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Managerial Decision Tools for the Efficiency of Perfect Competition: An Approach for Ensuring Economies of Scale in Perfectly Competitive Markets

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Abstracts
Perfect competition is an idealized market structure that achieves an efficient allocation of resources. The main focus of this manuscript is to elaborate the managerial decision model of perfectly competitive market structures which have a say to the ensuring economic and allocative efficiency and maximizing profit in the perfectly competitive industries. Accordingly, the main decision tools that firms use in the perfectly market competitive market structure are Marginal rate of technical substitution (MRTS) between any pair of inputs must be equal for all producers, marginal rate of substitution (MRS) between any pair of goods must be the same for all consumers and marginal rate of product transformation (MRPT) must be equal to the marginal rate of substitution for each pair of goods so that the firm is economically efficient. To be allocatively efficient firms in the perfectly competitive industry should operate at the point where the demand curve and the supply curve intersect. Marginal revenue and marginal cost (MC) are compared to decide the profit-maximizing output. If MR > MC, then the firm should continue to produce. If MR = MC, then the firm should stop producing the additional unit.
Keywords: managerial decision tools, economic efficiency, allocative efficiency, operation with zero economic profit, long-run equilibrium in perfect competition

1. INTRODUCTION

Perfect competition, as economists often admit, does not exist anywhere in reality (Chamberlin, 1960). Sometimes it is claimed that agricultural industries, come closest to being perfectly competitive because the products are close to being identical and the farmers take whatever price they can get for their products in the commodity markets.

It is often claimed that a free market leads to large firms gain in monopoly power and being able to restrict the output of the goods they produce to raise their prices (James, et al., 2000: 126-127). This alleged monopoly power is said to lead to greater economic inefficiency, a lower productive capability, and a lower average standard of living.

Hence, it is said the government must step in to restore competition. The free market allows for the maximum amount of competition that is possible in any industry and that deviating from a free market, with some form of government intervention in the name of allegedly increasing competition, actually decreases the intensity of competition that exists in the economy and thus decreases the level of economic efficiency, the productive capability, and the standard of living (Arnold. Roger A., 2001).

In real world, policy makers face a scenario where prices are bound to deviate from marginal costs and hence attainment of the "second best" (Lipsey and Lancaster, 1956) becomes the only viable option. Economic planners of a country want to allocate scarce resources optimally such that it maximizes overall welfare. Since an economy consists of various economic agents with diverse interests, allocating resources optimally becomes an intricate task. Economic planners have two mutually opposing means to solve this allocation problem: planning versus competition. Which avenue will be adopted by the planners depends crucially on their value judgments.

Competition can promote efficiency so long as private and social costs and/or benefits do not differ. However due to externalities in real world social and private costs do differ and hence government intervention in the form of appropriate fiscal measure (Kemp, 1955) becomes necessary. The problem is that egalitarianism is not a proper standard by which to judge anything. Economically, implementing egalitarian policies would lead to a lower average standard of living by sacrificing the productive to the unproductive through such schemes as the progressive income tax and the inheritance tax. Morally, such a standard is an abomination because it stands in opposition to the requirements of human life. It prevents the individual from being the beneficiary of his own action by forcing the individual to be a right less servant to the needs of others (James D. Gwartney, 2000).

Formulation of economic theories and scientific decision tools to solve managerial problems in various market structures is quite indispensible for the efficiency and profitability of the firms engaged in any industry there by contributing to the decision making process in the given industry. Moreover, developing scientific approaches emphasizing on the efficiency of the different market structures is quite indispensible for the policy

analysis and economic agents to understand point of maximizing economic profit and deciding to switch off the sector. Firms engaged in perfectly competitive market structures like agricultural businesses use various strategies of enhancing economic and allocative efficiency in the sector. However, managerial decision tools (models) which should be adopted in the perfect competition are not seen explicitly by the different literatures written earlier and inadequacy of scholarly articles on this particular area is foreseen. Therefore, the main focus of this manuscript is to elaborate the managerial decision model of perfectly competitive market structures that should be applied by the economic agents engaged in the industry and the conditions to be satisfied which will contribute for the better understanding of the economic and allocative efficiency and maximizing of profit in the industry.

2. CONCEPT OF PERFECT COMPETITION

A perfectly competitive market system was best described by Keynes (1927): "[laissez-faire] [i] implies that there must be no mercy or protection for those who embark their labour in the wrong direction. It is a method of bringing the most successful profit-makers to the top by a ruthless struggle for survival, which selects the most efficient by the bankruptcy of the less efficient.

Perfect competition is an idealized market structure that achieves an efficient allocation of resources. This efficiency is achieved because the profit-maximizing quantity of output produced by a perfectly competitive firm results in the equality between price and marginal cost. In the short run, this involves the equality between price and short-run marginal cost. In the long run, this is seen with the equality between price and long-run marginal cost at the minimum efficient scale of production.

The conditions of perfect competition, including: (1) large number of small firms, (2) identical products sold by all firms, (3) freedom of entry into and exit out of the industry, and (4) perfect knowledge of prices and technology, ensure that perfect competition efficiently allocates resources. In fact, this is a primary role of perfect competition: a market structure that illustrates perfection, the best of all possible resource allocation worlds (Arnold, 2001: 501).

2.1. Characteristics of Perfect Competition

Perfect competition: an economic model characterized by the assumption of (1) a large number of buyers and sellers, (2) free entry and exit, (3) product homogeneity, and (4) Perfect information.

Free entry and exit: a situation in which there are no differential impediments across firms in the mobility of resources into and out of an industry

Homogeneous products: standardized products that, in the eyes of consumers, are perfect substitutes for one another.

2.2. Theoretical Perspectives on Efficiency of Perfect Market

Adam Smith (1776): "Every individual endeavors to employ his capital so that its produce may be of greatest value. He generally neither intends to promote the public interest, nor knows how much he is promoting it. He intends only his own security, only his own gain. And he is in this led by an invisible hand to promote an end which was no part of his intention. By pursuing his own interest he frequently promotes that of society more effectually than when he really intends to promote it.

Rothbard (2004, p 83) argues that, " laissez-faire or free-market doctrine does not assume that everyone always knows his own interest best; it asserts rather that everyone should have the right to be free to pursue his own interest as he deems best." Thus it can be argued that competition policies alone cannot eradicate market imperfections. Economic policy makers need to consider reform agenda seriously. Broad based reforms in various sectors can create an environment.

However, whether competition promotes technical efficiency remains questionable (Schwartzman, 1973). To avoid conceptual muddle, Leibenstein (1973) calls unobservable technical efficiency X-efficiency which "involve internal organizational problems." In sharp contrast to the argument put forward by Schwartzman (1973) showed how competitive outcome is superior to monopoly outcome even in terms of the "degree of X-efficiency."

Hay and Liu (1997), concluded that "long run efficiency is related to investment by the firms, suggesting that in a more competitive environment the firm has not only a strong incentive to improve its efficiency performance (increased market share and higher profitability), but also the means (investment) to do so…Short run improvements in efficiency resulted, probably the result of managerial effort; and these improvements were larger the greater the improvements achieved contemporaneously by rival firms which is conducive for competition and hence economic efficiency can be achieved contemporaneously by rival firms.

As Hayek recognized, perfect competition is not a form of competition at all; it actually means the absence of all competition (Hayek, 1948: 92 - 96). Under perfect competition, there is no competition to differentiate one's product, no competition to gain economies of scale and drive one's costs down, and no

competition to gain or disseminate information. It is not a good concept because it has nothing to do with the actual nature of competition and exists nowhere in reality.

In fact, a good concept of competition is one based on rivalry. This says "to compete" one must try and outdo one's competitors in production and voluntary trade. It means a firm tries to differentiate its product, drive its costs down and set a lower price, advertise, and drive its competitors out of business by getting customers to voluntarily switch to its product. This provides one with a good understanding of how competition actually takes place in an economic system (Kelvin, 1974; Kautsoyiannis, 1979).

2.3. Applicability of the Theory of Perfect Competition

First, consider the idea that all products must be the same to have perfect competition. What does this imply? It implies that there is no competition with respect to differentiation in quality and style (Marshall, 1920). This means that if perfect competition is to exist; firms cannot try to make their product different from or better than their rivals' products. Therefore, this concept of "competition" actually excludes one major aspect of competition. Furthermore, there would be no variety in the types of goods that exist. As one can easily observe in real economies, actual competition has the exact opposite effect.

Second, what about the idea that an industry must have a large number of small firms in order to be considered perfectly competitive? This excludes competition by companies to drive their costs down and gain a competitive edge over their rivals by achieving economies of scale. This is probably one of the most intense aspects of actual competition in the marketplace. If every industry was composed of a large number of small firms, costs in many industries would be higher, and this would lead to a lower productive capability and standard of living. Again, this is the exact opposite result that is achieved by actual competition.

Third, what about the idea that an industry must have insignificant barriers to entry and exit to be perfectly competitive? This ignores a crucial distinction between two types of barriers to entry that one must consider when assessing whether competition exists: natural and government imposed barriers. Natural barriers, such as high capital requirements, brand loyalty, or knowledge about how to produce a good, are a part of competition and voluntary trade (Kelvin, 1974; Kautsoyiannis, 1979). For example, a firm gains customer loyalty by producing a product that customer like enough that they will not easily switch to a different brand.

The Government imposed barriers impede competition and voluntary trade and are achieved through the initiation of physical force. They are achieved by the government forcibly preventing some firms from competing (such as through exclusive government franchises), making it harder for some to compete (such as through tariffs, quotas, and licenses), or by providing an artificial advantage to some companies (through subsidies). These types of barriers restrict competition. By ignoring the fundamental distinction between these two types of barriers to entry, perfect competition lumps these two fundamentally different things together and says when any barriers exist competition is lessened.

Fourth, what about the idea that perfect information must exist for an industry to be perfectly competitive? This is blatantly absurd. Perfect information implies that humans must be omniscient in order for competition to exist. However, part of competition is competition concerning information and knowledge. Competition to gain knowledge about what methods of production to use, competition to gain knowledge about customers (such as through focus group studies), and competition among firms to disseminate information (Spring 2007).

By assuming that we must have perfect information to have an allegedly perfect form of competition, again, a major component of competition is excluded. For example, countries like India where almost half of the people are illiterate, the concept of perfect information may not be applicable.

Fifth, what about the idea that perfectly competitive firms are price takers? This characteristic ignores the fact that many firms set their prices based on costs of production they can achieve. Firms compete intensely by continuously driving their costs down, setting a lower price, and thus gaining a competitive advantage over their rivals. Hence, in requiring firms to be price takers, perfect competition excludes another aspect of actual competition.

3. MANAGERIAL DECISIONS TOOLS IN PERFECT COMPETITION

Tools of managerial economics can be used to achieve virtually all the goals of a business organization in an efficient manner. Typical managerial decision making may involve one of the following issues:

- Deciding the price of a product and the quantity of the commodity to be produced
- Deciding whether to manufacture a product or to buy from another manufacturer
- Choosing the production technique to be employed in the production of a given product
- Deciding on the level of inventory a firm will maintain of a product or raw material
- Deciding on the advertising media and the intensity of the advertising campaign
- Making employment and training decisions
- Making decisions regarding further business investment and the mode of financing the investment

3.1. Efficiency Condition in Perfect Competition

3.1.1. Economic efficiency

Following Pareto criterion (oppitimality) a particular allocation of resources can be called economically efficient if it is impossible to make an agent better-off without making someone else worse-off. This is a static concept in the sense that it always pertains to a given stock of knowledge and technology. It is a value-free definition. It is also narrow in nature because it only takes into account allocative efficiency and nothing else. In a barter economy where economic agents exchanged goods according to their respective tastes and preferences, terms of trade ensured attainment of economic efficiency.

However, in a modern market economy the whole system of exchange becomes too complex and hence economic agents require appropriate incentives that drive the economy towards economic efficiency. It is the prices which give required incentives to both consumers and producers and thereby facilitate achieving equilibrium which is efficient**.** Productive efficiency is the situation in which a good or service is produced at the lowest possible cost. Managers of firms strive to earn an economic profit by reducing costs. But in a perfectly competitive market, other firms quickly copy ways of reducing costs, so that in the long run only consumers benefit from cost reductions.

There are three fundamental conditions for attaining economic efficiency. Firstly, Marginal rate of technical substitution (MRTS) between any pair of inputs must be equal for all producers. Secondly, marginal rate of substitution (MRS) between any pair of goods must be the same for all consumers. Thirdly, marginal rate of product transformation (MRPT) must be equal to the marginal rate of substitution for each pair of goods. The first condition represents producers' equilibrium and hence gives us the possible combinations of optimal product-mix which is known as production possibility frontier (PPF). If an economy operates on PPF, then she utilizes her factors of production optimally with respect to the existing technology. The second condition gives us the utility contract curve of consumers along which no consumer can be made better-off without making someone else worse-off given the product-mix produced by the firms. The third condition ensures that market clears. In other words there is no unmet demand in the economy.

All the three conditions of economic efficiency elaborated above can be achieved in a perfectly competitive economy and this is called the first theorem of welfare economics. All producers pay factors of production according to the value of their marginal products. In other words, prices equal marginal costs. Consumers equate MRS of a pair of goods with respective relative prices. Finally, market clears with no excess demand. In the long run each firm operates at the lowest average cost.

3.1.2. Allocative efficiency

An efficient allocation of resources is achieved if it is not possible to increase society's overall level of satisfaction by producing more of one good and less of another good. Such efficiency is achieved by a firm if the price of a good is equal to the marginal cost of production. Consider how the equality between price and marginal cost results in efficiency. Competitive firms not only produce goods and services at the lowest possible cost, they also produce the goods and services that consumer's value most.

Perfect competition achieves allocative efficiency. Allocative efficiency is a state of the economy in which production represents consumer preferences; in particular, every good or service is produced up to the point where the last unit produced provides a marginal benefit to consumers equal to the marginal cost of producing it.

Productive efficiency and allocative efficiency are useful benchmarks against which to compare the actual performance of the firm. Allocative efficiency is when a business produces the optimal amount of a product. This is when the marginal cost is equal to the price that it is sold for. Essentially it is the equilibrium price, which is seen where the demand curve and the supply curve intersect. When something is allocatively efficient, the firm receives the maximum net benefit from the sale. If one were to achieve allocative efficiency, they would have made a perfect market. Producing what consumers want in the perfect amount would make for a happy consumer and producer. At this point it becomes impossible to increase the well-being of one individual without hurting the well-being of another.

- **Price***:* The price that buyers are willing to pay for a good indicates the satisfaction generated from producing and consuming the good. If a good generates more satisfaction, then society is willing to pay a higher price.
- **Marginal Cost**: The marginal cost of production indicates the satisfaction foregone from the production of other goods. If foregone production generates more satisfaction, then the marginal cost of production is higher.

If price is equal to the marginal cost, then the value of the good produced is equal to the value of goods not produced. The satisfaction obtained from production is just matched by the satisfaction foregone for other production.

In this way, society cannot squeeze any additional satisfaction out of resources by producing more of one good and less of another. If, however, price and marginal cost are not equal, then satisfaction can be

increased.

- **Price > Marginal Cost***:* If price exceeds marginal cost, then the satisfaction obtained from the good produced is greater than the satisfaction foregone from other production. As such, society can increase overall satisfaction by producing more of the good.
- ***Price < Marginal Cost***: If price falls short of marginal cost, then the satisfaction obtained from the good produced is less than the satisfaction foregone from other production. As such, society can increase overall satisfaction by producing less of the good.

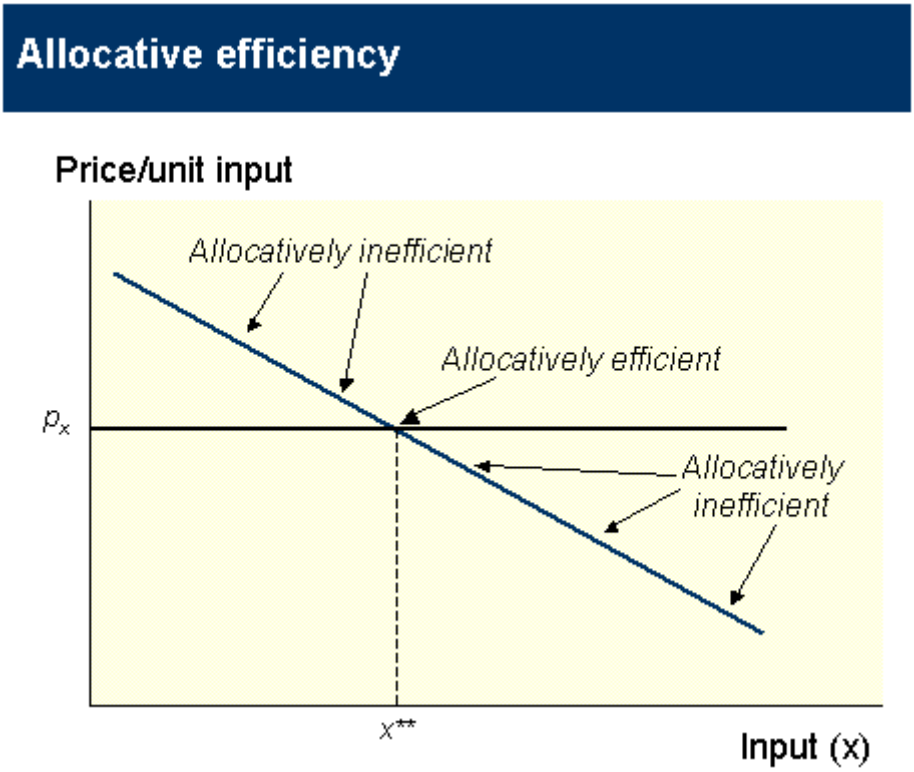

Figure1: Allocative efficiency of the perfect competition

3.2. Profit Maximization in Perfectly Competitive markets

3.2.1. Short- run analysis

In the short run, the firm has fixed resources and maximizes profit or minimizes loss by adjusting output. Firms should produce if the difference between total revenue and total cost is profitable (EP >0), or if the loss is less than the fixed cost (EP>- FC). The firm should not produce, but should shut down in the short run if its loss exceeds its fixed costs. By shutting down, its loss will just equal those fixed costs. Fixed cost in real life would be rent of the office, business license fees, equipment lease, etc. These costs would have to be paid with or without any output. Therefore, fixed cost would be the loss of shut down at any time.

If by producing one unit of output, this loss could be lowered, then this unit should be produced to minimize the loss. However, if by producing one unit of output, this loss would be higher, then this unit should not be produced. The firm should shut down, just pay for the fixed cost.

Marginal revenue and marginal cost (MC) are compared to decide the profit-maximizing output. If MR > MC, then the firm should continue to produce. If MR = MC, then the firm should stop producing the additional unit. As the additional unit's MC would be higher according to law of diminishing returns, MR would be less than MC; that is, the firm would loss profit by producing additional units. Therefore, this is the profit maximizing output level. If MR < MC, then the firm should lower its output.

Managerial Decision to Shut Down

In the short run, a firm should shut down when P < min (AVC). This means that it is impossible for revenues per unit to be as high as variable cost per unit–it is better to avoid these variable costs. Compare profits of producing Q to the profits when the firm shuts down:

B (0) = - FC

B (Q) = P×Q - FC – VC..... 1

Therefore, B (Q) > B (0) when P×Q > VC. Divide both sides by Q: P > AVC. If we can find a Q where P > AVC, then producing Q is better than 0. If P < min (AVC) then it is impossible to do better than shutting down.

If EP< - FC firm should shut down. Then its lost will be the fixed cost. EP = - FC. In order for EP < - FC, market price, P, must be lower than the minimum AVC. If EP> - FC, firm should produce. That is when market price is greater than minimum AVC.

Table 1 . Short run analysis of perfect competition

Short run cost and revenue of a competitive firm (in dollars)

Q	P	TR	TC	TVC	ATC	AVC	π	π/p	MR	MC
0	12	-	15	0	-	-	15	-	-	-
1	12	12	25	10	25	10	13	13	12	10
2	12	24	33	18	16.5	9	9	4.50	12	8
3	12	36	40	25	13.30	8.3	4	1.30	12	7
4	12	48	46	31	11.5	7.8	2	0.50	12	6
5	12	60	54	39	10.8	7.8	6	1.2	12	8
6	12	72	63	48	10.5	8	9	1.5	12	9
7	12	84	73	58	10.4	8.3	11	1.57	12	10
8	12	96	84.90	69.90	10.61	8.7	11.10	1.39	12	11.90
9	12	108	98	83	10.9	9.2	10	1.25	12	13.10
10	12	120	113	98	11.3	9.8	7	0.70	12	15
11	12	132	132	117	12	10.6	0	0	12	19

Profit is maximized at the output where total revenue (TR) exceeds total cost (TC) by the largest possible amount. This occurs at output q1 where profit is equal to AB. The total profit curve which plots total profit explicitly at each rate of output, also shows the point of profit maximization.

Figure 2, shows how we identify the most profitable level of output by using the total revenue and total cost curves. The total revenue curve is a new relationship, but it is a relatively simple one when we are dealing with a competitive firm. With the price per unit constant, total revenue rises in proportion to output and is, therefore, drawn as a straight line emanating from the origin. Its slope, showing how much total revenue rises when output changes by one unit, is marginal revenue.

In terms of Figure 2, the firm wishes to select the output level where total revenue exceeds total cost by the largest possible amount—that is, where profit is greatest. This situation occurs at output q1, where total revenue, Aq1, exceeds total cost, Bq1, by AB. The vertical distance AB is total profit at q1. At lower and higher output levels, total profit is lower than AB. Note that at a lower output level, q0, for example, the TR and TC curves are diverging (becoming farther apart) as output rises, indicating that profit is greater at a higher output. This reflects the fact that marginal revenue (the slope of TR) is greater than marginal cost (the slope of TC) over this range.

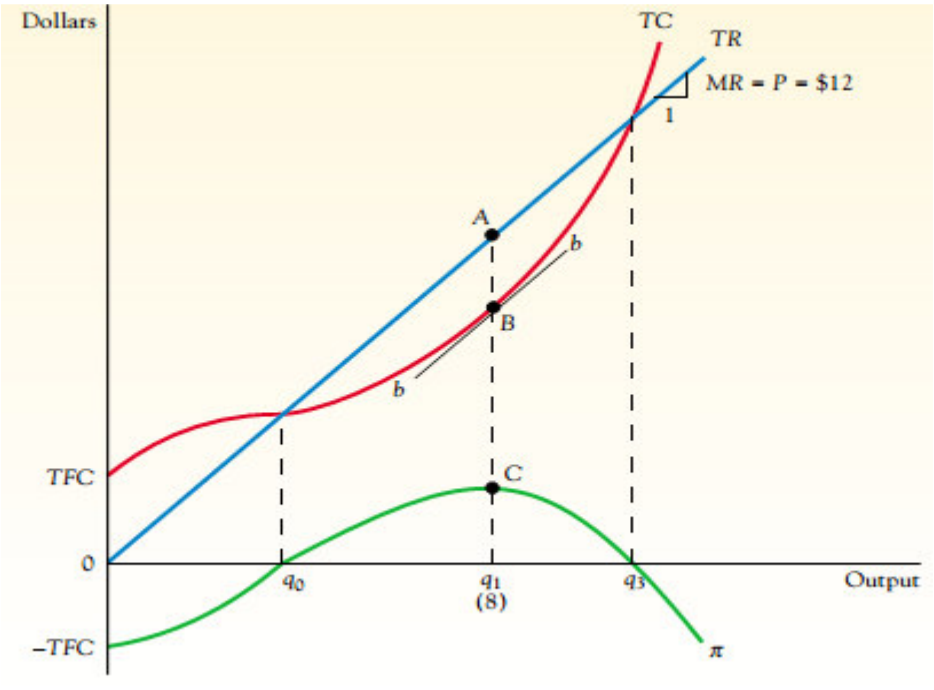

Figure 2: Short run analysis of the efficiency of perfect competition

3.2.1. Long-run analysis

In the long run, the number of firms in the industry, and their size can adjust. Changes in the market demand affect the price and thereby the firms' profits. The presence of an economic profit means that as time passes new firms enter the industry; the presence of an economic loss means that eventually some existing firms exit. When firms earn a normal profit, there is no incentive to enter or exit.

♦ Economic profits bring entry by new firms. The industry supply curve shifts rightward and reduces the market price. The fall in price reduces economic profit and decreases the incentive to enter the industry. New firms enter until it is no longer possible to earn an economic profit.

♦ Economic losses lead to exit by existing firms, which shifts the industry supply curve leftward. The price rises, and the higher price reduces economic losses. Firms exit until no firms incur an economic loss. Firms change their plant size if it increases their profits. In long-run competitive equilibrium, three conditions are satisfied:

- ✓ MR (= P) = MC — the firm maximizes its profits.
- ✓ P = minimum short-run average cost (SRAC) — the firm's economic profit is zero.
- ✓ P = minimum LRAC — the firm's plant size can- not be changed in order to increase its profits.

3.2.2. The Firm's long Run managerial Decision in perfect competition

In the long run, a profit-maximizing firm would exit the industry if TR < TC at all output levels. Dividing by Q, the condition for exit is: P < min (ATC) similarly, a potentially active firm should enter industry if it can receive positive profits. Remember that opportunity cost is included, so that the firm can receive higher profits than any other industry. Enter if P > min (ATCA perfectly competitive firm's long run supply curve is 0 below min (ATC), and its MC curve above min (ATC).

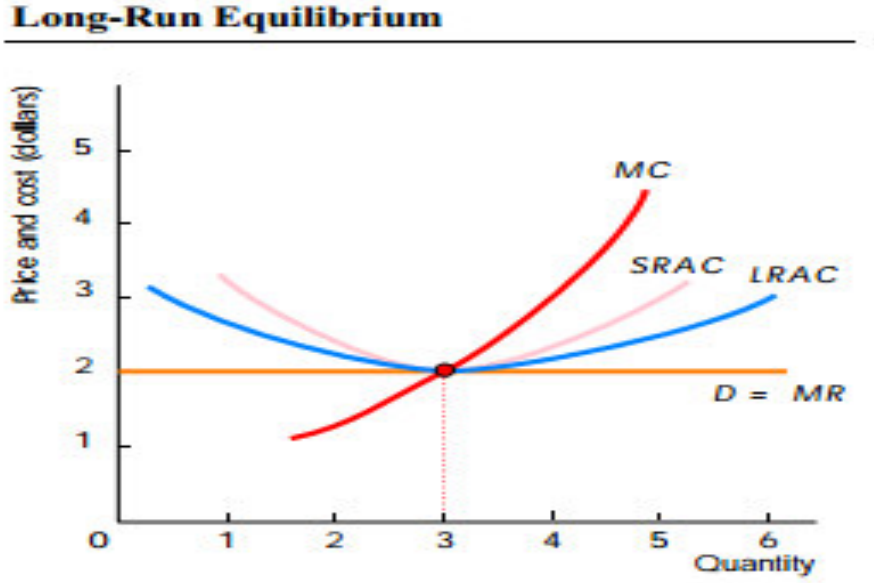

Figure3: Long run equilibrium of perfectly competitive market structure

3.2.3. Implementing the profit-maximizing output decision

We have known the fundamentals of the theory of profit maximization, now we will introduce how to implement and use the theory to maximize profits.

Five steps to find the profit-maximizing rate of production and the level of profit:

Forecast the price of the product: we can use time-series forecasting and econometric forecasting to forecast the price of the product. Remember that perfectly competitive firm does not face a downward sloping demand curve but simply takes the market price as given.

Estimate average variable cost $SAVC$ and marginal cost SMC . A cubic specification form for estimating a family of short-run cost curves.

$$STVC = aQ + bQ^2 + cQ^3 \quad \text{..... 2}$$

$$SAVC = a + bQ + cQ^2 \quad \text{..... 3}$$

The marginal cost function associated with this average variable cost function is:

$$SMC = a + 2bQ + 3cQ^2 \quad \text{..... 4}$$

Check the shutdown rule. The $SAVC$ reaches its minimum value at $Q_m = -b/2c$.

The minimum value of $SAVC$ is then determined by substituting Q_m into the $SAVC$ function:

$$SAVC_{\min} = a + bQ_m + cQ_m^2 \quad \text{.....5}$$

If $P \geq SAVC_{\min}$, the firm should produce at the output level where $P = MC$. If $P < SAVC_{\min}$, the firm should shut down in the short run and it losses an amount equal to its total fixed costs.

If $P \geq SAVC_{\min}$, find the output level where $P = MC$. In the case of a cubic specification for cost, it requires that: $p = SMC = a + 2bQ + 3cQ^2$

Solving this equation for Q^* gives the optimal output level for the firm unless $P < SAVC_{\min}$, and then the optimal output level is zero.

Computing of profit or loss;

Profit or loss is equal to total revenue minus total cost.

$$\pi = TR - STC = (p \times Q^*) - \left[(SAVC \times Q^*) + STFC\right]$$
$$= (p - SAVC) \cdot Q^* - STFC \quad \text{..... 6}$$

If $P < SAVC_{\min}$, then the firm shuts down, and $\pi = -STFC$

An example: Profit maximization at Beau Apparel (P459-465)

Price forecasts: $p_{high} = 20, p_{medium} = 15, p_{low} = 10$

Estimation of average variable cost $SAVC$ and marginal cost SMC

$$SAVC = 20 - 0.003Q + 0.00000025Q^2$$

Then, $$SMC = 20 - 0.006Q + 0.00000075Q^2$$

The shutdown decision is then

$SAVC$ Reaches its minimum value at $Q_m = -b/2c = -(-0.003)/2(0.00000025) = 6000$

$$SAVC_{\min} = 20 - 0.003Q_m + 0.00000025Q_m^2 = 11$$

So the firm should produce when $p_{high} = 20$ and $p_{medium} = 15$. The firm should shut down when $p_{low} = 10$.

The output decision

$$p = SMC = 20 - 0.006Q + 0.00000075Q^2$$

When $p_{high} = 20$, $Q^* = 0$ or $Q^* = 8000$, $SAVC_{Q=8000} = 12$ .When $p_{medium} = 15$, $Q^* = 945$ or $Q^* = 7055$. $SAVC_{Q=945} = 17.39$, $SAVC_{Q=7055} = 11.28$. So if the wholesale price is expected to be 15, the manager would produce 7055 units, at which $SAVC$ is 11.28.

Computation of total profit or loss:

$STFC = 30000$. When $p_{low} = 10$, $\pi = -30000$

$$\pi = (p - SAVC) \cdot Q^* - STFC$$

When $p_{high} = 20$, $Q^* = 8000, \pi = (20 - 12) \cdot 8000 - 30000 = 34000$

When $p_{medium} = 15$, $Q^* = 7055, \pi = (20 - 11.28) \cdot 7055 - 30000 = -3755$

3.3. Competition and Efficiency

Resources are used efficiently when we produce the goods and services valued most highly. When resources are used efficiently, no one can be made better off without making someone else worse off.

Consumers' demands reflect their efforts to get the most value from their incomes. The demand curve is consumers' marginal benefit curve. Producers' supplies reflect the firms' efforts to maximize their profits. The supply curve is producers' marginal cost curve. If there are no external benefits (benefits that accrue to people other than the buyer of the good) and no external costs(costs not borne by the producer of the good or service) perfect competition is efficient

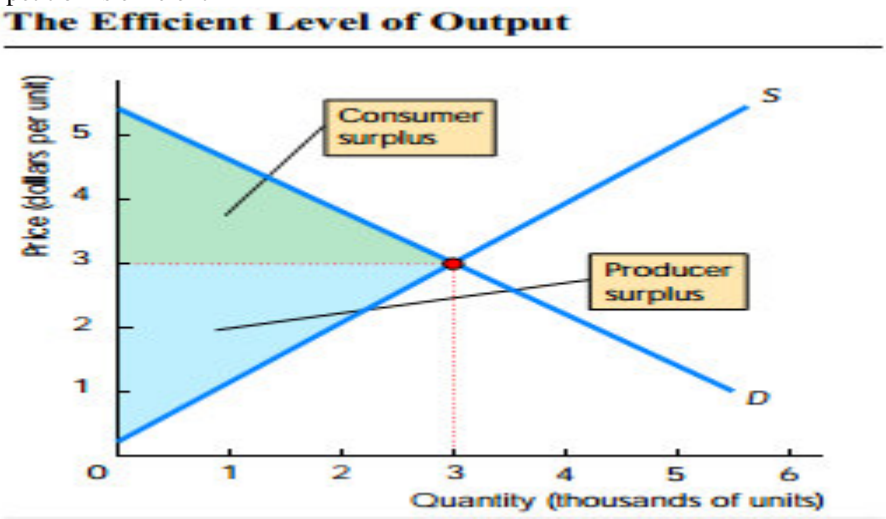

Figure 4: Efficiency in perfect competition

3.4. Operation With Zero Economic Profit

Why a firm does continue to operate even though its economic profit is zero? The key to this result rests in the definition of cost. Recall that the company's total costs are all its opportunity costs, which include both explicit and implicit costs. Among the implicit costs is the normal profit, the return the owners can earn on the average in an alternative business. When total revenue equals total cost, so that there is zero economic profit, the owners are earning the same profit they could obtain else-where. At this point, the firm earns a "normal profit." As the phrase implies, a normal profit is one that could normally be earned in any other industry. Even though the economic profit is zero, by earning a normal profit the firm is earning just as much profit as it could anywhere else and its owners therefore are content to continue producing in the same industry.

4. SUMMARY AND CONCLUSION

Agricultural industries come closest to being perfectly competitive because the products are close to being identical and the farmers take whatever price they can get for their products in the commodity markets. Perfect competition is an idealized market structure that achieves an efficient allocation of resources. This efficiency is achieved because the profit-maximizing quantity of output produced by a perfectly competitive firm results in the equality between price and marginal cost. *There are three fundamental conditions for attaining economic efficiency*. *Firstly*, Marginal rate of technical substitution (MRTS) between any pair of inputs must be equal for all producers. *Secondly*, marginal rate of substitution (MRS) between any pair of goods must be the same for all consumers. *Thirdly*, marginal rate of product transformation (MRPT) must be equal to the marginal rate of substitution for each pair of goods.

In the short run, the firm has fixed resources and maximizes profit or minimizes loss by adjusting output. Firms should produce if the difference between total revenue and total cost is profitable (EP >0), or if the loss is less than the fixed cost (EP>- FC). The firm should not produce, but should shut down in the short run if its loss exceeds its fixed costs. Profit is maximized at the output where total revenue (TR) exceeds total cost (TC) by the largest possible amount.

In the long run, the number of firms in the industry, and their size can adjust. Changes in the market demand affect the price and thereby the firms' profits. Economic profits bring entry by new firms. The industry supply curve shifts rightward and reduces the market price. The fall in price reduces economic profit and

decreases the incentive to enter the industry. New firms enter until it is no longer possible to earn an economic profit.

Economic losses lead to exit by existing firms, which shifts the industry supply curve leftward. The price rises, and the higher price reduces economic losses. Firms exit until no firms incur an economic loss. Firms change their plant size if it increases their profits. Resources are used efficiently when we produce the goods and services valued most highly. When resources are used efficiently, no one can be made better off without making someone else worse off.

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