



# Entry Deterrence and Predation

## Introduction

- A firm that can restrict output to raise market price has market power
- Microsoft (95% of operating systems) and Campbell's (70% of tinned soup market) are giants in their industries
- Have maintained their dominant position for many years
  - *Why can't existing rivals compete away the position of such firms?*
  - *Why aren't new rivals lured by the profits?*
- Answer: firms with monopoly power may
  - *eliminate existing rivals*
  - *prevent entry of new firms*
  - *BUT e.g., R&D to reduce costs is not predatory*

# Evolution of market structure

- **Evolution of markets depends on many factors**
  - one is relationship between firm size and growth
    - **Gibrat's Law**
      - begin with equal sized firms
      - each grows in each period by a rate drawn from a random distribution
      - this distribution has constant mean and variance over time
      - result is that firm size distribution approaches a log-normal distribution
    - **Very mechanistic**
      - no strategy for growth
    - **Including strategic decision making affects distribution but not conclusion that firm sizes are unequal**
  - **What about the facts in the market place?**

## Monopoly power and market entry

- **Several stylized facts about entry**
  - entry is common
  - entry is generally small-scale
    - *so small-scale entry is relatively easy*
  - survival rate is low: >60% exit within 5 years
  - entry is highly correlated with exit
    - *not consistent with entry being caused by excess profits*
    - *“revolving door”*
    - *reflects repeated attempts to penetrate markets dominated by large firms*
- **Not always easy to prove that this reflects predatory conduct**
- **But we need to understand predation if we are to find it**

## Predatory conduct and limit pricing

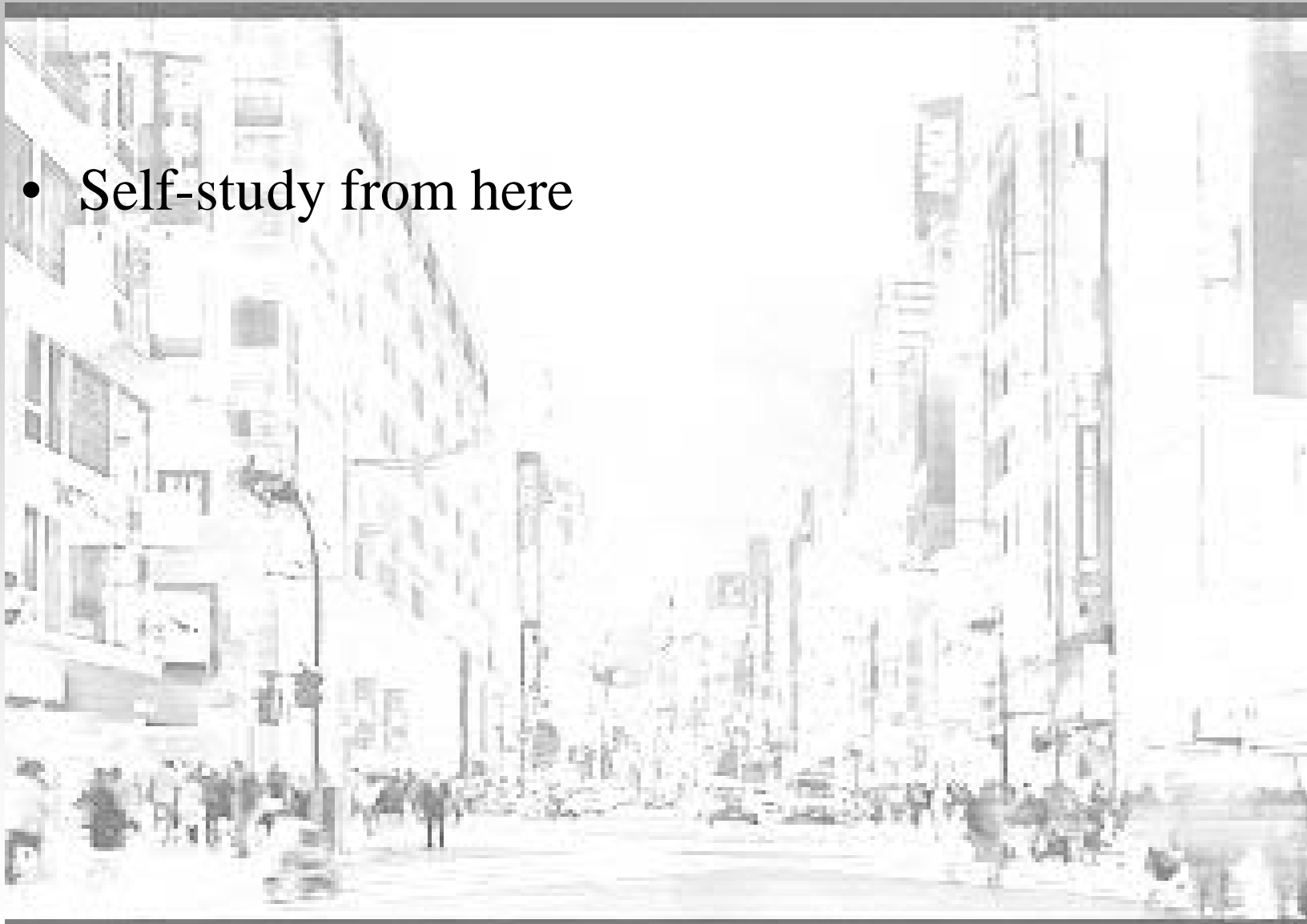
- **Predatory actions come in two broad forms**
  - **Limit pricing:** prices so low that entry is deterred
  - **Predatory pricing:** prices so low that existing firms are driven out
- **Outcome of either action is the same—the monopolist retains control of the market**
- **Legal action focuses on predatory pricing because this case has an identifiable victim**
  - a firm that was in the market but that has left
- **Consider first a model of limit pricing**
  - Stackelberg leader chooses output first
  - entrant believes that the leader is committed to this output choice
  - entrant has decreasing costs over some initial level of output



## Entry deterrence

- **Entry may not occur**
  - entrant's costs are too high
    - blockaded entry
    - not predatory
- **Entry may be accommodated**
  - entrant's costs are low
    - incumbent takes advantage of its being first in the market
    - but does not deter
- **Entry may be strategically deterred**
  - strategic deterrence profitable for the incumbent
  - installs excess capacity as an entry-deterring strategy
  - uses a credible commitment

- Self-study from here





## Preemption and the persistence of monopoly

- A distinct but related issue is an incumbent investing early to prevent new entry
  - market may be a natural monopoly at current size
  - but expected to grow and attract entry
- Now we have an issue of *timing*
- It may be in the interests of an incumbent to preempt by
  - building new plants prior to a rival's entry
  - adding new products prior to a rival's entry
- Related to another issue
  - entrant may race to innovate to preempt entry
- A simple model:

## Preemption and the persistence of monopoly 2

- **A market with an incumbent**
  - current profit  $\pi^M$
  - market is expected to double in the next period and stay at the new size in perpetuity
  - to meet the new demand requires additional capacity at cost of  $F$
  - the new capacity can be added:
    - In first period or in second period
    - By incumbent or by new entrant
- **With no threat of entry**
  - incumbent installs new capacity at beginning of second period
  - profit is  $2\pi^M$  minus cost of capacity
- **With threat of entry may need to install capacity early**

## Preemption and the persistence of monopoly 3

- Consider the entrant choosing in period 1
  - suppose that competition is Cournot if entry occurs
  - entry in period 1 gives the entrant  $\pi^e_1 = \pi^C + R\pi^C/(1 - R) - F$ 
    - $R$  is the discount factor  $= 1/(1+r)$  where  $r$  is the discount rate
  - entry in period 2 gives the entrant  $\pi^e_2 = R\pi^C/(1 - R) - RF$  in present value terms
  - suppose  $\pi^e_1 < \pi^e_2$  which implies  $(1 + r)\pi^C < rF$
  - entrant will enter in the second period

## Preemption and the persistence of monopoly 4

- **What about the incumbent?**
  - do nothing in period 1
    - *entry takes place in period 2*
    - *earns  $2\pi^C/(1 - R)$*
  - install additional capacity in period 1
    - *entry deterred*
    - *earns  $2\pi^M/(1 - R) - F$*
  - install capacity early provided that  $2(\pi^M - \pi^C)/(1 - R) > F$ 
    - *provided that present value of additional profit from protecting monopoly is greater than the fixed cost*
- **Incumbent wants to maintain monopoly; entrant only shares in non-cooperative profits**

## Market preemption

- **Why does the incumbent have a stronger incentive to invest “early”?**
  - the incumbent is protecting a valuable monopoly
  - the entrant is seeking a share of the market
  - so the incumbent’s incentive is stronger
  - willing to incur initial losses to maintain market control

## Evidence on predatory expansion

- **Some anecdotal evidence**
- **Alcoa**
  - evidence that consistently expanded capacity in advance of demand
- **Safeway in Edmonton**
  - evidence that it aggressively expanded store locations in response to potential entry
- **DuPont in titanium oxide**
  - rapidly expanded capacity in response to changes in rivals' costs
  - market share grew from 34% to 46%

## Introduction

- **Charges of predatory conduct are not new**
  - *Microsoft* is only one of the latest
  - goes back to the days of *Standard Oil*
  - more recent examples of predatory pricing
    - Wal-Mart
    - AT&T
    - American Airlines
- **But they face problems of credibility**
  - price low to eliminate rivals
  - then raise price
  - so why don't rivals reappear?

## Predatory pricing: myth or reality?

- **Theoretical and empirical doubts**
  - predation is generally not subgame perfect without uncertainty regarding the incumbent
    - return to this below
  - McGee's argument that predation is dominated by another strategy
    - merger is more profitable than predation
    - so predation should not happen
  - take an example
    - two period market
    - inverse demand  $P = A - B(q_L + q_F)$
    - $q_L$  is output of leader and  $q_F$  is output of follower
    - leader is a Stackelberg quantity leader
    - both leader and follower have constant marginal costs of  $c$



## An example of predation

- **At the Stackelberg equilibrium**
  - leader makes  $(A - c)^2/8B$
  - follower makes  $(A - c)^2/16B$
  - if the leader were a monopolist it would make  $(A - c)^2/4B$
- **Suppose that the leader predated in period 1**
  - sets output  $(A - c)/B$  to drive price to marginal cost
  - follower does not enter
  - leader reverts to monopoly output in period 2 but the follower does not enter
  - aggregate profit is  $(A - c)^2/4B$

## An example of predation 2

- Suppose instead that the leader offers to merge with the follower in period 1
  - monopoly in both periods
  - aggregate profit  $(A - c)^2/2B$
  - so the leader can make a merger offer that the follower will accept
- Merger is more profitable than predation but:
  - merger may not be allowed by the authorities
    - monopoly power
  - what if there are additional potential entrants?
    - may enter purely in the hope of being bought out
- Main point remains: threat of predation has to be *credible* if it is to work