Theoretical and Practical Research in Economic Fields

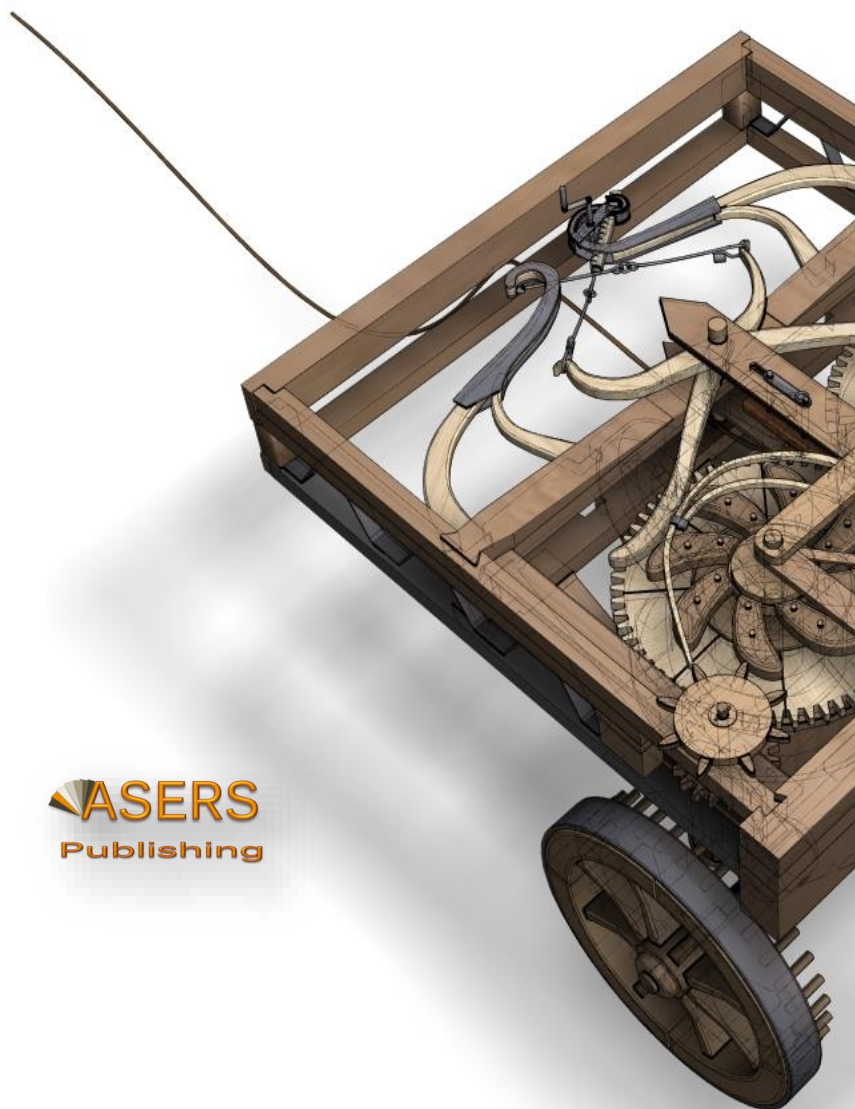**ASERS Publishing** is an advanced e-publisher struggling to bring further worldwide learning, knowledge and research. This transformative mission is realized through our commitment to innovation and enterprise, placing us at the cutting-edge of electronic delivery in a world that increasingly considers the dominance of digital content and networked access not only to books and journals but to a whole range of other pedagogic services.

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Theoretical and Practical Research in Economic Fields

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Is There Excess Capacity Really?

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Abstract:

Excess capacity is viewed as a distinctive feature and an essential inefficiency of monopolistic competition as the large-group case of imperfect competition. Using a simple geometrical approach and studying the demand and cost curves faced by the individual firm, we find that there is little potential for excess capacity in monopolistically competitive markets, opposite to the common perception and wide coverage in the literature. We see monopolistic competition as the true type of competition in the presence of transaction costs where perfect competition is a hypothetical and ideal benchmark which cannot exist under positive transaction costs.

Keywords: excess capacity, monopolistic competition, oligopoly, transaction costs.

JEL Classification: D23, D24, D43, L13.

1. Introduction

Excess capacity is viewed as a unique inefficiency of monopolistic competition as the 'large-group' case of imperfect competition. Since Robinson (1933) and Chamberlin (1947) various 'wastes' of monopolistic competition have been discussed. Some major sins of monopolistic competition mentioned are excessive advertising, selling costs, packaging, cross transportation, too much variety and lack of product standardization, too small or inefficient scale. The very idea of the inefficiency of monopolistic competition is enhanced by Chamberlin and Robinson who treat monopolistic competition as imperfect, implying thus its inefficiency. According to Klein (1960) Chamberlin (1947) gives an implication that imperfect competition causes inefficiency in economic organization and thus gives rise to excess capacity. Klein (1960) also notes that economic analysis is replete with use of the term capacity, but comparatively little attention is devoted to a precise theoretical statement of the concept or the measurement of capacity.

Such a harsh treatment of monopolistic competition perhaps originates in the fact that Chamberlin wrongly merged two concepts, monopoly and competition, to the extent that contemporary students perceive monopolistic competition as a form of monopoly. Chamberlin (1952) claims that his book arouse out of the 'attempt to combine the two theories of monopoly and of competition into a single one which would come closer to explaining the real world, where, it seemed the two forces were mingled in various ways and degrees.' In his own attempt to blend monopoly and competition, the marginal revenue curve was seen as a piece of pure technique unrelated to thecentral problem. Chamberlin, on the one hand, assumed that monopolistic competition shares the features of monopoly but, on the other, perceived the demand curve of the monopolistically competitive firm as very flat. In his response to Nichol Chamberlin reaffirms that he himself has 'described the typical curve as highly elastic' (Nichol, 1934). That Chamberlin

had no clarity on the distinction between monopoly and monopolistic competition becomes evident from his discussion of advertising in the two types of market structures:

'And although advertising is inevitably linked to monopoly in the sense that it could not take place under pure competition, it is a perfect illustration of the paradox of 'monopolistic competition': it is a leading means whereby monopolists compete with each other.' (Chamberlin, 1952)

Chamberlin seems to confuse oligopoly with monopolistic competition attributing advertising to monopoly and equating perhaps 'the small-group' case with the 'large-group' case when it comes to advertising. While today there is excessive advertising in oligopolistic industries, both monopoly and monopolistically competitive firms rarely resort to advertising. Monopoly does not normally advertise due to the absence of competitors and, hence, the lack of need for advertising. Monopolistically competitive firms advertise on a small scale being unable to afford mighty advertising campaigns. Monopolistically competitive firms which succeed in differentiating their product sufficiently through the means of promotion and advertising have the potential to grow into oligopolistic firms engaged in deeper advertising wars.

Excess capacity is still being taught in undergraduate economics classes as an inefficiency of monopolistic competition. It is also heavily explored in economic literature and economic research, whereby sophisticated dynamic optimization models are used to study the notion of excess capacity as a weakness of monopolistic competition. Monopoly and oligopoly are rarely referred to as sources of excess capacity. At the same time, there is the tendency in neoclassical economics to emphasize the inefficiency of monopolistic competition at the expense of the cost-economizing effects and economies of scale associated with market power. Monopoly and oligopoly are presented as attractive on account of economies of scale and lack of idle capacity, while monopolistic competition is condemned as socially inefficient and suboptimal. Ignoring transaction costs, firms with market power are much praised and justified on various grounds, while imperfectly competitive firms are considered undesirable. Since in reality perfect competition is hardly attainable and monopolistic competition as the real form of competition has shortfalls, excess capacity is a reason why markets should be organized along the 'small-group case' of oligopoly or along monopoly.

Accounting for positive transaction costs, this paper aims to rehabilitate monopolistic competition on account of the existence, or rather non-existence, of excess capacity. Using a geometrical approach, we find that there is little or insignificant excess capacity with monopolistic competition, its much stated shortfall. We thus see monopolistic competition as the true form of competition in the real world of positive transaction costs where consumers demand some variety. Questioning the existence of excess capacity with monopolistic competition we study the demand and cost curves faced by the typical firm in a given market. The excess capacity of monopolistic competition does not exist or is insignificant because: 1) the demand curve faced by the monopolistically competitive firm is flat as opposed to that of monopoly and oligopoly; 2) the envelope long-run average cost curve of the monopolistically competitive firm is likely to be steeper, not flatter, than that of a firm with market power.

Other scholars have also questioned the existence of excess capacity in monopolistically competitive markets. Some find general shortfalls in the concept of excess capacity. Nichol (1934) argues that a discontinued demand curve for the individual firm will not give rise to excess demand. Harrod challenges the free-entry principle adopted by Robinson and Chamberlin by which 'firms in imperfect competition would find equilibrium at a point where their [average] total cost curve had the same downward slope as the demand curve with which they were confronted (point of tangency).'(Kerr and Harcourt, 2002).

Harrod maintains that the entrepreneur will plan equipment accordingly, that is, 'on a scale that gives the lowest cost for producing what he can sell at such a price, and, having acquired the equipment, will sell at that price.'(Harrod, 1952, p.151) The entrepreneur will choose a plant which avoids excess capacity and will plan to charge a price yielding a normal profit (1952). Archibald (1967) distinguishes between excess capacity measured in terms of average production costs and that under average total costs, those of producing and selling. Using mathematical techniques, Dixit and Stiglitz (1977) incorporate product diversity in monopolistic competition and find that monopoly power does not distort resources and enables firms to pay fixed costs.

Our study gravitates around the second group of scholars who evaluate the demand and cost curves of monopolistically competitive firms. In real terms perfect and monopolistic competition are identical which eliminates the possibility for excess capacity. Nicols (1947) does not find essential differences between the competitive equilibrium and the Chamberlin-Robinson equilibrium except that 'consumers distinguish between products of the same general class' where Robinson (1933) recognizes that while large numbers are likely to be realized, 'the existence of a perfect market is likely to be extremely rare in the real world.'Nicols also finds that many of the cases treated by Chamberlin and Robinson are actually oligopolistic or monopolistic situations (Nicols, 1947).

To the extent that the two professors discuss firms with market power, excess capacity appears to be a problem of monopoly and oligopoly rather than perfect monopolistic competition. Schumpeter (1939) and Machlup

(1939) both suggest that perfect and monopolistic competition differ in nothing else but product differentiation and that the case of 'differentiated products without oligopolistic groupings… would not be much different from that of pure competition' (Machlup, 1939). Nutter (1955) finds that varieties are 'pure' substitutes for each other even though they may not be 'perfect' substitutes. Thus, although differentiated, products sold in monopolistically competitive markets are not essentially different.

Demsetz (1982) has argued that product differentiation, economies of scale, and capital cost differentials create entry barriers because of the costs of information. Patents and trademarks serve as entry barriers, while consumers view huge investments in fixed capital and sunk costs as commitment to quality. All these increase the market power of the firm. Demsetz (1959) demonstrates that excess capacity is not a necessary implication of the assumptions underlying Chamberlin's model. He correctly observes that keeping the assumption of product differentiation forces the problem into the structure of monopoly, natural monopoly or 'the never-never land of oligopoly,' while keeping the free-entry assumption forces the problem into the competitive frameworks (Demsetz, 1972).

Baumol (1964) discusses that in the narrow sense of the excess capacity theorem the typical company's demand curve may plausibly be expected to be quite flat and excess capacity correspondingly insignificant. The excess capacity theorem suggests that the same total output would be produced more efficiently and at less cost by a smaller number of firms[3]. Discussing the social costs of standardization, Baumol observes that if the number of firms in the industry is reduced, the variety of products available to consumers must fall. The resulting saving in resources is then to be considered a net gain depending on the case and the excess capacity theorem represents a real social cost only if the total physical costs increase more than the increased choice for consumers (Baumol, 1964)

2. The demand curve of the monopolistically competitive firm

A firm which produces at full capacity is one operating at the lowest point of its long-run average total cost curve .By definition, the further to the left of this minimal point the firm is, the more idle capacity there is in the operations of the firm. Thus a perfectly competitive firm is presumed to operate at full capacity since in a long-run equilibrium its demand curve is just tangent to the envelope curve exactly at the minimum point of capacity output, that is, the optimal scale of production. Due to its very nature of a price taker the individual perfectly competitive firm faces a horizontal demand curve. Monopoly and oligopoly face negatively sloped demand curves but are not normally seen as sources of excess capacity because they do not typically produce at the tangency point of price and average cost. These two market structures are said to explore economies of scale fully, preventing thus idle capacity. The argument of the efficiency of monopoly power on account of large size and economies of scale and scope undermines its high social costs, including deadweight social loss, monopoly rents, rent-seeking, along with price discrimination, X-inefficiency, etc.

Monopoly and oligopoly have steep demand curves with monopoly having the steepest demand curve of all market structures due to the fact that the monopoly firm captures the entire market demand andconsumerslack any substitutes or viable alternatives. In theory the demand curve of a monopoly firm serving a particular market is steeper than the individual demand curves of two or three oligopolists which could potentially serve the same market, though all firms will have relatively steep curves. The monopoly demand curve also is much more extended to the right in comparison with any other firm since it is the entire market demand the firm captures.

The flatness of the demand curve for monopolistic competition is key to the discussion of excess capacity. How flat the demand curve is, in effect, determines the magnitude of excess capacity, with a flat demand curve producing almost no excess capacity at the same cost structure and a steep demand curve causing significant excess capacity for the individual firm. Chamberlin, on the one hand, assumed that the monopolistically competitive firm resembles monopoly in that it has market power. At the same time, he perceived the demand curve of the monopolistically competitive firm as very flat and has 'described the typical curve as highly elastic' (Nichol, 1934).

This contradiction in Chamberlin's theory results from his wrong presumption of the market power of the monopolistically competitive firm. As long as this assumption is kept, the monopolistically competitive firm appropriates

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[3]Baumol writes: "The excess capacity theorem is not a statement about the desirability of the allocation of resources among industries. It does not say that there will be too little produced by an industry (however defined) whose products are differentiated. Rather, the theorem tells us that the organization of the "industry" into firms is apt to be wasteful. It suggests that the same total output if produced by a smaller number of more sizable firms, can be provided at a lower real cost per unit, and hence a smaller total use of society's scarce resources."

the features of oligopoly and the theory is valid. But as soon as the assumption of market power is dropped, the monopolistically competitive firm appropriates a very flat demand curve and excess capacity tends to disappear.

The contradiction is embedded in the fact that market power is associated with barriers to entry of one type or another and presents itself in a very negatively sloped and extended demand curve. Barriers to entry, associated with monopoly and oligopoly, lead to 1) a very steep demand curve, and 2) large demand as shown by a much extended demand curve. Free entry, that is, free competition causes 1) a very flat demand curve, and 2) very low demand with a demand curve much closer to the origin of the coordinate system. With free entry monopolistic competition is likely to resemble perfect competition, that is, a very flat and very low demand curve closer to the origin having a slightly negative slope rather than the steep demand curve of the oligopoly. Chamberlin's and Robinson's confusion stems from the fact that they attribute market power to the monopolistically competitive firm, as if there are barriers to entry, but when it comes to the tangency point, they assume free entry as in perfect competition. Mixing up free entry with a very steep demand curve is theoretically incorrect. Mixing up market power with free entry and competition was the major reason why the mistaken belief of excess capacity was formed.

In 'The Rehabilitation of Pure Competition' Nicols (1947) claims that where small numbers exist, demand is limited regardless of product differentiation which is significant only when the number of substitutes is small. When there are many substitutes available to consumers, 'the intensity of attachment for any one product decreases in very much the same manner described by Chamberlin in shifting of the straight-line… to the left... The elasticity should increase since it is possible to get a better substitute when the number of alternatives is greater' (Nicols, 1947). In oligopolistic competition product differentiation is essential in building market power because consumers have few alternatives to choose from.

 But in monopolistic competition the assumption of free entry cancels the effect of product differentiation and product differentiation alone cannot provide market power to the individual firm. Without barriers to entry demand is limited for the firm although it resorts to product differentiation. Not only does the demand curve shift left, despite the existence of product differentiation, but the free entry principle flattens the demand curve substantially. The availability of many substitutes reduces consumer loyalty. Opposite to oligopoly where due to few alternatives and branding consumers build loyalty, in monopolistic competition consumers are indifferent and Robinson (1933) seems to be in agreement with these effects:

'…the difference, from the point of view of buyers, between any one firm and the next would thus be reduced, the customers of each firm would become more indifferent, and the elasticity would be increased.'

Monopoly is not normally associated with excess capacity since it takes the entire market demand assumed to be large enough to explore the full potential of scale. Furthermore, the monopoly firm is not expected to advertise due to the lack of competitors. Figure 1 illustrates this effect – at sufficiently large market demand monopoly faced with the D_m demand curve causes no excess capacity. But similar is the effect for the monopolistically competitive firm as reflected by its demand curve D_c. While the demand curve of the monopoly firm is very steep and quite extended up and to the right due to the absolute market power of the firm, the demand curve of the monopolistically competitive firm is very flat and low, much closer to the origin of the coordinate system. Both firms operate under the same cost structure, using the same technology, production function and cost curves. If, *ceteris paribus* (that is, same envelope $LRAC$),the industry were organized along any of the two alternatives, a monopoly firm or a group of monopolistic competitors each faced with demand D_c, there would hardly be excess capacity with either market structure. Monopoly would not cause excess capacity due to large-scale production; likewise, as Figure 1 illustrates, there would barely be excess capacity with monopolistic competition due to free entry and the insignificant slope of the demand curve. Monopolywould be more costly to society though with a considerably higher price and lower quantity produced of the product.
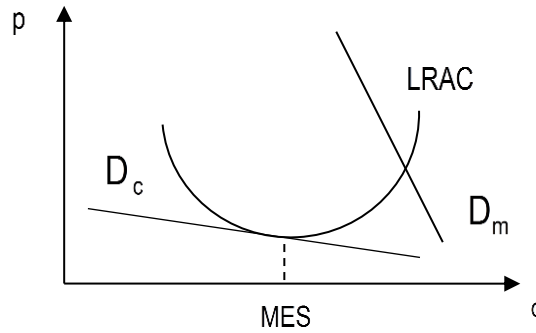
Figure 1. Monopoly versus monopolistic competition

In rare situations a monopoly might cause excess capacity. This would likely be the case in a small country where market demand is limited relative to the costs of the firm. Figure 2 represents a monopoly for which limited demand causes excess capacity. The firm is profit maximizing, presumably producing where marginal revenue equals marginal cost at price p_m, and realizing positive economic profits since price exceeds average cost in a section of the envelope curve. Yet, the monopoly produces way to the left of the minimum efficient scale and the capacity output - at the price p_m the average cost is higher than the minimum. The idle capacity at the profit-maximizing point is greater than that at the breakeven point for the firm and even more significant than what the competitive outcome could provide for. The monopoly would also give rise to excess capacity if faced with higher average costs. This would be the case with an expensive production technology or poor management leading to an elevated LRAC curve.

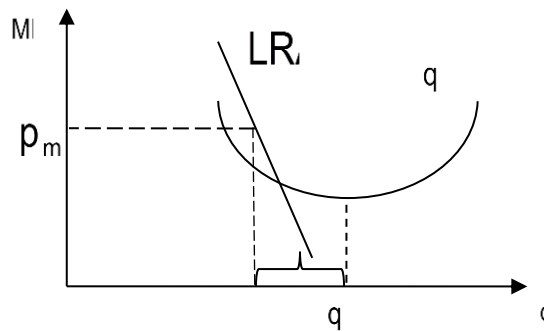**Figure 2.** Monopoly facing excess capacity

The excess capacity caused by monopoly increases the more expensive the technology and the more costly it is to organize the production process. Figure 3 illustrates that a higher envelope curve is associated with greater excess capacity, a result which follows from the steep demand curve of the monopoly D_m.
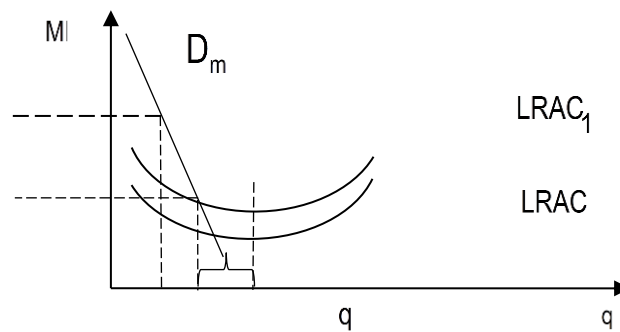

Figure 3. Monopoly under different cost structures

Excess capacity is marginally small with monopolistic competition where the perfectly competitive firm, taken as a benchmark, operates at the minimum efficient scale. Figure 4illustrates that the flatter the demand curve of the monopolistically competitive firm, the more insignificant the excess capacity. The perfectly competitive firm operates at MES and, hence, a demand curve with a zero slopes. The demand curve D_c of the monopolistic competitor would be steeper 1) the more he succeeds in differentiating his product in the market relative to other existing products, 2) the more he uses the elements of the promotional mix (particularly advertising and sales promotions) and the means of marketing, 3) the fewer the substitutes available on the market, 4) the smaller the number of firms in the industry. Alternatively, the demand curve would be flatter 1) the less successful the product differentiation undertaken by the monopolistic competitor is, 2) the less effort he invests in differentiating his product, 3) the more and closer substitutes there are available on the market and 4) the larger the number of firms in the industry. Some products in monopolistically competitive markets are totally non-differentiable enjoying thus a very flat demand curve as D_c in Figure 4. In a survey Sutton (1991, p. 566) reports that salt, sugar, bread, flour, canned vegetables and processed meat resemble homogenous industries where little advertising happens. At the same time, some other products are more differentiable with a steeper demand curve such as D'_c. Sutton found some imperfectly competitive industries such as ready-to-eat cereals, margarine, soft drinks, instant coffee, beer and pet foods to be quite advertising-intensive.
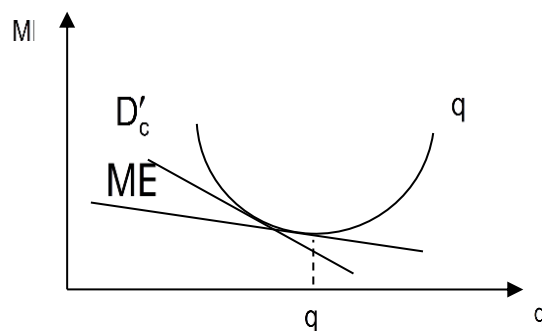

Figure 4. Monopolistic competition with different degrees of product differentiation

Because of the availability of close substitutes, the price-setting power of the monopolistically competitive firm is quite limited. Monopolistic competition is characterized by many firms producing similar though differentiated products in a market with easy entry and exit. Since the demand curve is relatively flat, the marginal cost does not lie much below price at the point of optimum and the market power of the firm in terms of the Lerner index is low. Therefore, $L = \dfrac{p - MC}{p}$ is close to 0.

Both firms in Figure 4 are monopolistically competitive and lacking market power. The long-run equilibrium setup adopted by the classical economists negates the concept of excess capacity further. Since these are long-run demand curves, they are seen as very flat, much flatter than the short-run demand curves faced by these two firms. As more and more substitutes enter the industry and consumers find cheaper and more suitable alternatives, the effect of product differentiation tends to fade away leaving the individual firm with little idle productive capacity. As can be seen in Figure 5, convex demand also reduces the potential for excess demand. Increased elasticity at greater units of output sold brings the firm nearly at the optimal scale of production.
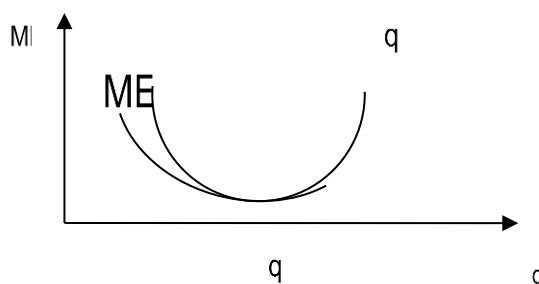
Figure 5. Monopolistic competition with convex demand

Advertising turns out to be an essential factor in the treatment of imperfectly competitive markets and the distinction between monopolistic and oligopolistic competition. As an element of the promotional mix of the firm, advertising helps the firm to differentiate its product and gain market power. Advertising acts as a barrier to entry and, at the same time, represents fixed costs for the individual firm extending thus the optimal scale of operations. Advertising is in this unique – it can change both the demand curve and the cost structure of the firm. Figure 6 illustrates advertising and a non-advertising company. The firm with the demand D_c is part of a highly competitive market and does not advertise. Consumers view its product as identical to those of other firms. Firm D_o emphasizes product differentiation by means of advertising. Advertising makes its demand curve steeper but also shifts it right bringing thus market power to this second firm. The use of advertising could potentially turn the monopolistically competitive firm ('the large-group case') into an oligopoly ('the small-group case'). Thus an oligopoly could arise of a monopolistically competitive firm which advertises heavily. With a large-scale, expensive advertising campaign a monopolistically competitive firm can shift its demand curve from D_c to D_o and turn into an oligopolist. An imperfectly competitive firm producing a unique product with no close substitutes is likely to patent it and prevent entry as well.

A monopolistically competitive firm producing a general product with many close substitutes in an industry with free entry and intense competition cannot easily carry out a magnificent advertising campaign. Due to its limited profit-making potential, small demand and low markup a monopolistically competitive firm can hardly afford massive advertising. A modest advertising budget cannot cause a significant rotation of the demand curve to the right from D_c to D_o. Thus most advertising happens within oligopolistic firms. They have the ability to advertise heavily and engage in destructive advertising wars as part of the behavior of strategic reaction but destructive advertising also raises their average costs. Advertising makes the demand curve of the individual firm steeper and extends it to the right increasing thus demand and building brand loyalty. Consumers perceive the product as unique, serving a unique purpose and not having close or distant substitutes. But advertising also acts as fixed costs for the firm, shifting its envelope curve up and to the right. In this new situation, the oligopoly becomes socially costly, creating a huge potential for excess capacity and increasing total costs due to heavy and unnecessary advertising.
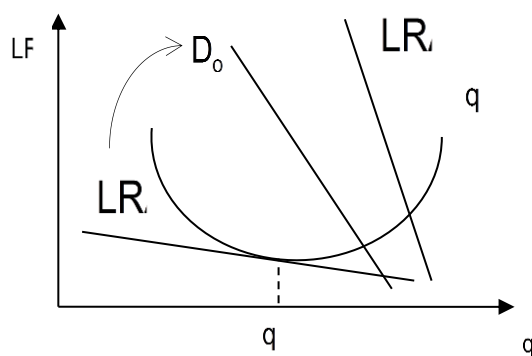

Figure 6. The monopolistically competitive firm with and without advertising

In Figure 7 the heavy advertising the oligopoly undertakes raises its costs significantly. Since advertising acts as fixed costs, the new envelope curve $LRAC'$ has its minimum to the right of the minimum of the original $LRAC$ without advertising, that is, the optimal scale of operations is extended to the right. An advertising oligopoly thus operates at significant excess capacity and increased minimum efficient scale from the competitive level MES to MES'.
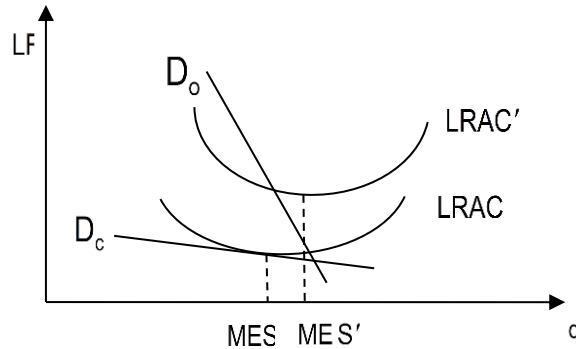

Figure 7. An advertising oligopoly

3. The cost structure of the monopolistically competitive firm

Somewhat similar to advertising would be the effect of the X-inefficiency and managerial slack. Due to its market power, the oligopoly is subject to increased administrative and managerial costs which shift the average cost of the firm up to the level of $LRAC_m$, as shown in Figure 8. Theoretically X-inefficiency does not increase the optimal scale of operations since it only brings up the envelope curve in a parallel fashion.

However, for firms with market power faced with very steep demand curves, a parallel shift of the enveloped curve results in excess capacity. For the same negatively sloped demand curve for the firm, the greater the magnitude of X-inefficiency and the less efficient the management, the higher the envelope curve and the greater the potential for excess capacity. Competitive firms have very flat demand curves but cannot be seen with X-inefficiency, operating thus at low long-run average costs. In Figure 8 the competitive firm has a low and flat demand D_c but is also faced with relatively low average costs $LRAC_c$. At the same time, oligopoly D_o and monopoly D_m have larger demand but are subject to X-inefficiency. At the competitive level of costs $LRAC_c$ the oligopoly does not create excess capacity and scale is fully exploited. But when X-inefficiency is introduced, oligopoly becomes an essential source of excess capacity. The new $LRAC_m$ envelope curve allows the oligopoly to breakeven at a point much to the left of minimum LRAC and capacity output. Subject to inefficient management, managerial slack, wasteful use of resources due to market power, poor organization and coordination of production, oligopolistic and monopolistic firms can cause serious inefficiency in terms of capacity.
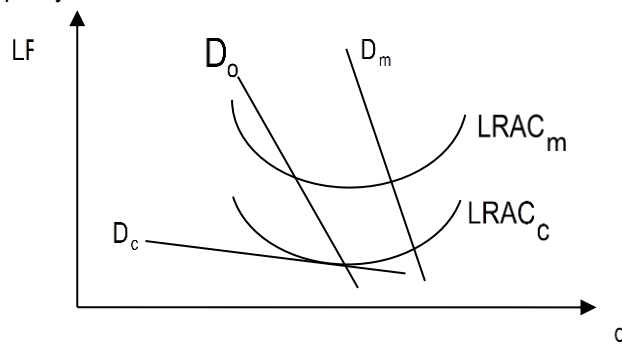

Figure 8. Monopolistic competition versus X-inefficiency

Firms which fail to innovate and improve their production technology are also likely to face a higher LRAC curve and, therefore, excess capacity. Except the efficiency of management, a given LRAC curve reflects the level of technology used in the production process. While a competitive entrepreneur would be enticed to consistently improve technology with the purpose of lowering average costs and in view of the possible threat of entry by other firms, a monopolist has less incentive to lower his LRAC curve and adopt a new, improved technology similar to what Figure 8 shows. Monopolistically competitive firms have great incentives to innovate and advance their production technologies or choose technologies and technical processes which are cost-efficient and cost-reducing. Part of this is to prevent entry, part is to respond to intense competition and part of it is to increase profit in an industry which offers a very low profit-making potential. Hence, the average cost curve of the monopolistic competitor is likely to be lower than that of the monopolist. The competitor charges the lowest price and produces the greatest production volume at minimum inefficiency possible.

This discussion reveals that excess capacity is more likely to arise in oligopoly rather than in monopolistic competition. Oligopoly is a good host for excess capacity because 1) the demand curve the oligopolist faces is quite inelastic due to intensive advertising with a strongly differentiated product where advertising expands capacity output and minimum efficient scale; 2) the demand of the oligopolist and his share of the market are lower than those of monopoly, therefore, likely lying closer to the tangency point with the LRAC cost curve; 3) the oligopolist is subject to X-inefficiency and inefficient management unlike monopolistic competition; 4) the oligopolist has less incentive to innovative relative to the monopolistic competitor. Grounds for excess capacity to arise with monopoly are X-inefficiency and failure to innovate in a sufficiently small market. Both monopoly and oligopoly charge a significantly higher price and produce much lower output than a monopolistic competitor.
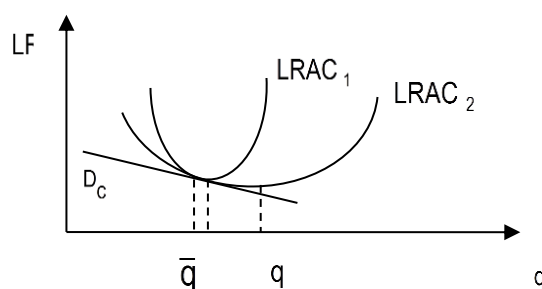

Figure 9. Monopolistic competition under different cost structures

Figure 9 shows $\overline{q}$ as a tangency point for both a steep average-cost curve such as $LRAC_1$ and a flatter one like $LRAC_2$. Along the same demand curve of a firm, excess capacity is marginally small with a steep average-cost curve such as $LRAC_1$ and significant with a flatter $LRAC_2$. Thus, whereas a flatter demand curve reduces the potential for excess capacity, a very flat average cost curve increases it. Being in a long-run equilibrium the monopolistically competitive firm will face a flatter envelope curve compared to a short-run one but all costs in the long run would be variable costs. Curve $LRAC_2$ provides essential advantages to scale, whereas $LRAC_1$ does not. In competitive markets entry is possible on a small scale and economies of scale are small relative to the size of the market.

This determines a large number of sellers, each with a small share of the market. Likewise, there are many buyers demanding small amounts of the product on the respective market. Contrary to competitive markets, in industries with market power economies of scale are extensive and entry is justified on a large scale so that to produce at lower unit cost. A new entrant requires a significant market share and monopolistic and oligopolistic industries with few participants in them are likely to be those with expanded envelope curves.
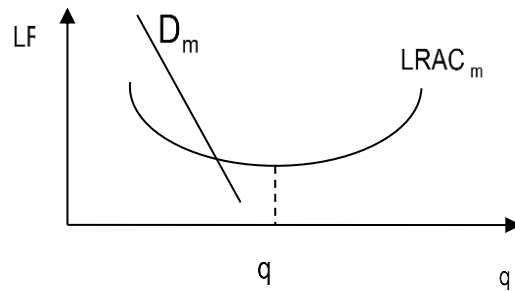
Figure 10. Monopoly's typical cost structure

Figure 10 shows an industry with room for only one firm due to extensive economies of scale. The specific technology and cost structure prevent entry on a small scale which favors only one or few large firms. A natural monopoly, faced with continuously falling long-run average costs, benefits from scale, too. Natural monopolies such as public utilities where most of the investment is in the form of initial, setup costs are examples of how technology favors a few large firms in the sector (Figure 11).
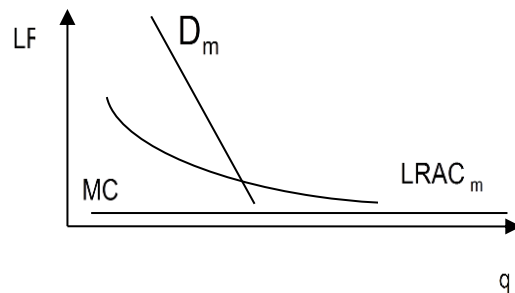

Figure 11. A natural monopoly

What are some determinants of scale which shape a particular industry? Some distinguish between economies of scale and returns to scale where the former are related to the cost of organizing production and the size of the firm relative to that of the market, while the latter reflect the technology the firm utilizes.[4]Scale can be measured by the index of scale economies

$$S = \frac{AC(q)}{MC(q)}$$

In the stage of economies of scale, as depicted in Figure 12,the index is $S > 1$since average cost exceeds marginal cost. Consequently, for constant returns to scale at capacity output q_c (Figure 12), $S = 1$, and $S < 1$ for diseconomies.Differentiating average cost with respect to output,

$$AC(q) = \frac{TC(q)}{q}$$

$$AC'(q) = \frac{TC'(q)q - TC(q)}{q^2} = \frac{MC(q)}{q} - \frac{AC(q)}{q} = \frac{MC(q) - AC(q)}{q}$$

At the capacity output q_c we have $MC(q) = AC(q)$. Furthermore,

1) $MC(q) < AC(q)$, $AC'(q) < 0$ - economies of scale;

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[4] We use economies of scale and returns to scale as synonyms throughout this paper.

2) $MC(q) = AC(q)$, $AC'(q) = 0$ - neither economies, nor diseconomies;

3) $MC(q) > AC(q)$, $AC'(q) > 0$ - diseconomies of scale.

For the second derivative,

$$AC''(q) = \frac{\big[MC(q) - AC(q)\big]'q - \big[MC(q) - AC(q)\big]}{q^2} = \frac{MC'(q) - AC'(q)}{q} - \frac{AC'(q)}{q} = \frac{MC'(q) - 2AC'(q)}{q}$$

At the stationary point we have $AC'(q) = 0$, so the second derivative should be positive for a minimum

$$AC''(q) = \frac{MC'(q)}{q} > 0$$

At the point of intersection with average costmarginal cost should be positively sloped.

$$AC'(q) = -\frac{AC(q) - MC(q)}{q}$$

From the first derivative we see that at a given volume of production there is a steeper long-run average cost curve, that is, smaller economies of scale, the larger the distance between average total and marginal cost. If every next unit is much cheaper to produce than the average and marginal cost rises quickly, then the firm will not benefit from scale. The closer marginal cost is to average cost, the greater the scale economies and the more likely the firm is to benefit from scale expansion. Graphically this is represented by Figure 12. Additionally, with a specific quadratic form of the average-cost function we have

$$AC(q) = aq^2 + bq + c$$

$$AC'(q) = 2aq + b$$

$2aq + b = 0$ at MES and capacity output $q_c = -\frac{b}{2a}$.

$$AC''(q) = 2a > 0 ,$$

Where $a > 0$ for a minimum of average costs and for positive output ($b < 0$). A higher value of a eliminates the potential for excess capacity, ensuring a steeply falling long-run average cost curve as shown by AC_2 in Figure 12. A lower value of a opens the potential for excess capacity. This parameter could be viewed as a scale factor or a scale parameter which determines a quickly or slowly falling envelope curve. At the same value of output q and the parameter b , a higher scale factor a guarantees a steeper slope $AC'(q)$ and entry on a small scale.

From the result $AC''(q) = \frac{MC'(q)}{q}$ we deduce that a rapidly rising marginal cost curve at the point of capacity output implies a high scale factor a and consequently entry on a small scale. A lower value of the scale parameter, on the contrary, means relatively flat LRMC and LRAC curves and allows entry on a large scale. What is the scale factor a reflective of?

Scale economies are often associated with indivisibilities, high fixed costs, high setup costs, highly specialized inputs, high volumetric returns to scale, etc. Indivisibilities result from the impossibility to scale inputs up or down where large firms have an advantage over small ones. With indivisibilities a low scale factor a results from the technology used which does not allow changing the quantities of inputs easily and forces firms to produce on a large scale. Large firms are often faced with indivisibilities, substantive fixed costs, setup costs and administrative costs which increase

minimum efficient scale. The presence of huge fixed costs enlarges the optimal scale of operations and causes a low scale factor. The management of huge corporations represents a heavy share of the fixed costs of the firm. High setup costs play the role of natural barriers to entry as is the case with natural monopolies or oligopolies.
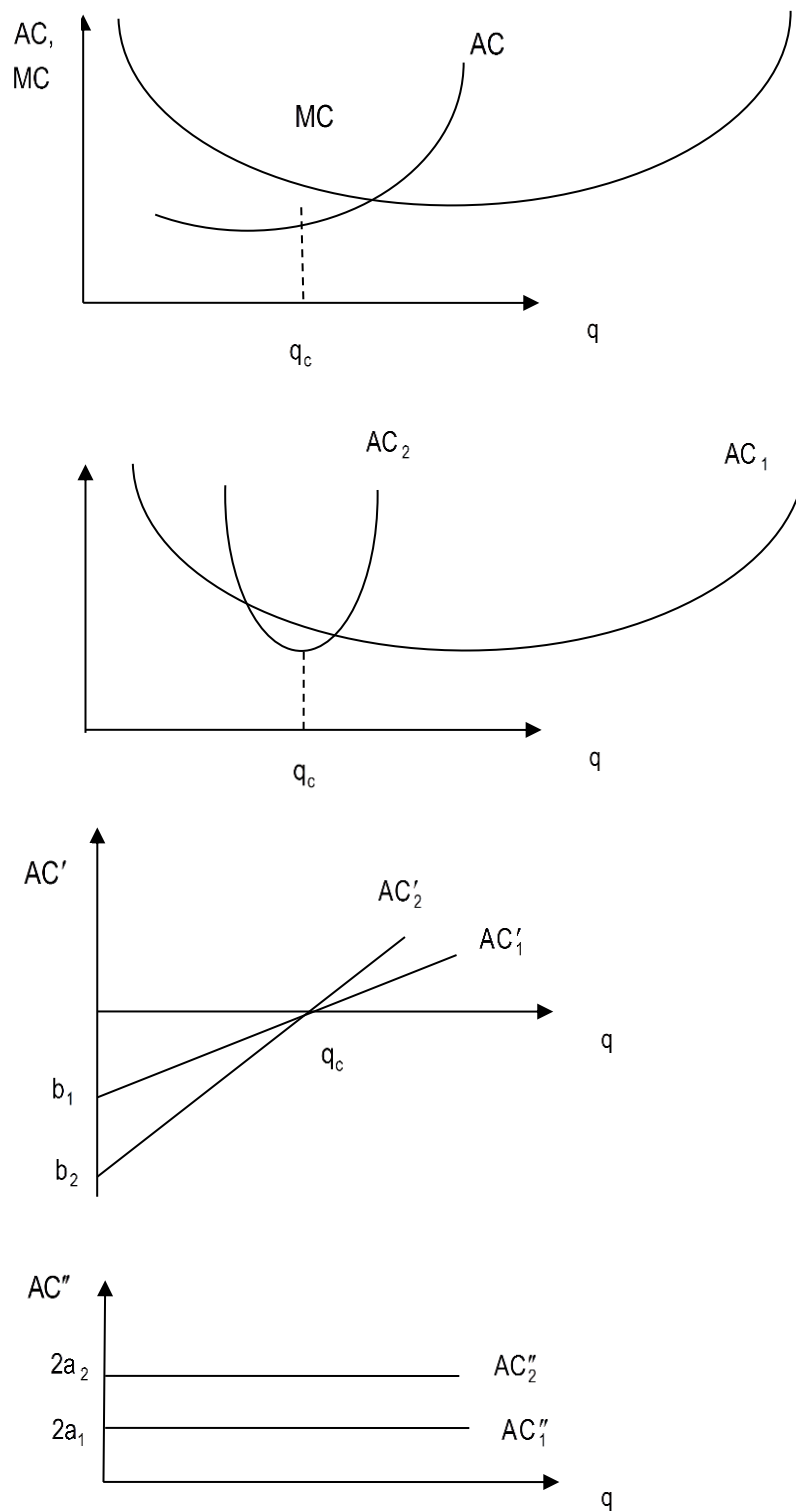

Figure 12. Long-run average costs and the scale factor

At the other extreme are productions in which inputs are highly variable, can easily be scaled down or up in response to the needs of the market and there are low setup costs involved in starting up production. A high scale factor results from the fact that mostly variable inputs are employed in the production process. The variable component prevails over the fixed one. Such industries are characterized by the absence of indivisibilities, low fixed or setup costs, and easy entry. These are also likely to be contestable markets due to the lack of sunk or setup costs.

Such businesses are characterized by both easy entry and easy exit. More often than not firms whose costs are recoverable and whose inputs could be used in alternative uses are competitive industries in which costs are mostly variable and represent the costs of providing variety. Compared to oligopoly, monopolistic competition faces a modest marketing and advertising budget. There are no significant costs of setting up the business compared to the colossal costs associated with natural monopolies or oligopolies; hardly any large-scale research and development take place within those small firms. Similar to perfect competition, most monopolistically competitive firms are run by a sole proprietor or a small management team so administrative and managerial costs are minimal.

Monopolistically competitive firms rarely use highly specialized labor and machinery unlike monopolies where the type of technology often necessitates the use of highly specialized capital. Monopolistically competitive firms for the most part use general-purpose equipment which is cheaper to buy at the outset. Monopolistically competitive firms are faced with both relatively flat demand curves and long-run envelope curves steeper than those associated with monopoly and oligopoly. In its various traits the monopolistically competitive firm resembles the ideal perfectly competitive bench mark more than it resembles oligopoly as a form of imperfect competition.

On the issue of scale Harrod (1952) maintains that the entrepreneur will plan equipment accordingly and will choose a plant which avoids excess capacity. To respond to the needs of a highly competitive market the manager-entrepreneur will not choose a clumsy, large-size production that cannot be scaled up easily. Rather he would choose a flexible technology and one or several small plants that provide for a high scale factor a . We have also demonstrated that in the absence of substantive fixed costs, the long-run average cost curve of the individual firm is likely to be steeper than that of monopoly or oligopoly .In the conditions of fierce competition the monopolistic competitor would have an inclination to sell at the lowest cost possible. Under a relatively steep envelope curve such cost minimization and a substantive cutting of price cannot occur at a volume of production much lower than the capacity output.When choosing equipment and plant size the manager might also plan for some reserve capacity in cases of excessively high and rising demand in a dynamically changing market environment. Such 'safe' or spare capacity which is unused but might serve a good purpose if demand increases suddenly may wrongly be interpreted as an inefficiency of monopolistically competitive firms.

In selling differentiated products monopolistic competitors are often driven by fashion, rapidly changing styles, tastes, customs and trends. Providing variety is not possible without a significant variable component. Inputs such as different colours, dyes, ingredients, components or moulds necessary to produce different models, sizes, shapes, styles, flavours, textures, etc. are primarily variable inputs. The costs of providing variety thus are mostly variable costs and variety and product differentiation result from the use of variable inputs. It is variable inputs and flexible technology that shape the cost structure of firms in competitive industries. Interesting is Stigler's observation on the clumsiness of large firms in providing variety:

'This source of inefficiency of large size is given little weight in the popular literature: size is almost equated with efficiency. Yet, anyone who watches a line of automobiles start forward as a traffic light changes will be impressed by how each additional driver starts a little later than his predecessor… This same slack is encountered in large organizations, so when frequent changes are called for, a large organization is very inept. The industries making style goods (women's apparel and shoes, novelty toys, and so forth) are consistently dominated my smaller and more flexible companies. Again, those enterprises requiring very close coordination of skills of men are seldom large scale.' (Stigler, 1968, p. 156)

Large firms with market power are said to have high learning curves and benefit from learning by doing in that their unit costs are consistently falling with output. By producing an identical product in large volumes and running repetitive production processes monopoly and oligopoly experience falling cost curves and, thus, achieve efficiency.

As opposed to the manager of a large corporation, a sole proprietor gains learning experience in adapting to change and has a high learning curve in rapidly changing styles, colors, shapes and models. Adapting to change and providing variety becomes the specialty of the sole proprietor whose diverse product becomes socially more important than a tedious, standardized one.

4. Transaction costs considered

Imperfect competition may arise from a limited number of competitors, price leadership, product differentiation, lack of direct substitutes, specific trade and marketing practices, exclusive dealership, specialized distribution, specialized advertising, etc. These features are common for both the 'small-group' case and the 'large-group' case of imperfectly competitive markets. But in addition to these characteristics monopolistic competition carries the features of perfect competition in that there are numerous buyers and sellers; entry is free and happens on a small scale, while exit is easy since all costs are recoverable. Perfect competition is always given as the ideal allocation of economic resources since it provides for full use of capacity at the social optimum and the lowest point of what is called full production costs.

Perfect competition is, therefore, given as a benchmark by which the efficiency of other market structures is judged. Yet, perfect competition is more of a theoretical construct and impossibility in real terms. Products in effect can hardly be perfectly homogeneous and the market power of the individual firm cannot be zero. Clark (1939) discusses this lack of realism in the following terms:

'Perfect competition is an impossible abstraction, and imperfect competition is inevitable, on account of the unavoidable characteristics of industrial production, regardless of the forms of trade practice within which actual competition is canalized.'

To the standard arguments given by neoclassical economics one can add the costs of using the market mechanism which can be significant with some types of market structures. Neoclassical analysis assumes that exchange occurs at zero transaction costs. Participants in perfectly competitive markets are presumed to conduct transactions at zero cost and be perfectly informed. Information costs as a type of transaction costs areignored and market participants are said to appropriate information about prices, quality levels and product features freely and at no cost. Since information is perfect both sides are fully and symmetrically informed. With zero transaction costs market exchange occurs at no cost and exactly at the competitive point. In real life transaction costs are positive, though. This limits the use of perfect competition as a theoretical foundation. Capacity and minimum efficient scale which originate from the theory of perfect competition and which welfare economics uses in its set of tools to compare the ideal outcome with suboptimal allocations, are thus purely theoretical concepts, rather than practical prescriptions. Under the assumption of positive transaction costs perfect competition and excess capacity lose their normative meaning and cannot prescribe how much to produce, what to produce or how to produce. Transaction costs render perfect competition an artificial construct.

Lower levels of transaction costs in some industries pair with smaller firms, while in otherhigher transaction costs relate to larger firms which supersede the market mechanism. Coase (1937) discusses that when the costs of transacting are sizable the manager undertakes to carry out the tasks of the market to economize on these costs and achieve efficiency within the firm. Thus firm size increases and the manager takes on more and more of the functions of the market as the costs of using the market increase and as it pays him to perform the duties of the market.In the extreme case, Coase hypothesizes, there will be only one firm engulfing all functions of the market and substituting it completely. Real market allocation does not occur at zero transaction costs but positive, and in some cases, significant transaction costs which provide for monopoly to overcome those.Since transaction costs could be viewed as a fixed cost component added to the full production costs of the firm, they increase its optimal scale of operations. Adding a fixed-cost component to firm structure always expands the minimum efficient scale of operations as demonstrated by Figure 13, the distance between cost level $LRAC$ and $LRAC'$ being the level of transaction costs on the particular market. In line with Coasean thinking a firm with market power arises out of sizable industry transaction costs.

In monopolistically competitive markets information can be obtained at low cost and transactions take less to organize, relative to market structures with market power. In Figure 13 the full production and transaction costs of the competitive firm lie at or slightly above the $LRAC$ curve. In monopolistically competitive industries where information is easy to obtain and the potential for opportunism is negligible, the costs of using the market mechanism are infinitesimal. Monopolistically competitive markets are characterized by strong competition, easy entry and exit, little opportunism, accessible and abundant information and nearly complete certainty. Under positive transaction costs, monopolistic, not perfect, competition is the true form of competition.
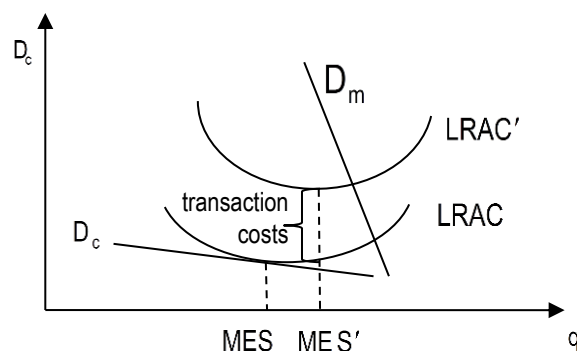
Figure 13. Optimal firm size under positive transaction costs

In contrast, private monopoly is an extreme form of market power where competition is absent, there is great potential for uncertainty and contractual opportunism on the part of the monopolist, information is costly to obtain and there are natural or artificial barriers to entry. As a form of market failure, monopoly power originates in transaction costs, with transaction costs being low in monopolistically competitive markets and high in monopoly and oligopoly. Monopolistic competition, therefore, is a situation which provides for optimal allocation of economic resources, since it reflects the social optimum at positive, yet minimal, transaction costs.

Advertising contributes essentially to information costs. Church and Ware (2000, p. 516) stress that 'if the world were like the description of perfect competition … where all consumers were perfectly informed, and all markets operated frictionless, then there would be no need for any advertising, whether it was informative or not.' Advertising is most intensive where greater informational asymmetries, opportunism on quality, cheating and other transaction costs exist and where the need for advertising is stronger. This happens more frequently with oligopoly and less so with monopolistic competition.

The concept of excess capacity in monopolistic competition thus is a misperception and should be abandoned altogether in economic theory and microeconomic classes. Excess capacity should not be considered an inefficiency of the monopolistically competitive firm in a long-run equilibrium, since this type of a firm offers optimal allocation of resources in the presence of positive transaction costs. Given that perfect competition is an unrealistic outcome, it is better to talk of perfect monopolistic competition or just competition. The monopolistically competitive firm is faced with a relatively flat and low demand curve, on the one hand, and an envelope cost curve which is not excessively extended.

Furthermore, the competitive firm provides greatest variety at lowest cost. It is possible that at the time Chamberlin and Robinson developed their theory of imperfect competition, demand curves were steeper due to greater product differentiation, entry was easy to prevent and monopolistically competitive firms resembled oligopoly. Perhaps in those days it was more difficult to distinguish between the 'small-group' case and the 'large-group' case. But today heavy advertising, large-scale research, patents, licenses, and other barriers to entry create a clear boundary between oligopolies and monopolistic competition. Contemporary production techniques allow small firms to set up flexible productions and offer variety at low cost. Due to innovation average cost curves are now lower than they have been several decades ago. Entry is easier since no significant setup costs or initial investments are necessary. Contemporary sophisticated consumers today might view monopolistically competitive products as less differentiated, if not perfect, substitutes. The cost of variety might have been reduced significantly by the means of contemporary technology also.
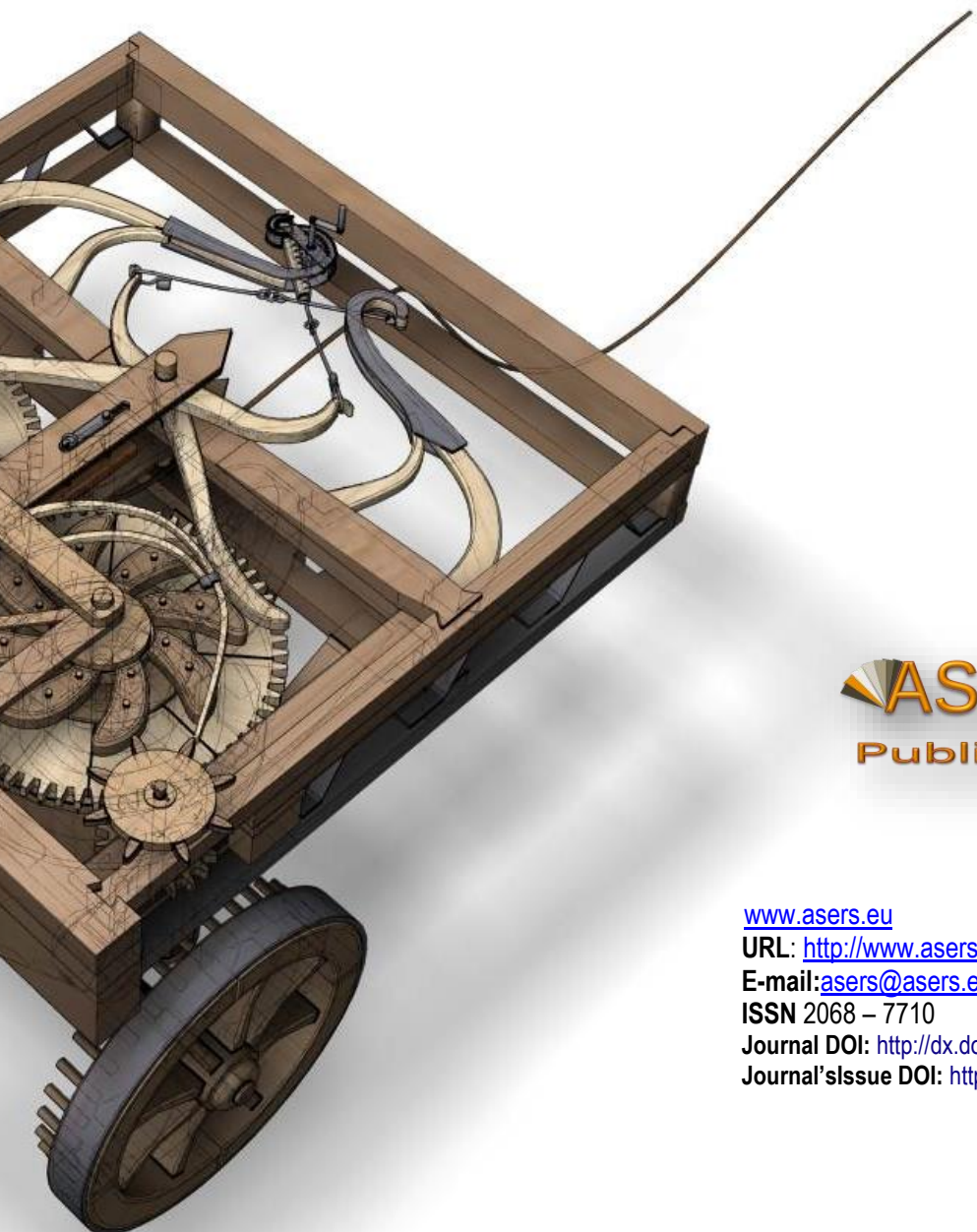
Conclusion

Classical economists wrongly merged the idea of competition with monopoly – they assumed a very steep demand curve with low demand for the monopolistically competitive firm. Under free entry a firm cannot have market power and charge little at the same time. Classical economists were also inconsiderate of transaction costs which render perfect competition an artificial setup. Using the standard tools of neoclassical analysis, we have demonstrated that there is little potential for excess capacity to exist in monopolistically competitive firms. This becomes evident from the analysis of both demand and cost curves. Accounting for positive information costs, as well as other transaction costs, we find that monopolistic competition is the true type of competition, compared to the unrealistic perfectly competitive setup, and, therefore, an optimal form of resource allocation.

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