Tools for Assessing Macro-prudential Regulatory Instruments

Discussion by
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Papers

Capital Regulation in a Macroeconomic Model with Three Layers of Default

Laurent Clerc, Alexis Derviz, Caterina Mendicino, Stephane Moyen, Kalin Nikolov, Livio Stracca, Javier Suarez, Alexandros Vardoulakis

Examples of Macro-prudential Policy Experiments in MAPMOD

Jaromir Benes, Michael Kumhof, Douglas Laxton

Bank Capital Requirements: A Quantitative Analysis

Thiên Nguyen

Outline

1. Introduction: Getting the level of bank capital requirements right
2. 3D Model (Clerc et al.)
3. Nguyen
4. MAPMOD (Benes, Kumhof, Laxton)

1. Bank Capital Requirements

What is the optimal level of bank capital requirements?

- Capital requirements set minimum level of equity as a fraction of (risk-weighted) assets.
- Theoretical benefits: bank capital can limit the moral hazard involved with deposit insurance/bailouts, or other externalities associated with bank failures.
- Why not set capital requirement = 100%?
  Fine in a Modigliani-Miller world.
- Possible costs:
  - Reduced lending if MM fails (due taxes, agency problems, special role of bank liabilities in creating liquidity,…)
  - Reduced liquidity creation
  - Activity could shift to shadow banking

An emerging literature: some examples

Paper	Banks' role	M-M failure	GE model	Key result
Clerc et al.	Lending specialness	Equity is scarce + deposit insurance	Stochastic growth model w/housing.	Optimal cap. req. = 10.5%
Nguyen (2014)	Lending specialness	Equity flotation costs + bailouts	Endogenous growth model	Optimal cap. req. = 8%
Van den Heuvel (2008)	Liquidity provision	Liquidity provision + deposit insurance	Neoclassical growth model	Gross welfare cost of 10 p.p. Δcap. req. = 0.2% of cons.
Begenau (2014)	Liquidity provision + lending specialness	Liquidity + bailouts + dividend smoothing	Stochastic growth model	Optimal cap. req. = 14%

2. Capital Regulation in a Macroeconomic Model with Three Layers of Default

A rich DSGE model with 3 types of defaultable debt:

1. Impatient households borrow from banks through **mortgages** to finance housing purchases
2. Entrepreneurs borrow from banks to finance capital accumulation (**C&I loans)**
3. Banks borrow from patient households through **deposits**

- All debt is non-state contingent and subject default risk due to idiosyncratic and aggregate shocks.
- Default entails large deadweight costs.

Banks in the 3D Model

- Bank loans are financed with deposits and equity.
- Bank deposits are insured and therefore 'cheap.'

  → Moral hazard: banks may provide excessive credit
- Equity is required to satisfy the capital requirement

  → Alleviates moral hazard ("skin-in-the-game")

  → lower bankruptcy costs & potentially better resource allocation.
- But equity is subject to financial frictions: it can only come from *bankers*, whose wealth accumulation is limited by a dividend policy.

  → equity is scarce and costly

Capital Requirements in the 3D Model

Optimal capital requirement trades off the resulting costs and benefits:

- Benefits: Capital requirements limit the moral hazard due to deposit insurance, which can result in excessive lending.

- Costs: Bank capital is costly due to financial frictions, so lending can be reduced too much.
  - No alternative to bank loans.

Results of the 3D Model

- Model is parameterized to quantify the tradeoff.
- Steady state welfare is maximized at a capital requirement equal to 10.5%.
- A higher capital requirement (lower bank leverage) makes the economy is less responsive to shocks.
  - The model features a financial accelerator that works through asset prices, defaults, and bank capital and borrower balance sheets.
- Starting from the optimal capital requirement, countercyclical adjustment further reduces volatility.

Comments – 3D Model

- This is a well-crafted model that elegantly combines many important elements that one would like to have in a framework for macro-prudential tools.

Some nits to pick:

- Steady state welfare comparison has limitations:
  - Does not take into account transition dynamics
  - Does not take into account effects on business cycle volatility. (Households are risk averse.)

Comments – 3D Model

- What are the key business cycle moments and bankers' return on equity?
- Sensitivity analysis around parameterization.
- Capital conservation buffer and stress testing (CCAR) can limit dividend distributions.
  - Is it possible to analyze changes to the banks' dividend payout policies?

3. Bank Capital Requirements in Nguyen

Nguyen quantifies the benefits and costs of capital requirements in an endogenous growth model --

- Benefits: government bailouts results in risk-shifting (excessively risky loans). Higher capital requirements imply more "skin-in-the-game"

  → less risk shifting

  → higher productivity and lower bankruptcy costs.

- Costs: reduced lending and growth. Why? →

Bank Capital Requirements in Nguyen

- Costs: reduced lending and growth.
  - Subsidy due to bailouts implies that deposits are cheap. This stimulates the volume bank lending.
  - Bank loans are assumed to be essential for investment, so this boosts capital accumulation and growth.
  - In an endogenous growth model, investment is sub-optimally low, so the subsidy improves welfare, *all else equal*.
  - Capital requirements lower the subsidy and thus reduce growth and welfare.

  - In addition, the model features equity flotation costs.

Results – Nguyen

- Model is calibrated to U.S. data to quantify these effects.
- Optimal capital requirement is 8%.
- Asymmetry: a sub-optimally low capital requirement is much more costly than a sub-optimally high capital requirement.

Comments – Nguyen

- This is a well-crafted model with a careful calibration.
- Link between capital regulation and long-run growth rates.

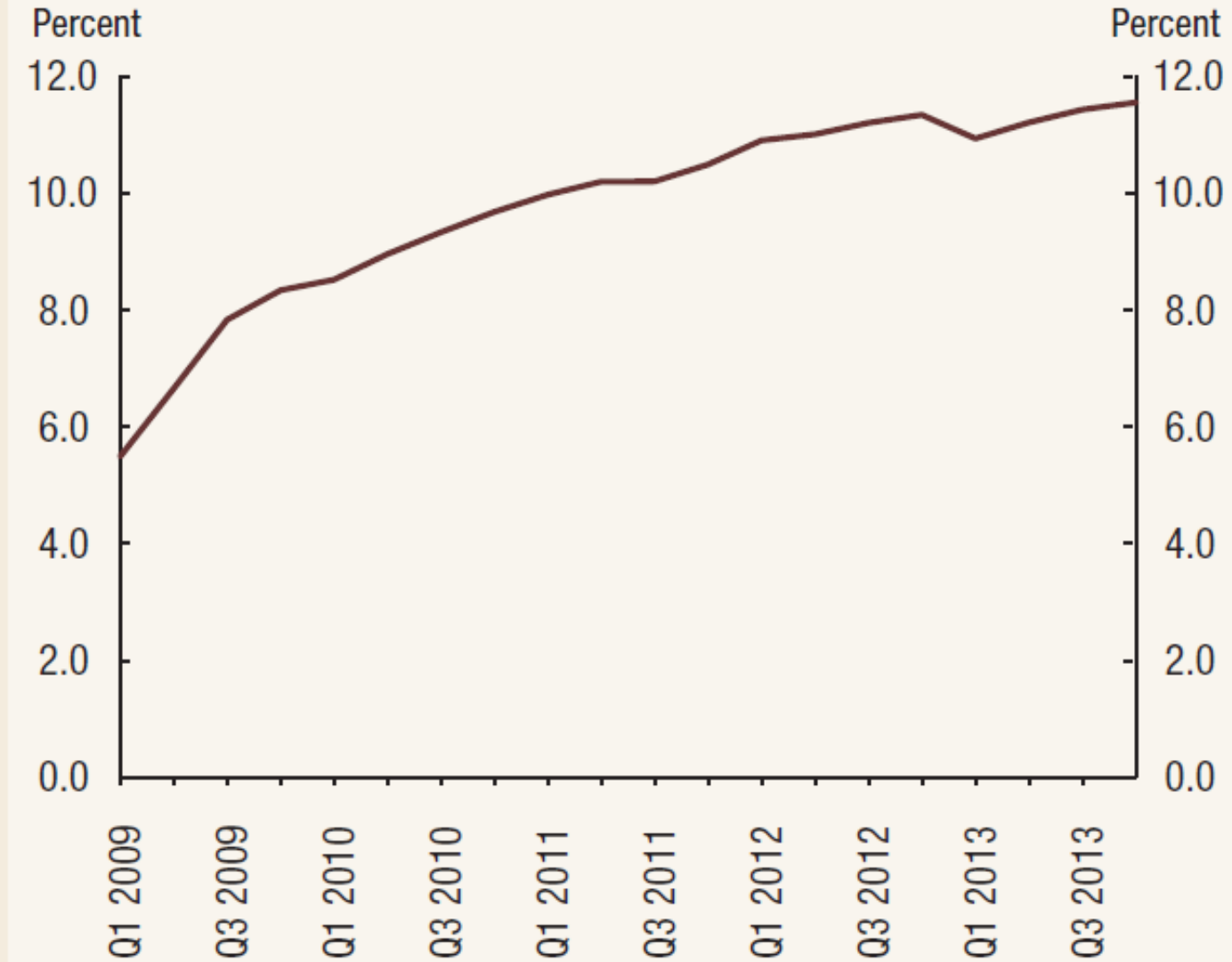
- Dynamic banking model is very rich and sophisticated. Gives rise to pecking order.
  - Does it capture the key M-M failures for banks?
  - Without bailouts, banks would be (nearly) all-equity.
    - We did not see this in the U.S. free banking era.

Comments – Nguyen and 3D

- Basel III raises the tier 1 ratio from 4% to 6%.
- Adds a capital conservation buffer of 2.5%.
- 6 + 2.5 = 8.5%.
- Central bankers must have had advance knowledge about this research!

- But we are not done yet.
  - Stress testing requires buffers, SIFI surcharge, countercyclical capital buffer.

Figure A. Tier 1 common ratio of CCAR 2014 BHCs



Source: Federal Reserve

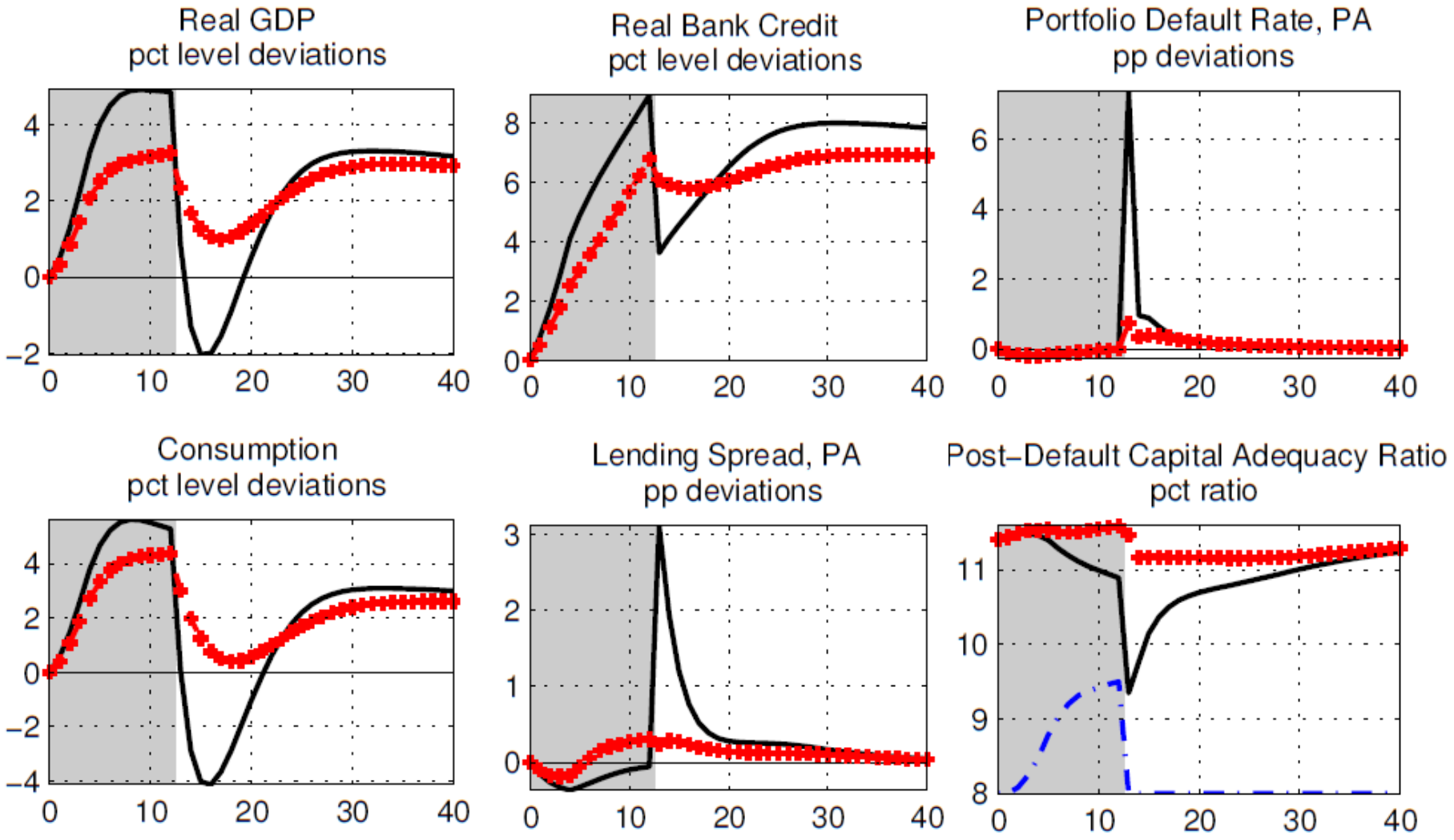
4. Examples of Macro-prudential Policy Experiments in MAPMOD

The MAPMOD model:

- Capital regulation: penalty for falling short of the capital requirement.
- Imperfect market for bank equity: Raising new bank capital is subject to frictions.

  →Bank capital channel; buffer stock of equity
- Non-state contingent loan contracts with non-diversifiable credit risk.
- Small open economy.
- Nonlinear dynamics.

Countercyclical Macroprudential Policy



Comments – MAPMOD

- Focus is on positive, rather than normative analysis -- interesting and relevant scenarios.
- To gauge the impact of financial amplification of real shocks, it would be nice to compare the results to a benchmark with frictionless finance.
- Is there any guidance from the model that would help policymakers “distinguish fundamentally sound (“good”) and excessive (“bad”) credit expansions and asset price bubbles in real time”?