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# Partial Cross Ownership and Innovation

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# Setup

- Firms invest in probability $\lambda_i$ of marginal cost reduction (from c to 0) in stage 1
- If both firms fail or succeed to innovate, they make zero profits in stage 2
- If only one firm succeeds, it reaps a profit margin c – only non-drastic innovations in competition
- So the firms compete in innovation and invest to $\lambda^*$

- Partial cross minority ownership (PCO) – at arm's length, asymmetric:
- Internalizes part of negative externality on the other firm's profits:
  - Reduces incentives to innovate in stage 1
  - Softens price competition in stage 2 – which induces firms to innovate more
- Introduces possibility of drastic innovation – if the other firm owns enough of the one firm ($\alpha_j > \sigma$)
- Asymmetry encourages the more shared firm to innovate relatively even more

# Key results

- The combined effect can increase innovation over $\lambda^*$ – if *price effect* trumps *cannibalization effect*
- Softened competition in stage 2 makes drastic innovation possible for large enough $\alpha_j$ – by lowering the competitive price to $c/(1-\alpha_j)$
- Consumers typically loose – price may drop to 0, but risk of market power if only one firm succeeds
- Except for special circumstances – prominently around drastic innovations
- PCO boosts innovation more and hurts consumers less than semi-collusion (joint pricing or RJV) and merger (full integration)

- Overall message: increasing small minority shareholdings typically hurts consumers, yet once over a threshold ($\sigma$<1/2) (asymmetric) CPO can benefit innovation and consumers – not such a bad idea

# Some comments

- Suggest there are some optimal α's – ratio?
  - Maximum CS – Section 6 looks at unit demand, DWL?
  - But how about profitability? – maybe the firms want to keep shares low in order to avoid strong price effect (although drastic innovation gives unconstrained monopoly)
  - And what about the socially optimal level of investments? – maybe PCO slows down or intensifies a wasteful innovation rat race

- Arm's-length assumption key in comparison to alternatives – who is controlling shareholder 'without stake in the rival firm' in duopoly case? Discussion of ownership versus control
- Spill-overs are key in R&D investment decisions – they reduce investments in competition
- By assumption (3), competition cannot generate drastic innovations – sounds worse than it is