

Session 7: Mid-Course Review and Platform Dynamics

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June 18th 2009

Agenda

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 - platform dynamics (Evans and Schmalensee 2009; Eisenmann and Hagiu 2007)

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- Need to understand dynamics of platform adoption - various strategies for getting multiple sides on board a platform in the presence of network effects (dynamic "chicken-and-egg" problem)

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- Context with *reversible participation decisions*:
 - Examples? Examples where this doesn't hold?
 - Key motivation and implications?

Direct network effects

- Utility of well-informed customer i from joining platform at time t and price P when $N(t)$ other customers join:

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- Suppose there are \bar{N} total customers and Ω_i is distributed with cdf $F(\Omega | P)$. Note that $F(\Omega | P)$ is *decreasing* in P .
- If customers are perfectly informed, then "*fulfilled expectations equilibrium*": $N(t) = F[N(t) | P]$

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- Problem: equilibrium (existence and nature) depends on distribution F of customer preferences

Direct network effects - possible configurations

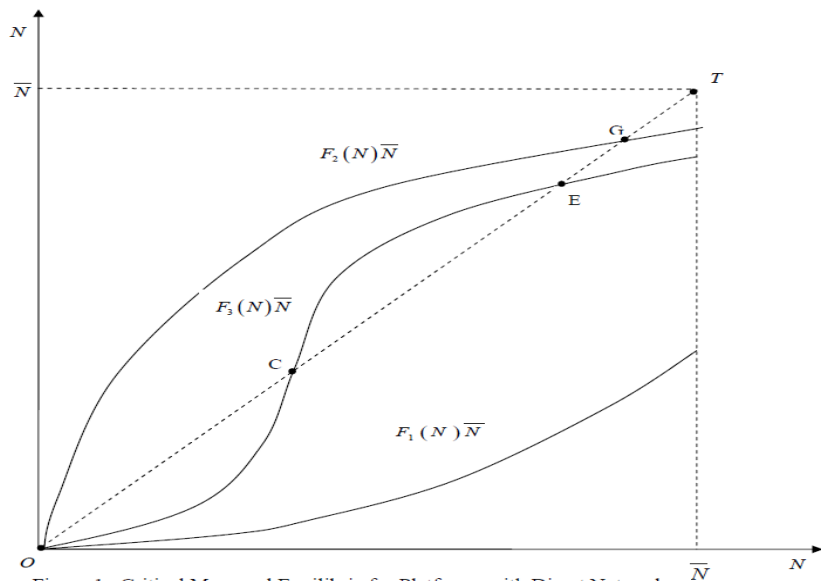


Figure 1. Critical Mass and Equilibria for Platforms with Direct Network

Direct network effects - Example

- Suppose $\theta_i = 0$ for all i and α_i uniformly distributed over $[0, A]$.
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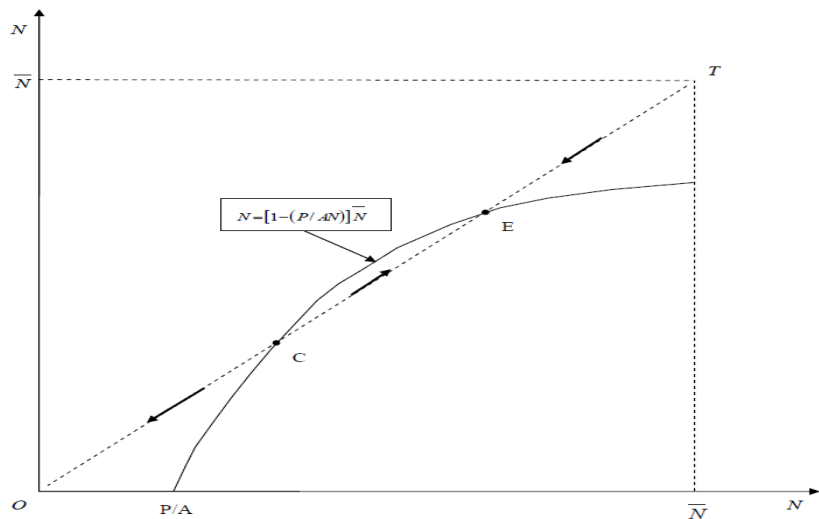
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- Solutions: $\frac{N}{\bar{N}} = \frac{1}{2} \left[1 \pm \sqrt{1 - \frac{4P}{AN}}\right]$. Does not exist if $\frac{P}{AN} > \frac{1}{4}$.

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- What happens if P is decreased? What if $P = 0$? Tradeoff?

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- P^* increasing in (A, \bar{N}, c)

Two-sided indirect network effects

- Two-sided *potential* demands if both sides are well-informed:

$$N^D(t) = F^D \left[N^U(t) | P^D \right] \overline{N^D}$$

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- But customers have imperfect information and demand adjustment is not instantaneous, therefore dynamic adjustment process (given initial conditions (N_0^U, N_0^D)):

$$\frac{dN^D(t)}{dt} = K^D \times \left[F^D \left[N^U(t) | P^D \right] \overline{N^D} - N^D(t) \right]$$

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Non-viable two-sided platform

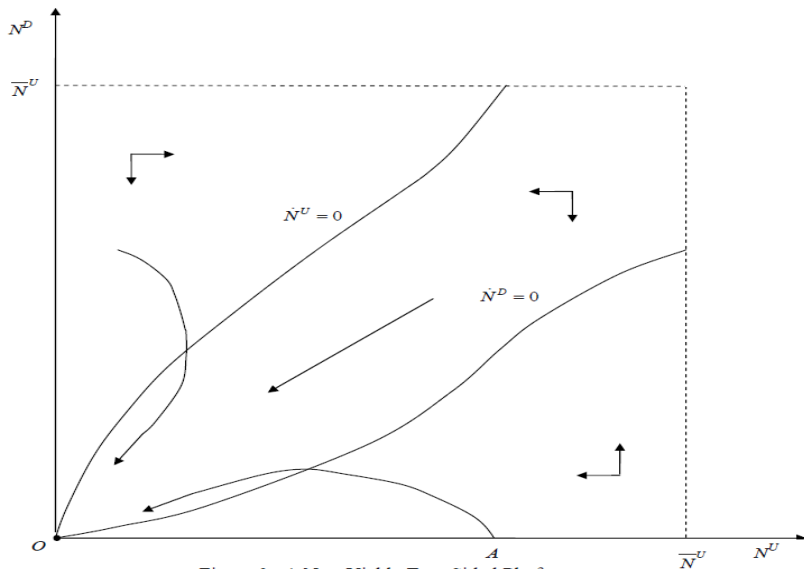


Figure 3. A Non-Viable Two-Sided Platform

Viable two-sided platform

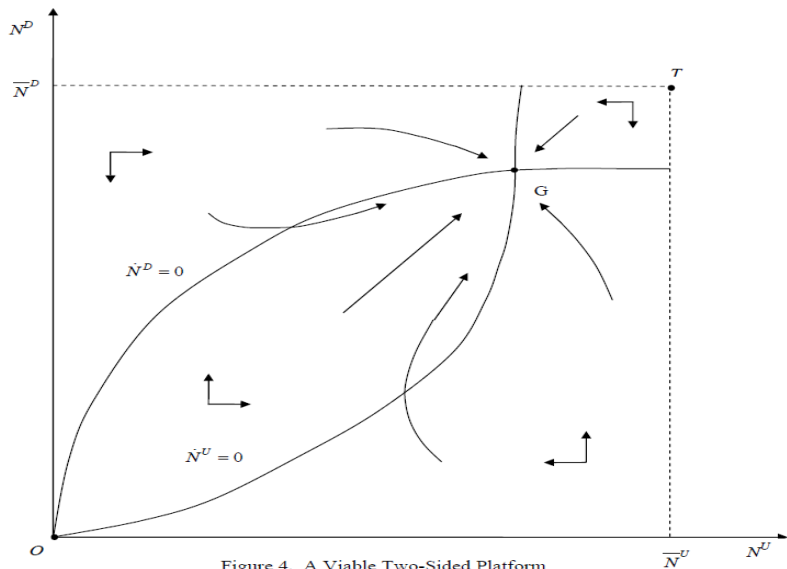
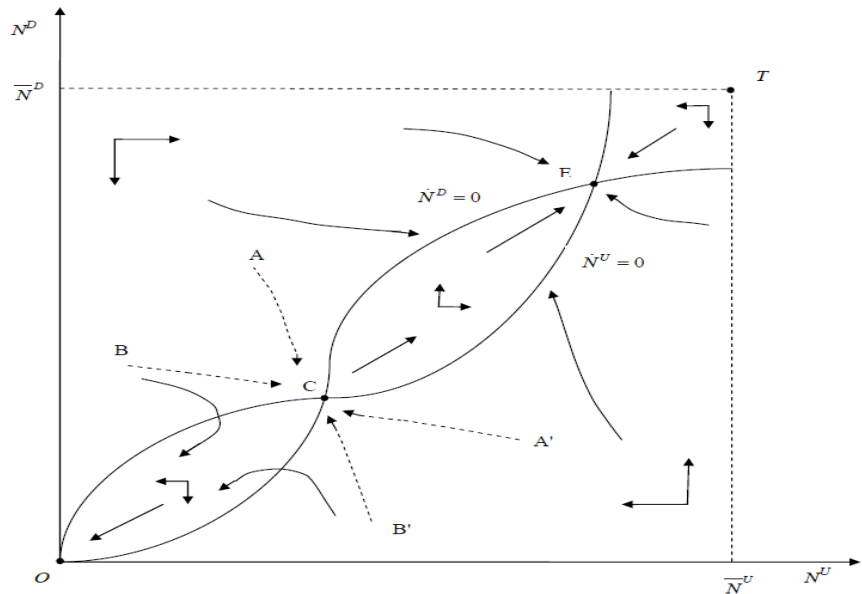


Figure 4. A Viable Two-Sided Platform

Potentially viable two-sided platform



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- Importance of costlessly reversible participation assumption?
 - Expectations of future installed base don't matter!
 - What if switching costs are present? What if completely irreversible decisions?

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- What else are we missing?

Thank you for your attention.