

Tutorial 3 – Market Structure

1. Read the article: “Supermarket wars are gaining traction” from *The Sydney Morning Herald*. Now consider what types of barriers to entry exist in the Australian supermarket industry?

Discussion: A close reading of the article gives some hints about this. First, note that last week we made the point about minimum efficient scale. Lidl, a supermarket chain similar to ALDI has apparently decided not to enter in essence because the market is not big enough. In a similar vein you might expect that the current players in the supermarket market have some scale advantages that new entrants could not match such as logistics. Note that minimum efficient scale is not a problem per se. Some small supermarket chains can be successful as suggested in the article – see reference to the unnamed Asian supermarkets. The other barrier to entry that is identified is what might be thought of as pre-commitment contract. Many of the good sites for supermarkets, especially large ones that wish to develop a chain are already taken. In fact there is intense competition between Coles and Woolworths over the sites that can be used for grocery retail and in the absence of new ones becoming available, a new entrant would be at a distinct disadvantage.

You might want to ask yourself why, given the discussion in the article, Amazon is coming?

2. Read the paper by the Grattan Institute which discusses competition in Australia (<https://grattan.edu.au/report/competition-in-the-australian-economy/>).

Discuss what has happened to competition among supermarkets in Australia in recent years. What barriers may there be to strong competition in the that industry? Are any developments identified that may be associated with greater competition?

Discussion: The Grattan Institute article is relatively long and only a small part of it relates directly to supermarkets. Nonetheless, I would encourage you to read the whole paper as it does discuss the idea of market power and the implications of market power, namely that firms earn a higher rate of return/profit because they are able to raise prices in the absence of strong competition. A few key points from the paper:

- *Concentration in Australia is high but has actually fallen in the supermarket ‘market’ as Aldi and Costco have taken market share from the two big players, Coles and Woolworths. Concentration (defined as the four firm market share) is high compared to most other countries, except perhaps the Netherlands. It is worth noting, nonetheless, that in similar sized ‘markets’ of Texas and Florida (which have a similar number of people as Australia), concentration is similar in the supermarket sector. See p. 16.*

- *Scale economies seem to be important in the Australian supermarket context (pp. 41-42 – see solution slides) and the implication of those scale economies is that potential entrants face barriers to entry and the existing players earn above average or super-normal profits (see p. 32-33). Look at Box 3 (p. 42) for a discussion of the cost advantages (large) supermarkets in Australia enjoy. They include: scale, better ability to defray IT, head office and distribution costs, and market power in procurement.*
- *In terms of the barriers to entry, see the note about zoning restrictions that limit the entry of competitors (p. 45). They write:*

Supermarkets remain highly concentrated and highly profitable. While the incumbents have built profitable businesses with large market shares in liquor and petrol retailing, they have lost market share to new entrants in their core supermarket businesses (Chapter 3). One option that might intensify competitive pressure is to relax zoning restrictions that can limit the entry of competitors.

3. What is market power? Market power is usually associated with some type of barrier to entry. Identify different types of barriers to entry and give examples of each.

Brickley (Managerial Economics) refers to market power as where firms output decisions of firms having a noticeable impact on prices. That is, they face a downward sloping demand curve. McAfee defines it as being able to increase prices above costs or above competitive levels for sustained period of time. Market power to be sustained usually requires some barrier to entry.

What might that look like? McAfee lists some barriers to entry on pp. 12-13

- *Scale economies and the impact of minimum efficient scale. There might only be room for one or two firms in the market.*
- *Reputation effects.*
- *Specific assets.*
- *Excess capacity*
- *Product differentiation and filling the product space.*
- *Learning curves*
- *Tied input suppliers*
- *Regulation/ legal barriers*
- *Network/ switching costs.*

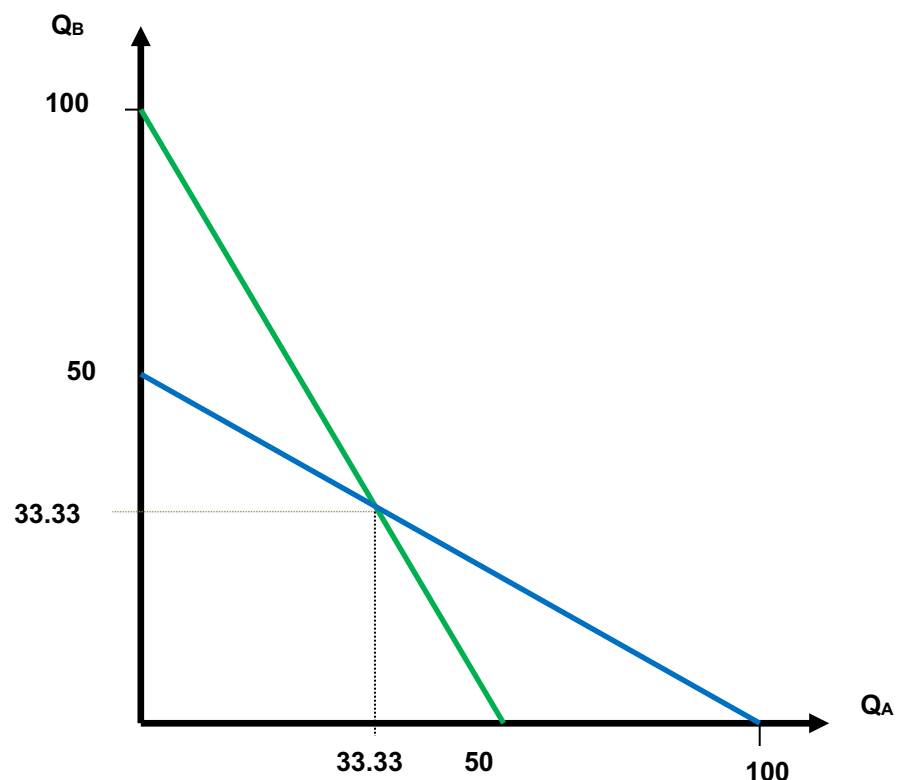
Think about what each of these might entail and how they can prevent new firms entering a market even when the existing firm is achieving high profits. The discussion in McAfee will help, as will the lecture notes.

4. In a model of Cournot oligopoly we discussed in class, we argued that the reaction functions or the best response curves for each firm slope downwards. Give an intuitive explanation of why that might be the case.

The standard Cournot oligopoly with two firms has a solution where the amount produced is more than in a monopoly but less than compared to a competitive market. As the number of firms increase, how might that results change? Why?

Answer: Below I have drawn a couple of reaction functions for a Cournot problem. Note that the reaction function or best response curve for firm B is given in blue and that for firm A is given by the green curve. Make sure you know how to interpret this. Let's take the blue curve (the reaction function for B). What it says is that when A is producing zero, it should produce 50. Note that if A is producing zero then effectively B is a monopolist and the profit maximising choice of output is then 50. Moreover, the reaction function slopes downwards – this tells us that as A produces more (Q_A increases) the best response by B will be to produce less. In fact, by the time A is producing 100, B should not be producing anything at all. An analogous interpretation can be given to the green reaction function for B.

Why do the reaction functions slope downwards here? One way to think about it is that as A produces more there is less room in the market for B so its best (profit maximising) response is to produce less. Keep in mind that in this model, the two goods produced by A and B are perfect substitutes, so that a buyer doesn't care whether they purchase a product from A or B.



Aside: the market demand curve for this problem is the following:

$$P=100-Q$$

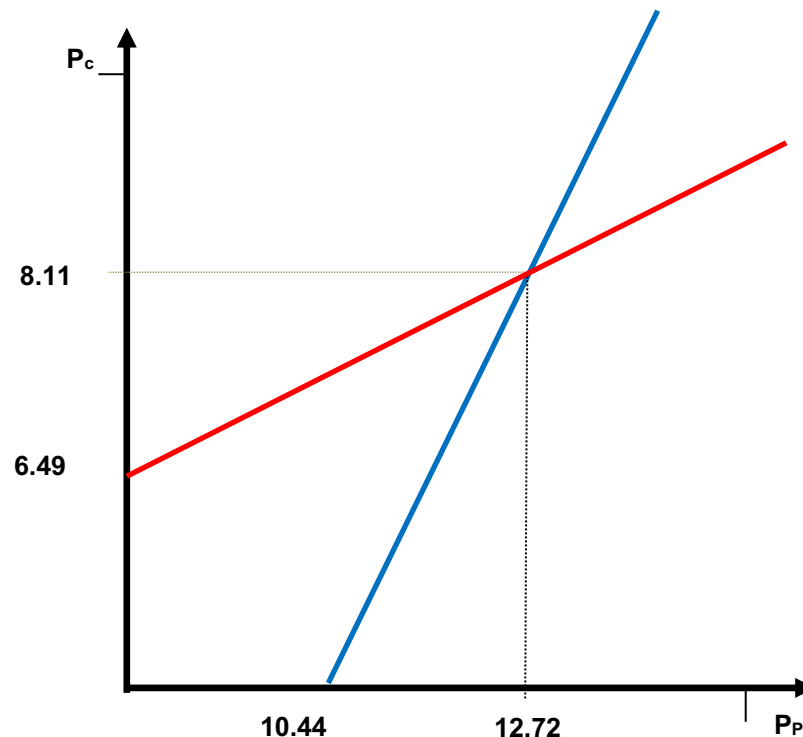
Also, it is assumed that the marginal cost of production equals zero for both firms. A similar model is worked through mathematically in lecture 3.

As the number of firms increase, the quantity produced by A and B will continue to decrease. This is for the same intuitive explanation as the downward sloping demand curves.

5. Discuss why in a model of Bertrand competition with differentiated products the best response curves are upward sloping.

Answer: Below I have drawn a couple of reaction functions for a Bertrand problem with differentiated products. It is the same problem that I discussed in lecture 3. Note that the reaction function or best response curve for Pepsi is given in blue and that for Coke is given by the red curve. Make sure you know how to interpret this. Let's take the blue curve (the reaction function for Pepsi). What it says is that when Coke is setting a price of 8.11, Pepsi's best (profit maximising) response is to set a price of 12.72. Moreover, the reaction function slopes upwards – this tells us that as Coke sets a higher price the best response by Pepsi will be to also set a higher price. An analogous interpretation can be given to the green reaction function for Coke.

Why do the reaction functions slope upwards here? One way to think about it is that as Coke sets a higher price it provides an opportunity to Pepsi to also increase its price. Keep in mind that in this model, the two goods produced by Coke and Pepsi are imperfect substitutes. What this means is that as Coke increases its price it will lose some but not all sales to Pepsi. If Pepsi does nothing when Coke increases its price it will increase its sales. However, an even better response than doing nothing will be to also increase its price. This will mean that it will lose some sales when buyers switch back to Coke, however, it is now getting additional revenue for each unit that it sells. It is this tradeoff, higher revenue per unit but fewer units sold that dictate how much Pepsi will increase its price following an increase in price by Coke.



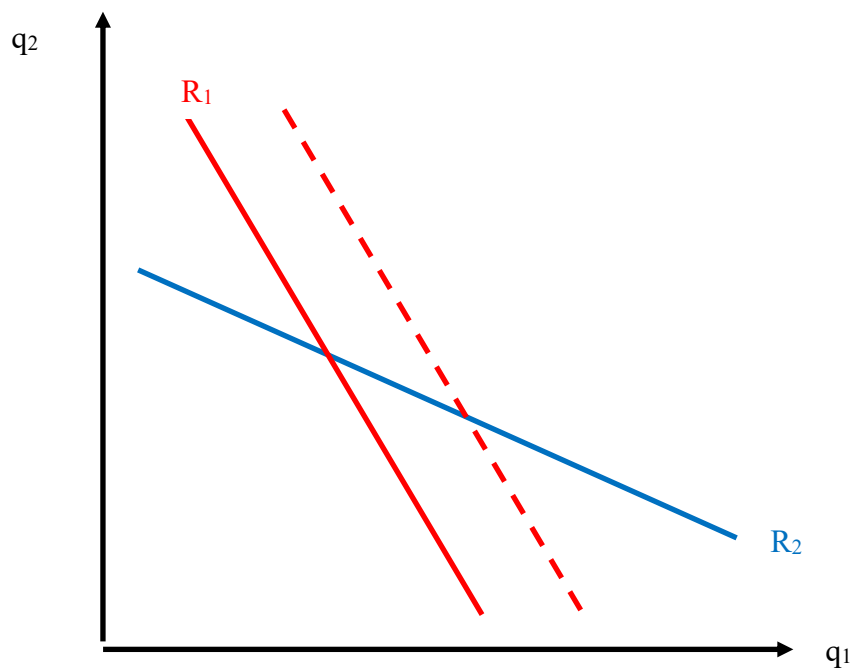
The Nash equilibrium in this model is for Pepsi to set a price of 12.72 and Coke a price of 8.11.

6. Define what is meant by a strategic substitute? What is meant by a 'tough commitment' and a soft commitment?

Answer: When one firm chooses more of some action, such as an output decision, and its rival firm cuts back on the same action, we say that the actions are strategic substitutes.

For strategic substitutes we used the Cournot and Stackleberg models and argued that in response to a rival doing more (if a rival produces more in a Cournot model), your best response is to 'do less', which in the case of Cournot means you produce less. That is, for a Cournot model (and strategic substitutes generally), reaction functions will slope downwards. In the first diagram below we see firm 1 (in red) has a downward sloping reaction or best response function, just like firm 2.

In lectures we noted that it is possible that a firm may make a strategic move. For example, firms involved in Cournot competition may decide to open a new plant (increase production). We think about this as a tough commitment. What this means is that at any given level of output of your rival, you now produce more. The easiest way to think about a tough commitment is that in a Cournot model the reaction function of the firm making the commitment shifts out (see diagram below). In particular, the initial reaction function is given by the solid red line, and the tough commitment leads to the reaction function shifting out to the red dotted line.

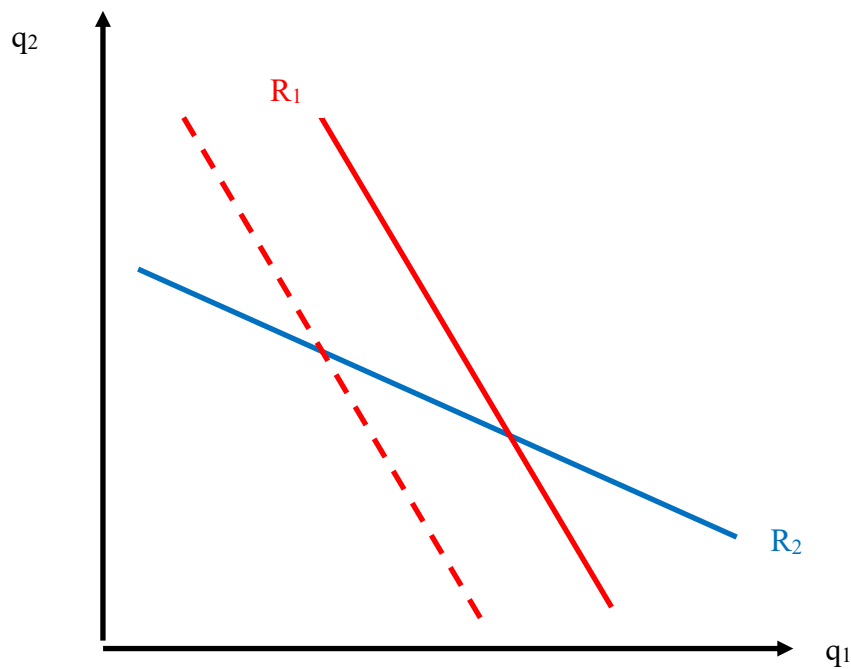


There is a direct negative effect for firm 1 because as it produces more, the price it receives will go down. There may also be a cost to the commitment (for example, the cost of the investment in a new plant).

However, firm 2 will produce less. When firm 2 produces less, this will tend to increase price in the marketplace, and this is good news for firm 1.

It is possible that the negative direct effect of the commitment will be outweighed by the indirect beneficial effect of the response of firm 2. This indirect effect could make the strategic move profitable.

In the diagram below I have demonstrated what would happen if the strategic commitment was soft and therefore shifted the reaction function inwards. This might come about, for example, if a firm decides to exit a market or at least reduce its exposure to it.



There is a negative strategic effect for firm 1 because as it produces less, firm 2 will produce more. When firm 2 produces more, this will tend to decrease price in the marketplace, and this is bad news for firm 1. The indirect negative effect of the move, however, is to induce a response on the part of the rival which tends to reduce profits for the firm making the commitment. Hence, this indirect effect could make the strategic less profitable.

In the diagram below I have shown what might happen under Bertrand competition with differentiated products when firm 1 makes a tough commitment.

Firm 1 makes a commitment that reduces its cost of production and therefore allows it to lower the price it wants to charge given the price charged by firm 2 (effectively firm 1's reaction function shifts in). Here the direct effect of the commitment is positive because the reduction in costs should increase profits.

However, the strategic response on the part of firm 2 is a negative. When the commitment is made **both** firm 1 and 2 drop their price. Here, the drop in price by firm 2 hurts firm 1 and so the strategic effect is negative from the perspective of firm 1.

Overall, the effect of the direct and indirect/strategic effect could be positive or negative.

