Check Your Understanding: The Profit Motive-The Marshallian Diagram

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Why “people not profits" makes no sense in a market economy.

Introduction

Many people, especially politicians, say that firm should not maximize profits for shareholders, but look out for interest of all the “stakeholders,” including consumers, workers, those concerned with the environment and other issues of social justice. Economic theory holds that this is fundamentally incorrect and that only mission that a firm should undertake is to maximize profits for shareholders, not “stakeholders.” In fact, there is no defintion of stakeholders in economic theory. Introducing the idea is just a way to give some consumers more power and influence than they would have in a competitive market. It is a way of defining a social welfare function that seems to get around the Arrow Impossibility Theorem, which after all, remains a real impossibility.

The main reason that firms should not do anything but maximize shareholder value is that firms are owned by households. If firms earn the maximum amount possible that will lead to the largest incomes for the households. The more efficient a firm is in maximizing profits, the better off are households. They then can use this extra income to pursue their own goals, whether they are helping the working poor, improving the environment or fighting for social justice. When consumers who wish to do this argue that firms should join forces in these efforts, they are attempting to multiply the impact of their own preferences through non economic means. In economic theory, this amounts to double counting preferences. The reason is that the same individuals are in the firms as in households. If the preferences of firms are taken into account then some individuals are counted twice.

The Marshallian diagram shows how the profit motive is part of the *signaling system* consumers use to direct firms to produce the goods and services the households want. This what is meant by an “efficient allocation of scarce resources.” As consumers change their preferences, firms must respond to the change and reorganize production to deliver different goods and services.

The Marshallian Diagram

The diagram is a combination of a market supply and demand (SD) diagram and the cost curve of the representative firm. The SD diagram determines the price and quantity sold in the market. There are usually many firms in a market and in a competitive market, there must be more than one (monopolist) and even more than a few (oligopolists). The average and marginal cost curve for the *representative firm* is given in figure 2. Let n firms in the market and n_c consumers on the demand side.

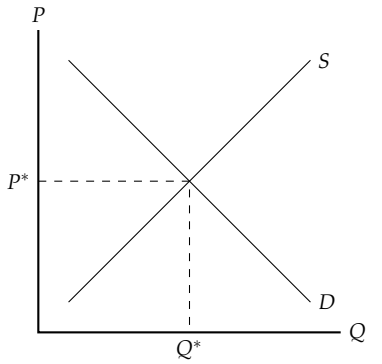

Figure 1: Price and quantity determined

This profit attracts additional firms into the market. Assume for the moment that $n \to n+1$, that is that there is one additional firm that comes into the market. This causes the supply curve to shift to the *right* by ΔS as shown in figure . The change in output divided by $n+1$ may be greater than, equal to or less than the original value of Q/n. In any event, the total supply increases to $Q + \Delta Q$ and the price falls to p^-. Figure 4 shows that the process leads to lower profits, mainly driven by the fall in the price.

If the price does not fall, or just falls by some small amount, the quantity demanded will not change. Thus the same quantity of demand will have to be shared by a larger number of firms. In this case,

$$(Q + \Delta Q)/(n+1) = Q/(n+1)$$

which is smaler than Q/n. Only if the price falls will $\Delta Q > 0$. If the profit in the marginal firm is

$$\pi = pQ - C(Q)$$

where $C(Q)$ is the cost function of the representative firm, profits will fall so long as

$$\Delta\pi = p\Delta Q + Q\Delta p - \Delta C(Q)$$

This gives

$$\Delta\pi/\Delta Q = p + Q\Delta p/\Delta Q - \Delta C(Q)/\Delta Q$$

where the term on the right, $\Delta C(Q)/\Delta Q$, is the marginal cost. Since price is equal to marginal cost, in both figures 2 and 4, this last condition can be written as

$$\Delta\pi/\Delta Q = Q\Delta p/\Delta Q$$

or

$$\Delta\pi = Q\Delta p$$

so that profits fall so long as $\Delta p < 0$

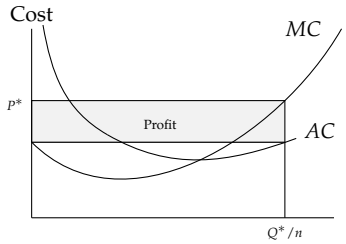

Figure 2: Short-run marginal and average cost

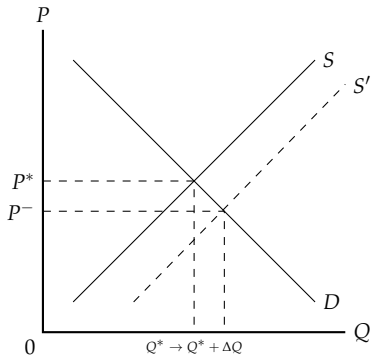

Figure 3: Profits attract entry of new firm

Numerical example

Demand is:

$$X = \alpha B/p \tag{1}$$

where: $\alpha = 0.2$ and the budget $B = 0.03$. Assume that there are 12,000 customers in the market.

The supply is given by the production function

$$Q = K^{\beta} L^{(1-\beta)}$$

while labor demand is normally the marginal product. With fixed capital however it is given by

$$L = (Q/K^{\beta})^{[1/(1-\beta)]}$$

where $\beta = 0.6$. The prices of the factors of production are $r = 0.25$ and $w = 1$. Let capital be fixed in the short run at $K = 2.12$ and the number of firms is $n = 50$. The fixed cost is the cost of capital, $r = 0.25$ times the quantity of capital and variable costs are wL, while total cost is the sum of variable and fixed. Marginal cost is the change in total cost divided by the change in output, while average is the total cost divided by quantity. Aggregate supply is nQ.

The supply price is the marginal cost. This is a basic principle of economic logic; firms are only able to supply more output if the price covers its *marginal cost*. The demand price is derived from equation 1, solved for p. Equilibrium is when the supply price is equal to the demand price.

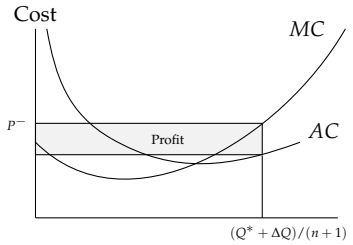

Figure 4: Profits fall for every firm

Exercise: Program this example in Excel and compute the table above. The Marshallian diagram for this problem is given in figure ??.

References

Table 1: The solution

Q	Labor Demand	Fixed Cost	Variable Cost	Total Cost	Marginal cost	Average cost
0.500	0.057	0.530	0.057	0.587	–	1.175
0.705	0.135	0.530	0.135	0.665	0.380	0.943
0.910	0.256	0.530	0.256	0.786	0.589	0.864
1.116	0.426	0.530	0.426	0.956	0.827	0.857
1.321	0.650	0.530	0.650	1.180	1.090	0.893
1.526	0.932	0.530	0.932	1.462	1.377	0.958
1.731	1.278	0.530	1.278	1.808	1.684	1.044
1.937	1.691	0.530	1.691	2.221	2.012	1.147
2.142	2.175	0.530	2.175	2.705	2.359	1.263
2.347	2.734	0.530	2.734	3.264	2.724	1.391
2.552	3.372	0.530	3.372	3.902	3.106	1.529
2.758	4.091	0.530	4.091	4.621	3.504	1.676
2.963	4.895	0.530	4.895	5.425	3.918	1.831
3.168	5.788	0.530	5.788	6.318	4.348	1.994
3.373	6.771	0.530	6.771	7.301	4.791	2.164

Source: Made up numbers

Table 2: The solution

Aggregate Supply	Supply Price	Demand Price	Profit	Equilibrium Price
25.0	–	2.880	–	1.090
35.3	0.380	2.042	-0.563	1.090
45.5	0.589	1.582	-0.274	1.090
55.8	0.827	1.291	-0.030	1.090
66.0	1.090	1.090	0.197	1.090
76.3	1.377	0.944	0.418	1.090
86.6	1.684	0.832	0.640	1.090
96.8	2.012	0.744	0.866	1.090
107.1	2.359	0.672	1.096	1.090
117.4	2.724	0.614	1.333	1.090
127.6	3.106	0.564	1.577	1.090
137.9	3.504	0.522	1.829	1.090
148.1	3.918	0.486	2.087	1.090
158.4	4.348	0.455	2.353	1.090
168.7	4.791	0.427	2.627	1.090

Source: Made up numbers