LECTURE 9: MONOPOLY

Today's Topics: Market Power

1. **Why Monopolies? resources, governments, economies of scale → *natural* monopolies.**
2. **Monopoly Output and Price: monopoly v. competition, revenue, $MR = MC$, monopoly's mark-up and profit.**
3. **Price Discrimination: capturing Consumer Surplus, examples.**
4. **Inefficient Too: Deadweight Loss, profiteering?**
5. **Competition Policy: regulation, privatisation.**

WHY MONOPOLIES?

A *monopoly*: sole seller of its product, with no close substitutes.

Price-setting with market power, not price-taking.

Because of *barriers to entry* — other firms cannot enter the market to compete with it. Three possible reasons:

1. **A key resource is owned by a single firm.**
2. **The government has given the firm exclusive rights.**
3. **The high *FC* (and $\therefore$ falling *ATC*) make a single producer more efficient than a large number of producers.**

MONOPOLY RESOURCES

A key resource, such as a single seller of bore water in a town, or mining a unique mineral.

Few examples, however.

Single sellers of gas in Victoria (Esso-BHP, from Bass Strait), South Australia and NSW (a consortium, from the Cooper Basin).

Problems when there is disaster (Vic. in 1998, SA in 2004).

For historical reasons, different uses in Melbourne (residential) and Sydney (industrial). Different price elasticities? in the SR and the LR?

GOVERNMENT-CREATED MONOPOLIES

Exclusive rights: such as mail carriage, patents, copyrights.

Statutory monopolies over Intellectual Property (IP) can lead to higher prices, but provide an incentive for invention.

Examples?

NATURAL MONOPOLIES

Cable TV: high *FC*, the cable. Other reticulation networks, as service (more households) grows, the *FC* are shared by many more users, so there are *economies of scale,* falling *AC* (or IRTS).

Demand occurs with falling *AC*: cheaper for a single supplier than for two or more.

***A natural monopoly*: a monopoly that arises because a single firm can supply a good or service to a whole market at a lower cost than could two or more firms.**

Examples?

Less concerned about new entrants. Why?

MONOPOLY v. COMPETITION

A competitive firm is a *price taker*: sees a horizontal demand curve at the going price P.

A *monopolist*: sees a downwards-sloping demand curve — if it cuts production, it can sell at a higher price: can squeeze the market.

A firm facing a downwards-sloping demand curve has *market power*.

But not all-powerful: constrained by the demand curve: can only choose combinations of price and quantity on or below the demand curve.

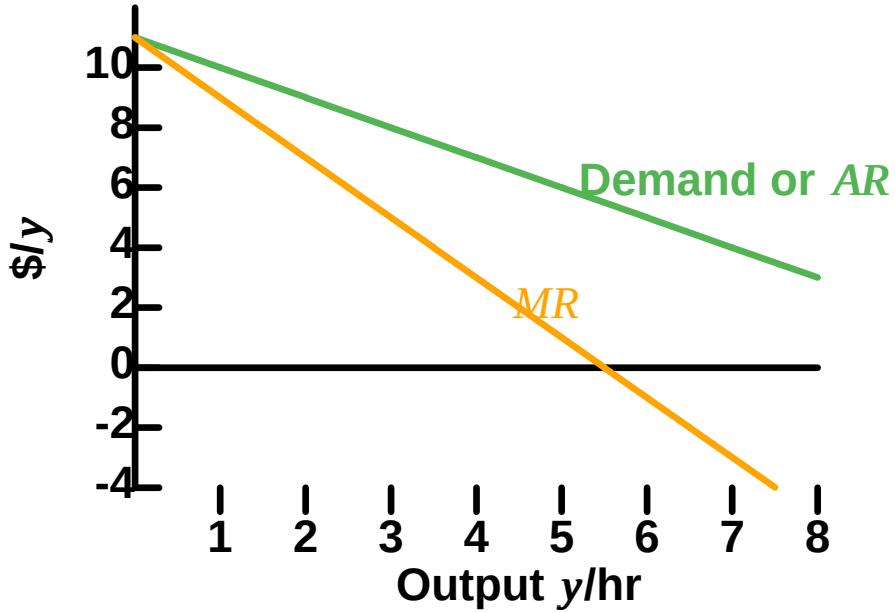
Chooses y^* so that $MR(y^*) = MC(y^*)$. But where is this?

A MONOPOLY'S REVENUE

Quantity of output y	Price \$ P	TR \$ $=P \bullet y$	AR \$/unit $=\frac{TR}{y}$	MR \$/unit $=\frac{\Delta TR}{\Delta y}$
0	11	0	-	
				10
1	10	10	10	
				8
2	9	18	9	
				6
3	8	24	8	
				4
4	7	28	7	
				2
5	6	30	6	
				0
6	5	30	5	
				−2
7	4	28	4	
				−4
8	3	24	3	

This assumes a single price for all units sold. (Later, we allow price discrimination and market segmentation.)

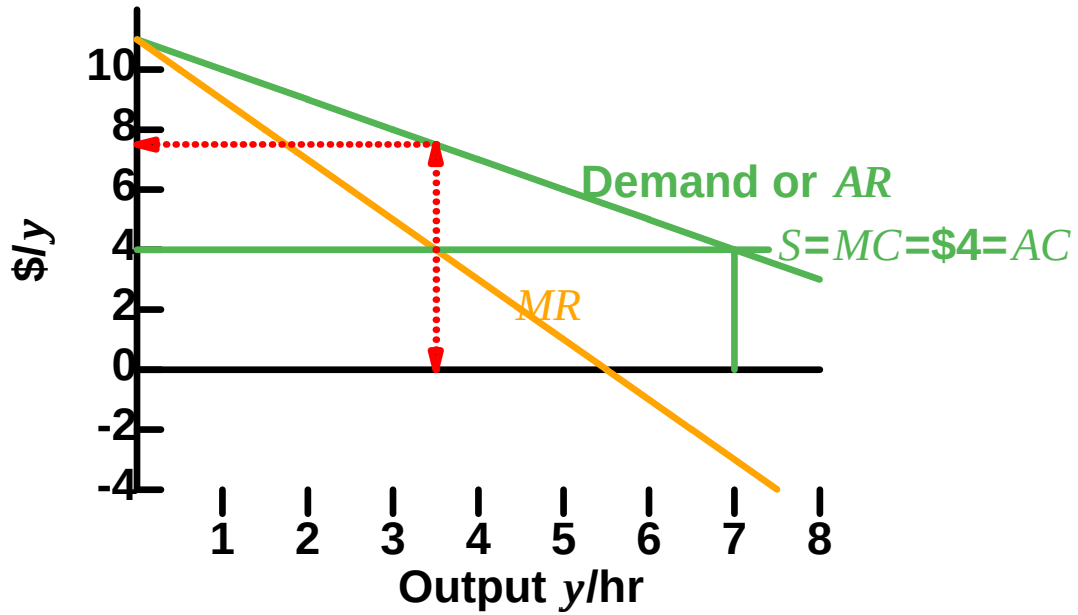
MONOPOLIST'S MARGINAL REVENUE



The *MR* curve is *always* twice as steep as the linear Demand (= *AR*) curve.

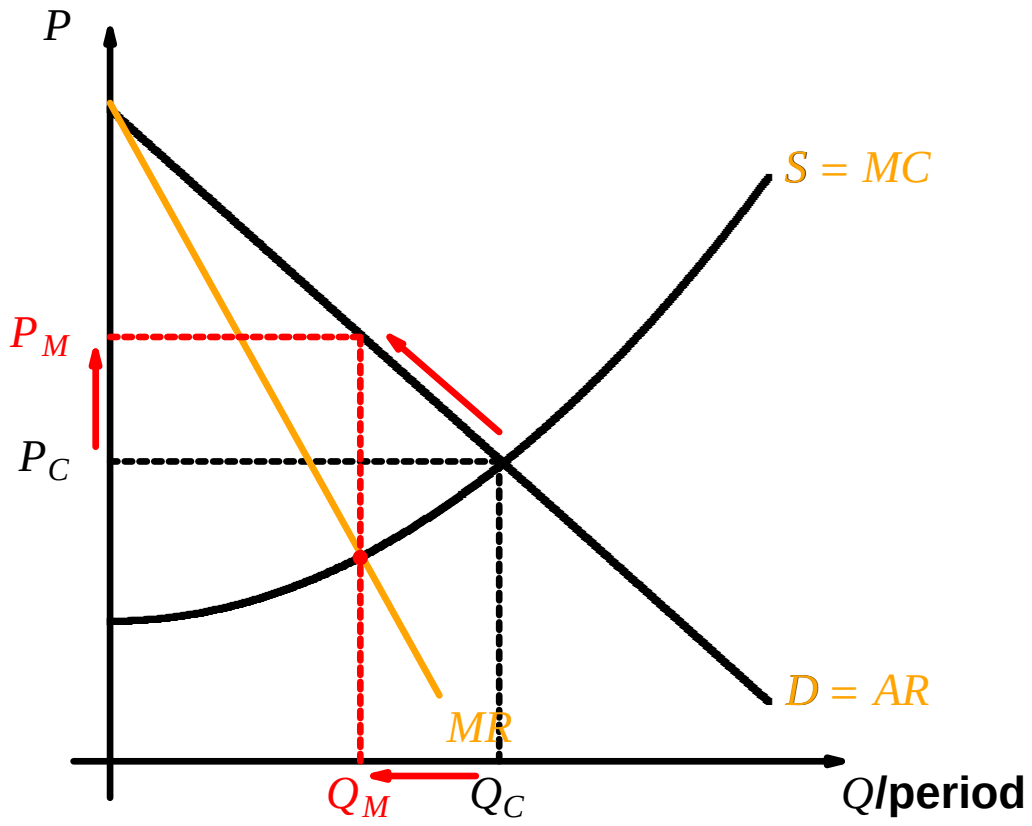
If Bill's *MC* is zero, where should he operate as a monopoly? 5.5 units. His price? $5/unit → $27.50 profit.

PROFIT MAXIMISATION



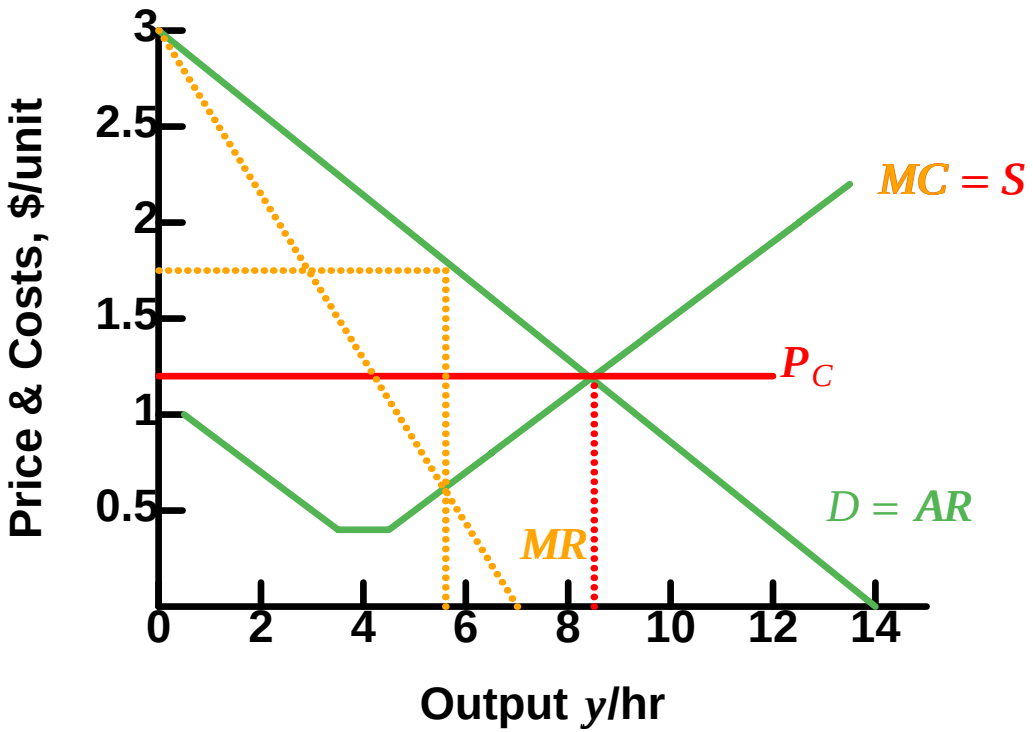
If the firm is CRTS, then *AC* = *MC* = $4 is a horizontal line. A price-taking firm operates where *S* = *D*, at 7 units, $4/unit. ($\pi_C$ = 0) A monopolist operates at quantity where *MC* = *MR*, at 3.5 units, $7.50/unit. ($\pi_M$ = $12.25)

PRICE-TAKING v. MONOPOLY



So lower output ($Q_M < Q_C$), and higher price ($P_M > P_C$).

BOB'S BAGELS, AGAIN



Acting as a price-taker, Bob would choose 8.5 units at the market-clearing price of $1.20. As a monopolist, 5.6 units at the monopolist's price of $1.75.

A MONOPOLY'S PROFIT

In the Appendix we derive the monopolist's π-maximising mark-up:

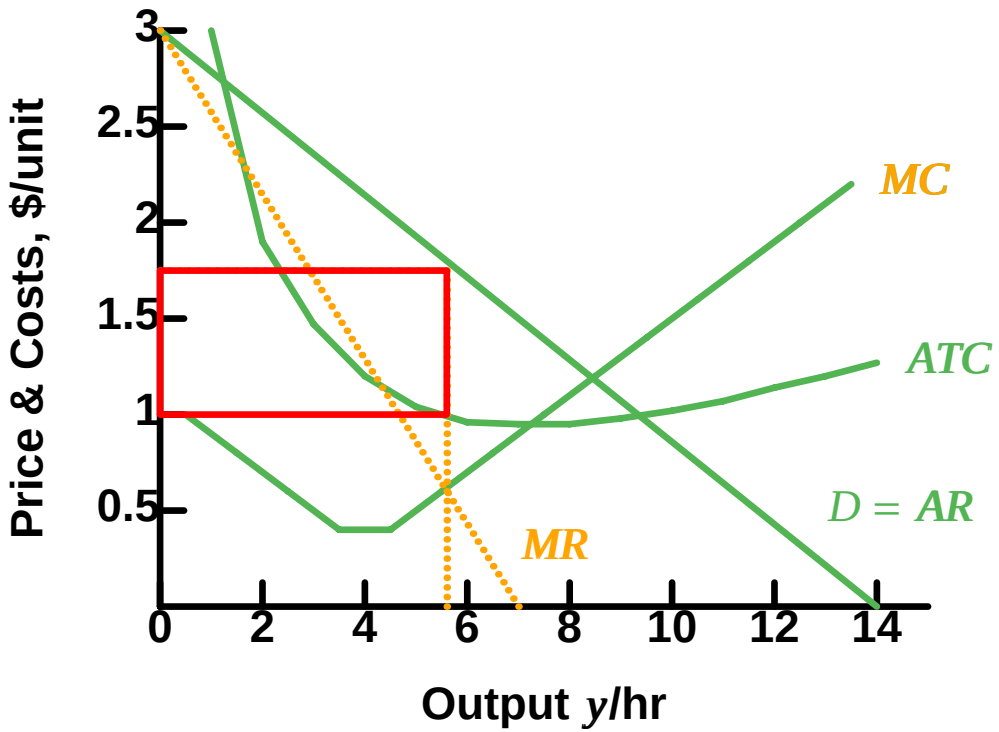
$$MC(y^*) = MR(y^*) = P\left(1 - \frac{1}{|\eta|}\right), |\eta| > 0$$
$$\therefore\ MC = MR \leq P$$

When demand is perfectly elastic, the demand curve is horizontal, and the mark-up $\frac{P}{MC} - 1 = \frac{1}{|\eta| - 1}$ is zero.

The less elastic the demand (up to unitary elasticity), the higher the price mark-up. ($\eta = -5 \rightarrow$ m.u. = 0.25; $\eta = -1.5 \rightarrow$ m.u. = 2; $\eta = -1.1 \rightarrow$ m.u. = 10)

The monopolist only chooses to sell when demand is elastic ($|\eta| > 1$). (That is, price on the upper half of the linear demand curve.)

BOB'S BAGELS, AGAIN, AGAIN



Bob's monopoly profit is shown by the red rectangle. His average profit = $1.75 − $1 = $0.75/unit, and he sells 5.6 units. ∴ his profit is $4.20 with this demand (up from 8.5•0.20=$1.70).

PRICE DISCRIMINATION

When a seller charges *different prices for essentially the same product*. If $\frac{P_2}{P_1} \neq \frac{MC_2}{MC_1}$.

The monopolist wants to *segment the market* according to the price elasticity of demand η and charge higher prices for those consumers with lower elasticities of demand, according to the mark-up formula.

Why? To increase profits, at the expense of Consumer Surplus. Three types of price discrimination.

1ST-DEGREE PRICE DISCRIMINATION

How to capture all the consumers' surplus?

Charge each customer the maximum price that customer is willing to pay for each unit sold.

Perfect price discrimination.

But difficult to achieve: knowledge of WTP and arbitrage. Examples?

2ND-DEGREE PRICE DISCRIMINATION

In some markets (water, electricity, etc.) each consumer buys many units of the good over any given period, and the consumer's demand falls with each unit.

So a firm can discriminate according to quantity bought → *Multi-part pricing* or *declining block pricing*, where the price for later blocks bought is lower than that for the earlier blocks.

Examples?

3RD-DEGREE PRICE DISCRIMINATION

Segment the market **into two or more groups with separate demand curves, and charge the members of each group the same price, but members of different groups different prices.**

This is the most common version of price discrimination (haircuts, air fares, generic brands, student and pensioner discounts).

The higher price is charged to the consumers with the lower demand elasticity

Need to prevent arbitrage.

Other examples?

TWO-PART TARIFFS

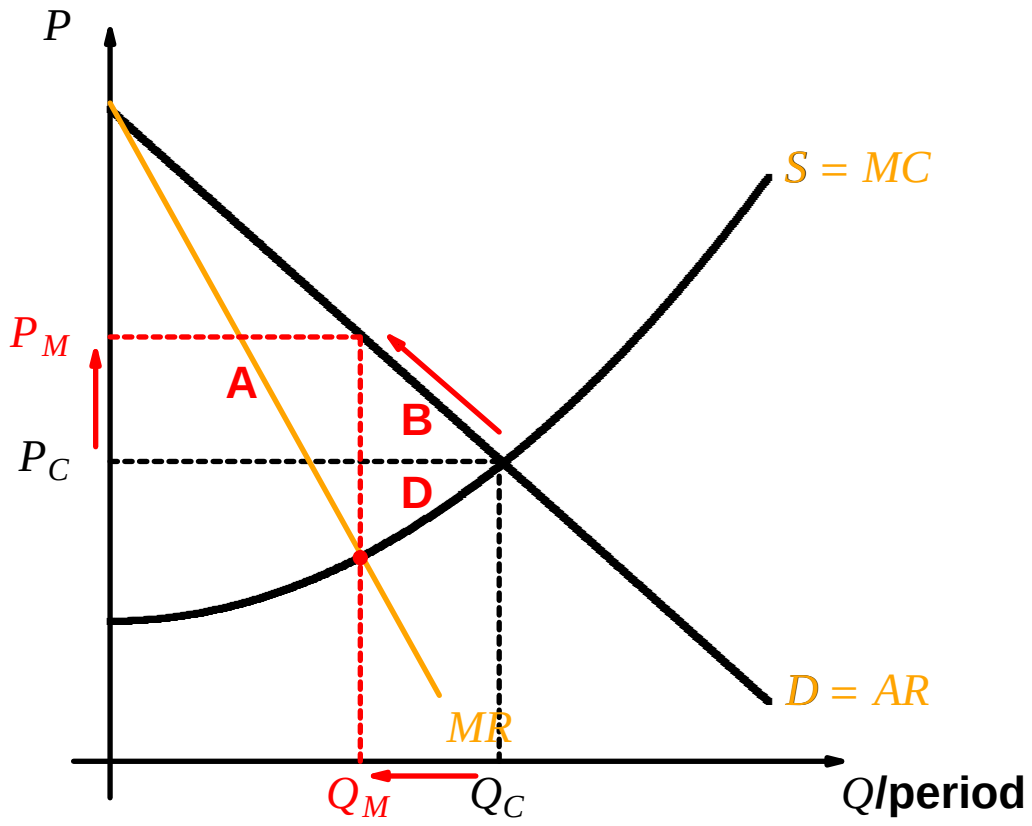
Another way of extracting consumer surplus:

- **charge an up-front fee *T* (for membership or entrance or connection or a "monthly service fee") and then**
- **charge a further per-unit price *P* for usage (for use or rides or phone calls or water litres).**

How to set the connect/entry fee *T* and the usage fee *P*? For a single consumer: ideally let *P* = *MC* and *T* equal the entire consumer surplus.

Examples? Ink-jet printers. Mobile phone contracts.

THE DWL OF MONOPOLIES



Fall in Consumers Surplus = areas A + D.
Rise in Producers Surplus = areas A − D.
(Profit π = Producers Surplus − Fixed Costs.)

MONOPOLIST'S PROFITS: A SOCIAL COST

There are ∴ two reasons to dislike monopolies:

1. **the waste or DWL (areas B+D) associated with a monopoly (efficiency)**
2. **the extra PS (area A) the monopolist wrests from consumers, wasting area B in the process (equity, or fairness)**

To what extent do the dynamic incentives of patents and copyrights mitigate these?

COMPETITION POLICY

Governments (here, ACCC) may intervene by:

1. **maintaining or increasing competition: by vetting mergers and acquisitions, to prevent market domination (paint, cable TV, building supplies, telcos, pipelines, trans-Tasman airlines).**
2. **regulation: forcing $P = MC$ (but possible losses); forcing $P = AC$ (little incentive for economising); subsidising.**
3. **privatisation: change of ownership does little for competition.**
4. **nothing. Market dynamics and the lure of fat profits will be enough. e.g. Polaroid?**

ALWAYS WITH US

Firms are always trying to obtain market power (downwards-sloping demand curves).

Vertical integration: **"SunRice — from the paddock to the plate": 3000 rice growers seek market power.**

Advertising: **create a brand image, which results in (some) market power.**

M & A: **buying up competitors.**

Buying suppliers: **to squeeze one's competitors.**

Colluding: **forming cartels to support price or restrict output.**

THE MORAL

You're gouging on your prices if
You charge more than the rest.
But it's unfair competition if
You think you can charge less.
A second point that we would make
To help avoid confusion:
Don't try to charge the same amount—
Since that would be collusion!
You must compete. But not too much,
For if you did, you see,
The total market would be yours,
And that's monopolee!

— R. W. Grant, *Tom Smith and his Incredible Bread Machine*, Competitive Enterprise Institute, 1964.

SUMMARY

1. **Reasons for monopolies (governments, economics).**
2. **How monopolies squeeze the market to push up price. The less elastic the demand, the higher the price.**
3. **Ways in which monopolies segment the market and price discriminate.**
4. **The costs (efficiency and equity) of monopolies.**
5. **How governments respond.**

APPENDIX: MARK-UPS

(Not for exam.)

Profit $\pi = P \bullet y - TC(y)$

Differentiating totally:

$\therefore \frac{d\pi}{dy} = P + \frac{dP}{dy} y - MC(y)$ **(the monopolist can vary price *and* quantity, along the demand curve)**

$= 0$ **when** $P(1 - \frac{1}{|\eta|}) = MC(y^*)$, **(i.e.** $MR = MC$**),**

(the necessary condition for y^* **to maximise profit** π**), where** $|\eta|$ **is the price elasticity of demand (+ve).**

So $P > MC(y^*) = MR(y^*)$ **when** $|\eta| > 1$ **(or elastic demand).**

When demand is perfectly elastic ($|\eta| = \infty$**),** $P = MR = MC$**, the competitive solution (horizontal demand).**

The *monopoly mark-up* = $\frac{P}{MC} - 1 = \frac{1}{|\eta| - 1}$ **is positive.**

The monopolist will only operate where demand is elastic, or $|\eta| > 1$**.**