Supervisory Incentives in a Banking Union

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Centralized versus local supervision

- Home country supervision
  - Nation-bound supervisors do not internalize cross-border effects
  - Perception of excessive risk taking by financial institutions and laxity in countries' regulatory policies
- Hub and spoke system
  - Internalizes spillovers
  - Less "captive", can impose tighter standards
  - May have to rely on local supervisors to collect actionable information

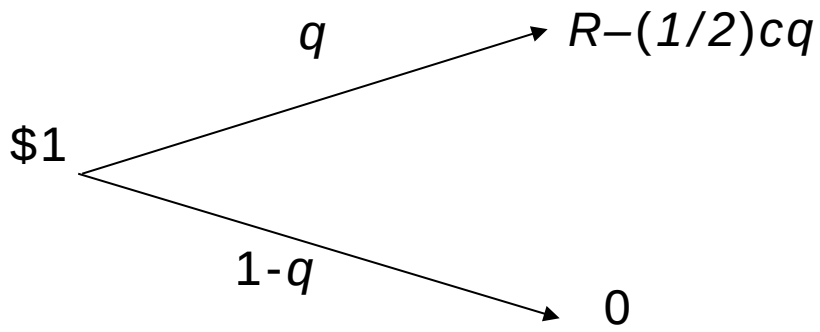
What we do

- Explore consequences of centralization for supervisory incentives and bank behavior
  - Centralization leads to tighter standards
  - But causes agency problem between central and local supervisors
  - Central supervisor sets standards / local collects information
  - Effect on bank risk taking?

- Use classical approach to bank supervision
  - Banks subject to limited liability choose their portfolios
  - Supervisors influence banks' risk taking through capital requirements, portfolio restrictions, and intervention
  - Some banks comply with supervisory requirements; others don't comply and hope not to get caught

Model: Banks

- Banks have capital *k*, and raise *1-k* in deposits
  - Limited liability for banks; deposits are insured
  - Opportunity cost for deposits and capital is the same and equal to 1
- Banks choose portfolio *q* on the efficient frontier:



In other words, a higher payoff can be earned at greater risk

- If bank fails, there is a social cost of $\psi_L \geq 1$ per unit of deposits

Bank's moral hazard problem

- Bank chooses portfolio q to maximize its profits

$$\max_q q\left(R - \frac{1}{2}cq - (1-k)\right) - k$$

- Profit-maximizing portfolio $\hat{q}(k)$ is increasing in k: *Leverage + Limited liability = Excessive risk taking:*

$$\hat{q}(k) = \frac{R-(1-k)}{c}$$

- Maximize total surplus

$$\max_q q\left(R - \frac{1}{2}cq - (1-k)\right) - (1-q)(1-k)\psi_L - k$$

Implies: $q_L^*(k) = \frac{R+(1-k)(\psi_L-1)}{c} > \hat{q}(k)$

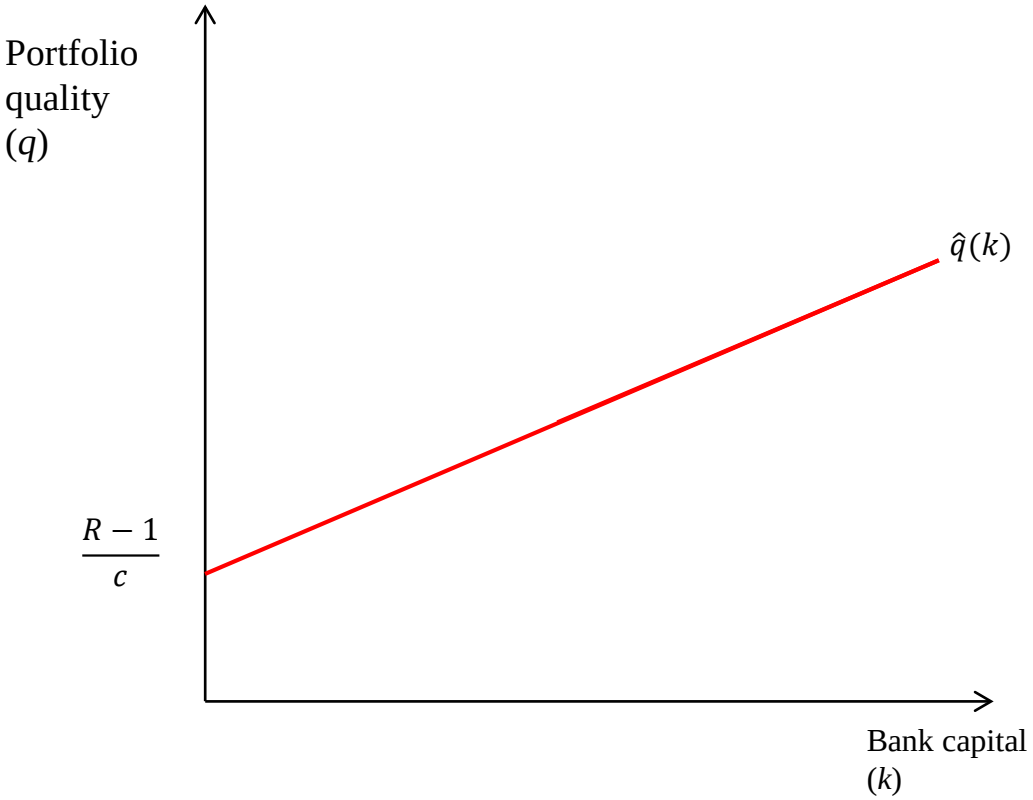
Model: Supervisors

- A (local) supervisor can invest costly resources to collect information about banks' balance sheets
  - With probability *e*, observes the balance sheet of the bank; otherwise, observes nothing
  - Quadratic cost of supervisory "effort"

- Conditional on obtaining information, the supervisor can intervene the bank:
  - This entails a cost $A_L > 0$
  - Fully expropriate shareholders (maximal punishments)
  - Implement a portfolio q_L^* to maximize total surplus

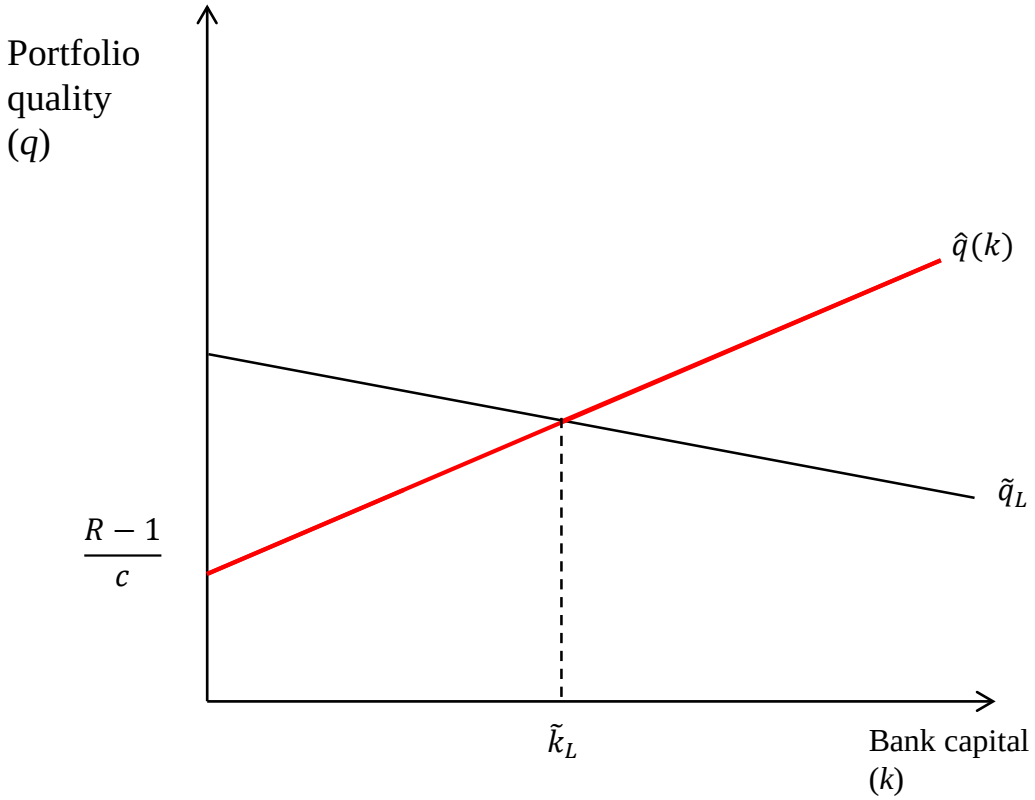
- Since intervention is costly, supervisor takes over a bank only when the bank deviates "enough" from regulatory standards
  - Social cost of failure decreasing in bank capital. Then, regulatory q is decreasing in capital
  - Bank faces a risk-based capital requirement

Portfolio quality and regulatory standards



Bank's choice of portfolio quality increases in its capital

Portfolio quality and regulatory standards



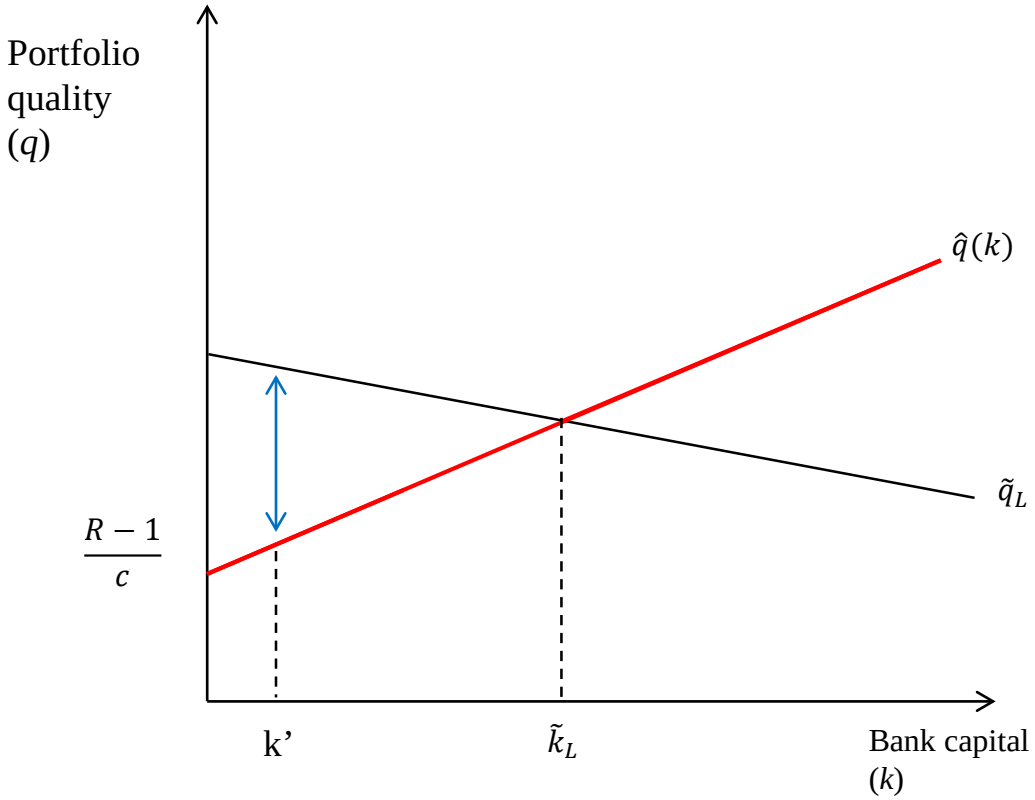
Supervisor demands a minimum portfolio quality $\tilde{q}_L$ decreasing in k

Banks' reaction to supervision

- Banks recognize that, if discovered, they will be intervened
  - Lose franchise value

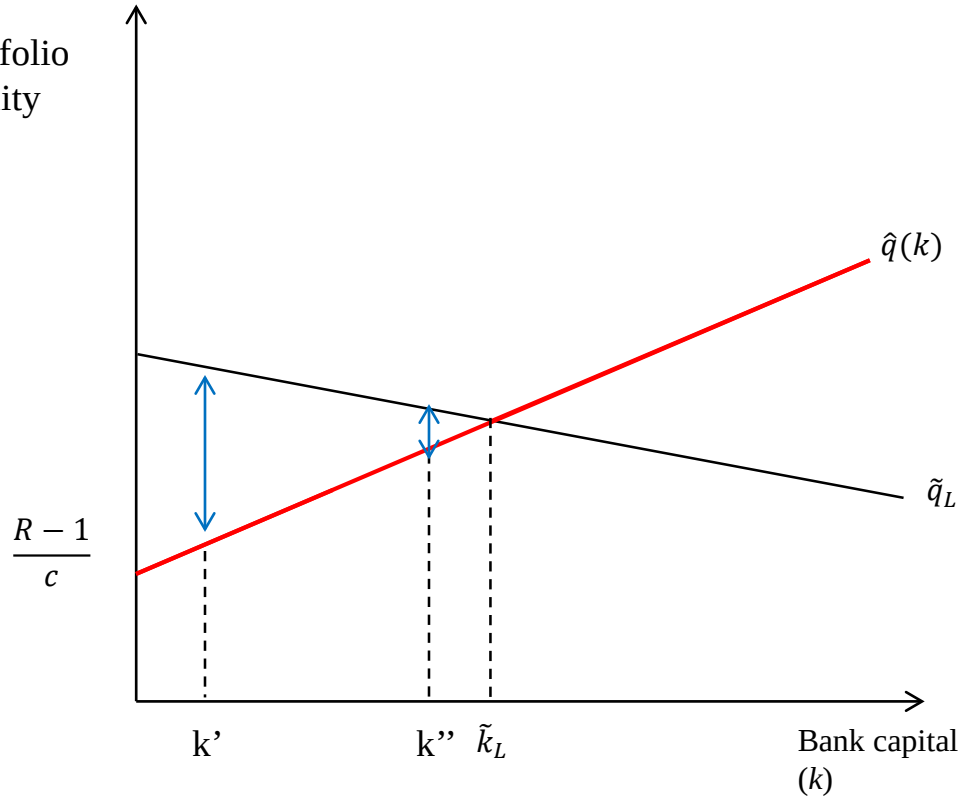
- For a given expected supervisory effort (a given probability of q being revealed to the supervisor), a bank weighs:
  - Choosing its preferred portfolio but risk intervention
  - Choosing a portfolio it likes less but avoid intervention

Bank reaction to regulation



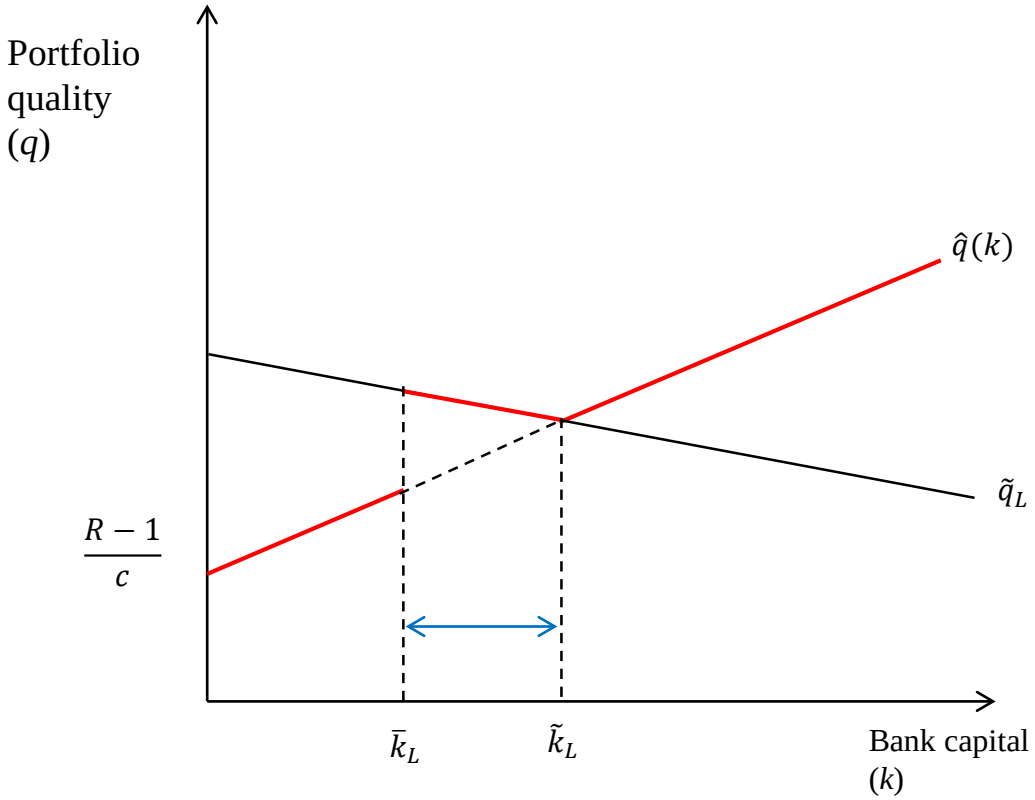
Banks with less capital find it too costly to adopt regulatory standard

Bank reaction to regulation



Banks with a more capital bear little cost of adopting regulatory standard

Bank reaction to regulation



Banks with capital below $\bar{k}_L$ stick with their preferred portfolio; those with capital between $\bar{k}_L$ and $\tilde{k}_L$ choose regulatory standard (they *comply*)

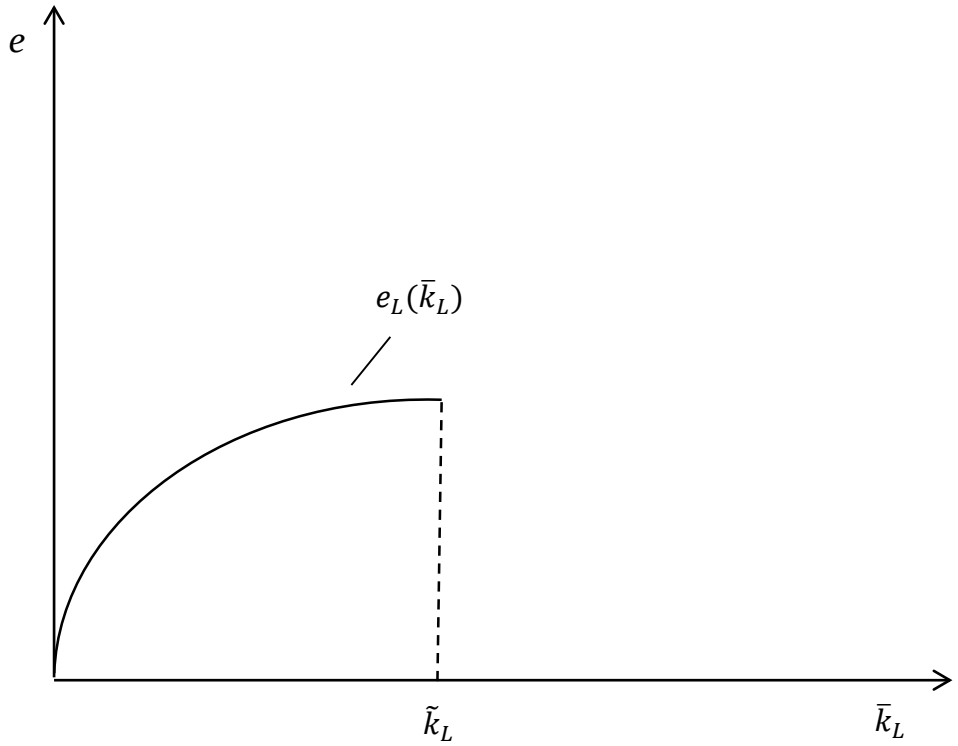
Equilibrium with local supervision

- Now we need to determine
  - Optimal supervisory information effort e^*
  - Aggregate banks' response

- Benefits from supervisory effort:
  - Greater when a larger mass of banks are expected not to comply
  - Formally, e is increasing in $\bar{k}_L$

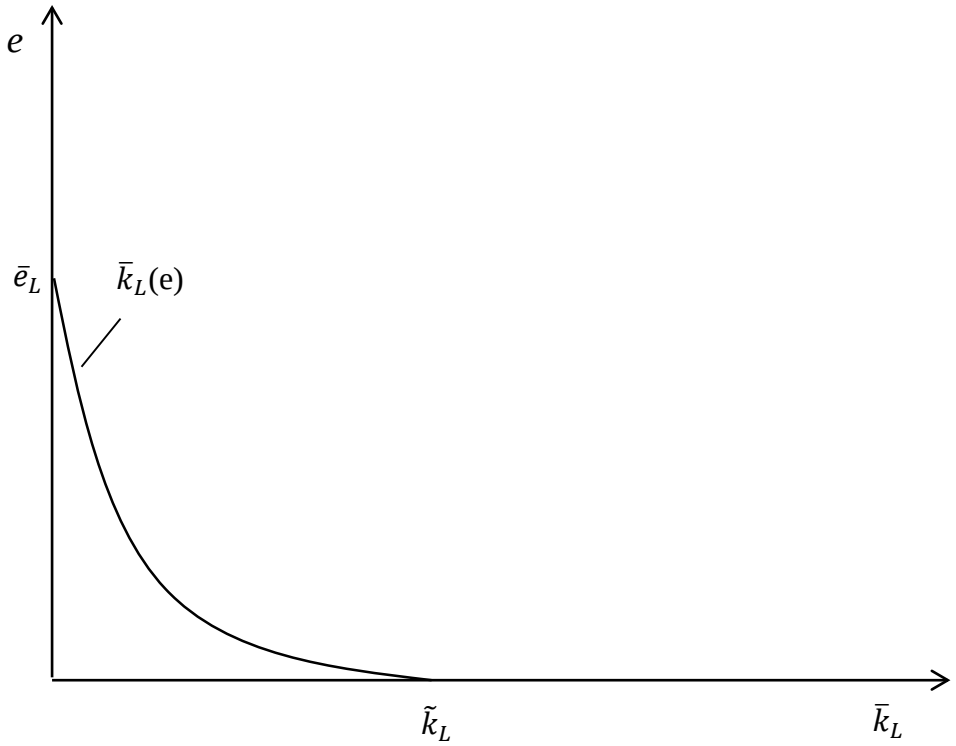
- Capital of marginal bank that complies with regulatory standards:
  - Decreasing in expected supervisory effort
  - Formally, decreasing in e $\bar{k}_L$

Equilibrium with local supervision: supervisor effort and bank behavior



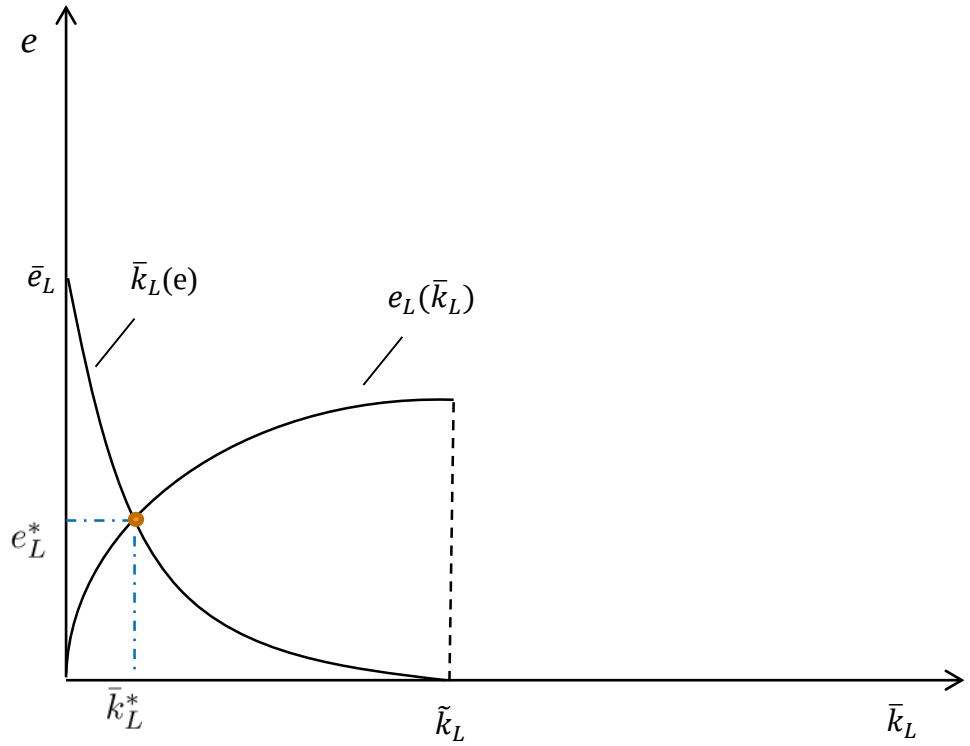
The supervisor's reaction function for effort is increasing in the threshold level of capital $\bar{k}_L$

Equilibrium with local supervision: supervisor effort and bank behavior



The banks' reaction function is characterized by the threshold level of capital, $\bar{k}_L(\mathrm{e})$, above which banks comply. It is decreasing in the supervisor's effort *e*

Equilibrium with local supervision: supervisor effort and bank behavior



The intersection of the two reaction functions – for the banks and for the supervisor – defines the equilibrium

Introducing a central supervisor

- A central supervisor decides *when* to intervene and *which portfolio* to implement upon intervention

- Local supervisor retains control over information collection (*e*)

- Conflict: A central supervisor may be **tougher** either because:
  1. He is less captured by local banks: $\mathcal{A}_C < \mathcal{A}_L$
  2. He internalizes more of the losses associated with bank failure: $\psi_C > \psi_L$

Central supervisor's intervention decisions

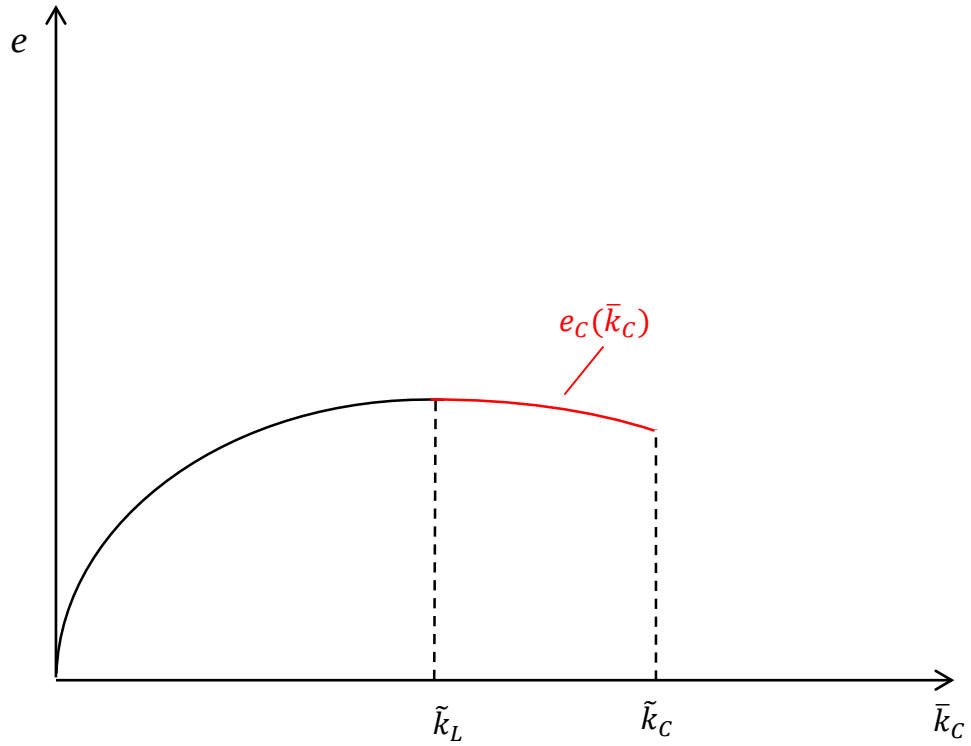
- In either case ($A_C < A_L$ or $\psi_C > \psi_L$) central supervisor is **tougher** in his **intervention policy**: $\tilde{q}_L(\mathrm{k}) < \tilde{q}_C(\mathrm{k})$
  - Higher intervention threshold
  - So that now banks with $k < \tilde{k}_C$ are intervened, where $\tilde{k}_L < \tilde{k}_C$
- If $\psi_C > \psi_L$, central supervisor imposes also a **higher portfolio quality** when he intervenes: $q_C^* > q_L^*$
- Two sources of conflict between central/local supervisors:
  - Intervention thresholds – which banks to intervene
  - Implemented quality – what to impose on intervened banks

Reaction functions with $A_C < A_L$

- **Result:** Effort by local supervisor will be *weakly* lower than under independence
  - Central supervisor mandates to intervene banks, which the local supervisor would prefer **not** to intervene

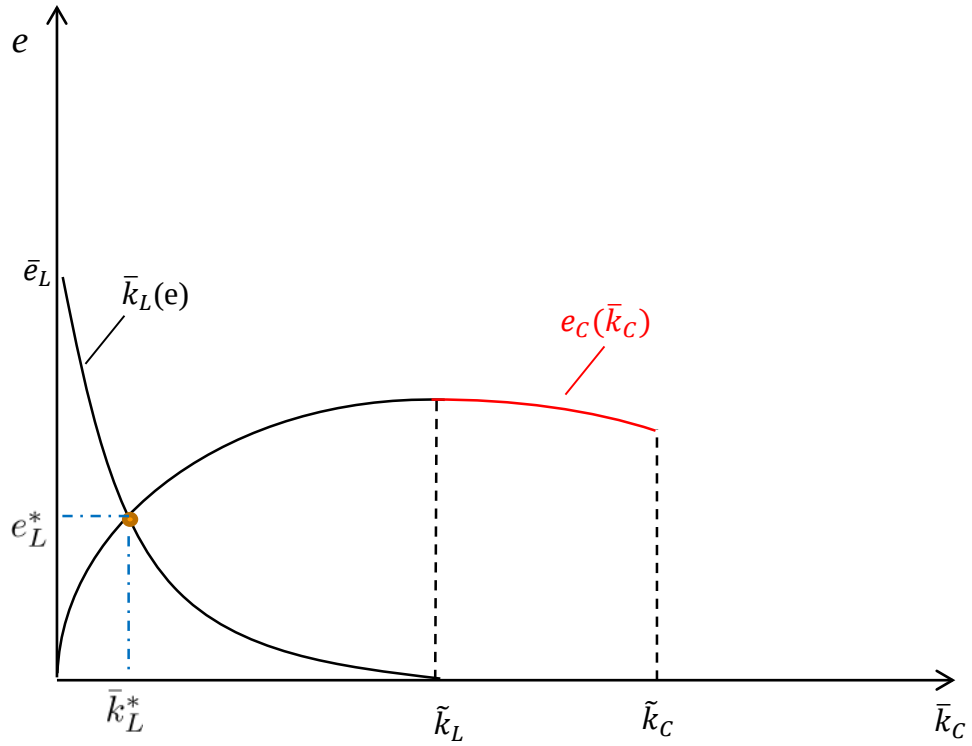
- **Result:** For given supervisory effort, fewer banks will comply with supervisory standards
  - Tougher standards make it more costly for banks to comply

Centralization and the local supervisor's effort decision with $A_C < A_L$

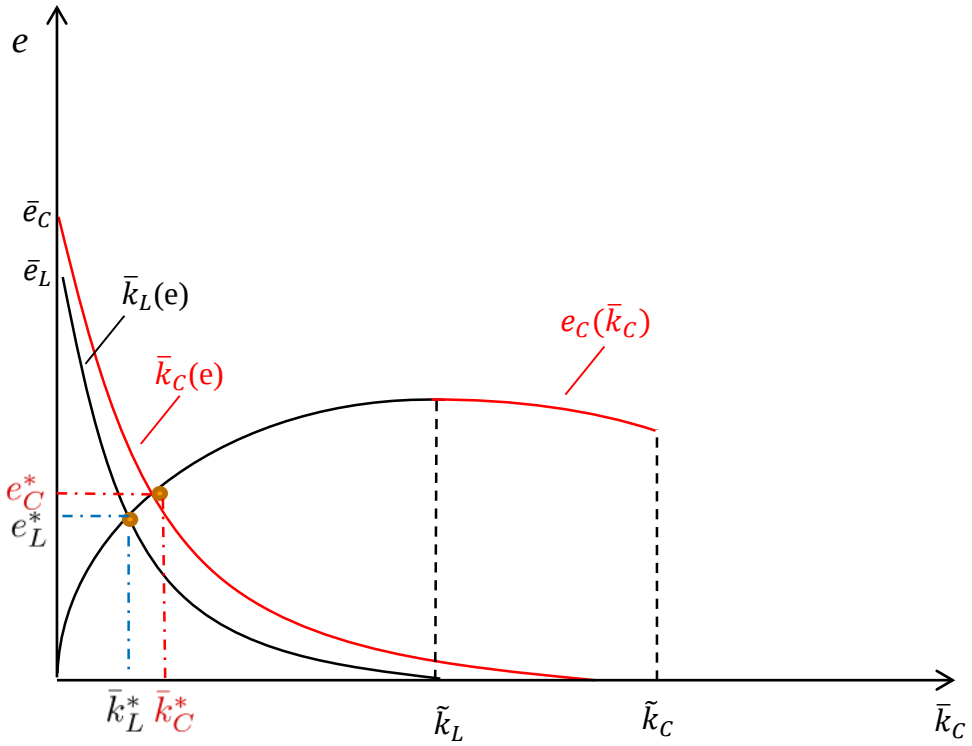


Supervisory effort becomes decreasing in the banks' threshold level of capital beyond $\tilde{k}_L$

Centralization and the local supervisor's effort decision with $A_C < A_L$

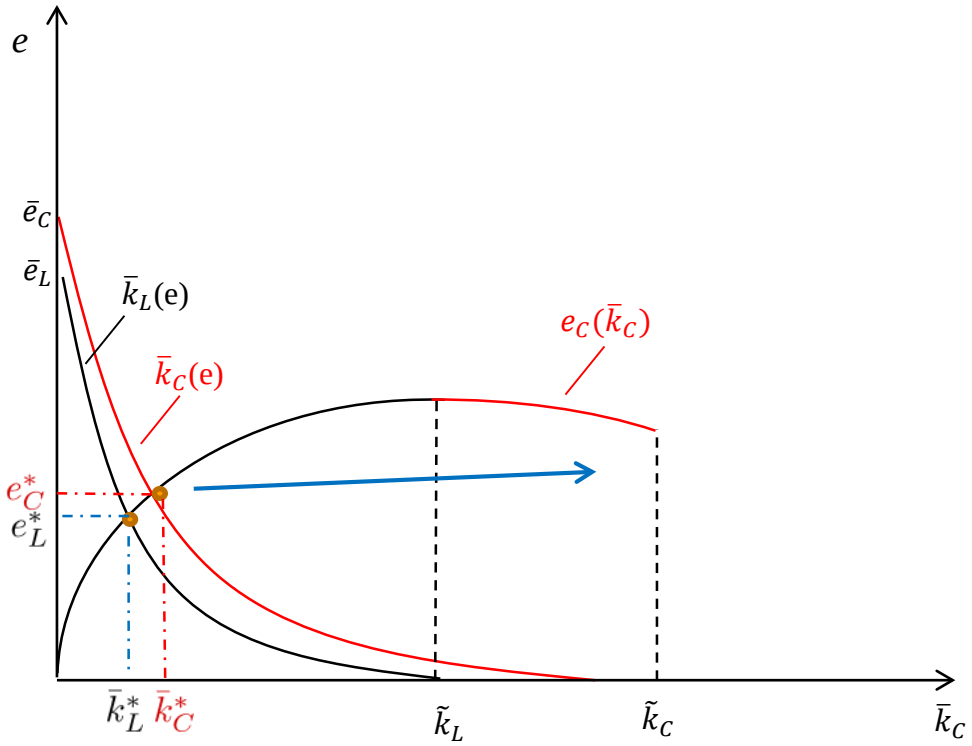


Centralization and the local supervisor's effort decision with $A_C < A_L$



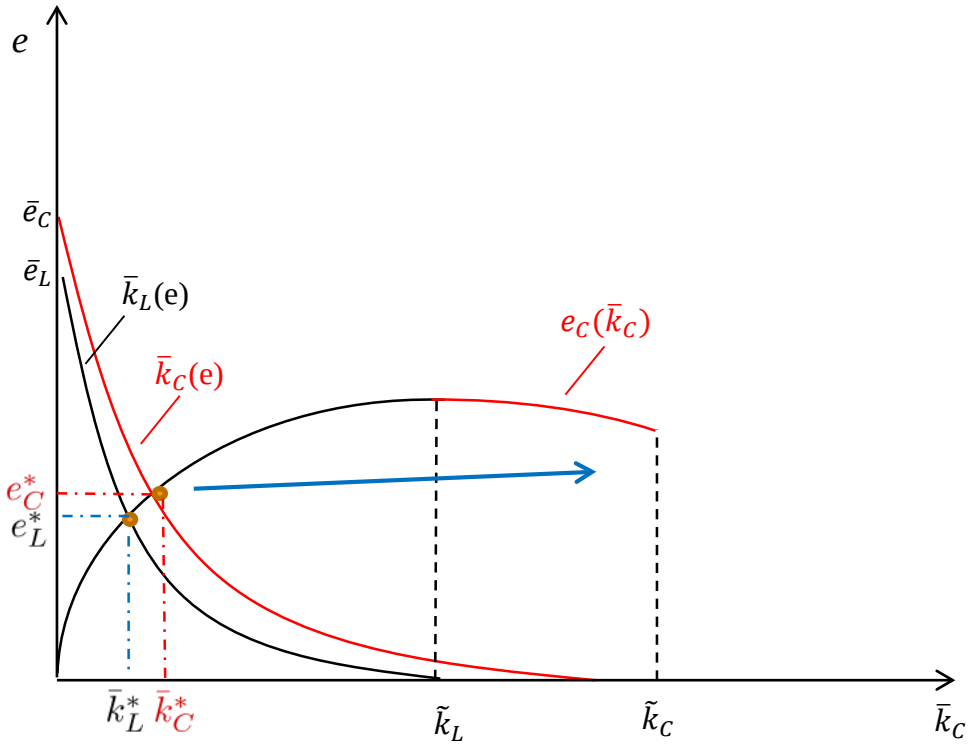
Banks' reaction function shifts up; leads to an increase in supervisory effort in equilibrium

Centralization and the local supervisor's effort decision with $A_C < A_L$



Q: Can supervisory effort decrease?

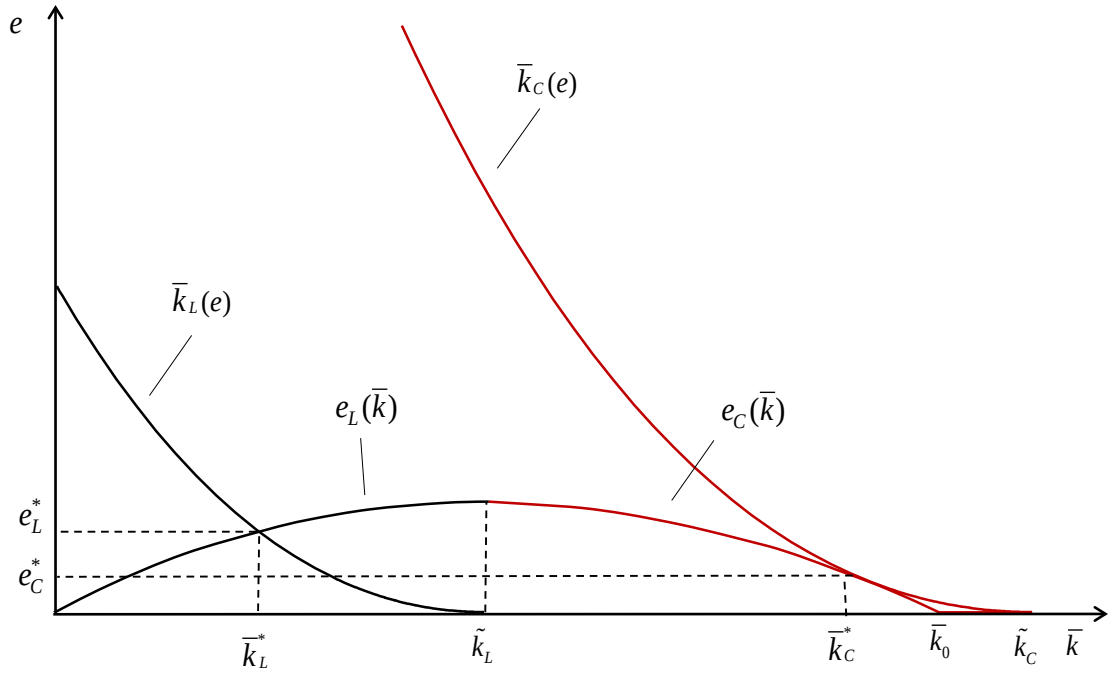
Centralization and the local supervisor's effort decision with $A_C < A_L$



Q: Can supervisory effort decrease?

A: Yes, if agency problem between supervisors is large enough (if $A_L - A_C$ is large enough)

Centralization and the local supervisor's effort decision with $A_C < A_L$



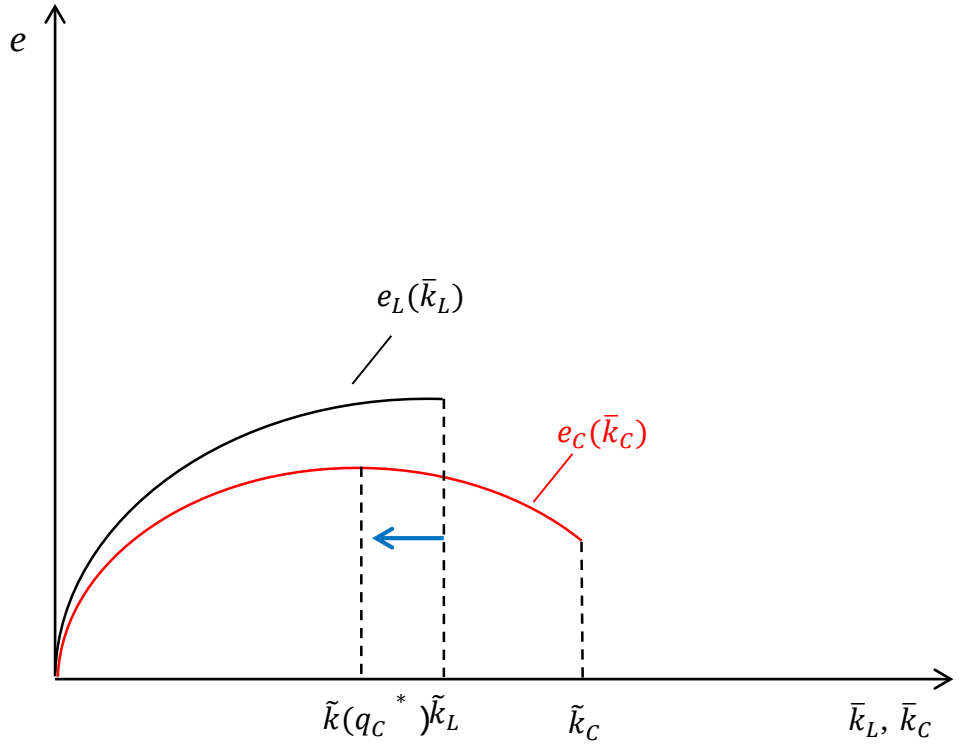
Result: If A_L - A_C is large enough, there are equilibria with **lower** regulatory effort under centralization

These equilibria can entail **more** overall risk in the banking sector

Case 2: Greater internalization of costs: $\psi_C > \psi_L$

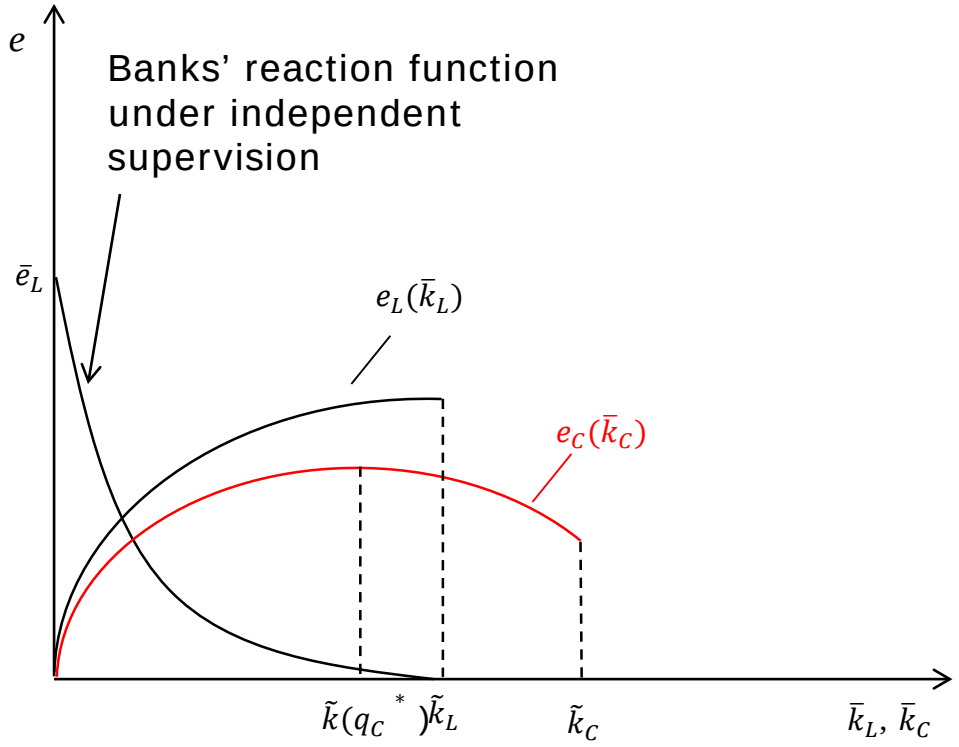
- Central supervisor will now want to implement a safer portfolio conditional on intervention: $q_C^* > q_L^*$
  - This has a much larger effect on local supervisor since he is unhappy no matter what happens!
  - Even for banks she would have liked to intervene, central supervisor imposes a different portfolio choice

Centralization and the local supervisor's effort decision with $\psi_C > \psi_L$

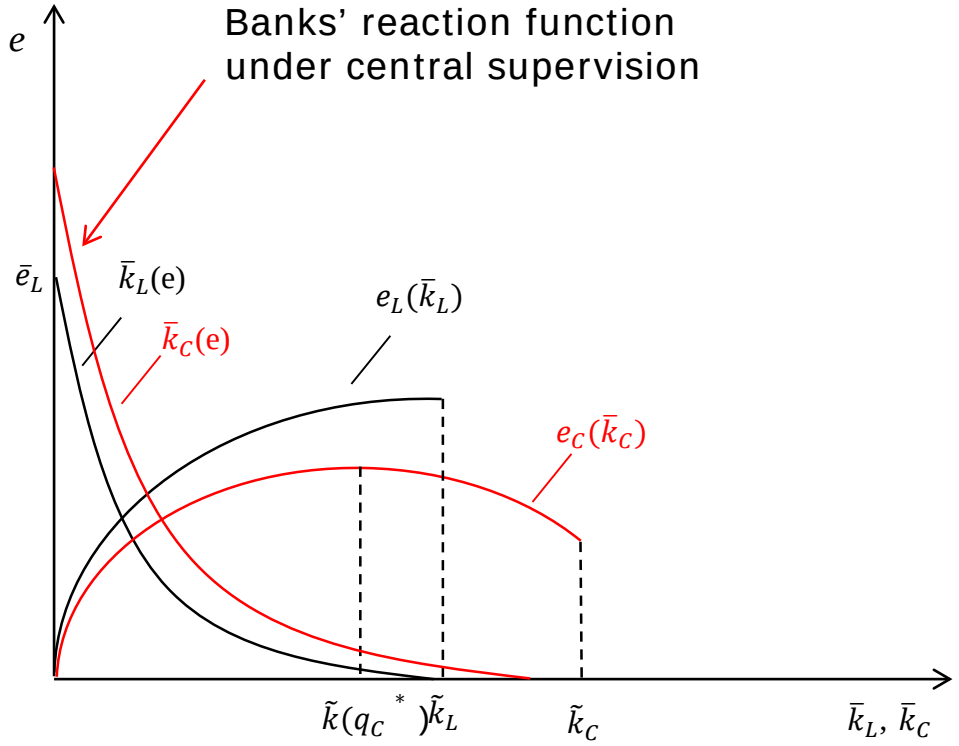


Local supervisor's reaction function for effort shifts down (i.e., $e_C(k)$ is lower) when central supervisor has a lower cost of funds

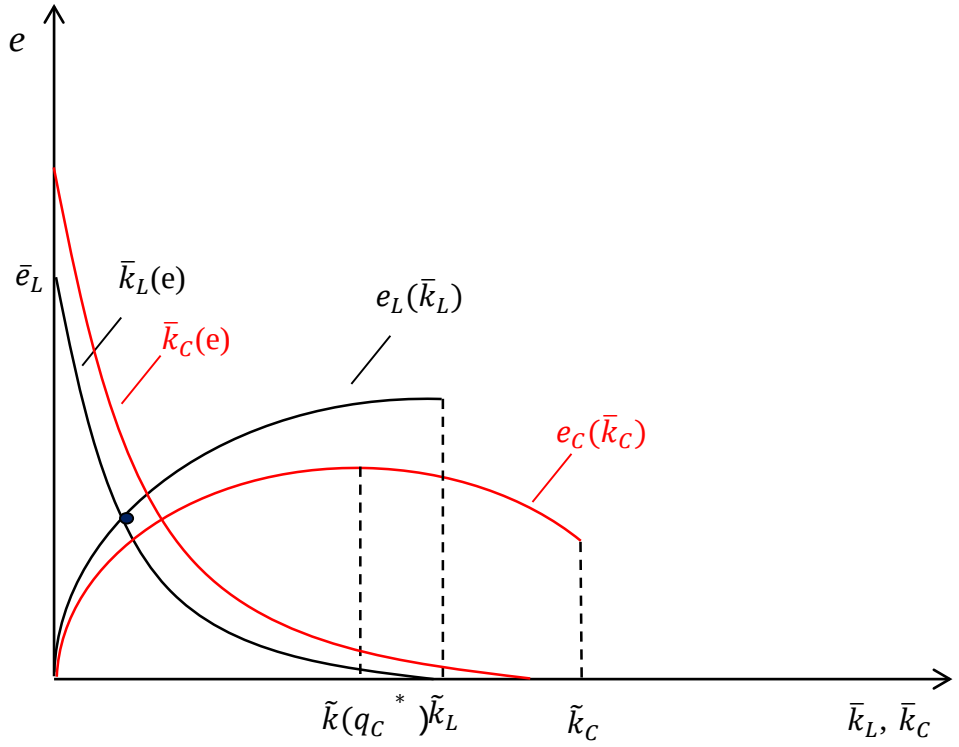
Centralization and the local supervisor's effort decision with $\psi_C > \psi_L$



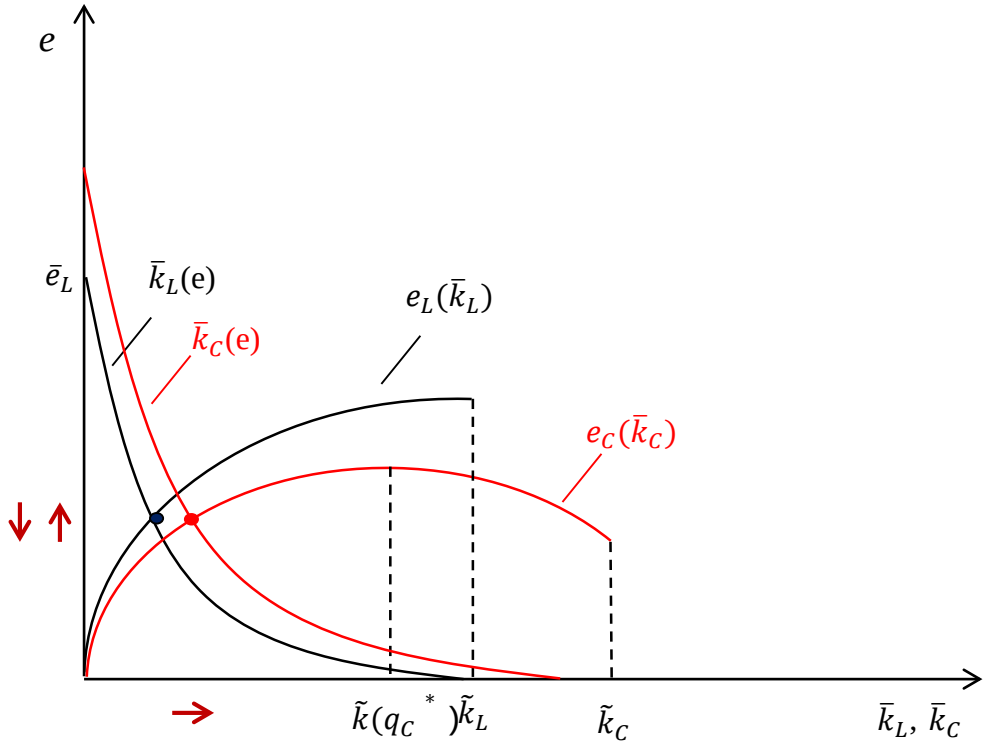
Centralization and the local supervisor's effort decision with $\psi_C > \psi_L$



Centralization and the local supervisor's effort decision with $\psi_C > \psi_L$



Centralization and the local supervisor's effort decision with $\psi_C > \psi_L$



Supervisory effort may increase or decrease in equilibrium – Aggregate portfolio risk may be higher even though regulatory standards have increased

Conclusions

- When supervision is centralized
  - Standards increase, but …
  - … Reliance on local supervisor who faces a larger agency conflict may lead to less information acquisition, which …
  - … may lead to greater risk-taking by banks
  - As a result, aggregate portfolio risk may go up or down

- Our analysis highlights hurdles that centralization may face to the extent that local agencies still play an important role in information acquisition and implementation of regulation

Conclusions

- SSM and Fed/States models
- Several mechanisms to address agency problems
  - Multi-country teams
  - Direct information collection
  - Power to switch to direct supervision
  - Alternating on-site inspections