Common Ownership, Institutional Investors, and Welfare

Oz Shy* Rune Stenbacka**

*Federal Reserve Bank of Atlanta **Hanken School of Economics

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Common Ownership

- Institutional investors channel funds to acquire ownership in competing firms producing under imperfect competition.
- Institutional investors: an important factor contributing to the increasingly important role of common ownership.
- The theoretical mechanism: Common ownership weakens product market competition, because firms internalize the effects of their production decisions on rivals, O'Brien & Salop (2000), Lopez & Vives (2019).
- Empirical documentation of common ownership: Azar (2016), He & Huang (2017), Seldeslachts, Newham & Banal-Estanol (2017), OECD (2017), Schmalz (2018), Backus, Conlon & Sinkinson (2019).
- Examples of industry studies arguing that there is a causal link between common ownership and consumer prices: banking (Azar, Raina & Schmaltz, 2016), airlines (Azar, Schmaltz & Tecu, 2019).
- Advocate restrictions on common ownership: Elhauge (2016), Posner, Scott Morton, and Weyl (2017).

The Research Question

- An increased degree of common ownership weakens the intensity of product market competition (competition-softening effect) .
- But, it also reduces the risks in the intra-industry portfolios of institutional investors (diversification benefit).

- In this study we conduct a detailed welfare analysis to analyse the tradeoff between the relaxed competition in the product market and the improved risk diversification in the asset market for risk-averse savers.

- The question: What is the effect of increased common ownership on total welfare with risk-averse savers?

Main Results

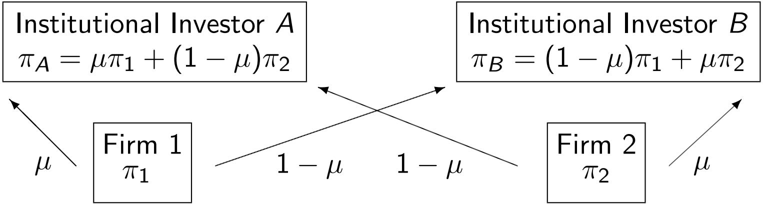
- The socially optimal degree of common ownership is importantly influenced by two factors:
  (i) the degree of risk aversion,
  (ii) the relative weight society assigns to consumption of the final product versus that assigned to returns on savings via institutional investors.

- Under risk neutrality complete ownership specialization (no common ownership at all) is socially optimal as long as the relative weight on consumption of the final good is sufficiently high.

- We show analytically that with risk aversion, and for the class of CRRA utility functions, an increase in the degree of risk aversion increases the socially optimal degree of common ownership.

Common Ownership by Institutional Investors

The model



Shares of common ownership in producing firms 1 and 2 by institutional investors A and B.

Investor A owns μ in firm 1 and $1-\mu$ in firm 2.
Investor B owns $1-\mu$ in firm 1 and μ in firm 2.

Assumption: $\mu \geq \frac{1}{2}$ (hence, majority and minority ownerships).

Terminology: $\mu \searrow \frac{1}{2}$ means more (equal) common ownership.
$\mu \nearrow 1$ means more ownership specialization.

Common Ownership by Institutional Investors

The model continued

The Product market: Producing firm 1 and firm 2

Homogeneous product market duopoly with linear inverse demand and marginal costs normalized to zero. Profit functions (firm $i = 1, 2$) are:

$$\pi_i(q_i, q_j) = [\alpha - \beta(q_i + q_i)]q_i.$$

Institutional investors A and B's ownership of producing firm 1 and firm 2

Institutional investor A owns share μ in firm 1 and share $1 - \mu$ in firm 2.

Institutional investor B owns share μ in firm 2 and share $1 - \mu$ in firm 1.

Therefore, their profits are:

$$\pi_A(q_1, q_2) = \mu\pi_1(q_1, q_2) + (1 - \mu)\pi_2(q_1, q_2),$$
$$\pi_B(q_1, q_2) = (1 - \mu)\pi_1(q_1, q_2) + \mu\pi_2(q_1, q_2).$$

Common Ownership by Institutional Investors

The model continued

Introducing of risks into the model:

ϕ^{II} = probability that both firms fail;

ϕ^{I} = probability that one firm fails while the other does not ($\times 2$);

ϕ^{0} = probability that neither firm fails.

The sequence of events is as follows:

For any given investors' ownership rates μ and $1-\mu$,

- Stage 1: The failure risk of each producing firm is realized according to the probabilities defined above.
- Stage 2:
  - Investor A determines the output of firm 1 (if firm 1 does not fail), and
  - investor B determines the output of firm 2 (if firm 2 does not fail).

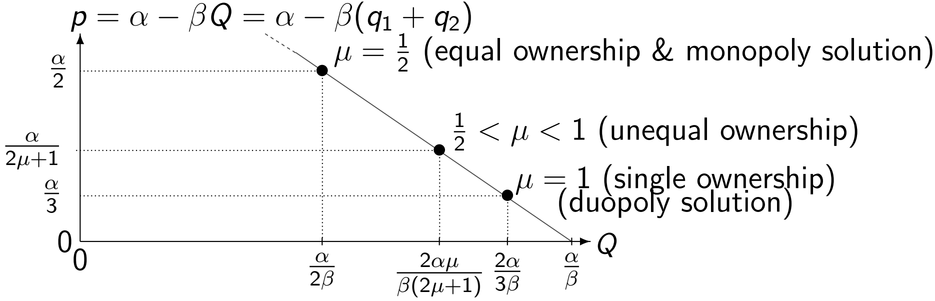
Product Market Equilibrium with Common Ownership

Result 1.

Suppose neither firm fails (probability ϕ^0), so the product market operates as a duopoly controlled by investors A and B.

- An increased degree of common co-ownership ($\mu \searrow \frac{1}{2}$) raises price, reduces aggregate industry production, and increases all profits.
- The maximum degree of common ownership ($\mu = \frac{1}{2}$) implements the monopoly solution where aggregate investors' profit equals the monopoly profit level.
- The highest degree of market competition is achieved with specialization such that each investor fully owns only one firm ($\mu = 1$) with market performance equivalent to that of standard Cournot competition.

Product Market Equilibrium with Common Ownership



Equilibrium price and aggregate industry output with various degrees of common ownership.

The Effect of Common Ownership on Portfolio Risks

The variance of the entire portfolio managed by investor A is

$$\mathrm{Var}[\pi_A] = s_{A1}^2 \mathrm{Var}[\pi_{A1}] + (1 - s_{A1})^2 \mathrm{Var}[\pi_{A2}] + 2 s_{A1}(1 - s_{A1}) \mathrm{Cov}\left[\pi_{A1}, \pi_{A2}\right],$$

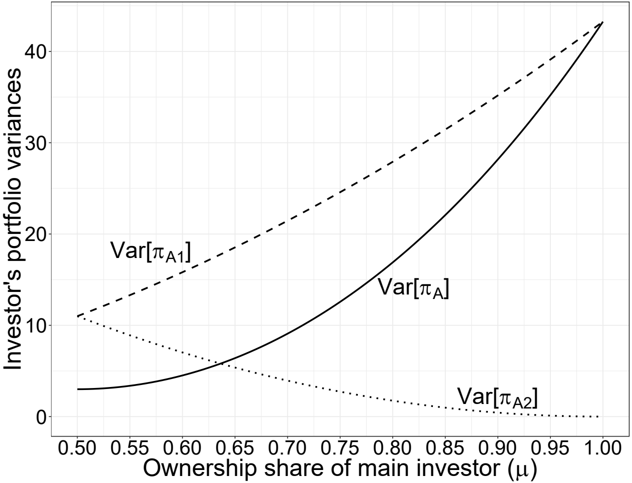
where the (value-based) *portfolio's weights* of the two assets are

$$s_{A1} = \frac{\mathrm{E}[\pi_{A1}]}{\mathrm{E}[\pi_{A1}] + \mathrm{E}[\pi_{A2}]} \quad \text{and} \quad s_{A2} = 1 - s_{A1} = \frac{\mathrm{E}[\pi_{A2}]}{\mathrm{E}[\pi_{A1}] + \mathrm{E}[\pi_{A2}]}.$$

Observations:

a. Increasing an investor's majority share μ in one producing firm while reducing the minority share in the other firm increases the investor's portfolio variance.
b. Portfolio variance is minimized when each investor maintains an equal share in each of the product market rivals ($\mu = \frac{1}{2}$).

The Effect of Common Ownership on Portfolio Risks



Variances of each asset in investor A's portfolio as functions of the majority share μ.

Welfare Evaluations of Common Ownership

The Central Tradeoff

The central tradeoff:

- Result 1: An increased degree of common ownership (lower μ) weakens competition. (hurts consumers as product buyers)
  versus
- An increased degree of common ownership reduces portfolio risks. (benefits consumers as savers/investors).

<u>Welfare criterion</u>: Define expected total welfare:

$$\mathrm{E}W = \omega \underbrace{\mathrm{E}U(CS)}_{\text{consumers' utility } \mathrm{E}W_c} + (1-\omega) \underbrace{[\mathrm{E}U(\pi_A) + \mathrm{E}U(\pi_B)]}_{\text{savers' utility } \mathrm{E}W_s},$$

where ω $(0 < \omega < 1)$ is the weight in social welfare assigned to consumers in the product market (CS).

Profits π_A and π_B are random payoffs earned by institutional investors according to the failure probabilities.

Welfare Evaluations of Common Ownership

Formalization of the Central Tradeoff

The effect of an increased ownership concentration (higher μ) on expected consumer utility is given by

$$\phi^0 U'(CS^0)\frac{4\gamma\mu}{(2\mu+1)^3} > 0.$$

The effect of increased ownership concentration (higher μ) on the expected utility associated with the earnings of institutional investors is given by

$$2\phi^I \frac{\gamma}{4}\left[U'(\frac{\gamma\mu}{4}) - U'(\frac{\gamma(1-\mu)}{4})\right] + 2\phi^0 U'(\frac{\gamma\mu}{(2\mu+1)^2})\frac{\gamma(1-2\mu)}{(2\mu+1)^3} < 0.$$

Result 2.

An increased degree of common ownership by institutional investors of product market firms (lower μ) decreases expected consumer utility in the product market and increases expected utility associated with earnings generated by institutional investors.

Welfare Evaluations of Common Ownership

Risk Neutrality

$$\frac{\partial \mathrm{E}W}{\partial \mu} = \text{constant} \times \frac{2\gamma\phi^0}{(2\mu+1)^3}\left[\omega 2\mu + (1-\omega)(1-2\mu)\right],$$

- Strictly increasing when $\omega > 1/2$, implying that $\mu = 1$ maximizes welfare when $\omega > 1/2$
- Interior solution

$$\mu^*(\omega) = \frac{1-\omega}{2(1-2\omega)},$$

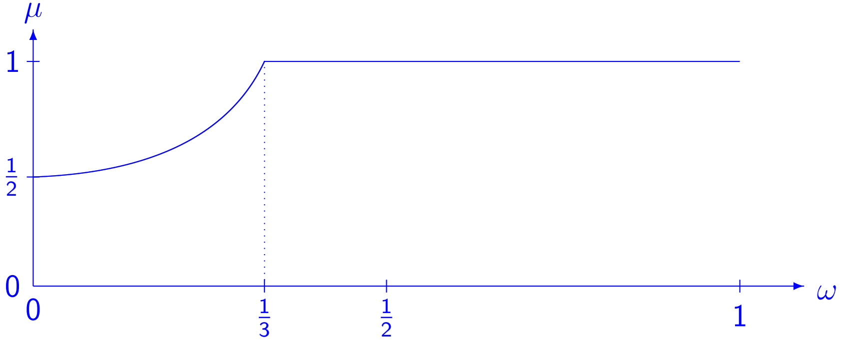
  if $\omega > 1/3$.
- The interior solution violates feasibility ($1/2 \leq \mu^*(\omega) \leq 1$) if $\omega > 1/3$. Therefore, $\mu = 1$ maximizes welfare also for $\omega \geq 1/3$.

Welfare Evaluations of Common Ownership

Risk Neutrality

Result 3. Suppose that consumers as well as savers are risk neutral. The institutional investors' degree of common ownership that maximizes total welfare is given by

$$\mu^*(\omega) = \begin{cases} \frac{1-\omega}{2(1-2\omega)} & \text{if } 0 \leq \omega < \frac{1}{3} \\ 1 & \text{if } \frac{1}{3} \leq \omega \leq 1. \end{cases}$$



Welfare Evaluations of Common Ownership

Risk Aversion

- CRRA utility function $U(y) = y^\theta$ where $0 < \theta \leq 1$.
  (Index of relative risk aversion $= 1 - \theta$)

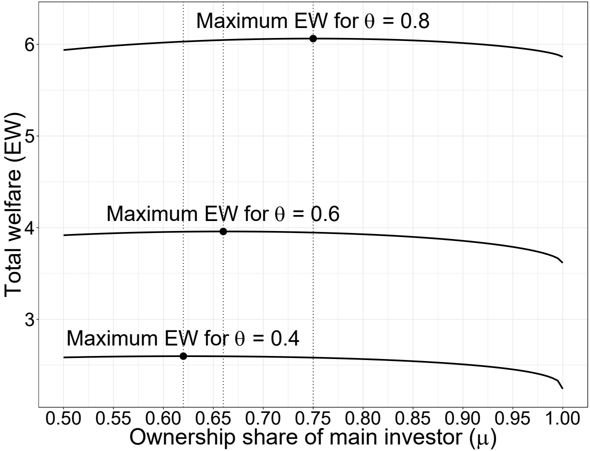
$$\mathrm{E}W = \omega \underbrace{\left[2\phi^I \left(\frac{\gamma}{8}\right)^\theta + \phi^0 \left(\frac{2\gamma\mu^2}{(2\mu+1)^2}\right)^\theta\right]}_{\text{consumers' utility } \mathrm{E}W_c}$$

$$+ (1-\omega) \underbrace{\left\{2\phi^I \left[\left(\frac{\mu\gamma}{4}\right)^\theta + \left(\frac{(1-\mu)\gamma}{4}\right)^\theta\right] + \phi^0 \left[\left(\frac{\gamma\mu}{(2\mu+1)^2}\right)^\theta + \left(\frac{\gamma\mu}{(2\mu+1)^2}\right)^\theta\right]\right\}}_{\text{savers' utility } \mathrm{E}W_s}.$$

- Next slide shows numerical simulations to illustrate how increased risk aversion (decrease in θ) affects the welfare-maximizing level of μ^*.

Welfare Evaluations of Common Ownership

Risk Aversion



- A higher degree of risk aversion (lower θ) tends to induce a higher degree of common ownership (lower μ^*) in the social optimum.

Welfare Evaluations of Common Ownership

Risk Aversion

Result 4.
Suppose $\omega = \frac{1}{2}$ and $\alpha^2/\beta > 9$. Then, an increase in risk aversion (lower θ) increases the socially optimal degree of common ownership (lower μ^*).

- With a higher degree of common ownership the institutional investors offer more diversified investment portfolios to their savers.
  (a) The value savers derive from diversification is increasing as a function of the degree of risk aversion,
  (b) This is the mechanism for why the socially optimal degree of common ownership increases with risk aversion.
- The socially optimal degree of common ownership balances the gains from diversification against the offsetting effects on consumer surplus. This tradeoff is importantly determined also by the parameter ω.

Concluding Comments: Summary

- The socially optimal degree of common ownership is determined by two factors:
  (a) The degree of risk aversion,
  (b) The relative weight society assigns to consumer surplus associated with the consumption of the final good compared with the returns on savings via institutional investors.
- Under risk neutrality, complete ownership specialization with no common ownership is socially optimal if the relative weight on consumption of the final good is sufficiently high.
- With risk aversion, and for the class of CRRA-utility functions, the socially optimal degree of common ownership increases with risk aversion.

Concluding Comments: Extensions

1. Investors as consumers: Suppose investors A and B consume a fraction λ of all output $(0 \leq \lambda < \frac{1}{2})$.
   Result: Anticompetitive effects of common ownership are mitigated but not eliminated.
2. Multiple producing firms: Investor A owns fraction μ in N_A producing firms. Investor B owns fraction μ in N_B producing firms.
3. Small ownership shares and passive investors: