BANQUE DE FRANCE
EUROSYSTÈME

« MACRO-FINANCIAL MODELLING OF THE SINGAPORE ECONOMY: A GVAR APPROACH »

BY FILIPPO DI MAURO AND ALESSANDRO GALESI

DISCUSSION

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WHAT THE PAPER DOES

- Model of Singapore economy that accounts for its international environment and includes a banking sector
- GVAR approach that models real-financial linkages
- Banking sector is granular (bank-level data) and includes data on credit, lending rates and NPLs.
- Impulse responses show reasonable results:
  - The US economy, as major global economy player, influences Singapore significantly;
  - The improvement of Singapore's economy improves the banking sector and fuel credit and property prices.

LINKS WITH THE GVAR LITERATURE

- The GVAR model has been used for several purposes
- Use of GVAR for financial stability purposes is developping
  - First use of GVAR approach in stress testing in Castren et al. (2010).
  - In Al Hashimi et al. (2014), link between macromodel and bank's expected default
  - Several contributions by Gross et al. included in the ECB macroprudential ST toolkit - STAMP€ (2017)
  - Inclusion of credit and property prices in GVAR: Xu (2012), Eickmeier and Ng (2015), Cesa-Bianchi (2013), Dees (2016)
- Di Mauro and Galesi add to this literature by providing an application to Singapore and by enriching the bank-level dataset
- In all cases, GVAR appears as a relavant tool to quantify interconnexions between real developments and financial stability

COMMENT #1 – IMPULSE RESPONSES

- Interpretations of the GIRFs:
  - Di Mauro and Galesi use the GIR approach for simulating the SINGVAR:
    - the GIR approach considers shocks to individual errors and integrates out the effects of the other shocks using the observed distribution of all the shocks without any orthogonalization
    - Advantage: the GIRF is invariant to the ordering of the variables and the countries in the GVAR model
    - Inconvenient: the approach is silent as to the reasons behind the changes

COMMENT #1 – IMPULSE RESPONSES

- Interpretations of the GIRFs (cont'd):
  - Implication to the shocks studied:
    - No causal link between fall in equity and the other variables (e.g. growth), only association
    - Similarly, interest rate shock is not a monetary policy shock
  - The lack of identification may render the interpretation difficult
  - Suggestion: Improve the identification strategy by using sign restrictions (see Dees, 2017) or Orthogonalised Impulse Responses

COMMENT #2 – BANKING SYSTEM

- Bank model:
  - The financial block includes the major FIs in Singapore
    - FIs only depend on domestic variables.
    - What about the role of foreign banks? They may play an important role in financing Singapore
    - The model includes NPL but what about banks' solvency measures (e.g. capital ratios)
    - It would have been interesting to study the macro impact of bank-specific shocks
  - Given the role of Singapore as financial centre, have you considered cross-border banking flows?

COMMENT #3 – MACROPRUDENTIAL POLICY

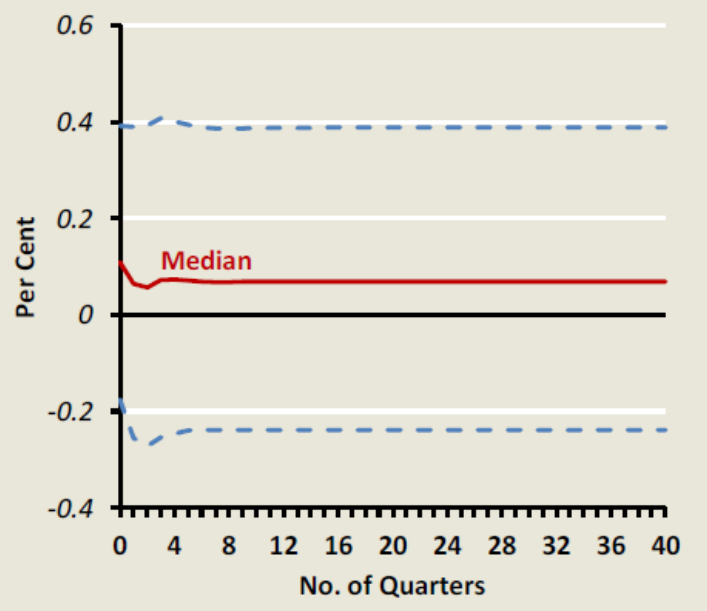
- SINGVAR as a macroprudential policy tool:
  - Inclusion of macroprudential policy indicators or instruments would be helpful
  - Bank capital ratio could be added also as an appropriate solvency target variable
  - Cross-border banking flows and macroprudential policy spillovers
  - Indentification of monetary policy could also be helpful to gauge impacts on financial stability

CONCLUSIONS

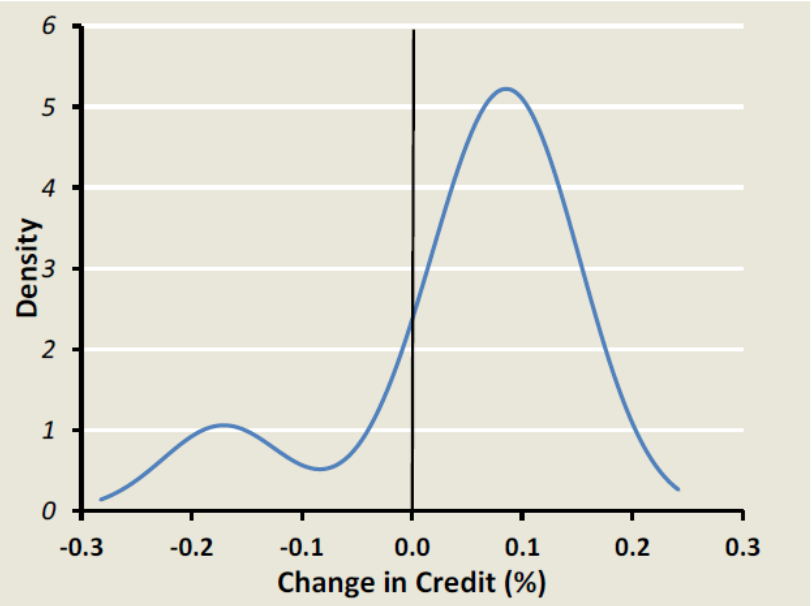
- The GVAR approach seems appropriate to quantify real-financial linkages
- Approach particularly appropriate in the case of an open-economy like Singapore with a major role played by the international environment
- The SINGVAR also shows the need to include granular information into macro models.
  - Some responses may appear as not significant at aggregate level but very significant for some specific Fis
  - Capture heterogeneity across FIs

IMPACT OF REAL GDP SHOCK ON CREDIT

Aggregate level



Granular level



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