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Discussion of Jan Brůha and Jiří Polanský's paper "The Housing Sector over Business Cycles: Empirical Analysis and DSGE Modelling"

CNB Research Open Day 2015

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Monday, 18 May 2015

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Disclaimers

The views presented here are mine and not necessarily those of the Bank of Canada or its staff

I am NOT an expert on housing market

I have some experience with modifications of large-scale DSGE models

Contribution

- A thorough exploration of cross-correlations in housing and macro data in OECD and Czech Republic
- An even more thorough analysis of implications of various production functions for the new housing construction sector
- Somewhat arbitrary calibration of the housing sector, but with robustness checks

Main results

- Housing prices & construction are pro-cyclical but have almost no impact on macro variables
- Models with land in the housing production function seem to stand out somewhat from the rest
- High degree of uncertainty regarding calibration of housing sector parameters and shocks

Assumptions

- Wealth and collateral channel effects of housing are dismissed based on previous empirical research at CNB – likely to become more important in the future
- Land plays a small role, at most 5% of the value of new housing - seems problematic, Davis & Heathcote (JME 2007)
- Prices of new houses are sticky – simplistic logic suggests that new housing prices should be flexible

The objective: add a housing sector to **g3** without disturbing its main properties

My suggestion

Calibrate housing market parameters to match the responses of housing prices and quantities to an exogenous shock (e.g. the Great Recession)

The shock (e.g. trade shock) can be backed out from g3 to match the behaviour of Czech GDP after October 2008

IRIS is very handy for that kind of purpose!

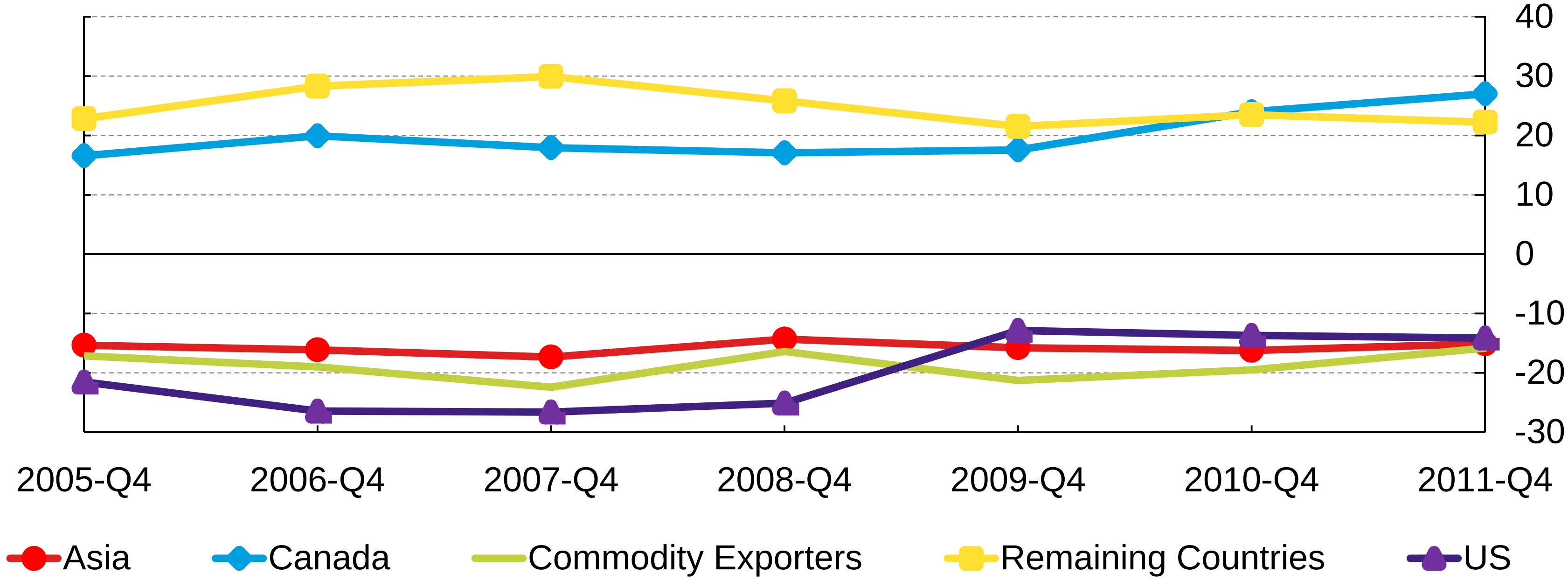
Shukayev & Toktamyssov (2014) approach to a similar problem

- Introduced an international interbank market into BoC-GEM-Fin (multi-region DSGE - 2500 equations)

- Tried to preserve IRFs relatively intact

- Calibrated the new block by matching changes in International Interbank Lending positions occurring during the Great Recession

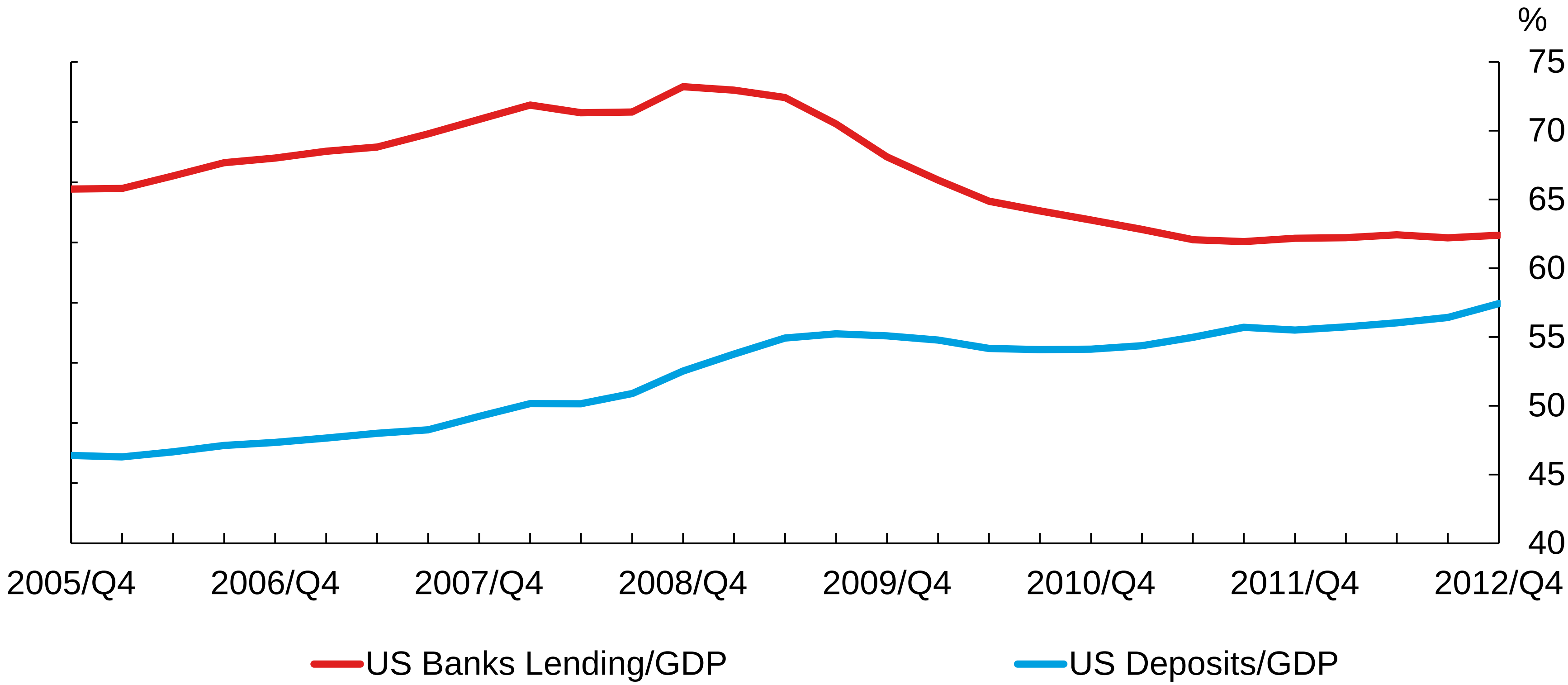
Large adjustments in cross-country interbank lending



International Interbank Lending positions relative to respective GDP

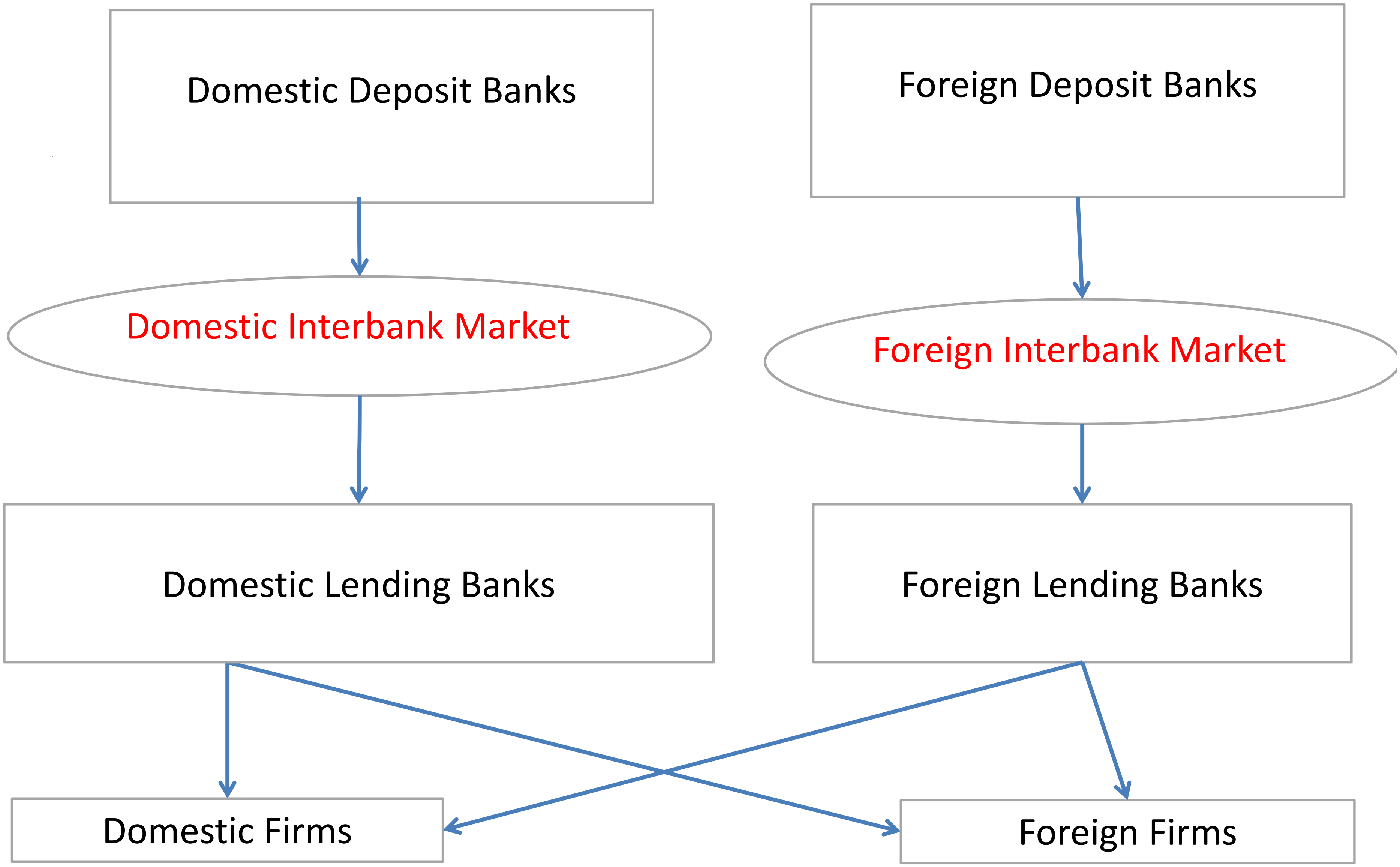
Drop in net lending to US banks: 14 percent of US GDP

Comparable to fall in lending by US banks

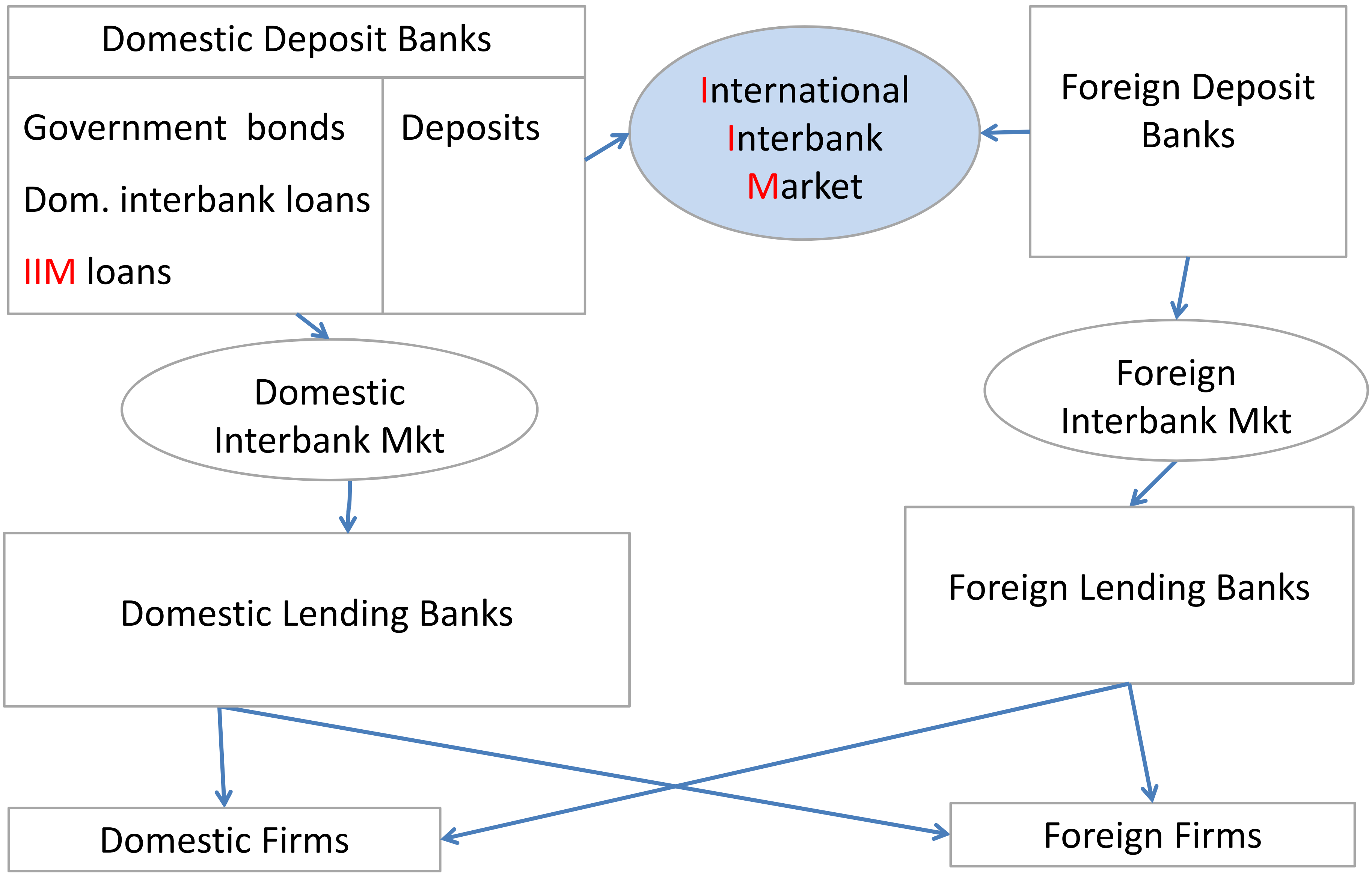


No model counterpart in BoC-GEM-Fin (BGF)

BGF: Region-specific interbank markets



Introducing cross-border interbank lending



Implementation details

- Deposit banks' balance sheet:

Dom. Interbank Loans + Govt. Bonds + Intl. Interbank Loans = Deposits

- Interbank rates reflect international asset positions of deposit banks (as well as of households)

$$R^{IB}_{t,CA} = \mu^{CA} * R^{IB}_{t,US} * S^{IB}_{CA}\left(\frac{B^{IB}_{t,CA}}{GDP_{t,CA}}\right)$$

- Internat. interbank mkt clears: $B^{IB}_{t,CA} + B^{IB}_{t,RC} + \ldots + B^{IB}_{t,US} = 0$

Calibration

$$R_{t,CA}^{IB} = \mu^{CA} * R_{t,US}^{IB} * S_{CA}^{IB} \left(\phi^{CA} \left(\frac{B_{t,CA}^{IB}}{GDP_{t,CA}} - b^{CA} \right) \right)$$

Match BIS international interbank lending data:

- b^{XX} - average net international interbank lending positions of BGF regions (relative to own GDP), 2005-2011
- ϕ^{XX} - change in those positions after the onset of U.S. financial crisis

Calibration strategy for ϕ^{XX}

Step 1: Pick initial values of ϕ^{XX}

Step 2: Shock productivity of US lending banks in the model

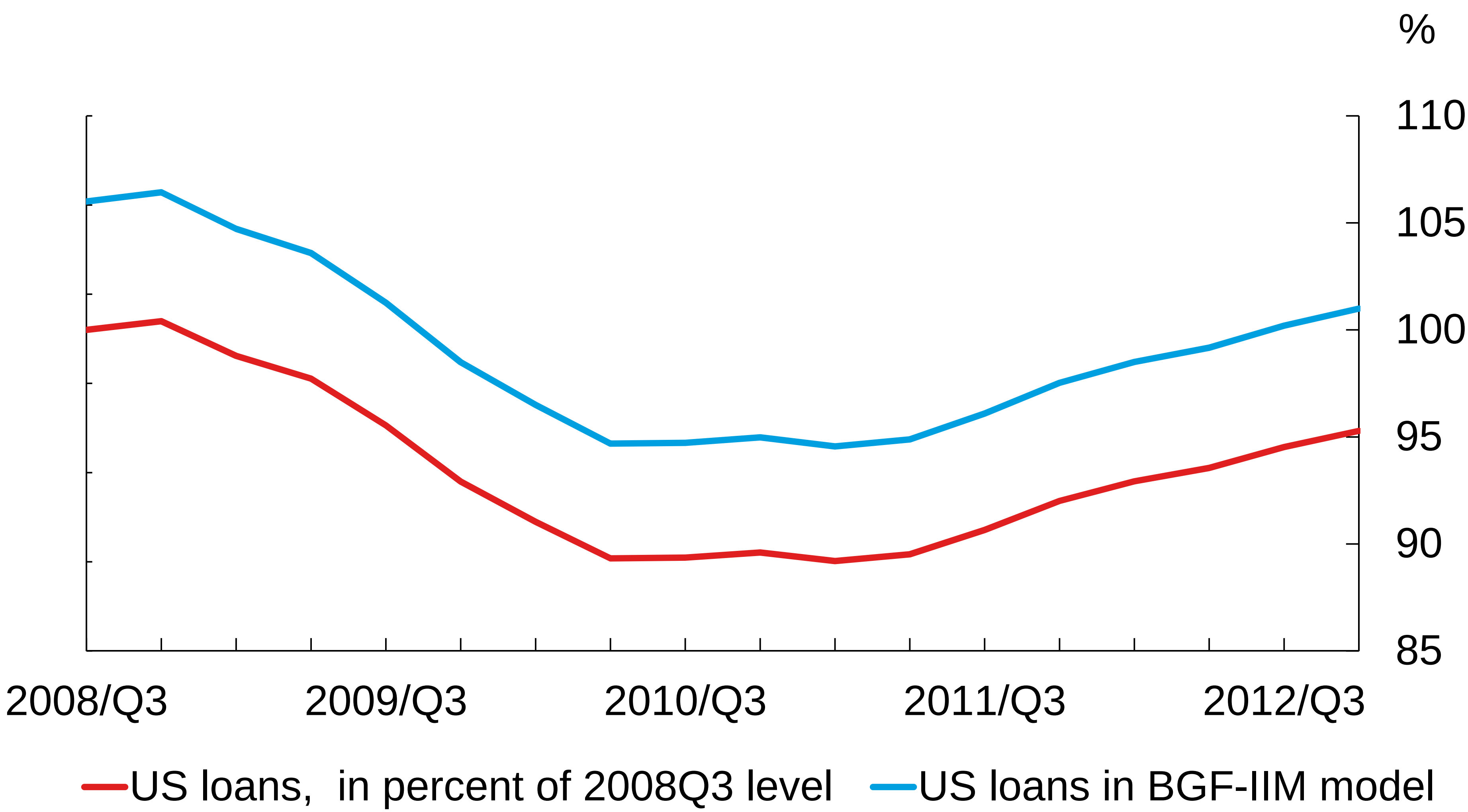
Loans to firms = Productivity * Liabilities

to replicate the dynamics of US banks' lending after 2008q3

Step 3: Compare changes in net interbank lending with data

Step 4: Search ϕ^{XX} values to minimize difference in Step3

Total lending by US banks



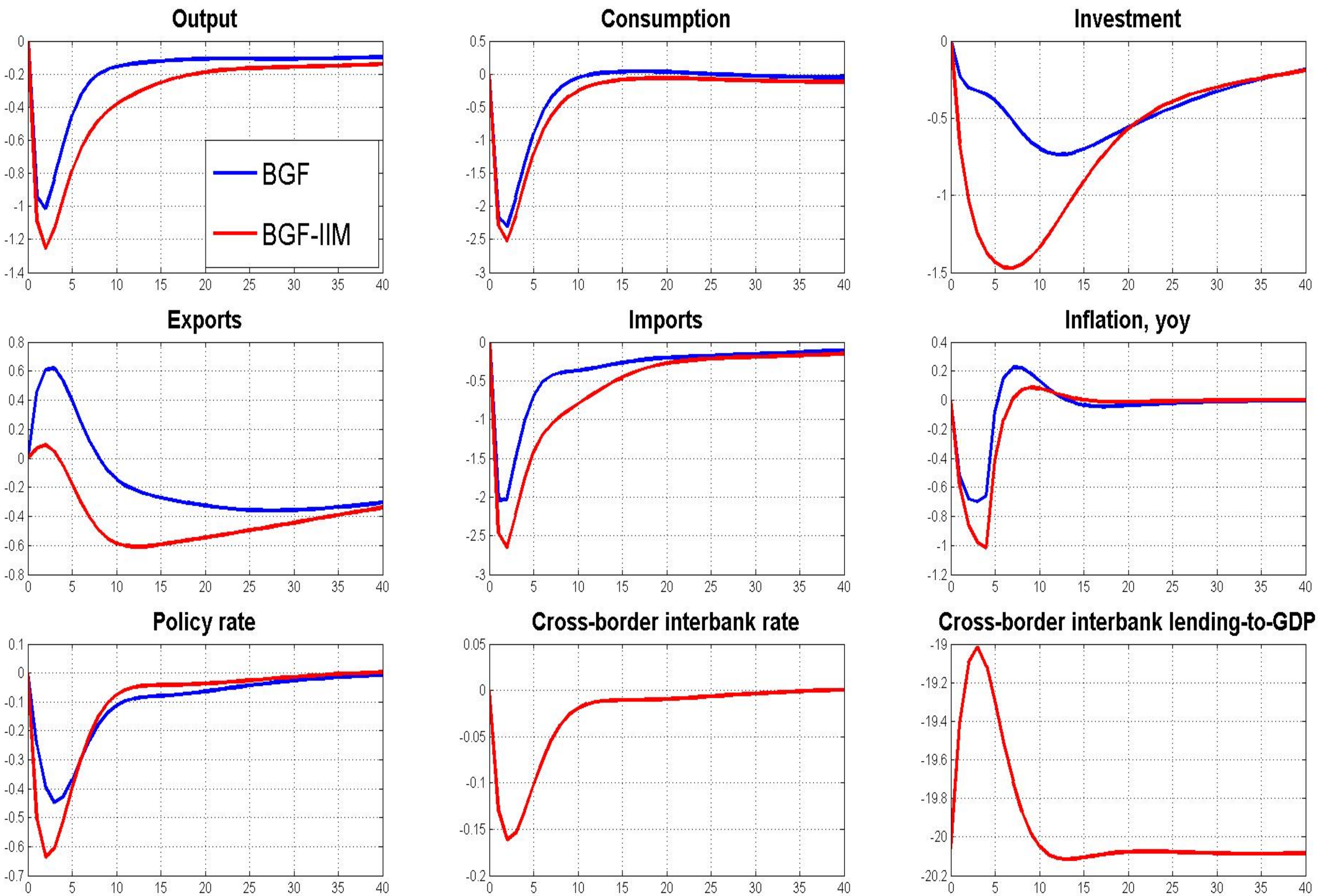
Source:Haver Analytics, BGFI model data

Last observation: 2012Q4

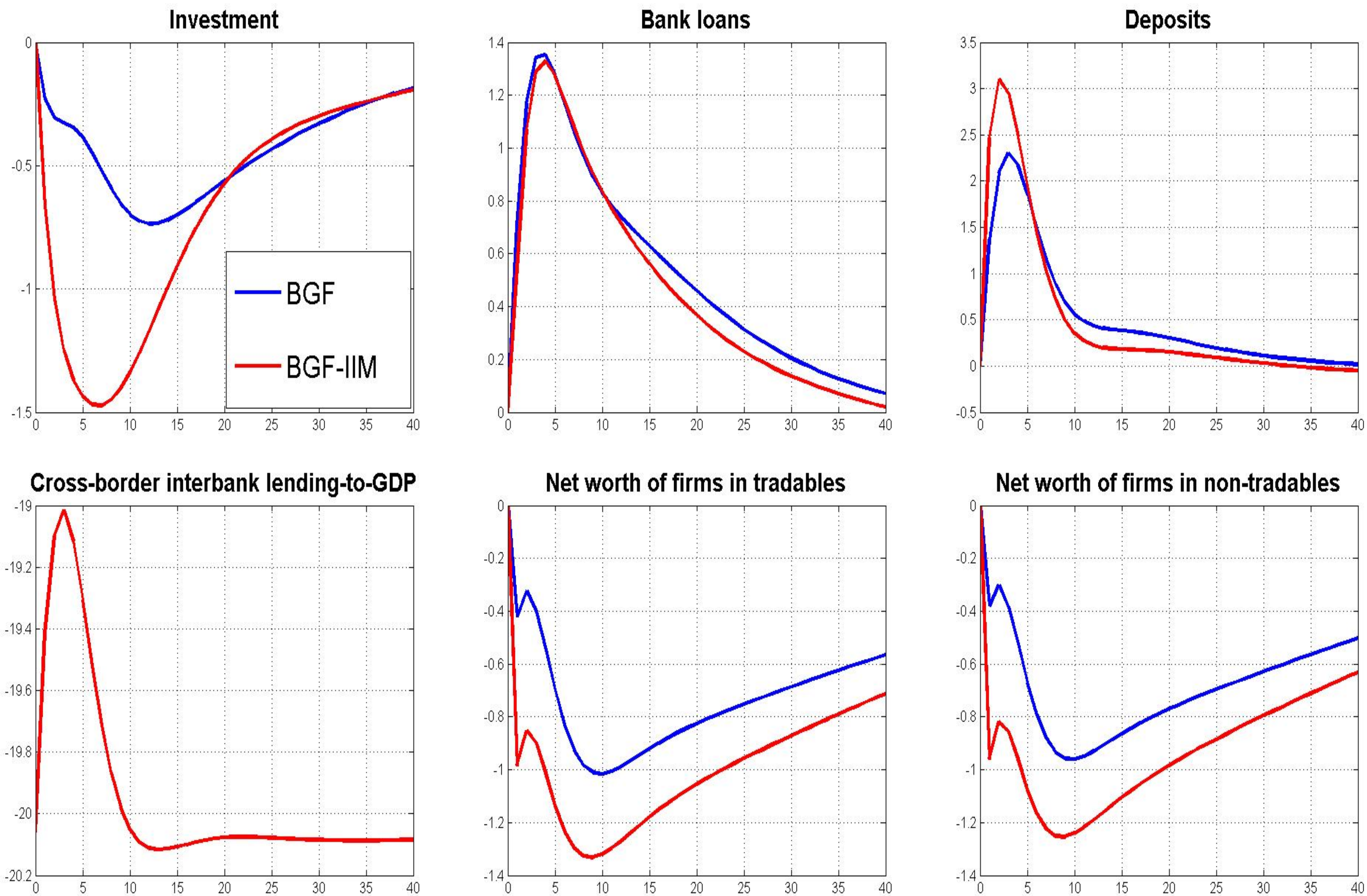
Changes in net international interbank lending, relative to respective GDP 2008Q3-2009Q4

Region	Data	Model
Asia	-0.9	0.5
Canada	0.3	-1.5
Commodity Exporters	0.7	0.1
Remaining Countries	-9.2	-8.6
US	14.9	15.0

US demand shock: effect on US



Amplification via BGG accelerator



Monetary policy shock

Moderation of US MP shock spillovers on Asia

Amplification of RC MP shock spillovers on Asia

Relaxing EXR targeting in Asia, removes moderation of US MP spillovers on AS

Thank you