

Big firms behavior and monopolistically competitive fringe

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Abstract

- There is a differentiated market involving a handful of oligopolistic firms and a myriad of monopolistically competitive firms (fringe).
- The presence of small non-strategic firms makes “oligopolists” behaving like monopolistically competitive firms, non-strategically.
- Ownership structure (mergering and splitting) is irrelevant for outcome.
- These effects are robust to various assumptions, including heterogeneous firms, but not to non-additive utilities.

Outline

1 Competitive fringe

Why look on competitive fringe?

- Existing models: **(a)** competitive industries; **(b)** oligopolistic industries; **(c)** monopolistic-competitive industries. Need for: **(d)** industries with big and small firms altogether; **(e)** very heterogeneous industries a' la Melitz. We discuss “**d**” then “**e**”.
- When big firms have dominant share of the market, do they behave strategically? How free entry of small firms influence them? Do existing small shops change behavior of chain-stores? Does number and market share of chain-stores matter for prices and welfare?
- **Unexpected result:** Under fringe, ownership structure is irrelevant. So, oligopoly modelling looks irrelevant for markets with competitive fringe. MComp. model fits these (numerous!) markets better. Policy implications: deregulation...

Related literature

- The idea is *traditional*, that free entry stabilizes and disciplines “almost-oligopoly” or simple monopoly. Does free entry of MC-firms work similarly?
- General ideas on “Endogeneous market structures”: Xavier Vives (1999), Philipp Etro(2009), Peter Neary (2009) highlight impact of free entry but not for two-tiers market.
- Closer reference: Shimomura, K.-I. and J.-F. Thisse (2009) “Competition among the big and the small”, CEPR Discussion Paper No.7404: CES utility and static Nash equilibrium among all firms. In contrast, we take general additive utility and two-stage SPE: big firms behave *understanding* the reaction of small firms.

“Big-and-small” model

One differentiated good and one production factor - labor. L workers, each supplies E units of labor. Continuum N of horizontally differentiated varieties indexed by $i \in [0, N]$, produced by monopolistically competitive (MC) firms. Each variety needs fixed cost $f > 0$ and a marginal cost $c > 0$ of labor, so total cost is $f + cq$ to supply q . A given number N of multi-product (MP-) Big firms have some market power. A continuum M of small single-product (SP-) firms can only adjust and enter/exit. Each atom = MP firm $j = 1, \dots, N$ supplies a given variety range $[0, n_j]$; $n_j > 0$. Utility is additive (u neoclassic):

$$\max_{x, X} U = \int_0^M u(x_i) di + \sum_{j=1}^N \int_0^{n_j} u(X_{jk}) dk, \quad \int_0^M p_i x_i di + \sum_{j=1}^N \int_0^{n_j} P_{jk} X_{jk} dk \leq E + \Pi$$

Comp. fringe equilibrium

3-rd stage of the game: from consumer's FOC, inverse demands for each variety are expressed with Lagrange multiplier λ :

$$p(x_i) = \frac{u'(x_i)}{\lambda}, \quad P(X_{jk}) = \frac{u'(X_{jk})}{\lambda}.$$

2-nd stage: from SP producer's FOC and their zero-profit condition $\pi^*(\lambda) = f$, using $r_u \equiv -xu''(x)/u'(x)$ we find equilibrium consumption and **stabilized** λ :

$$M = r_u \left[\frac{f}{cL} \left(\frac{1}{M} - 1 \right) \right] \text{ or } \frac{x}{1/r_u(x) - 1} = \frac{f}{cL}, \text{ then } \lambda = \frac{u'(x)(1 - r_u(x))}{c}$$

1-st stage: big firms understand that λ is constant whatever they do, so simply find their X_{jk} from similar pricing rule. Strategic interactions *disappear*, and profit-maximizing X_{jk} or price P_{jk} is found **per-variety!**

Market stabilization by fringe

- **Proposition.** Thus, (i) Main statistic λ is stable whatever happens. (ii) Pricing of each variety follows the same monopolistic-competition pricing rule. (iii) The ownership structure (which variety belongs to whom) is irrelevant for prices, consumptions and welfare. (iv) Exogenous shocks - in number of big firms, their costs and variety ranges n_j - do not influence price of SP firms and other MP firms, only some SP firms enter or exit.
- **Extentions.** This remains true under (i) heterogeneous big and small firms; (ii) big firms choosing variety ranges n_j .
- **Caution.** This result crucially depends on *additivity of utility* which can be replaced by *quasi-linearity*. Otherwise stability and ownership irrelevance may disappear (there is a counter-example).

Non-additive quasi-linear utility

Example: quadratic utility with cross-effects and numerarie A (Ottaviano et al., 2002)

$$U = \mathbf{X} - \frac{\gamma}{2} \left(\int_0^M x_i^2 di + \sum_{j=1}^N \int_0^{n_j} X_{jk}^2 dk \right) - \frac{\mathbf{X}^2}{2} + A, \quad \mathbf{X} = \int_0^M x_i di + \sum_{j=1}^N \int_0^{n_j} X_{jk} dk$$

Then $\lambda = 1$ and equilibrium main statistic - total production \mathbf{X} is

$$\mathbf{X} = 1 - \lambda \left(c + 2 \sqrt{\frac{\gamma f}{\lambda L}} \right)$$

being stabilized. It is not impacted by the MP-firms' strategies chosen in the first stage. *Stabilization!*

Non-additive utility

Example: quadratic utility with cross-effects (Ottaviano et al., 2002)

$$U = \mathbf{X} - \frac{\gamma}{2} \left(\int_0^M x_i^2 di + \sum_{j=1}^N \int_0^{n_j} X_{jk}^2 dk \right) - \frac{\mathbf{X}^2}{2}, \text{ where } \mathbf{X} = \int_0^M x_i di + \sum_{j=1}^N \int_0^{n_j} X_{jk} dk$$

Then equilibrium marginal utility of income is

$$\lambda = \frac{\gamma E(P) - \gamma(\gamma + M + \sum_j n_j) Y}{(\gamma + M + \sum_j n_j) E(P^2) - E^2(P)}$$

where P is the price profile of all varieties. Therefore, λ depends on the price moments $E(P)$ and $E(P^2)$ as well as on the income Y . It is impacted by the MP-firms' strategies chosen in the first stage through the prices' moments. *Absent stabilization!*

Why (non)stabilization?

Common sufficient (almost necessary) condition for price-stabilization by competitive fringe in many settings:

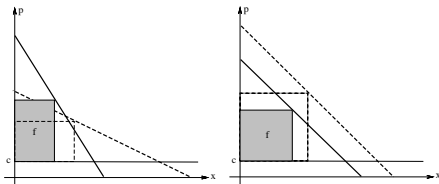


Figure: Whenever competition changes the demand curve without intersecting previous curve \Rightarrow stabilization.

Proposition. If market statistics are *scalarizable* to some t and (through demand curve) maximal profit of any SP firm is monotone w.r.t. t , then t and SP prices are independent from MP sector, so, stabilize it.

Conclusions and extensions

Our setting sheds new light on the well-documented fact that prices are sticky in some markets

- GMC modelling can be perceived as generally realistic concept for most manufacturing industries, since competitive fringe does exist
- The effect remains valid under heterogenous firms a'la Melitz
- In “additive” industries - anti-trust regulation is redundant.

Thank you.