

Bank capital requirements and lending decisions

Saleem Bahaj (UCL) Chiara Lattanzio (UCL) Frederic Malherbe (UCL)

CR as a macroprudential tool

• The take of a theorist

• Premise: ceteris paribus, higher capital requirements (γ) make banks safer

Ŵ

- 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: WACC = $(1 \gamma)(1 + \delta) + \gamma(1 + \kappa)$

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

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

Remarks

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

with $\delta < \kappa$



Endogenous WACC

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

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

• Typical assumptions:
$$\kappa_e > 0$$

W

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

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

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

Ŵ

Implicit subsidy

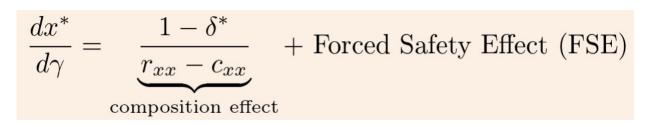
 $c(x, \gamma) = x \text{WACC} - s$

- 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)

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

Bahaj and Malherbe (2020)

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



Marginal return to lending

• Go back to Example 1

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

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

- 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!