Ch.8 - BDSS Dynamics of Pricing Rivalry

Key questions raised by the chapter:
What factors influen price competition in a market?
What influences coordination
Why do price wars erupt? Value of price commitment policies? When should a firm match its competitors price and when not?
The chapter also discusses non-price competition
Price competition is a dynamic process
↳ Competitive moves that have short-run benefits may in the-long-run be non-beneficial.
↳ Hence we can develop a theory of rivalry:
* Cournot and Bertrand are not dynamic, but static b/c firms make once and for all p and Q decisions
↳ short-term/single period view.
↳ They cannot explain why in some highly concentrated industries firms can maintain p. above competitive levels and in others they cannot, w/out formal collusion.

* Starting point of analysis is that firms prefer monopoly price and quantity to Bertrand prices and quantities ($\hat{\pi}_m > \hat{\pi}_b$).
* Firms can achieve this through cooperative, not formal collusion, pricing
* There are certain conditions under which a firm will not undercut its rivals.
* Chamberlin said: π will be reduced if you cut price now, because your competitor will also cut price.

* Competitors compare the presented discounted values of price cooperation (i.e. following your price ↑) and of

undercutting. Having a tit-for-tat strategy in place can deter the other from undercutting, b/c he now knows you will follow his every action in the previous period.
↳ i.e. undercutting becomes even less attractive.

* Tit-for-tat w/ many firms

$$\frac{1/N\,[\pi_m - \pi_o]}{i\pi_o - \frac{1}{N}\pi_m} \geq i$$

π_o = non coop. π
π_m = monopoly π

left-hand side: benefit/cost ratio
denominator is extra profit in the period from non-coop.
numerator is the single period benefit from coop.
right-hand side: discount rate

* The above implies that if firms are reasonably patient (i.e. discount rate i is not too large) the cooperative outcome is sustainable.
↳ we can solve the prisoner's dilemma

* To coordinate on a cooperative equilibrium firms must coordinate on a strategy, which makes it in each firm's self-interest to not undercut.
↳ the strategy (e.g. tit-for-tat) must be a focal point → so compelling that a firm would expect all other firms to adopt it.
* Coordination can be difficult in competitive environments that are rapidly changing.
↳ Solve by: make competitors moves and intentions easier to follow

* Why tit-for-tat?
- Easy to understand and announce → e.g. "we will not be undersold"
- Axelrod says it is a robust strategy b/c it combines: "provocability", "niceness" and "forgiveness" →
  ↳ it is never the first to defect
  ↳ it immediately punishes
  ↳ if the rival returns to coop. so does tit-for-tat.

* Firms can misread others' actions:
① Believes a competitor charges 1 price while it charges another
② Firm misunderstand the reasons for a rival's pricing decision.
One misread of non coop. while actually coop. can lead to infinite rounds of tit-for-tat.
Dixit and Nalebuff hence state that pricing strategies that are less provocable and more forgiving are more desireable.
↳ competitors should ascertain carefully the details of each other price moves → e.g. are discounts/bonuses offered?

Market structure and Sustainability of Pricing
↳ can influence coordination upon a focal point
↳ it can influence the benefit-cost ratio seen above.
Effects on cooperative pricing of:
* Market concentration - benefit/cost ratio goes up as N ↓ → intuition: a typical firm's market share is larger in a concentrated market and hence it captures a larger share of the overall benefit as prices go up. Also, the cost of coop (i.e. π of under-cutting is less) b/c it already has a large market share.

* Reaction Speed, Detection Lags - looking at the benefit/cost ratio by dividing the discount rate and the left by 4, it becomes easier to cooperate. E.g. we now observe π every quarter instead of every year.
4 factors that influence reaction speed to rivals' p. cuts:
① lags in detecting competitor's prices
② Infrequent interactions w/ competitors
③ Difficulty in identifying which firm is cutting price.
④ Distinguishing btw. ↓ Q due to price cutting by rivals or due to less market demand.

Structural conditions that affect the previous 4 factors:

① Lumpiness of orders - affect the frequency of competitor's interaction → e.g. airframe industry.
↳ makes price more attractive.
↳ the long lag btw. this contract and the next ↓ the perceived cost of retaliation.

② Information about the sales transaction
↳ when prices are public coop. pricing easier to sustain b/c retaliation easier and quicker
↳ can use trade allowances to secretly cut price → making deviations more difficult to detect
↳ also more difficult to detect price cuts if products are highly customized (e.g. airframe industry). Misreadings also become more likely.

③ Number of buyers - detecting deviations from coop. pricing is easier when there a lot of buyers b/c they communicate price concessions to rival firms.

④ Volatility of demand - pricing cutting is harder to detect when demand conditions are volatile → especially when a firm can only observe its own p. and Q. and not that of the rival firms (private signal).
This is especially severe when high Fixed costs b/c mc will drop quickly at below capacity output leading to very volatile monopoly prices.

* Assymetries among firms - when firms have different marginal cost → making it difficult to coordinate on the monopoly price. → there is no single focal price.
Differences in capacities, costs or product quality

create incentives to deviate b/c e.g. small firms have more incentive to defect. large. large firms b/c they benefit more from coop. extend a price umbrella over smaller firms → i.e. in the example in the book allowing Panasonic to sell at a lower price than Epson. → see lecture for GE vs. Westinghouse.
→ small firms have an additional incentive to cut price in order to attract more customers who may repeat purchase → i.e. they hope when the higher price equilibrium is restored customers loyal to their brand will purchase at the higher price.

* Price Sensitivity and sustainability of coop. pricing
If buyers are very price sensitive a small price cut can boost sales significantly → i.e. not benefitting coop. pricing.
Factor influencing buyer's price sensitivity: when products are horizontally differentiated, buyers value it b/c of other attributes than price. → price comp. is ↓ & the above.
e.g. Ready-to-eat cereals → low price comp. b/c
Not much differentiation in capital goods mrkt.
p. 286 gives a table summarizing the above points.

Price cooperation Facilitating practices:

① Price leadership - Leader announces price changes 1st, which are then matched by followers (e.g. Philip Morris in Tobacco)
- helps overcome the problem of coordinating on a focal point.
- price leaders should react to defections by followers
Should be distinguished from barometric price leadership
↳ different firms are price leaders and they only lead in order to signal Δ's in market conditions, such as changes in demand + input prices

② Advance announcement of intended changes in prices
↳ followers will follow if they are identical in costs, etc.

③ Most Favored Customer Clauses → a promise that it will charge the buyer the lowest price.

2 types: Contemporaneous - if you sell at a lower price to buyer Y than to buyer X, you will lower your price to X.

Retroactive - Give a rebate to the buyer if in the future (e.g. 2 yrs.) it sells at a lower price.

↳ make it expensive to cut prices in the future

Contemporaneous MFC clauses discourage to use selective price cutting to compete for high price-elastic demands!

④ Uniform Delivered Pricing - makes it possible to only
↳ a single delivered price cut price to those areas where the defecting firm operates (i.e. less harmful and hence more beneficial to coop. pricing)

Quality competition

Quality - any attribute that ↑ demand for a product at a fixed price.

Quality choice in competitive mkts

- If products are perfectly vertically differentiated all consumers agree about which product they prefer.
↳ This allows sellers to sell products at different w/ different quality levels → the market will force firms to sell the same price for a certain level of quality
↳ NOTE: this makes the assumption that buyers can perfectly observe quality of each seller.
↳ sellers that charge more than the going price per unit of quality may still have customers.
↳ If uniformed consumers cannot gauge quality a lemons market can develop
↳ some sellers might skimp on quality and still sell the going price → creates a problem for high-quali sellers b/c buyers will think their products are low quality and hence they will only be willing to pay so

Grossman and Stiglitz find that there might be an underinvestment in information gathering b/c some uninformed consumers will free-ride on those uninformed consumers that bear a cost to gather info. → hence those will not gather info.
↳ e.g. market for corporate control

Quality choices of Sellers w/ market power

* Firms invest in quality b/c it makes the demand
* firm will choose quality such that marginal ~~cost~~ of the ↑ in quality equals the ↑ in the marginal revenue caused by the investment.

Marginal Cost of quality ↑

According to literature on Continuous Quality improvement investment in quality can simultaneously ↓ costs and ↑
↳ e.g. making the production process more efficient
However, if a firm is productively efficient investment in quality is costly. → running computer back ups everyday when you only a $p=0.5$ of failure.

Marginal Benefit of Improving Quality

How much additional revenue the improvement brings depends on: ① ↑ Demand caused by the ↑ in quality
② ↑ profit on each additional unit sold.

Elaboration
① Spence → look at influencing marginal consumers (i.e. attract new customers).
consumers must be able to observe the ↑ in quality
↳ must switch from the sellers they were loyal to.
↳ hence sellers concentrate on attributes that consumers can directly observe (e.g. shop fronts)
↳ especially important for products of which quality is difficult to observe before purchase

High margins may give incentives to boost quality but e.g. a monopolist might not have many marginal consumers, ↓ its incentives.
→ if quality differences are low incentives to invest in quality are lowered