ECON 4335 The economics of banking

Lecture 6, 27/2-2013: Bank regulation

Bent Vale,
Norges Bank*

*Views and conclusions are those of the lecturer and can not be attributed to Norges Bank

Topics covered in Lectures 6,7, 8 and 9

- Why the particular regulation of banks (F&R ch. 9.1, 9.2 and A&G ch. 7.1)
- Risk sharing and bank capital regulation (A&G ch. 7.1.1, 7.1.2)
- Deposit insurance
- Moral hazard from deposit insurance (F&R ch. 9.3)
- Solvency arrangements (F&R ch. 9.4.4)

- Capital regulation, Basel III
- Liquidity regulation
- Contagion (A&G ch. 10)
- Equilibrium credit rationing

Other reading material for these lectures:
Santos (2000), Goodhart & al. (2004), Vale (2011), Borchgrevink & al. (2013).

Bank regulation, regulation that is specific to banks

- Solvency or capital regulation, capital requirements
- Liquidity regulation, reserve requirements
- Other portfolio restrictions
- Deposit insurance

Why?

General reason for regulation, market failures: externalities, excessive market power.

In banking:

- Pecuniary externalities
- Fragility
- Unsophisticated creditors, i.e., depositors
- Other costs if a bank fails
- Moral hazard

Pecuniary externalities (Bianchi (2011)

- With incomplete markets, the distribution of wealth may matter for efficiency of the equilibrium.
  - Value of a borrower's wealth or collateral may determine borrowing conditions. (Lecture 9)
  - A bank suffering losses, forced by its creditors to sell its assets.
  - Fire sales of assets $\Longrightarrow$ fall in asset prices $\Longrightarrow$ lower value of wealth and collateral $\Longrightarrow$ stricter credit conditions $\Longrightarrow$ profitable projects do not get funding and are not realized. A pecuniary externality
  - An individual bank does not internalize such potential pecuniary externalities on other agents (other banks and their borrowers) when it decides on the riskiness of its portfolio.

– An argument for reducing the probability of a bank becoming insolvent by regulation, e.g. by capital requirements.

Fragility of banks:

- Illiquid assets (loans) and liquid liabilities (demandable deposits). Can cause:
  - run (Lecture 3)
  - contagion, via interbank exposures or simply informational contagion.

Unsophisticated creditors

- Bank depositors, unlike creditors of other institutions, not able to monitor bank management. Need to be represented by a monitoring agent. *Representation hypothesis* for bank regulation (Dewatripont &Tirole 1994 (not on the reading list)).

Other costs if a bank fails:

- Banks important for solving asymmetric information. (Lecture 3)
  - Failure of a bank can thus have negative externalities on its borrowers, costs of being shut off from the bank's credit.

- Moral hazard (Lecture 7)
  - Cost of bank failure may lead to an implicit government guarantee for banks ("Too big to fail")
  - Deposit guarantee may imply: depositors able to monitor and discipline banks do not do so.

- Argument for capital requirement on banks

Types of regulation covered in this course

- Liquidity regulation (lecture 8)
- Capital or solvency regulation (lecture 7-8)
- Deposit insurance (lecture 7)

But like a market, regulation also has its imperfections or failures. Costs, direct (resources spent) and indirect (distortions) such as:

- Regulators may be dependent on politicians and follow political aims rather than regulatory aims.
- Self-interested regulators may be captured by the industry.
- Regulation may necessitate more regulations, (deposit insurance causes need for capital requirements).

An imperfect unregulated market *may* be better than an imperfectly regulated market.

- Market imperfection is not sufficient condition for a regulation.
- Can the regulator improve the market outcome? Does the regulator have superior information or power to improve on a market failure?
- An example from Allen & Gale, ch. 7.1 where that is not the case.

"Allen & Gale intermediaries" with capital for risk sharing

- Three dates $t = 0, 1, 2$
- A good that can be consumed or invested.
- Two assets:
  - Short asset yields one unit of the good at $t + 1$ for each unit invested at t.
  - Long asset yields $R > 1$ units of the good at date 2 for each unit invested at date 0. Certain returns, no aggregate uncertainty. Price of date 2 consumption at date 1 is $\frac{1}{R}$.

- Identical investors/consumers at date 0 who each owns one unit of the good.

- They consume either at $t = 1$ if early consumer, or at $t = 2$ if late consumer. Utility $u(c)$ with standard properties at date 1 or 2.

- At date 1 each consumer learns if he is early consumer, probability is $0 < \lambda < 1$.

- Two equally sized consumer groups A and B.

- Two equally probable aggregate states in the economy $\left(\underbrace{\lambda_H}_{A}, \underbrace{\lambda_L}_{B}\right)$ and $\left(\underbrace{\lambda_L}_{A}, \underbrace{\lambda_H}_{B}\right)$ where $0 < \lambda_L < \lambda_H < 1$.

- No Arrow securities

- Several banks. A bank only serves group A or group B.

- At $t = 0$ consumer deposits one unit at a bank. The bank invests y in the short asset and x in the long asset, and promises the consumers the following consumption stream $(c_{1,H}, c_{2,H}; c_{1,L}, c_{2,L})$.

- Introduce a third type of agents, risk neutral capital investors who at $t = 0$ invest e_0 in each bank. In return the bank offers (e_H, e_L) at date $t = 2$, depending on the outcome of λ.

- Can the market outcome be improved upon by requiring banks to hold more capital than they choose in equilibrium?

- Investors demand an expected return of $\rho > R$, hence their participation constraint is

$$0.5(e_H + e_L) \geq \rho e_0 > R e_0$$

- Thus a bank must transfer some of the depositors returns to the capital investors since bank's assets cannot yield more than R.

- But capital is beneficial because it can smooth consumption for consumers across states.

- Large number of investors $\Longrightarrow$ participation constraint holds with equality.

- Many banks in A and B, each bank maximizes expected utility of typical consumer, subject to investors' participation constraint and banks budget constraints:

$$\begin{aligned} \text{at } t &= 0 \quad x + y \leq e_0 + 1 \\ \text{at } t &= 1 \quad \lambda_s c_{1,s} + (1 - \lambda_s)\frac{c_{2,s}}{R} + \frac{e_s}{R} \leq y + x \end{aligned}$$

- Market clearing conditions across A and B at date 1 and date 2:

$$\begin{aligned} 0.5\lambda_H c_{1,H} + 0.5\lambda_L c_{1,L} &= y \\ 0.5\left((1 - \lambda_H)c_{2,H} + e_H\right) + 0.5\left((1 - \lambda_L)c_{2,L} + e_L\right) &= Rx \end{aligned}$$

- Assume e_H and e_L are set s.t. $c_{2,H} = c_{2,L}$. The capital provides full insurance, and the marginal benefit of more insurance is 0. But the cost of insurance is > 0 since $\rho > R > 1$. Hence over insurance.

- The optimal capital structure when $RRA > 1$ should increase average consumption in the H-state and decrease it in the L-state. Solution is

$$e_H = 0 \text{ and } e_L = 2\rho e_0$$

  Does not imply full insurance though, cf. argument on last slide.

- Tempting to say: A regulator should force banks to hold enough capital that $c_{2,H} = c_{2,L}$.

- But that argument does not take into account that insurance through capital is costly. The market solution does so.

- Hence market solution is constrained optimal and cannot be improved upon by a regulator that has available the same technology as market agents have.

Next time, an example where incomplete markets make capital regulation, forcing banks to hold more capital than in the market solution, is optimal.