Lecture 14: Entry and Exit

Primary reference:
Besanko et al, Economics of Strategy, Ch. 11
Entry and Exit

- Entry and exit are pervasive. Consider Dunne, Roberts and Samuelson (1988), who study 250,000 manufacturing firms through 1982.

- In an “average” industry including 100 firms with annual sales of $100 million, you can expect the following:
  - Between 30-40 new firms will enter in the next five years, with annual sales of $12-20 million. During that same time, about 30-40 firms will exit.
  - Half the new firms will be brand new and half will be diversifying in some way.
  - Entrants will be about 1/3 the size of incumbents.
  - More than half the firms that enter in the next five years will be gone by year ten. The ones that do survive will be twice as large as when they entered.

- There is lots of variability by industry.
Barriers to Entry

- Joseph Bain characterized barriers to entry according to structural versus strategic barriers.
- **Blockaded** entry: if structural barriers are so high, that incumbent firms don’t need to do anything to prevent entry. Control of natural resources or lack of demand may give rise to this.
- **Accomodated** entry: if structural entry barriers are low and attempts by incumbents to deter entry will not work, then incumbents will simply accomodate. This is typically the case in fast-growing industries characterized by technological improvement.
- **Deterred** entry: if the incumbent can keep entrants out through strategic maneuvers and doing so raises the incumbent’s profit, then they may deter entry. This type of behavior is called *predation* or *predatory acts*. 
Asymmetry Between Incumbent and Entrant

- In principle, there need be no asymmetry between incumbent and entrant.

- In practice, incumbents have often made large sunk-cost investments, giving them a fixed-cost advantage over entrants.

- FedEx and UPS have made large investments in hub facilities, planes, trucks, etc. Prospective entrants have not, placing them at a disadvantage.

- Airlines have large bases of customers loyal to them through rewards programs.
Structural Entry Barriers

▶ Control of scarce resources. DeBeers has historically controlled a huge majority of diamond mining, though new finds always cut into their profits (they have had to pay steep prices to buy out such finds).

▶ In some instances, courts require firms to allow access to their resources.

▶ Economies of scale and scope. Entrants that are unable to gain market share quickly will not be able to spread fixed costs over a large number of units, and will be at an average cost disadvantage. Scope economies may be equally important. Large breakfast-cereal companies, like Kellogg and General Mills, can handle multiple production lines within one facility. Entrants may need to establish multiple brands to survive, placing them at a disadvantage in a new brand launch against an incumbent.

▶ The breakfast cereal industry has seen little entry during the last several decades.
Entry Deterrence

- It is typically better to be a monopolist than to be a duopolist. It seems logical, then, that taking actions to deter entry would be profitable.
- This is not necessarily the case, though. If entry costs are very low, then a monopolist could make entry look unprofitable by pricing sufficiently low. But low prices lead to low profits for the monopolist.
- When a monopolist cannot raise price above average cost, the market is said to be perfectly contestable and there is nothing an incumbent can do.
- If the market is not perfectly contestable, the incumbent has several strategies that could work.
Entry Deterrence

- Limit pricing.
- Predatory pricing.
- Capacity expansion.
- Spatial preemption.
Limit Pricing

- Limit pricing occurs where an incumbent firm charges a low price before any entry, to discourage such entry.
- The simplest form of limit pricing is where the incumbent has a lower marginal cost than the entrant, and charges a price that just undercuts the entrant’s marginal cost. The outcome is effectively the same as Bertrand duopoly with asymmetric marginal costs. The incumbent serves all demand and earns positive profits but cannot charge the monopoly price.
- The more complicated strategic limit pricing involves the incumbent setting a price to influence the entrant’s beliefs about what the incumbent will do conditional on entry.
Let demand be given by $P = 100 - Q$, let fixed costs be $800$ per period and let marginal costs be $10$ per unit.

Let the game last two periods. In the first period, an incumbent monopolist operates alone. In the second period another firm may enter and compete, or it may stay out.

It is relatively easy to show that the monopoly price is $55$. Charging this price, the monopolist would earn $2,025 - 800 = 1,225$ in the first period.

The equilibrium price under (Cournot) duopoly would be $40$, and each firm would earn $900 - 800 = 100$. 
Strategic Limit Pricing

- Suppose the monopolist prices lower in the first period, say $30, then total demand would be 70 units. It would earn $1,400 - $800 = $600 in the first period.

- If the price were $30 in the second period and if the demand were split evenly, then the entrant would earn $700 - $800 = $-100 in the second period.

- Can the monopolist influence the entrant’s entry decision with its first-period action? If it can deter entry, then the strategy is profitable. It would earn $600 in the first period and $1,225 in the second period, better than $1,225 followed by $100 if it sets a monopoly price in the first period and the entrant enters.

- But there is a problem here. What is it?
Strategic Limit Pricing

- Is the limit price outcome consistent with a subgame perfect equilibrium?
- Let’s look at the game tree...
Asymmetric Information

▶ Suppose that the incumbent knows more about its costs than entrants.
▶ Suppose further that a low-cost “tough” incumbent would cut prices when facing entry but a high-cost “weak” incumbent would not. Suppose that the incumbent knows its cost but the entrant does not.
▶ Then, the entrant might be inclined to stay out if it knows it will face a “tough” incumbent.
▶ What can the incumbent do?
The low-cost incumbent would like to signal to the entrant that it has low costs.

To do this, it must take an action that would be unprofitable for an incumbent with high costs.

Thus, it will often not be sufficient to merely set the monopoly price consistent with low costs. The firm may need to price even lower. The high-cost incumbent would not do this even if second-period entry is deterred.
Predatory Pricing

- **Predatory pricing** occurs when a firm sets low prices to drive competitors out.
- The “gunpowder pool” of the 1880s and 1890s, and Standard Oil, are historical examples where it appears predators drove out smaller competitors.
- Suppose a monopolist faces entry in multiple markets sequentially. Have we seen this before?
The Chain-Store Game

- The classic version of this is called the *Chain Store Game*, where we think of a chain store competing against rivals in multiple cities. The entry decision in one city comes first, then another, then another....let there be a finite number of periods and let competition be the same in all periods.
- If entrants believe that the incumbent will set predatory prices, they may prefer not to enter.
- If, conditional on entry, the incumbent earns a higher profit by accommodating entry, then a subgame perfect equilibrium includes accommodation as part of the incumbent’s equilibrium strategy.
- Thus, predatory pricing cannot work, unless...
Suppose the incumbent has private information about how “tough” he is (there could just be some chance that the incumbent really is crazy).

By fighting entry periods, the incumbent can develop a reputation for toughness, convincing subsequent entrants to stay out.

Wal-mart, American Airlines and other firms have historically enjoyed reputations for being tough due to their willingness to engage in fierce price competition.

Let’s revisit the Boulton & Watt example...
Entry with differentiated products

Consider the case where a firm is contemplating entering a differentiated market. To keep things simple, let’s start by ignoring product location choice. Assume the incumbent is located at one end of a Hotelling line and consider the decision of an entrant who can either enter, pay fixed cost $F$ and locate at the other end of the line, or stay out and pay no fixed cost.

Recall that when two firms are located at opposite ends of the line, and the travel cost of going from point 0 to point 1 is $c$, both firms charge $c$ in equilibrium and sell to half the customers.

Thus, the entrant will earn profit $\frac{c}{2} - F$.

Entry is profitable if

$$F < \frac{c}{2}.$$
If products are highly differentiated, the entrant can survive a higher entry cost.
With a “good” cost position, an entrant may be able to survive even if products are not highly differentiated.

When the prospects for entry fall in the middle area, more information will be necessary.
Firms often sell multiple products. A good example is cereal makers. By positioning them strategically, they may be able to preempt entry.

Consider the situation where one firm positions two products.

Let the transport cost be $t$ per unit distance and let entry cost $F > 0$.

How far apart do the products need to be to make entry unprofitable?
The entrant would ideally locate halfway between the incumbent’s two products. If this yields profit greater than $F$, entry is profitable.

What is the ideal $d$ for the firm, the one that just makes entry unprofitable?
Spatial Preemption

- When two firms are located at opposite ends of the line, and the travel cost of going from point 0 to point 1 is $c$, both firms charge $c$ in equilibrium.

- Therefore, if the entrant locates halfway between products that are distance $d$ apart, equilibrium prices will equal the travel cost from the entrant to either firm, $\frac{dt}{2}$.

- The entrant will sell to a mass of customers equaling $\frac{d}{2}$, so its profit will be $\frac{d^2t}{4} - F$.

- This is negative if

$$d < 2\sqrt{\frac{F}{t}}.$$ 

- The necessary distance is increasing in the fixed cost $F$, but at a decreasing rate.
Capacity Expansion

- If an incumbent has a sustainable cost advantage, then it may be to the incumbent’s strategic advantage to maintain excess capacity.
- Then, an entrant can expect entry to start a price war that it will lose.
- If demand is growing rapidly, then demand will eventually outstrip capacity, preventing the firm from executing the strategy.
- If the capacity is merely threatened and not sunk, then the incumbent might not expand capacity upon entry.
- More on this in our section on strategic commitment...
Incumbents have a variety of ways to retaliate to entry or try to convince entrants that retaliation will come.

Sometimes, entrants can use the incumbent’s size to its own advantage.

In 1989, Sega entered the video game console market with a 16-bit player. How would you expect Nintendo to respond?
By responding quickly to Sega and focusing resources on a new 16-bit player, Nintendo would limit Sega’s ability to gain market share, but it would also cannibalize sales of its popular 8-bit console and games.

Because Nintendo is so big, it (potentially) has more to lose by retaliating to the 16-bit threat directly.

As things played out, Nintendo waited until 1991 before introducing its 16-bit player in the US.

Sega was able to establish a strong position.

Amazon.com’s entry into online book sales, while Barnes & Noble was reluctant to do, is a similar example.
Judo Economics

- **Judo economics** is using the incumbent’s size to the entrant’s advantage.
- Find a way to enter such that if the incumbent wants to drive you out, it has to hurt itself in a prohibitive way.
- If done properly, such entry will be accommodated entirely.
- One possible way is to commit to remain small (by, say, building a small capacity). Then, a price war to claim the market share you are after hurts the other part of the incumbent’s market.
- It may not be possible to make such a commitment credible. American Airlines drove out Braniff in 1991 with its “Value Advantage” price strategy, just after (a restructured) Braniff announced its intention to serve a limited number of routes.
Recall the Holland Sweetener case. By entering the market for aspartame, Holland added value...for Coke and Pepsi...and none for itself.

One alternative is to get paid to play. In 1989, Craig McCaw made a bid for LIN Broadcasting, which had cellular phone licenses in New York, Los Angeles, and other big cities, 18 million potential customers.

His opening bid was $110/share, for a $5.3 billion total.

LIN did not want to sell to McCaw, at least not for that price. So LIN initiated talks with BellSouth.
Entry and Adding Value

- BellSouth had less optimistic forecasts about cellular penetration, making them a weak bidder relative to McCaw.
- This was also an expensive road for BellSouth to go down. It would have to pay lawyer and investment banking fees, and its entry would trigger a bidding war. This would create a lot of value for LIN, but not for BellSouth.
- BellSouth got LIN to agree to pay it $54 million in a *consolation prize* plus $15 million more if it loses the bidding. BellSouth made a bid in the $105-112 range.
- McCaw raised his bid to $112-118/share. BellSouth asked to bump the $15 million to $25 million to bid again. LIN agreed. BellSouth entered a $115-125 million bid. McCaw then raised his bid again and paid $22.5 million to BellSouth to go away.
- LIN’s value increased by nearly $1 billion in the bidding. BellSouth made $76.5 million plus expenses.
Knowing Your Market: Walmart in Germany

- In 1998, Walmart set its sights on expanding into Europe.
- It acquired 21 stores from Wertkauf and 74 Interspar stores from Spars Handels AG.
- It used its well-known policies in US stores: door greeters, smiling staff, willingness to forgive shoppers with more than 5 items in the express lane.
- Entry was “easy,” just a matter of buying the Wertkauf and Interspar facilities.
- What happened and why?