Bank capital requirements and lending decisions

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CR as a macroprudential tool

- The take of a theorist
- Premise: ceteris paribus, higher capital requirements (γ) make banks safer
- Questions:
  - how do individual banks react to changes in γ
  - How does it play out in the aggregate

Canonical approach

marginal return (to lending) = marginal cost of funds

$$r_x(x, \gamma) = c_x(x, \gamma)$$

Ultimately, object of interest is $x^*(\gamma)$

$$\frac{dx^*}{d\gamma} = -\frac{r_{x\gamma}(x^*, \gamma) - c_{x\gamma}(x^*, \gamma)}{r_{xx}(x^*, \gamma) - c_{xx}(x^*, \gamma)}$$

The most basic case

- Exogenous, diminishing returns to lending

- Exogenous, linear cost of capital: $\text{WACC} = (1-\gamma)(1+\delta) + \gamma(1+\kappa)$

with $\delta < \kappa$

$$r_x(x^*) = 1 + \gamma(\kappa - \delta)$$

$$\frac{dx^*}{d\gamma} = \frac{\kappa - \delta}{r_{xx}} < 0$$

Remarks

- This is the "composition effect"
- Starting point for empiricists

Endogenous WACC

- Costly equity capital (cost of debt normalised to 1)

$$\text{WACC} = (1-\gamma) + \gamma(1+\kappa(e^*))$$

$$r_x(x^*) = 1 + \gamma\kappa_e(e^*)$$

- Typical assumptions: $\kappa_e > 0$

$$\text{WACC} = (1-\gamma)(1+\delta(d^*)) + \gamma$$

$$r_x(x^*) = 1 - \gamma\delta(d^*)$$

$\delta < 0$ (liquidity services) and $\delta_d > 0$

Implicit subsidy

$$c(x, \gamma) = x\text{WACC} - s$$

- See asset side as portofolio of individual assets + portfolio of options
- Maximising the value of the latter: make sure that all options are in the money in exactly the same states Harris, Opp, and Opp (2023)
- Impossible in practice (but still risk concentration)

$$r_x(x, \gamma) = \text{WACC} - s_x(x, \Omega, \gamma)$$

Bahaj and Malherbe (2020)

$$\frac{dx^*}{d\gamma} = \underbrace{\frac{1 - \delta^*}{r_{xx} - c_{xx}}}_{\text{composition effect}} + \text{Forced Safety Effect (FSE)}$$

$x^*(\gamma)$ is typically U-shaped

Marginal return to lending

$$\frac{dx^*}{d\gamma} = -\frac{r_{x\gamma}(x^*,\gamma) - c_{x\gamma}(x^*,\gamma)}{r_{xx}(x^*,\gamma) - c_{xx}(x^*,\gamma)}$$

- Go back to Example 1

$$r_x(x^*) = 1 + \gamma(\kappa - \delta)$$

- Market power alone doesn't affect the logic above
- But moral hazard can lead to $r_{x\gamma}(x^*,\gamma) \neq 0$ (e.g. incentives to monitor depends on skin in the game)
- Exogenous heterogeneity complicates the analysis

$$r_{x^{ij}}(x^{ij}, \Omega^i, \Psi^j, \gamma) = c_{x^{ij}}(x^{ij}, \Omega^i, \Psi^j, \gamma)$$

  - Aggregation is a nightmare
  - Methodological advances: HOO (2023), Lattanzio (2023)

Taking stock

- Empirical studies super challenging
  - Not only finding exogneous variation is tricky enough
  - But theory yields ambiguous predictions

- We should certainly move on from the early days
  - composition effect: CR reduce lending
  - Effect is stronger for banks closer the the requirements

Thank you very much!