Monopoly and Monopolistic Competition Worked

Monopoly Key Assumptions

The same as perfect competition except:

- There is only one seller
- The seller engages in price setting behavior.
    - In PC, firms observe price and then choose quantity to maximize profits.
    - In Monopoly, firms observe demand and then choose quantity and let the price adapt.
- No entry or exit. Technically you only need no entry but no exit makes this simpler.

Monopolies are

Don't think of monopolies as being globe spanning huge corporations. Monopoly power often simpler and smaller.

- The only gas station in a small geographically isolate town.
- The only provider of a drug needed for a medical condition.
- Local newspaper/radio or TV station for local news.
- Sometimes the best answer to a problem, but we regulate those.

The Keys

- Entry is somehow blocked or hard to do.
- There are no close substitutes
- The firm can control price.

How can I get one?

- Geographic isolation
- Barriers to entry
- Control of a unique resource – Rich minerals, a face, knowledge
- Government grants it to you – franchise
- Intellectual Property – Patent, copyright.
- Large economy of scale – like natural gas distribution
- Other Cost/Quality advantage
- Network externalities – non-standard connectors, social media platforms

What is Different About the Analysis?

- In perfect competition, $MR = AR = P = D_{firm}$.
- In monopoly (Single price), MR splits off.
- Because of no entry or exit – no long-run analysis on extensive margin. Plenty happens on intensive but wait till EC 311/415 for that.

Marginal Revenue

The additional revenue from selling one more unit.

- This is price in perfect competition.
- $MR < Price$ in monopoly because to sell one more, you must reduce price on all units sold.

Math For Calculus Folks

Assume a linear demand, $P = P_0 - \alpha q$

$$R(q) = Pq = (P_0 - \alpha q)q = P_0 q - \alpha q^2$$

The derivative of revenue is marginal revenue

$$MR(q) = \frac{\partial}{\partial q} R(q) = P_0 - 2\alpha q$$

Same intercept but twice as steep.

Graphically

Similar but in Table form

Quantity	Price	TR	MR
1	20		
2	18		
3	15		
4	5		

Key Takeaways

- Same intercept but twice as steep.
- Marginal revenue can be negative.
- Revenue, not profit, is maximized when $MR = 0$.

Note that in a table, you don't always see MR $=0$ or even MR $=$ MC. Integers are funny that way.

Profit Maximizing Output

These are the same as Perfect Competition.

- Find q^* where $MC = MR$
- Start at q^* go to AC and hang a left.
    - That is AC^*.
    - Box is Total Cost, $TC^* = AC^* q^*$
- Start at Start at q^* go to $AR = D_{firm}$ and hang a left.
    - That is AR^*.
    - Box is Total Revenue, $TR^* = AR^* q^*$
- Little box on top is profit.

Monopoly Graph (Positive Profit: D cuts AC twice)

Monopoly Graphs (Negative Profit: D never cuts AC)

Why Monopoly is Bad

- Price and quantity effects
    - Price is higher
    - Less is sold
- Welfare Effects
    - DWL
    - Reduction in CS
- Long-run Effects
    - Price and cost above marginal cost

But We Need it Sometimes

- There is an argument for a monopoly when they can produce for less than multiple competitive firms
  - $AC = K/q$, just fixed cost and no variable cost
  - $AC = 10/q$, a specific one
  - Suppose we need 10
  - One firm $AC = 1$
  - Two firms $AC = 5/10 = 2$

Why there is only one local electricity or natural gas distribution company in your area.

- We typically have these publicly owned, water for example.
- Simulate the pressure of a market with price regulation. This is what the Public Utilities Commissions do.

Monopolistic Competition

Old model from the 1930s and before game theory. Probably the most common market.

If you can remember a brand, it is probably monopolistic competition.

- Smartphones
- Toothpaste
- The cereal aisle in the grocery store (if you ignore they are made by the same company)

Assumptions

- Many buyers and sellers
- Heterogeneous goods. There are non-price differences.
- Firms have price setting behavior.
- Free entry and exit
- All firms effect all other firms. Nothing is local.

The model is used a lot of macroeconomics but only at the EC312 and higher level.

Good Things About Monopolistic Competition

- Good at small innovation
- More personalized, while still mass produced
- Preserves historical variety

Small Innovation

Technical Rain jackets

- Napoleon pockets
- Pit zips
- Low cut in back

American Hefeweizen

More Personalized

- Shoes and foot models
- Cut of pants

Preserve Historical Variety

- Tomatoes
- The Porter
- Modelo Negra

The Graphs are the same as Monopoly

The Bad Things

- Price and quantity effects
  - Price is higher
  - Less is sold
- Welfare Effects
  - DWL
  - Reduction in CS

The long-run effects are a little different.

What is Different?

- Entry and exit, yes but how they enter and exit.
- Entry and exit means that profits are competed down to zero.

Try drawing a monopoly graph with zero economic profit.

MC in Long-Run

Every time a firm leaves or enters, all the other firms' demand functions change.

- Entry and exit cause decreases and increases in demand.
- It also changes the elasticity depending on how similar.

Lets Talk Beer

Imagine I own the only brewery in a small town. People can either drink the one beer I make, a pilsner, here or they can sit at home and drink water (moist county).

- If I increase the price of beer – more people stay home.
- If I decrease the price of beer – more people come in

In other words it is a demand curve but pretty inelastic.

A New Brewery Comes to Town

They make a stout.

Now people have three choices:

- Drink pilsner here.
- Drink stout there.
- Drink water at home.

Pretend people have strong beer tastes

- They either like pilsner or stout
- Some are willing to switch sides because – beer.

You lose some customers, decreasing demand.

What if . . .

They make a pilsner too?

We make the same beer. They are perfect substitutes.

- If my price is higher – no customers
- If my price is lower – all the customers

We are now perfect competitors and take price as given.
$P = AR = MR = D_{firm}$ Again

What if . . .

They made and IPA?

Similar to, but not the same, and people that like pilsners also like IPAs

Customers become more sensitive to price:

- If I raise price, some go home and drink water, others leave to drink IPA.
- If I lower price, some water drinkers come back, and some IPA drinkers come back.

The more similar the new product, the more your demand curve rotates, becomes more elastic.

How Entrant Changes Your Demand

Now Pretend You are the Entrant

What kind of beer do you make?

- Similar enough to steal customers
- Not so similar so that you have market power

Beerspace

Each New Entrant

- Picks a spot where there is profit.
- Lowers everyone's profit
- Sooner or later there are no more profitable spots – everyone has zero economic profit.

This is an evolutionary equilibrium

In the Long-Run

- Profits are zero, same as PC.
- Costs are higher than the minimum of average cost, different than PC.
- The produce less than quantity at min of AC. They have excess capacity