

# Monetary and Macroprudential Policies

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# Outline

- Financial crisis and debate on modelling
- Towards a new framework?
- Monetary and macroprudential policies in a model with financial intermediation
  - Experience at Banca d'Italia
  - *“Financial Intermediation and the Real Economy: Implications for Monetary and Macroprudential Policies”*, Neri (2012)

# Pre-crisis consensus on modelling

## New Keynesian framework

- Representative agent cash-less economy
- nominal rigidities → role for monetary policy
- no financial frictions and no intermediaries

*“The paradigm that has emerged [...] is one that is clearly applicable to **normal times** [...] in **developed, stable economies**”, Galí (interview for EABCN, 2009)*

Estimated models (e.g. Smets and Wouters, 2007) used for policy analysis (e.g. RAMSES at Riksbank )

# The global financial crisis

The crisis showed how:

- important are links between financial markets and the real economy
- many assumptions in NK-DSGE framework were wrong
- financial markets are far from being efficient
- financial markets originate and propagate shocks
- monetary policy alone cannot smooth business cycle during financial crises

# Debate on lessons for modelling

- Buiter, Goodhart, Cecchetti, Spaventa and De Grauwe to mention some of critics of DSGE models
- Main missing elements:
  - financial intermediation
  - insolvency and default
  - liquidity
  - regulation of intermediaries and markets
  - booms and busts in asset markets

## Debate on lessons for modelling (cont'd)

*When a theorist builds a model, it is an attempt to highlight the features of the world the theorist believes are the most important for the **question at hand** (R. E. Lucas, The Economist, Aug 6<sup>th</sup> 2009).*

# Crises as opportunities

- Financial crisis → opportunity to improve framework
- Before global financial crisis, few papers have considered financial intermediation in modeling (Kiyotaki and Moore, 1997 and Bernanke et al., 1999)
- Intensive research ongoing since 2009
  - Examples: Angeloni and Faia, Curdia and Woodford, Gertler and Kiyotaki, Bianchi and Mendoza, Jeanne and Korinek
- Almost all of them fall short of modelling **systemic risk**
  - “A Macroeconomic Model with a Financial Sector”, Brunnemeier and Sannikov (2014)?

# Recent research on monetary and macroprudential policies

Quite a few (interesting!) papers at this conference...

- *“Basel III regulation and monetary policy: a macroprudential approach”*, Rubio and Carrasco-Gallego
- *“Macroprudential regulation and the role of monetary policy”*, Zilberman and Tayler
- *“Monetary and macroprudential policies for small open economies”*, Unsal and Ozkan



# Recent research on monetary and macroprudential policies

... and more around (to mention some)

- *“Assessing capital regulation in a macroeconomic model with three layers of defaults”*, mendicino et al.
- *“Monetary and Macroprudential Policy in an Estimated DSGE Model of the Euro Area”*, Quint and Rabanal
- *“Leaning Against Boom-Bust Cycles in Credit and Housing Prices: Monetary and Macroprudential Policy”*, Lambertini, Mendicino and Punzi
- *“Monetary and macroprudential policies in an estimated model with financial intermediation”*, Gelain and Ilbas

# Towards a new framework?

- A new framework? Taking into account critiques will require time, if feasible at all. Desirable?
- Policy-makers: questions that require timely answers
- Researcher in both academia and central banks to cooperate and develop new models
- Meanwhile, modify current models and use them for policy analysis
  - Experience at Banca d'Italia

# Monetary and macroprudential policies in a model with financial intermediation

Use model in Gerali *et al.* (JMCB, 2010), modified in Angelini, Neri and Panetta (JMCB, 2014), to answer questions related to **monetary and macroprudential policies** (see Neri, 2012)

- 1) What was the impact of the financial crisis on economic activity in the euro area?
- 2) Should monetary and macroprudential policies co-operate?
- 3) Should macroprudential policy lean against financial cycles?

# A bird's eye view of the model

Medium-scale model with:

- real and nominal rigidities (Smets and Wouters, 2007)
- financial frictions à la Kiyotaki and Moore (1997)
- monopolistic competition in banking sector
- slow adjustment of bank rates to policy rate
- role for bank capital
- time-varying risk weights in bank capital regulation
- countercyclical capital requirement rule

# A bird's eye view of the model (cont'd)

- Project started in September 2007
- Model has been estimated using Bayesian methods and data for euro area over 1998-2009
- Model has also been used to study:
  - impact of a credit crunch on euro-area economy (October 2008)
  - impact of transition to higher capital requirements
  - Basel I vs. Basel II (pro-cyclicality)
  - Interaction between monetary and macroprudential policies

# Modelling monetary and macroprudential policies

## Monetary policy

- interest rate rule à la Taylor

$$R_t = (1 - \rho_R)\bar{R} + (1 - \rho_R)[\chi_\pi(\pi_t - \bar{\pi}) + \chi_y(y_t - \bar{y})] + \rho_R R_{t-1}$$

## Macroprudential policy

- bank capital requirements rule

$$v_t = (1 - \rho_v)\bar{v} + (1 - \rho_v)\chi_v\left(\frac{L_t}{Y_t} - \frac{\bar{L}}{\bar{Y}}\right) + \rho_v v_{t-1}$$

# Modelling monetary and macroprudential policies (cont'd)

Monetary policy → well defined objectives

- Price stability, in some cases maximum employment

Macroprudential policy → less clear objectives

- Systemic risk: *“the risk of disruption to the flow of financial services that is caused by an impairment of all or parts of the financial system and has the potential to have serious negative consequences for the real economy”* (Financial Stability Board).

# Modelling monetary and macroprudential policies (cont'd)

## Monetary policy

- stabilise inflation and output (around trend)

$$L^{cb} = \sigma_{\pi}^2 + k_{Y,cb}\sigma_Y^2 + k_{R,cb}\sigma_{\Delta R}^2$$

## Macroprudential policy

- stabilise loans-to-output ratio (Basel III)

$$L^{mp} = \sigma_{L/Y}^2 + k_{Y,mp}\sigma_Y^2 + k_{v,mp}\sigma_{\Delta v}^2$$



# Modelling monetary and macroprudential policies (cont'd)

- Monetary policy can influence stability of financial system
- Macroprudential policies aiming at preventing accumulation of systemic risk can affect output and inflation

$$R_t^{L,i} = \mu_t^{L,i} \left[ R_t - \kappa_{Kb} \left( \frac{K_t^b}{w_t^E L_t^E + w_t^H L_t^H} - v_t \right) \right]$$

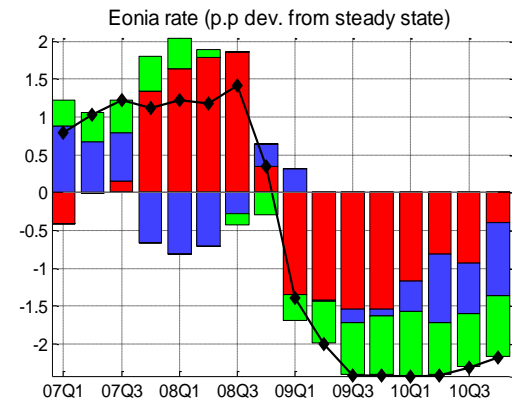
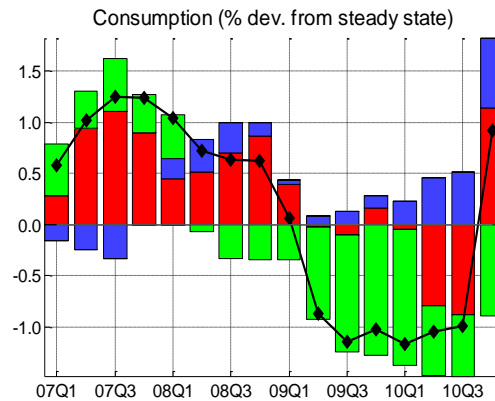
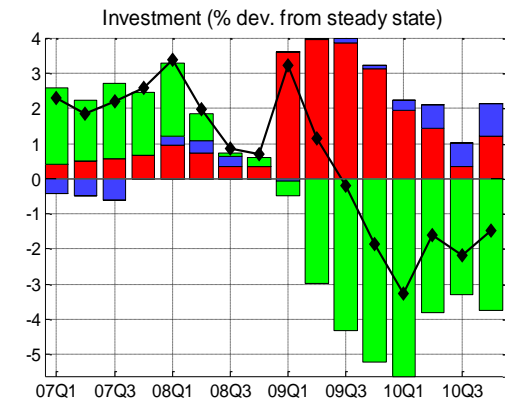
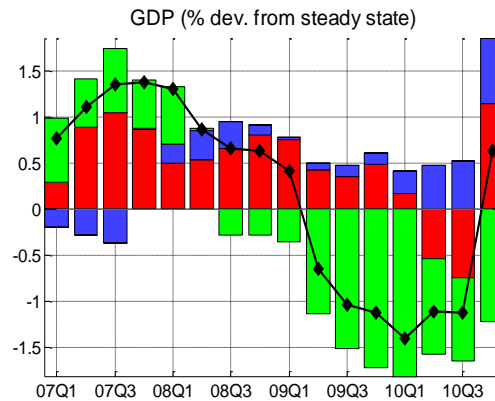
lending rates

monetary policy

macroprudential policy

# What was the impact of the financial crisis on economic activity in the euro area?

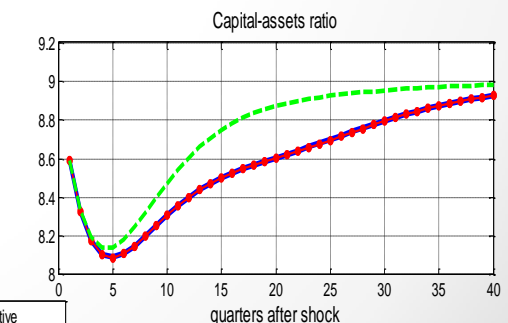
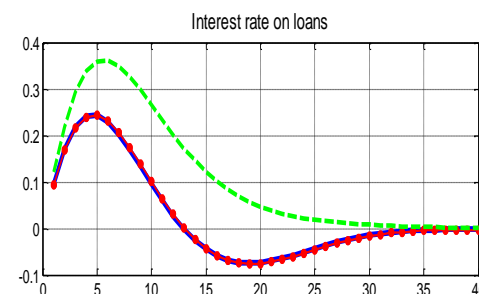
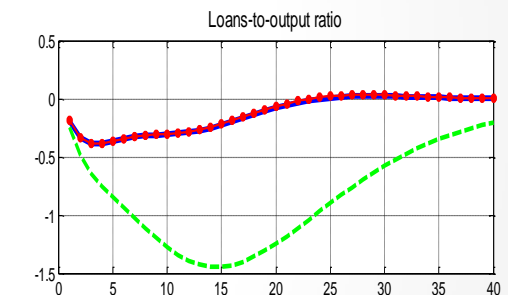
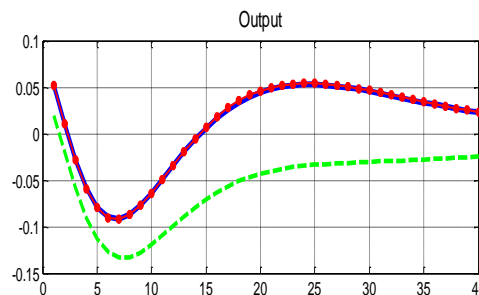
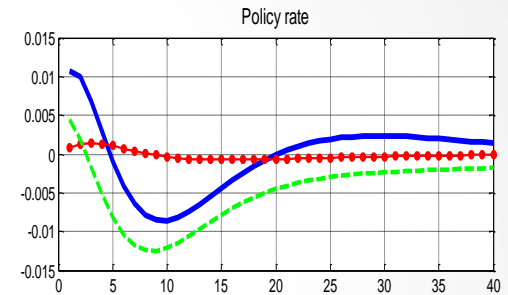
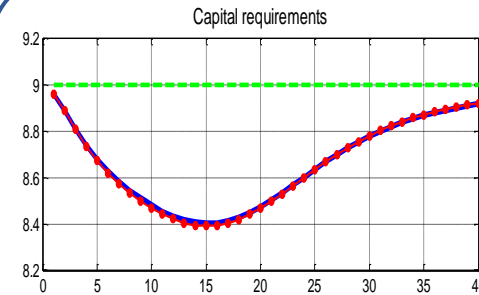
- The recession in 2009 was almost entirely caused by adverse shocks to banking sector
- The sharp reduction of policy rates attenuated the strong and negative effect of the crisis on the euro-area economy



■ macroeconomic ■ monetary policy ■ banking —◆— total

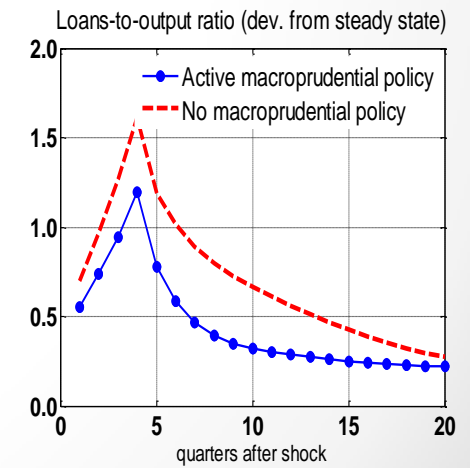
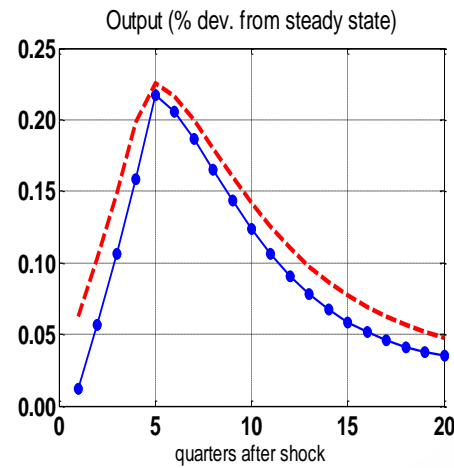
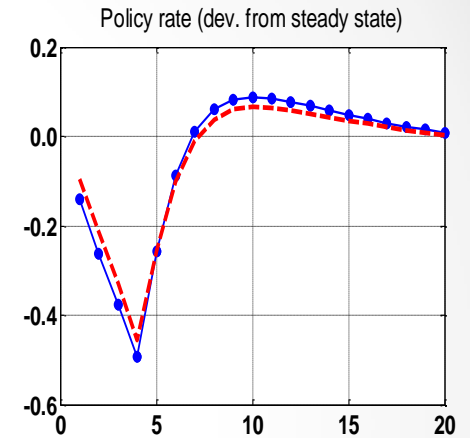
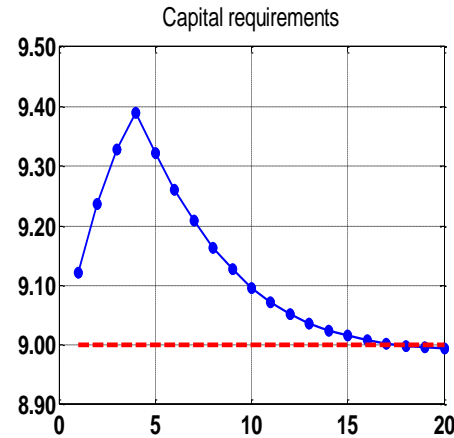
# Should monetary and macroprudential policies co-operate?

- “Normal” times: macroprudential policy yields small benefits
- If authorities do not cooperate, policy tools are extremely volatile
- Benefits sizeable when economy hit by financial shocks and macroprudential tools are available



# Should macroprudential policy lean against financial cycles?

- Reduction in aggregate risk expected in one year
- Given target for leverage, banks have incentive to increase lending
- After a year shock does not materialize
- Tighter capital requirements can be effective in containing expansion of lending



# Implications for monetary and macroprudential policies

- Aggressive monetary policy can help mitigating negative impact of shocks to banking sector
- Monetary and macroprudential policies should closely co-operate
  - Benefits of introducing macroprudential tools can be sizeable when economy is hit by financial shocks
- Macroprudential policy can be effective in leaning against financial cycles

# Concluding remarks

- DSGE models have undergone severe criticism
- No doubt that models must be improved, but working alternative still missing
- Intensive research ongoing
- Modeling systemic risk is key: still not much progress, at least within macro models
- Meanwhile, adapt current models with a role for financial intermediation to address questions related to monetary and macroprudential policies