PLATFORM COMPETITION WITH "MUST-HAVE" COMPONENTS

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QUESTION

- Platform/component model
  - Superior technology / well-known brand name gives some component providers more power
  - Examples:
    - ESPN in the US pay-TV market
    - Squaresoft in the Japanese video game market
    - SMS in the Chinese cell phone market
  - Often called "must-have" components; not really perfect complements
- Platform/component bargaining
  - Must-have components (MHC) stand in contrast to basic components
  - Must-have component provider's incentive to offer exclusive or non-exclusive access contracts to platforms

TECHNIQUES

- Effect of MHC on platforms and basic components
  - Analyze equilibrium sales/prices/profits of platforms
  - Consider exclusive/non-exclusive contracts between MHC and platforms
- Based on Crémer, Rey, Tirole (2000) (CRT) / Malueg & Schwartz (2002)
  - Two interconnected (at varying quality levels) Internet backbone providers
  - Direct network effect between Internet service providers
  - Larger backbone may not want to interconnect
- CRT model includes strategic behavior by platforms (backbones) and partial compatibility between them (quality of interconnection).
  - Reinterpret the direct network effect as a reduced form indirect network effect – see Clements (2004)
  - Reinterpret interconnection quality as the degree of compatibility in the indirect network industries – see Rohlfs (2003)

MODEL

- Two platforms with installed customer bases β_1, β_2, platform 1 is bigger, $\Delta_1 = \beta_1 - \beta_2 \geq 0$; each platform tries to enroll new customers q_i
- $\theta \in [0, 1]$ is the degree of compatibility between the two platforms.
- Basic components depend on <u>effective</u> user base: $N_i = s[(\beta_i + q_i) + \theta(\beta_j + q_j)]$.
- MHC gives utility μ (a constant) to customers, receives γ (also constant) in direct income from customers
- Platforms are Hotelling differentiated
- Platforms maximize profits by choosing q_i. Equilibrium profits are:

	EXCLUSIVE, PLATFORM 1	EXCLUSIVE, PLATFORM 2	NON-EXCLUSIVE
π_1	$\pi_1^E = \pi_1^B + H_1^E$	$\pi_1^{E'} = \pi_1^B + H_1^{E'}$	$\pi_1^{NE} = \pi_1^B + H_1^{NE}$
π_2	$\pi_2^{E'} = \pi_2^B + H_2^{E'}$	$\pi_2^E = \pi_2^B + H_2^E$	$\pi_2^{NE} = \pi_2^B + H_2^{NE}$

- Comparative statics (like CRT): if MHC is on platform 1, increased μ…
  - expands total demand in the platform market; q_1 increases, q_2 decreases
  - increases total platform profits; π_1^E increases, $\pi_2^{E'}$ decreases
- Increased compatibility weakens the MHC effect

BARGAINING WITH EXCLUSIVE ACCESS

- MHC pays transfer payments T_i according to Nash bargaining

PAYOFF	EXCLUSIVE, PLATFORM 1	EXCLUSIVE, PLATFORM 2
Platform 1	$H_1^E + T_1^E$	$H_1^{E'}$
Platform 2	$H_2^{E'}$	$H_2^E + T_2^E$
MHC	$\gamma(\beta_1 + q_1^E) - T_1^E$	$\gamma(\beta_2 + q_2^E) - T_2^E$

- Simultaneous bargaining solution:
  - $T_2^E = -\left(H_2^E - H_2^{E'}\right)$ (Smaller platform must pay for exclusive contract.)
  - $T_1^E = \frac{1}{2}\left\{\gamma\left[(\beta_1 - \beta_2) + (q_1^B - q_2^B)\right] - \left(H_1^E - H_1^{E'}\right) - \left(H_2^E - H_2^{E'}\right)\right\}$
  - MHC always contracts with larger platform; it pays less as μ increases
  - MHC pays less if platforms are similar-sized; limit is Bertrand competition
- Compatibility effect ambiguous: expands market (CRT); weakens size advantage (CRT); weakens MHC effects, reducing MHC bargaining power. Probably MHC prefers low compatibility in a mature market and high compatibility in a growing market.

BARGAINING WITH NON-EXCLUSIVE ACCESS

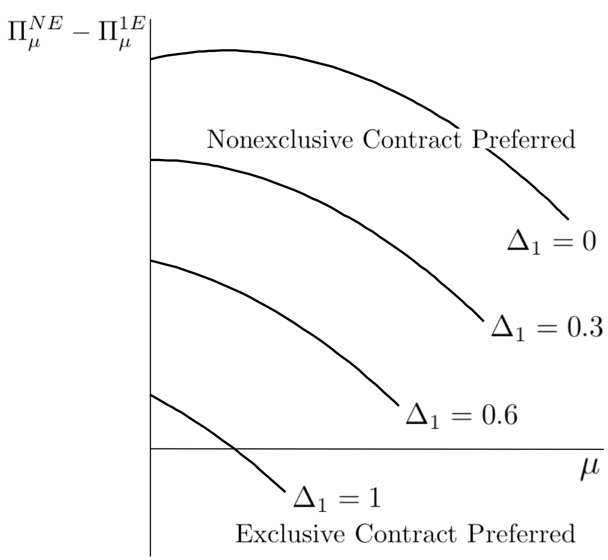
- Many alternatives for non-exclusive bargaining -- here MHC negotiates non-exclusive contracts while carrying the threat of going exclusive. (Anything else undercuts MHC bargaining power.)
- If the must-have component fails to reach an agreement with either platform, the bargaining stops and the must-have provider initiates an exclusive negotiation; exclusive results become the outside options.

PAYOFF	NON-EXCLUSIVE	EXCLUSIVE, PLATFORM 1
Platform 1	$H_1^{NE} + T_1^{NE}$	$H_1^E + T_1^E$
Platform 2	$H_2^{NE} + T_2^{NE}$	$H_2^{E'}$
MHC	$\gamma(\beta_1 + q_1^{NE} + \beta_2 + q_2^{NE}) - T_1^{NE} - T_2^{NE}$	$\gamma(\beta_1 + q_1^E) - T_1^E$

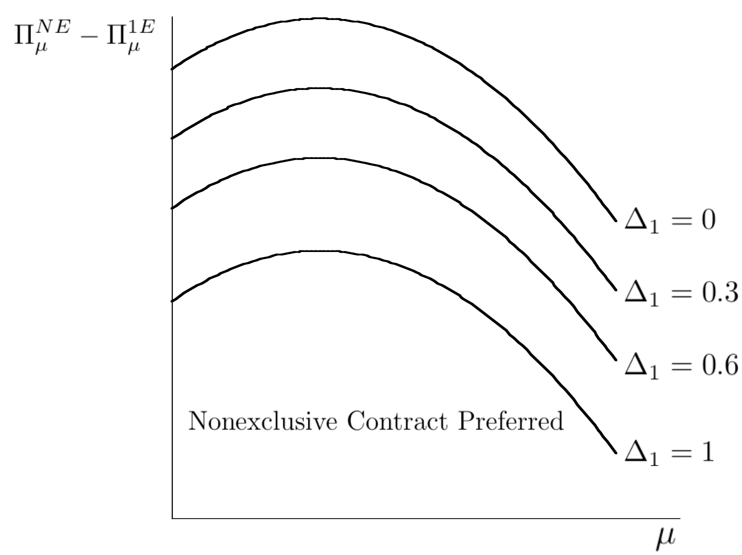
- In simultaneous bargaining, transfer payments have similar properties to exclusive case:
  - MHC pays less as μ increases
  - MHC pays less if platforms are similar-sized
  - Effect of compatibility is ambiguous

EXCLUSIVE VERSUS NON-EXCLUSIVE CONTRACTS

- Payoff difference to MHC is $\Pi_\mu^{NE} - \Pi_\mu^{1E}$
  - If positive, MHC will sign non-exclusive contracts with both platforms.
  - Otherwise, MHC will go exclusive on platform 1.
- Parameterize $s = 0.25$, $c = 0.2$, $\gamma = 0.5$, and $\mu \in [0, \bar{\mu}]$ to prevent tipping



INCOMPATIBILITY $\theta = 0$



FULL COMPATIBILITY $\theta = 1$

CONCLUSION

- If the MHC gains in popularity, then it will make a smaller transfer payment to the platform(s).
- For any given platform market, the larger the initial market share difference, the higher the payment from MHC to the platform(s).
- The level of compatibility has an ambiguous effect on the transfer payment. We conjecture that in a growing platform market, a higher level of compatibility is associated with a lower transfer payment, while in a mature platform market it is associated with a higher transfer payment.
- MHC is more likely to sign an exclusive contract if the level of compatibility is low and the initial market share difference between the platforms is high.
- Interesting policy implication -- a mandated increase in compatibility can induce the must-have component provider to sign non-exclusive contracts with platforms.
- Technological compatibility causes a contractual impact as well. Government may implement high-compatibility policies to open technological standards, but their effect can spill over to the contractual arena.