Entry Costs

- We can relate our previous results to the cost structure of firms in a given industry.
- The cost structure we just imposed is an extreme case where average cost is always decreasing.
- To explore the relation between increasing returns to scale and market structure (i.e. level of concentration) we need a measure of of the degree of scale economies.
- One such measure we discussed earlier on was the minimum efficient scale.
- Recall this is the scale at which a firm's AC is close to the minimum.
- In the simple model $C = F + cq$, AC is minimized at c.

- The MES is the minimum is the minimum scale such that average cost is equal to sum number, say c'.
- Equating AC to this number we get:

$$MES = \frac{F}{c' - c}$$

- Note this is proportional to F so we can a get a relationship to $\hat{n}$.
- Specifically, if MES doubles, the number of firms decreases by a factor of the square root of 2.
- Note also if both market size and MES both double, the equilibrium number of firms does not change.

- An alternative measure of increasing returns is the coefficient of scale economies, which is simply the ratio of average costs to marginal costs.
- Recall if this ration exceeds 1 we have scale economies, and we can relate the degree of scale economies to the concentration level in the industry.
- With our simple cost structure we have

$$\frac{AC}{MC} = 1 + \frac{F}{cq}$$

- The greater F is the greater scale economies are, and we also know, the smaller the number of firms in equilibrium.
- So concentration is greater the the greater the degree of scale economies.

- MES and scale economies are examples of barriers to entry.
- There are examples of industries and countries where the relationship between size and concentration does not agree with our results.
- One example is the beer industry where the US and Portugal had similar structures despite the large difference in the sizes of their respective economies.
- Why is the actual number of firms much less than our model predicts?
- In this specific industry, advertising matters a lot and is not accounted for in our model.
- Advertising expenditure are a large fraction of sales revenue in both countries.

- In fact, the percentage of sales is similar in both countries and since sales are much larger in the US, so is the advertising expenditures.
- So to enter the US industry and compete with the likes of Pissy and Pissier, a potential new entrant must pay a much greater entry cost than in Portugal.
- So this is an example of entry costs being endogenous to market size.
- This will add quite a wrinkle to our previous model.
- Specifically, if entry costs are increasing with market size we have an extra reason why the equilibrium number of firms does not increase proportionately to market size.
- So the number of firms would increase more slowly even if there was not an increase in competition.

- Advertising is just just one example of endogenous entry costs.
- Two other important ones are bidding for a government license and and R and D expenditures.
- The former can be illustrated with a simple auction model.
- Say the government of some country decides to allocate one license to only for the right to develop a new technology.
- The revenues for the firm that gets the license are denoted by S and the entry costs by F.
- Suppose that upon paying this fixed cost, each firm must bid for the right to exploit the license.

- Bids are made simultaneously and the highest bid gets the license.
- If there is more than one entrant, then the bidding game is similar to the Bertrand competition.
- Now it is the highest bid, not the lowest price that wins.
- By analogy to Bertrand, the equilibrium is for all firms to bid the value of the license S.
- So like in Bertrand the equilibrium profit is 0.
- So no firm will enter the bid if it expects another firm to enter, and this regardless of market size.

- This is the exact opposite to if the license were allocated by a lottery.
- There the equilibrium number of firms is S/F.
- In that setting the only entry cost, F, is exogenous.
- So this tells us that if entry costs are endogenous, there is a weaker relationship between the number of firms in equilibrium and market size.
- These conclusions can be tested empirically by plotting concentration levels versus size for high and low advertising industries.
- The results are quite striking in the sense that the relationship is much flatter for advertising intensive industries.

- We can conclude this chapter by relating the notion of free entry to social welfare.
- If certain conditions of the free market fail then it is not necessarily the case that free entry is desirable from the perspective of economic efficiency.
- To illustrate, suppose first there are n firms each producing q_n so total output is given by nq_n.
- Then suppose a new firm enters so the output produced by each firm declines to q_{n+1}, so total output is $(n+1)q_{n+1}$.
- It may be the case that the increase gross surplus is smaller than the the gross profit earned by the latest entrant.
- This will imply a divergence between the private and social incentives for the entry of $n+1$ firm.

- Specifically, free entry could result in excessive entry.
- This is because part of the profits earned are taken from incumbent firms, resulting in a transfer that does not correspond to a benefit to society.