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Munich School of Management

What does Market Share Buy You? An Empirical Investigation of First-Mover Advantages in the Mobile Phone Industry.

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Motivation

- Mobile operators compete fiercely for (subscriber) market share, esp. in the early stages of the market.
  - Yet, most of an operator's revenues come from follow-up purchase of services (call minutes) rather than first adoptions, so discounting heavily to gain adopters may be counterproductive if these adopters do not call intensively.
- Operators also spend huge amounts of money on branding, advertising etc., presumably to build brand reputation.
  - However, reputation may also stem from incumbency in previous technological generations.
- Existing literature mainly considers a single output measure (market share) and a single definition of first mover (first entrant) to identify FMA.
  - This may not be appropriate for complex goods, and
  - does not allow (m)any statements about the likely source of FMA.

Questions

1. Is a first-mover advantage (FMA) in terms of market penetration sufficient to generate advantages in terms of usage intensity of the technology?
   - Mobile telephony ➔ # of subscribers vs. minutes called

2. Is there an FMA regardless of how the identity of a first-mover is defined – as an early entrant or incumbent in the previous generation of the technology?
   - Mobile telephony ➔ early cellphone entrant vs. fixed-line incumbent

3. Do FMA erode over time or are they stable?
   - FMA ➔ persistent differences vs. fleeting advantages

Entry in Mobile Markets

- No free entry – a national licence required:
  - Typical # of licences varies between 2 and 4 per country
  - Clear definition of early entrant: Whoever starts offering cellular service first.
- Competition is intense:
  - Price/non-price competition
  - Long-term contracts induce switching costs
- But: Previous generation also matters:
  - Fixed-mobile substitution
  - Fixed-line incumbent typically also offers mobile through a subsidiary (same brand)
  - Potential complementarity via network effects

➔ Potential first-mover advantages in terms of # of subscribers, but possibly also in usage.

Data

- Sources
  - EMC/Informa (Market Research and Telecoms consultancy)
  - Merrill Lynch Global Wireless Matrix
  - IMF International Financial Statistics, World Bank World Development Indicators
- Dataset covering 90+ network operators worldwide, quarterly over 5½ years
- Variables:
  - Minutes of use (MoU)
  - Total # of users
  - Revenue per minute - proxy for price
  - Fixed-line users and fixed-line price
  - Controls: GDP per capita, share of prepaid card users
  - Technology deployed (GSM, US TDMA, etc.)

Econometric Model

Simultaneous Equations: (1) Usage Intensity and (2) Penetration

$$\textbf{(1)}\ MoU_{ijt} = \alpha_{ij} + \delta_0 * MoU_{ij(t-1)} + \delta_1 * CellP_{ijt} + \delta_2 * CellP_{i(-j)t} + \delta_3 * FixedP_{it} + \\ + \delta_4 * CellSubs_{ijt} + \delta_5 * CellSubs_{i(-j)t} + \delta_6 * FixedSubs_{it} + \\ + \delta_7 * GDP_{it} + \delta_8 * Prepay_{ijt} + \varepsilon_{ijt}$$

$$\textbf{(2)}\ CellSubs_{ijt} = \beta_{ij} + \gamma_0 * CellSubs_{ij(t-1)} + \gamma_1 * CellP_{ijt} + \gamma_2 * CellP_{i(-j)t} + \gamma_3 * FixedP_{it} + \\ + \gamma_4 * MoU_{ijt} + \gamma_5 * CellSubs_{i(-j)t} + \gamma_6 * FixedSubs_{it} + \\ + \gamma_7 * GDP_{it} + \gamma_8 * Prepay_{ijt} + \zeta_{ijt}$$

Estimation Method: GMM (Arellano-Bond, 1991) with additional instruments for price and penetration variables

Regression Results

	MoU_t	$CellSubs_{it}$
$MoU_{j(t-1)}$ / $CellSubs_{j(t-1)}$	**0.825*** **	**0.839*** **
$CellP_j$	-1.512***	0.025
$CellP_{(-j)}$	-0.457	0.037
FixedP	-0.581	0.046
MoU_t		**0.003**
$CellSubs_{jt}$	**-1.454*** **	
$CellSubs_{(-j)t}$	0.196	0.039**
FixedSubs	-0.373	0.012
Prepay	-0.526**	0.049***
GDP	2.095***	-0.018
AR(2) test	-1.18	-1.34
Hansen J statistic	87.03(195)	74.59(195)
Observations	1044	1013

Explaining Operator-Specific Effects by First-Mover Indicators

	MoU	$CellSubs_j$
Early entrant	19.094***	1.074**
Incumbent	14.223***	2.337***
Early-adopting country	5.661	0.010
Constant	83.006***	-4.004***
R^2	0.245	0.311
Observations	90	90

Summary

- Both early movers and fixed-line incumbents enjoy first-mover advantages
- **Early entrants** have higher advantage in terms of **usage intensity**
- **Fixed-line incumbents** have higher advantage in terms of **penetration rate**
  - Entering early lets entrants capture high-intensity users.
  - Fixed-line incumbency helps capture comparably low-intensity users, but many of them.
- Extensions
  - Calculate long-run effects
  - Allow the operator-specific effects to vary over time
- Lock-in of high-usage customers by early entrants gives rise to long-lasting asymmetries/advantages
- Reputation advantages of incumbents work across generations of technology

THANK YOU FOR YOUR ATTENTION!

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