Long Run Competitive Equilibrium for Pure Competition

The previous chapter considered how prices and quantities are determined in a state of short run pure competition. Short run here means that the level of capital of the firm is fixed, both in scale and in use. In the long run, the size of the firm can change. The firm does this by either investing in new machinery or by selling off unused capacity, both of which take time to accomplish. By changing the scale of the firm, economies of scale can be exploited and even greater profits can be earned. However, the industry is now wide open to entry by new firms (remember that in the short run no new firms have time to machine-up for competition). The entry of these new firms into the market can radically change the level of variable costs and can introduce a new long run equilibrium level for firms that may differ substantially from the short run.

The movement of firms towards their long run equilibrium begins when short run, above-normal profits induce existing firms to invest in greater scale and encourage new firms to enter the market. The motivation for this change in scale and competition is the fight for the existing short run profits. By expanding production and inducing new firms to enter the industry, these short run profits are guaranteed to be short lived and will be reduced to normal levels. We now find that competition should drive prices to their long run costs – something very close to the thing that Marx and others believed (that values were determined by labor costs and not demand).[1]

Recall that short run equilibrium for pure competition can be depicted as in Figure 1. The firm is small and cannot control the price in the market. Thus, it is a price taker. Given this, the firm selects the output which will produce the greatest profit. Since the price is above AVC where MR = MC, we know that the firm will produce output and sell where the price line intersects the upward sloping MC curve. This is said to be an efficient solution since the value of the marginal output society buys is equal to the marginal value it places on the resources used to produce that output. At any other level of output this is not true. Both consumers and producers can be made better off by moving to the output where MR=MC.[2] Economists feel that efficiency is important. Waste is something all of us understand. Efficiency is merely the lack of waste. Therefore, as normal human beings, we are always

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[1] Do not be overly impressed with this broad and rather imprecise statement. Relative prices in the economy will still be determined by the supplies and demands for goods in the individual markets, while money or nominal prices will be determined largely by the supply of money relative to its demand. The notion that minimum costs of production in the long run are attained independent of demand for all competitive goods ignores that such minimums may be inconsistent with the levels freely desired by society at those prices – hence the need for the demand for competitive goods to guarantee consistency. This is the danger of applying Marshallian microeconomic analysis to general equilibrium problems that are better handled by Walrasian macroeconomic analysis.

[2] To see this think of supply and demand. Fix the price at equilibrium and extend the quantity out. Clearly producers are asking for a higher price to produce this quantity, while consumers require a lower price to buy this quantity. Neither would like to transact at the equilibrium price for quantities GREATER than equilibrium quantity. A similar argument can be made for quantities LESS than equilibrium quantity.

interested in what the level of efficiency is in the economy. If you are a person who doesn't like to waste your time, effort, and money, then you can understand economics. It is all about describing behavior that raises efficiency to its highest level. The condition, MR=MC, is considered to be a point of great efficiency. By contrast, Marxists do not believe that the market should impersonally determine what people will have. Instead, they feel that a small group of people should decide what is best for the whole of society. One of the things that

Figure 1 -- Short Run Equilibrium with Pure Competition

MC
AVC
ATC

MC

ATC

D = P = AR = MR

AVC

Y
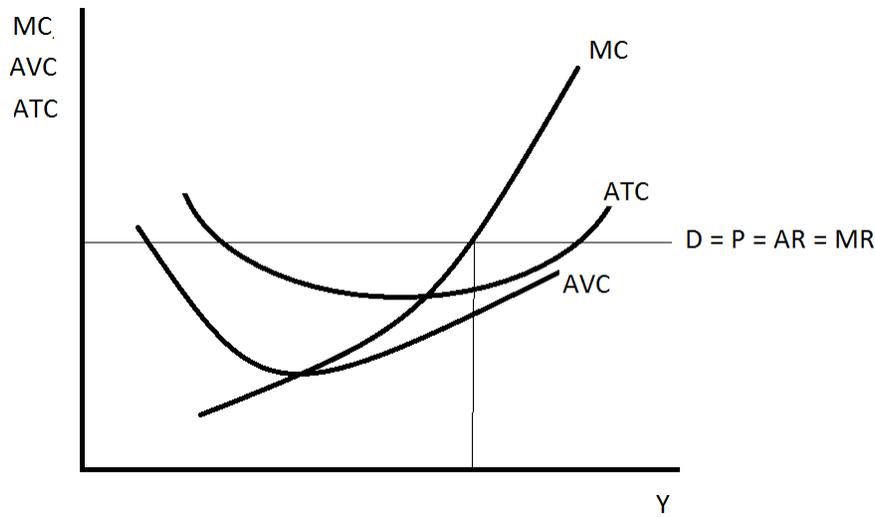
bothers Marxists is the existence of profits. In the short run profits are the residual of income after wages, interest, and rent have been paid out. But, the existence of these high profits in the short run are precisely the signal that is given to others to produce more and enter the market. High profits are an important and informative signal for what competitors should do. The transition from short run to long run is what eliminates these very high profits and brings them down to a normal level. If above-normal profits last over a long time, there _must_ be some anti-competitive barrier to firms producing more or new firms entering the market. Ensuring a strong and competitive environment is an important function of government, although it often fails in this respect.[3]

In drawing Figure 1 we have implicitly assumed that technology and productivity do not change, the scale of the firm does not change, new firms cannot enter the market, and wages and other factor prices are constant. As we pass to the long run, these assumptions can

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[3] Why do governments often fail to create a sufficiently competitive environment? Well, some might feel that government is also needed to ensure that competition is _fair_. For example, if the domestic government opens its markets to extremely powerful foreign competition (perhaps subsidized strategically by foreign governments) the environment will certainly be competitive, but it may be rightly judged unfair to domestic firms. There may be strong reasons to open slowly while allowing domestic firms time to prepare for a full opening. Still, these sentiments are controversial since most people feel competition is a force for good. Finally, such views are controversial since it may take decades for domestic firms to compete well with foreign firms, if they can prepare sufficiently at all.

change. Technology can improve, firms can adjust the size of their company, new firms can enter or exit the market, and factor prices can go up or down.

To simplify things, let's assume that only the size of the firm can change – that there are only scale changes. This is certainly unrealistic, but it is a first step in understanding what

Figure 2 -- The LRAC as Envelope of SRACs

Costs

SRAC(K1)

LRAC

SRAC(K2)

SRAC(K4)

SRAC(K3)

minimum point of LRAC

Y
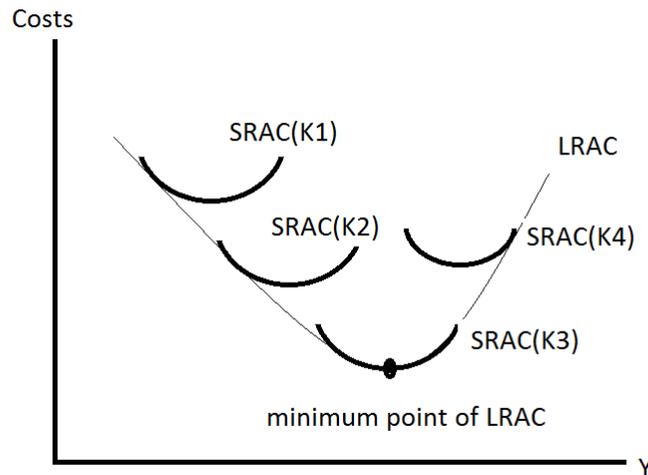
is happening. Figure 2 shows different short run average cost curves when we allow the scale of the firm to change. In the figure K1 is a smaller scale than K2, and so on. At first, increasing the scale of the firm drives down long run average costs, but only to a point, after which increasing the scale raises long run average costs. Remember, we are not allowing many other things to change such as the number of firms in the industry and the factor prices in the labor and capital markets. The falling long run average costs indicate increasing returns to scale (meaning a doubling of all factors *more than doubles* output). By contrast, a rise in long run average costs points to decreasing returns to scale (meaning a doubling of factors *fails to double* output). The minimum point of the long run average cost curve corresponds to *constant returns to scale*.

Now, given the price is P and the firm can adjust its capital stock to a higher (or lower) level, how much output will it plan to produce and at what scale? The answer here is that it will produce where long run marginal cost is equal to the price. By doing this it can maximize its profits. Over and over we have emphasized that decisions are made on the margin and in this case MR=MC is where price = LRMC. This is shown in Figure 3 at point A. The long run average cost was previously shown to be constructed from all possible SRAC's corresponding to different capital stocks. The firm now plans to use capital stock K' while maintaining the assumption of a fixed demand price and fixed factor prices.[4] The firm believes that the resulting profit from its decision will be feasible or obtainable. But, the firm cannot control new entry into the industry when there are positive above-

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[4] This is sometimes called the competitive assumption, where the firm is a price taker and cannot control either the demand price or the factor prices. To think otherwise is to assume the small firm can determine the price by itself, which is impossible since the firm is too small. It merely holds the price constant in making its decisions, at least for now.

normal profits. One must expect that new firms will enter the market and compete for the extra-high profits. The entry of new firms may force higher factor prices and the additional supply will

Figure 3 – Optimal Scale in the Long Run for the Firm (No Entry of New Firms)
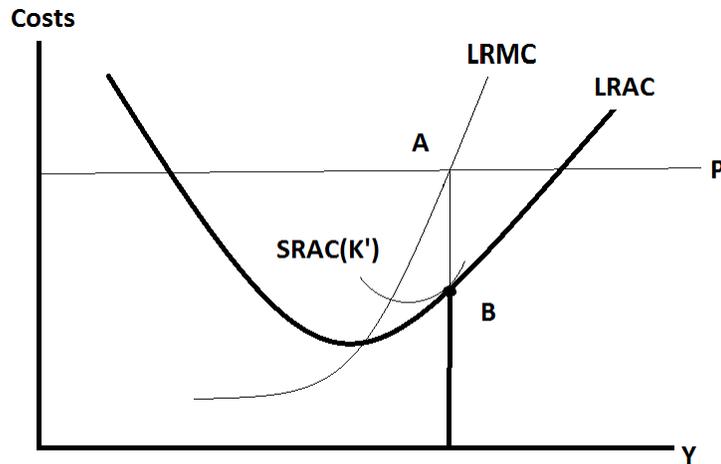
lower the demand price in the market. Existing firms are thus squeezed by two important competitive pressures. One, the falling demand price for the good they are producing due to increasing supply, and two, the rising factor costs that drive up average costs from what firms expected. The upshot is that the firm is brought to a long run equilibrium as shown in Figure 4 where there are no long run above-normal profits to the firm. The process is very much complicated by new firms entering. Note that it is even possible that the long run equilibrium quantity (with entry) could rise with a drop in the price. This would produce a downward sloping long run supply curve. Figure 4 is drawn assuming B' is lower than B so we know that equilibrium quantity falls when entry is allowed. Price falls from P to P' and quantity falls from B to B'. It is entirely possible to draw the shifts in such a way that B' rises from B instead of falls. Marshall was apparently aware of this type of situation.

Figure 4 – Final Long Run Equilibrium (with Entry of New Firms)
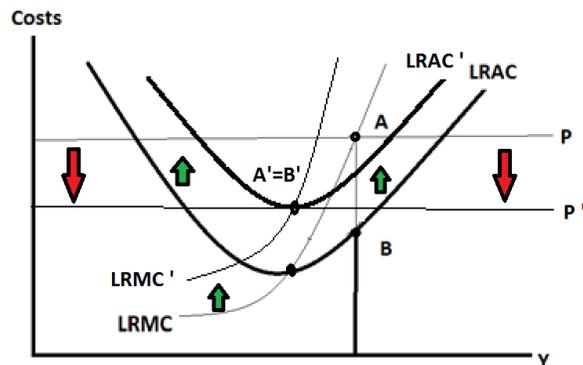
(P1) What is meant by the term long run in microeconomics?

(P2) What is the profit maximizing condition for a competitive firm in the short run?

(P3) What do economists mean by the scale of a firm?

(P4) What do economists mean by efficiency and why is MR = MC the point of efficiency in microeconomics?

(P5) Alfred Marshall was interested in the internal and external economies of scale that a firm would enjoy as it grew. Look on the internet and try defining what external and internal economies of scale mean.

(P6) How do we construct the long run average cost curve for a competitive firm assuming there is no entry of new firms?

(P7) What can happen to the LRAC and LRMC of a firm when entry occurs?

(P8) Draw the case where entry of new firms causes each firm to produce more even though the price has fallen.

(P9) Explain the economic intuition behind the result in (P7)