Optimal Monetary and Macroprudential Policies: Gains and Pitfalls in a Model of Financial Intermediation

Michael Kiley Jae Sim

Board of Governors of the Federal Reserve System

The views expressed are the authors, and not those of the Federal Reserve Board

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Overview

Motivation

- The interaction of monetary and macroprudential policy is a key policy question
- A growing literature explores the potential role of macroprudential policy and its interaction with monetary policy (e.g., Kannan et al (2012))
- Much of this literature considers small models, employs a calibration strategy, emphasizes housing market frictions/shocks, and focuses on *ad hoc* policy approaches/losses

Our contribution

- Develop quantitative model in which the financial sector is important for macroeconomic outcomes (building on Kiley and Sim (2014))
- Estimate model (Smets and Wouters (2007) approach)
- Assess the importance of a macroprudential instrument (a leverage tax) for economic performance under both Ramsey and simple approaches to policy

Plan for the presentation

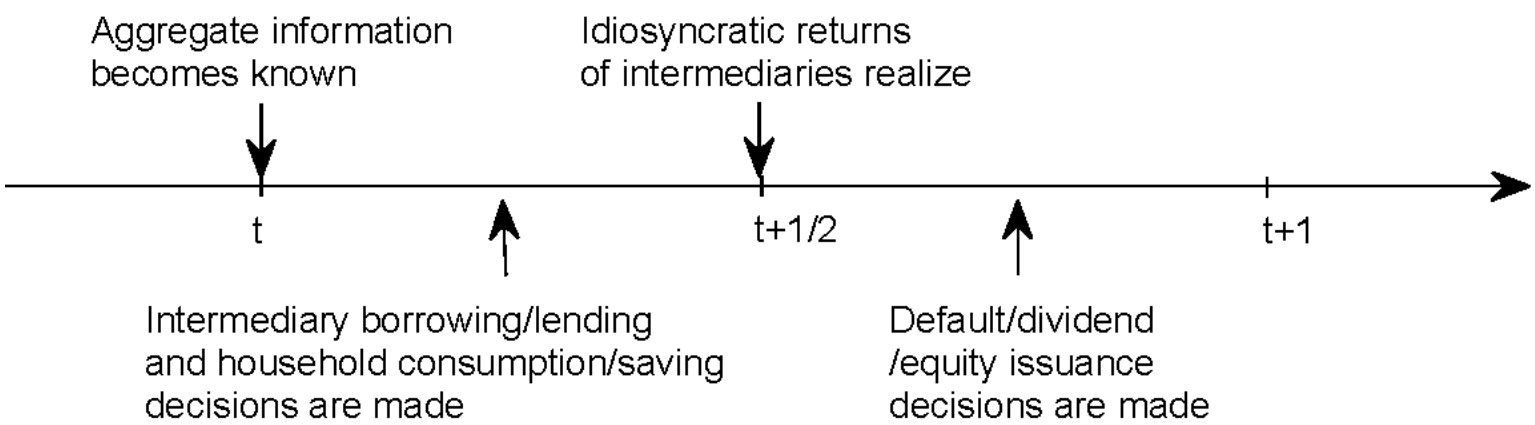
- Present key features of model
- Discuss policy implications of estimated model
- Highlight how the model structure and policy implications compare to insights from other models and approaches
- Consider model uncertainty, building on Guerrieri, Iacoviello, Covas, Driscoll, Jahan-Parvar, Queralto, and Sim (2017) *Macroeconomic Effects of Banking Sector Losses across Structural Models*

The Model

Financial-sector overview

- Risk-averse households invest in risky assets through financial intermediaries
- Several frictions make debt/equity mix of intermediaries important:
  - Maturity/liquidity mismatch between assets and liabilities
  - Limited liability, bankruptcy cost, and tax advantage of debt
  - Raising equity externally dilutes claims of existing shareholders

Figure: Sequence of Events



Effect of frictions on intertemporal decisions

- Optimality condition for representative household in a standard model,

$$1 = \mathbb{E}_t\left[M^H_{t,t+1} \cdot R^H_{X,t+1} / \Pi_{t+1}\right]$$

- With intermediation, condition becomes

$$1 = \mathbb{E}_t\left[M^F_{t,t+1} \cdot \frac{1}{m_t}\left(\frac{\mathcal{R}^F_{t+1}}{\Pi_{t+1}} - (1-m_t)\frac{R^B_{t+1}}{\Pi_{t+1}}\right)\right]$$

  - A **levered** asset-pricing equation
  - Required returns to **equity and debt matter**
  - Liquidity wedge (Holmstrom and Tirole [2001]): $M^F_{t,t+1} \neq M^H_{t,t+1}$ and $M^F_{t,t+1}/M^H_{t,t+1}$ varies for **endogenous/exogenous** reasons

$$M^F_{t,t+1} \equiv M^H_{t,t+1} \frac{\mathbb{E}_{t+1}\left[\lambda_{t+1}|\Omega_{t+1}\right]}{\mathbb{E}_t\left[\lambda_t|\Omega_t\right]} \begin{array}{l} \leftarrow \text{ liquidity tomorrow} \\ \leftarrow \text{ liquidity today} \end{array}$$

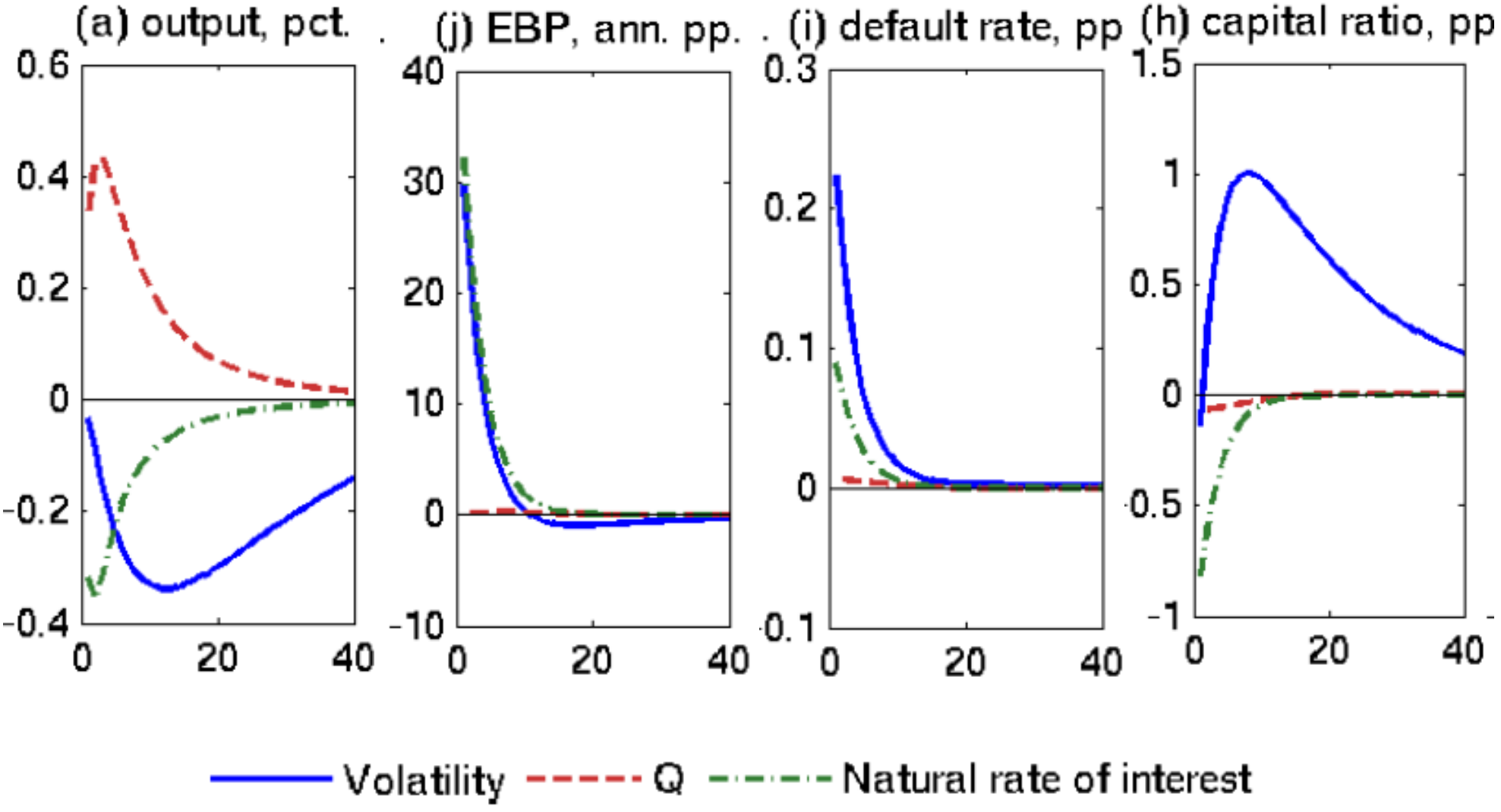
Rest of model

- Consumption and investment
  - Households preferences include habits
  - Investment subject to adjustment costs
  - Consumption and investment Euler equations subject to shocks
- Nominal price rigidity: Creates strong motive for price stability
- Monetary policy follows interest-rate rule, with Π^* drift

Estimation approach

- Stochastic shocks
  - "Real": Technology, autonomous demand
  - "Nominal": Nominal interest rate, inflation target, markup
  - "Financial": Risk premium, Q, *volatility*
- Data (1965-2008)
  - ΔY, ΔC, ΔI, ΔH, ΔP, R & $E[\Delta P^{LR}]$
  - Excess bond premium (from Gilchrist and Zakrajsek (2012))
- Results
  - Activity driven by risk premium, auto. demand, markup, & Q
  - Excess bond premium primarily driven by volatility and risk premium
  - Nominal variables driven by inflation target
  - Adverse volatility shock leads persistent credit downturn/economic slump

Impulse responses to financial shocks



Policy Analysis

Optimal policies: Ramsey and simple rules

- Policy instruments
  - Monetary: Nominal interest rate
  - Macroprudential: Intermediary leverage tax
- Ramsey policy vs simple rules
  - **Ramsey policy**: Complex, model-dependent rule responds to exogenous shocks
  - **Simple rule**: Policy instrument follows simple rule reacting to endogenous variables

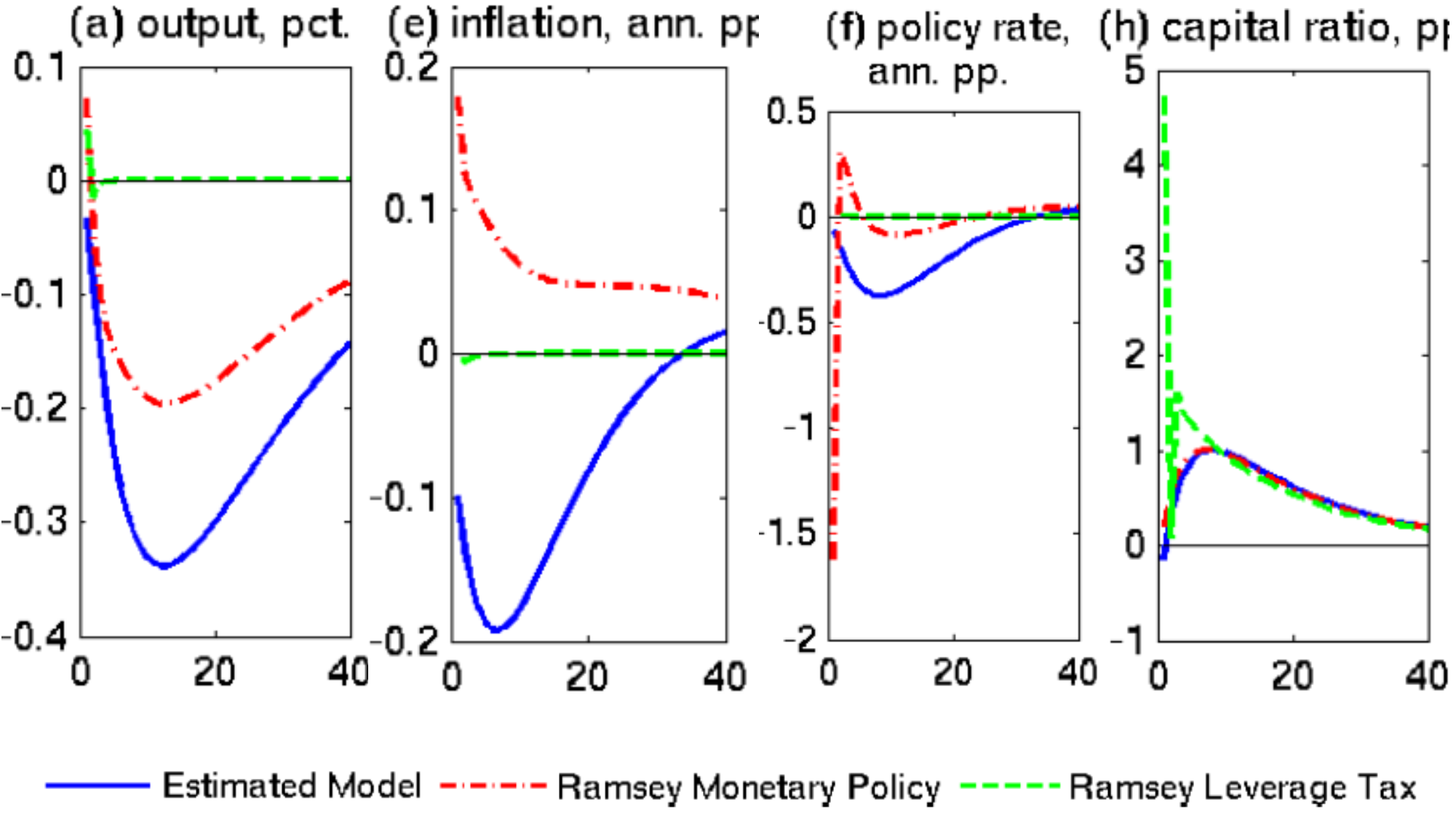
Welfare under alternative policies

Table: Welfare Under Alternative Policy Settings

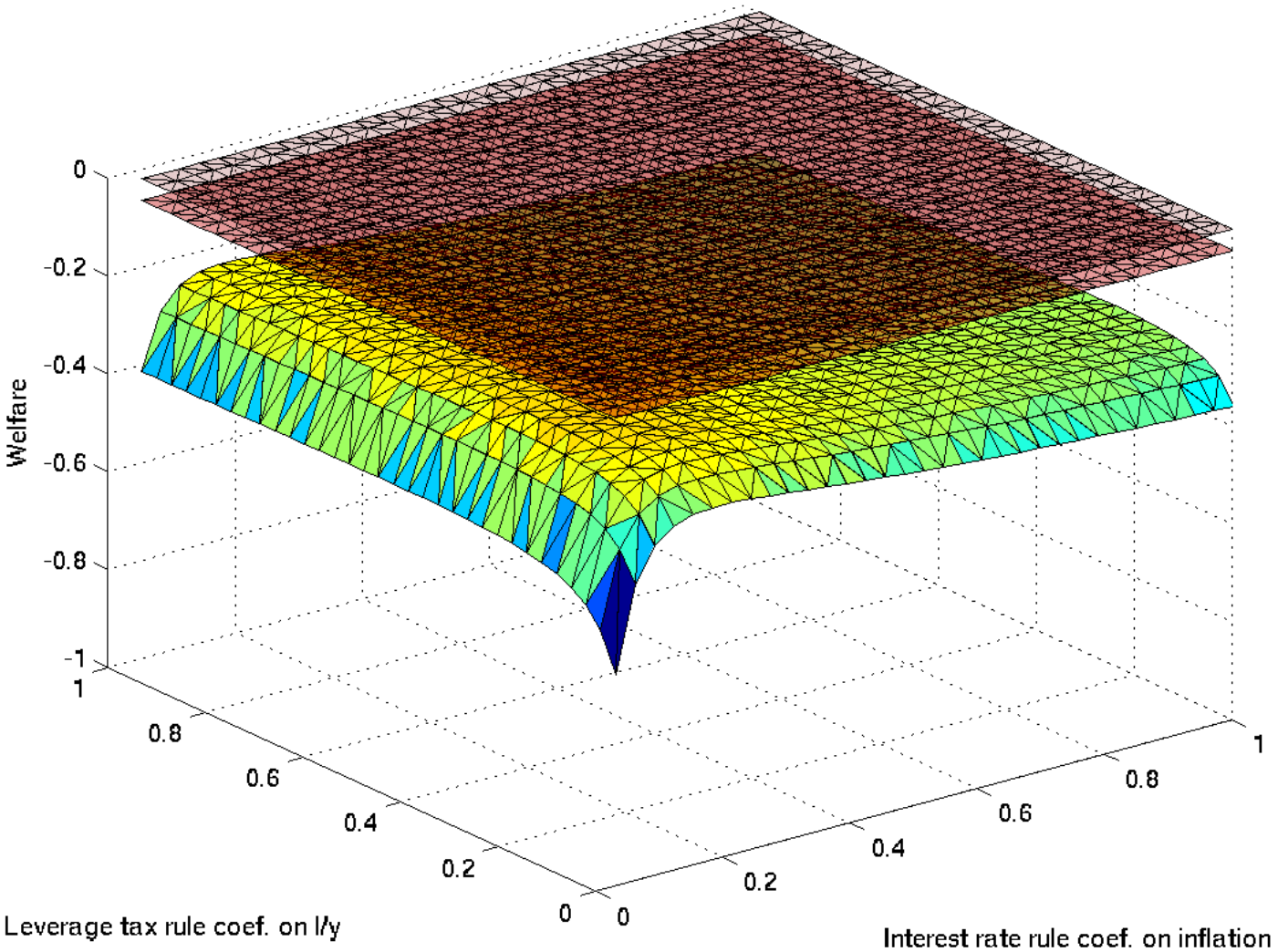
	Cons Equiv (%)
Baseline (no macroprudential policy)	-0.40
Optimized simple rules	
Instrument: r_t and τ_t^m	-0.19
Instrument: r_t	-0.28
Ramsey policy with	
Instrument: r_t and τ_t^m	-
Instrument: r_t	-0.22
Instrument: τ_t^m	-0.04

Note: Welfare under Ramsey policies were computed with the planner Lagrangian multipliers set equal to their steady state values.

Ramsey Rules: Volatility Shock

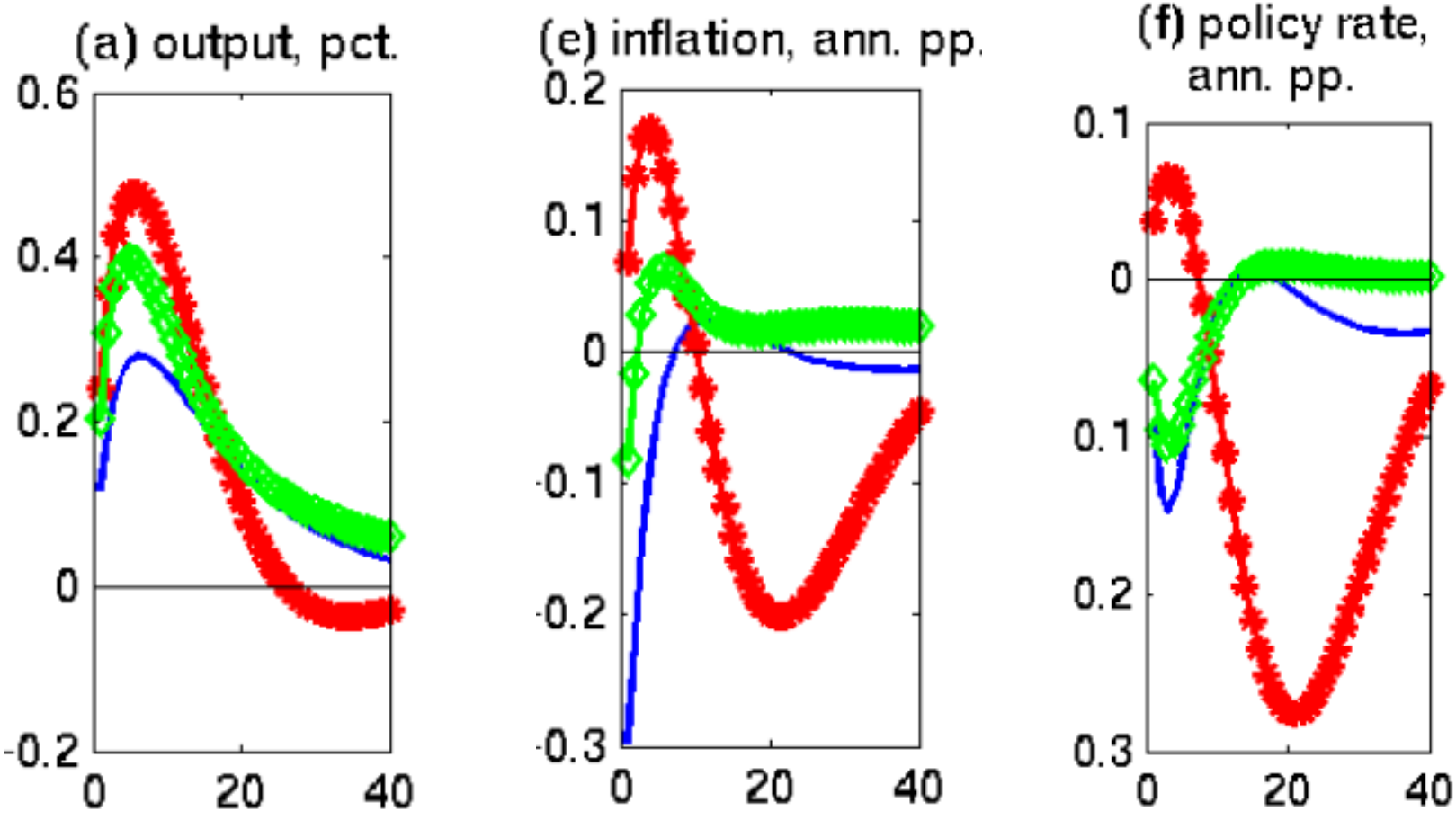


Ramsey vs Simple Rules: Welfare Surface for the Macroprudential Rule

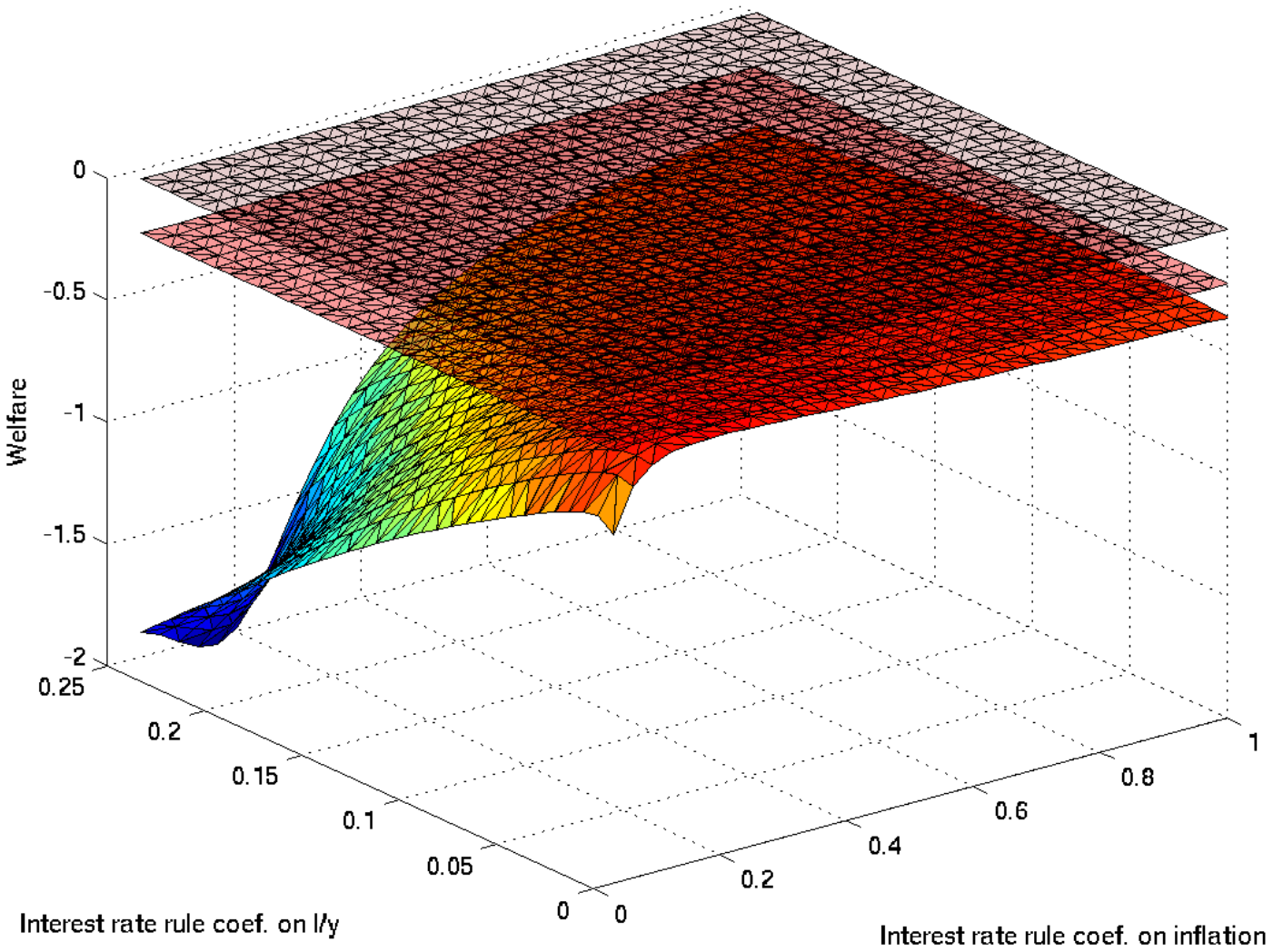


Monetary policy for macroprudential aims?

A monetary policy response to the credit/GDP gap: Impulse responses to a technology shock



A monetary policy response to the credit/GDP gap: Welfare surface



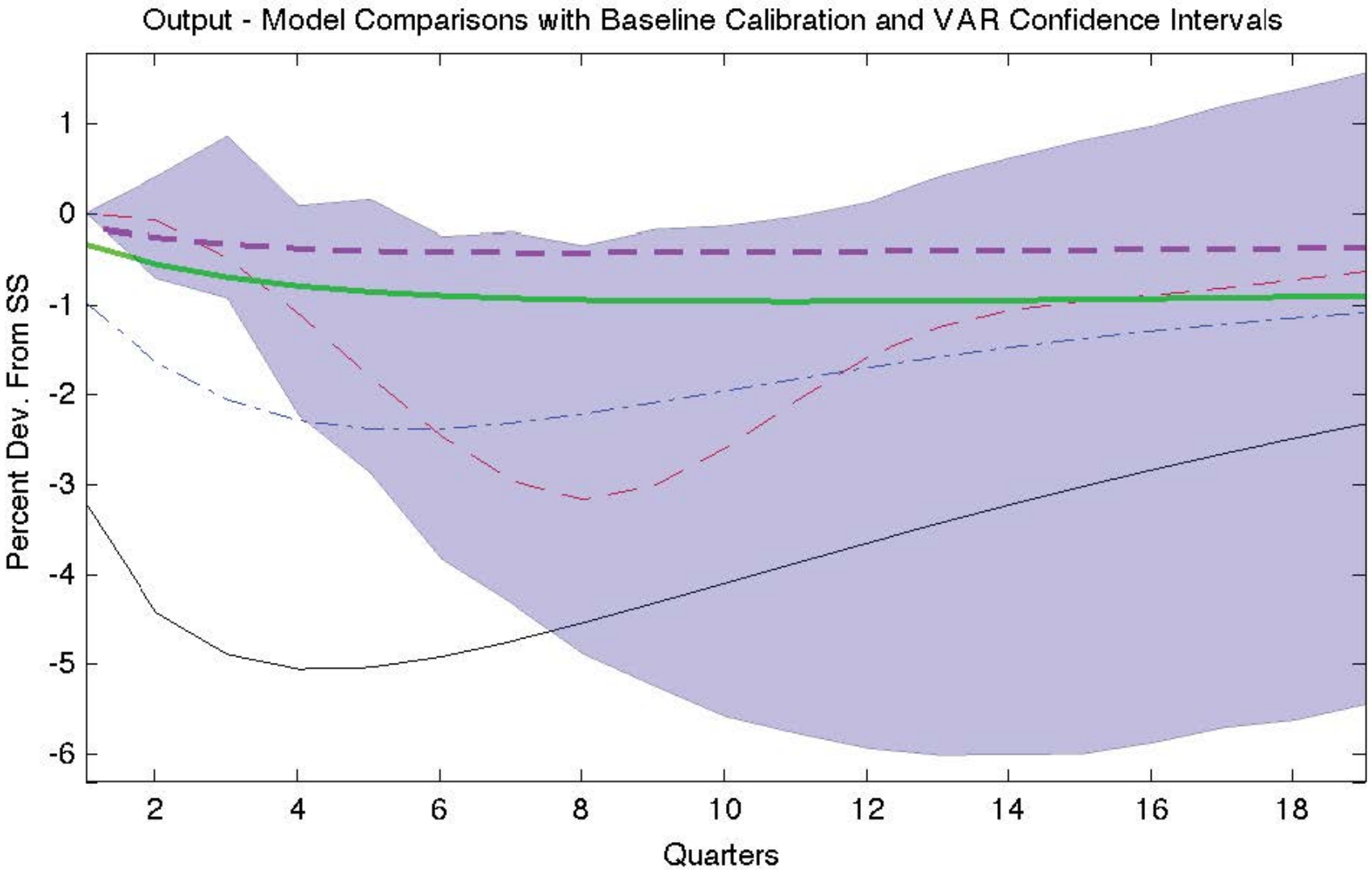
Model Uncertainty

Model features across models: View from Guerrieri et al (2017)

	Iacoviello	Covas Driscoll	Kiley Sim	Queralto	Guerrieri Jahan-Parvar
Choices available to banks					
Issue new equity	no	no	yes	yes	no
Reduce dividend payments	yes	yes	yes	no	no
Increase operating efficiency	no	no	no	no	no
Raise interest spread	yes	yes	yes	yes	yes
Increase non-interest income	no	no	no	no	no
Services offered by banks					
Liquidity provision	yes	yes	yes	yes	yes
Liquidity transformation	no	no	no	no	no
Other Features of the model					
Multiple sources of funding(*)	yes	yes	no	no	yes
Nominal rigidities	no	no	yes	no	yes
Solution Method	1st order	nonlinear	1^{st}-2^{nd}order	1st order	piecewise lin.

(*) "Multiple sources of funding" refers to the presence of sources of funding other than bank credit.

Responses to losses in banking sector: View from Guerrieri et al (2017)



Key takeaways

Summary

- We have estimated a DSGE model with frictions in financial intermediation
- Estimation suggests important role for New-Keynesian frictions/shocks *and a significant role for financial frictions/intermediation*
- Model implies that it is important for monetary policy to focus on price stability
- While a Ramsey planner can use monetary policy for macroprudential goals, use of monetary policy for macroprudential purposes can do harm under a simple rule