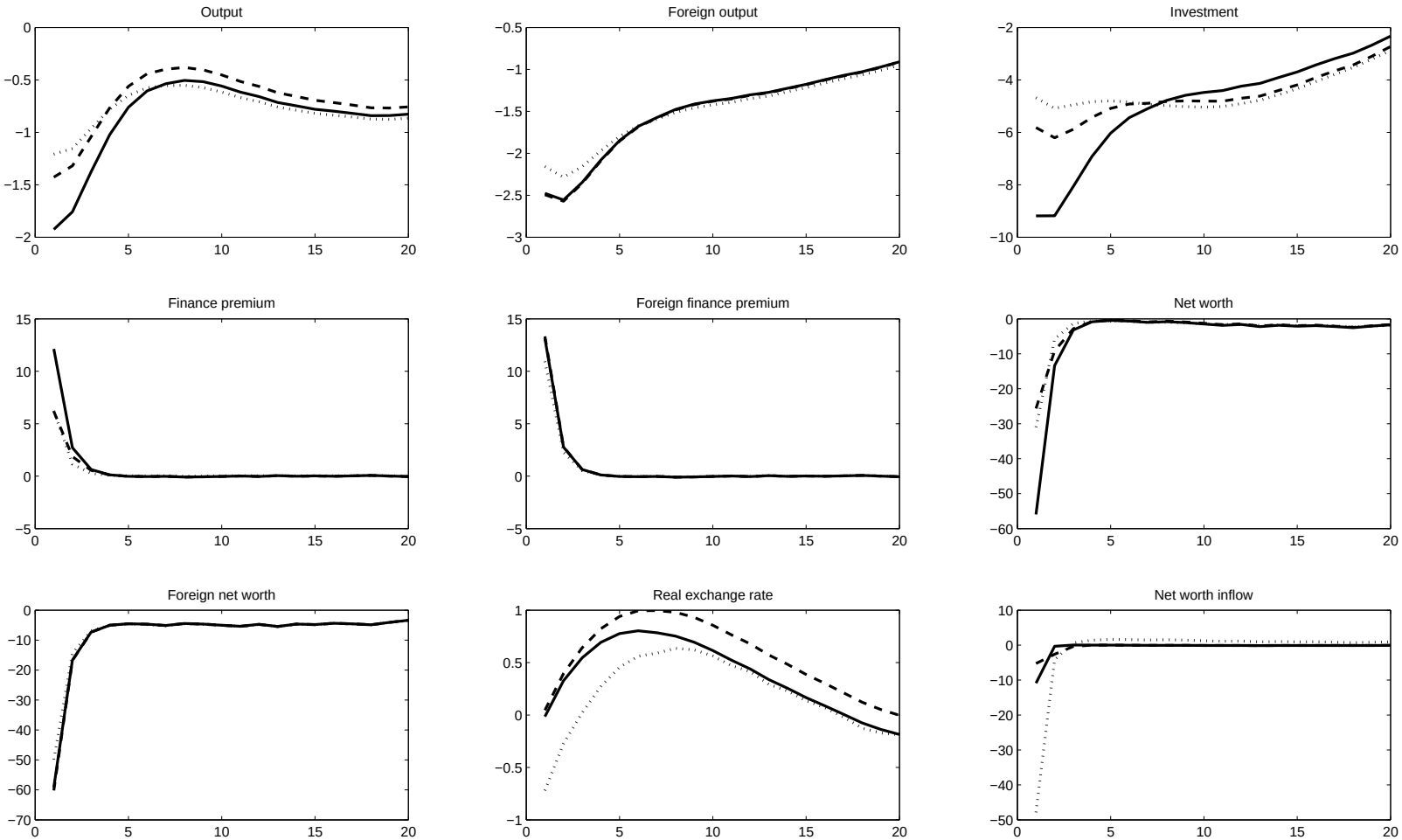
- In 2009 Western European banks face huge losses
- They intend (anecdotal evidence) to withraw capital (collect dividends) from local subsidiaries
- This is prevented by banking supervision



Crisis scenario

- Use foreign capital quality shock to generate recession in EA (GDP 2.6% below trend as in 2009)
- Apply two domestic regulatory policies to prevent spillovers:
  - capital injection for domestic banks
  - limit on capital flows
- Both calibrated as to reduce increase in home finance premium by half
- Findings:
  - sizable spillovers
  - can be reduced by regulatory policy
  - but recapitalization is costly (18% of GDP) - capital transfered to foreign economy
  - capital controls work better

Simulation



solid - no regulation; dashed - capital controls; dotted - capital injection

Conclusions

- We offer a structural macro model with bank foreign ownership
- Model consistent with empirical evidence: FO amplifies spillovers from foreign shocks
- Show that
  - FO also amplifies transmission of monetary and macroprudential policy
  - During foreign banking crisis capital restrictions are more effective than capital injections