

EIOBook-5: Market Entry

A coherent review guide (Entry as the fixed-cost stage of IO)

The one mental picture

Entry models turn observed market structure—who is in, how many stores operate, and where they locate—**into information about**

- **fixed/entry costs**, and
- how competition intensifies when an additional firm enters (the **competition effect**).

Why this matters: demand estimation and pricing FOCs recover **variable objects** (elasticities, markups, marginal costs), but they do **not** identify fixed costs. Entry does, via revealed preference: if a firm is observed operating, its value of being in must exceed the value of being out.

Coherence spine (read this first)

Entry is the fixed-cost stage of empirical IO. Earlier chapters recover variable profitability (through demand and pricing equilibrium), but fixed costs remain invisible. Entry models close this gap by using revealed preference inequalities: observing a firm in a market implies that expected profits (given market size and rivals) must cover the fixed/entry cost. Therefore, **market structure is itself an equilibrium outcome** that identifies fixed costs and the intensity of competition. Everything after the baseline model either (i) adapts this revealed-preference logic to richer environments (identities, locations, chains, incomplete information), or (ii) addresses the econometric consequences of strategic entry (multiple equilibria, unobserved heterogeneity, computation).

The chapter's spine (how each part connects)

1. **Define the entry game** (players, actions, timing).
Connection: entry is strategic, so profits depend on rivals' actions. The game defines the payoff object $\Pi_i(\text{market}, a_{-i})$ that will later be linked to costs.
2. **Choose the data environment** (identities? only counts? locations? store-level outcomes?).
Connection: what you observe determines what can be identified. Identities permit firm-specific effects; counts typically identify average competition effects and thresholds; location data are needed when competition is local.
3. **Write profits as variable profits minus entry costs:**

$$\Pi_i = \pi_i(\text{market size, rivals}) - F_i.$$

Connection: $\pi_i(\cdot)$ links back to demand/competition (variable profits), while F_i is the fixed-cost object that entry uniquely reveals.

4. **Use equilibrium entry conditions to obtain inequalities/thresholds.**
Connection: these conditions convert observed entry patterns into testable restrictions that identify F_i and how $\pi_i(\cdot)$ declines with additional rivals (competition effects).

5. **Add realism via extensions:** heterogeneity, product choice, space, multi-store chains, incomplete information.
Connection: each extension repairs a baseline simplification (e.g., “all entrants are identical” or “markets are points”) while preserving the same revealed-preference logic.
6. **Face the econometrics:** multiple equilibria, unobserved market heterogeneity, and computation.
Connection: these are consequences of strategic entry and richer action spaces; they affect estimation rather than the core economic logic.

Study plan (60–90 minutes)

Pass 1 (10 min): Lock the entry inequality (everything is a variation on this)

A firm enters iff its value of operating covers the fixed/entry cost:

$$\Pi_i(\text{market}, a_{-i}) \geq 0 \iff V_i(\text{market size}, n, \text{rivals}) \geq F_i.$$

Intuition: entry is a revealed-preference inequality that makes fixed costs and competitive pressure empirically visible.

Pass 2 (10–15 min): Data taxonomy (the model is chosen to match the data)

Three canonical datasets:

- **Global entrants (identities observed):** observe a_{im} for each firm i in each market m .
- **Local entrants (only counts observed):** observe only n_m (“isolated towns”).
- **Mixed:** some large chains identified + many local/unknown entrants.

Connection: observables determine whether you can estimate firm-specific fixed costs and rivalry effects or only average competition effects and thresholds.

Pass 3 (15 min): Baseline count model (Bresnahan–Reiss thresholds)

When prices/quantities and firm identities are unavailable, entry counts can still identify key objects. Equilibrium implies:

- the n -th firm earns nonnegative profit, and
- the $(n + 1)$ -th firm would earn negative profit.

This yields **market-size entry thresholds**: how large must the market be to support 1, 2, 3, ... firms? *Connection:* as n rises, variable profit per firm falls; thresholds therefore reveal both fixed costs (the level) and competition intensity (how fast profits shrink with rivals).

Pass 4 (15–20 min): Add realism (each extension fixes a baseline limitation)

1. Endogenous product/type choice (Mazzeo-style).

Firms choose not only whether to enter, but also type/quality.

Connection: differentiation changes rivalry; entry counts alone can confound weak competition with segmentation, so composition (who enters as what type) becomes identifying information.

2. Spatial competition (Seim-style).

Markets have locations; profits depend on nearby rivals.

Connection: once distance matters, the “market as a point” assumption breaks; location choice becomes the differentiation margin that governs local competition.

3. Multi-store firms (chains).

Chains choose multiple locations; the action space grows rapidly (on the order of 2^L).

Connection: the economic logic is unchanged, but computation becomes the constraint; structure (e.g., supermodularity) or inequality-based estimation avoids enumerating all location sets.

4. Complete vs. incomplete information.

Complete information entry often implies multiple equilibria; incomplete information introduces private shocks and yields equilibrium in entry probabilities.

Connection: incomplete information can simplify estimation because probabilistic equilibria are well-defined even when pure-strategy equilibria are multiple.

Pass 5 (10–15 min): Econometric “boss fights” (consequences of strategic entry)

1) Multiple equilibria. Multiple equilibria is not the same as “not identified,” but it complicates likelihood-based estimation unless one imposes an equilibrium selection rule or uses methods robust to multiplicity. Common strategies:

- specify a selection rule,
- exploit outcomes that are unique across equilibria (sometimes counts n),
- inequality/moment methods,
- pseudo-likelihood or two-step methods (especially under incomplete information).

2) Unobserved market heterogeneity. If markets differ in unobservables (e.g., local amenities, regulation, tourism), high entry can be misread as weak competition. Remedies include random effects/mixtures (often EM-style) or panel approaches with market fixed effects.

An exam-ready coherence sentence

Entry models endogenize market structure. Demand and pricing recover variable profits and marginal costs; entry conditions recover fixed costs and the intensity of competition; spatial and multi-store extensions move competition to location/network margins; and the econometrics section exists because multiplicity and unobservables make the equilibrium mapping non-unique and require robust estimation.

Connection tags (paste under headers if needed)

- **Game specification** → defines strategic payoffs and equilibrium mapping.
- **Data environment** → determines what can be identified (identities vs counts vs locations).
- **Profit decomposition** → links variable-profit logic to fixed costs.
- **Entry inequalities** → reveal fixed costs and competition effects.
- **Threshold model** → applies inequalities to count-only data.

- **Extensions** → repair baseline assumptions (type, space, chains, information).
- **Econometrics** → addresses multiplicity, heterogeneity, and computation.

Five-minute self-test

1. Why can't demand + pricing FOCs identify fixed/entry costs, but entry can?
2. What changes when you observe firm identities vs only counts n_m ?
3. What are market-size entry thresholds, and what do they reveal about competition?
4. Why do spatial models require location/distance structure?
5. Why are multiple equilibria primarily an estimation/computation issue rather than automatically an identification failure?