Costly State Verification Model

Setup

- An entrepreneur has a risky project of size 1, but their net worth $N < 1$, so external finance is required of amount B, where
$$B = 1 - N.$$

- Project payoff at date 1 is random, $Y \sim G(y)$.
- The actual, realised payoff y is observed privately by the entrepreneur.
- Lenders can verify y, but only by paying a monitoring cost $\kappa > 0$.
- This creates an asymmetric information problem:
  - without verification, the entrepreneur can under-report payoff;
  - with many small lenders, monitoring becomes a public good and each lender wants to free-ride.
- **Role of banks:** a bank arises as a *delegated monitor* that raises funds from depositors, lends to the entrepreneur, monitors on behalf of all lenders, and reduces duplicated verification costs.

CSV model

Optimal Contracts

- **Bank–entrepreneur contract:** standard debt is optimal.
  - The bank lends $B = 1 - N$ and requires fixed repayment D.
  - If $y \geq D$: the entrepreneur repays D, with no verification.
  - If $y < D$: default occurs, the bank verifies and recovers $y - \kappa$.
- Debt $\gg$ equity because verification occurs *only in default states*, rather than in all states.
- **Depositors–bank contract:** depositors are promised fixed repayment $R_d B$, while the bank keeps the residual return, giving it incentives to monitor.
- With competitive banking, expected profits are driven to zero:

$$\mathbb{E}[\Pi_B] = \mathbb{E}[\text{loan repayment}] - R_d B = 0.$$

- Optimal gross lending rate

$$R_l = \frac{D}{B}$$