HOW SERIOUS IS THE
PROBLEM OF MONOPOLY?

Yrd. Doç. Dr. Cenk Gökçe ADAŞ*

ABSTRACT

This paper provides a survey of literature for the welfare losses due to monopoly. Since 1954 economists have been trying to measure the social costs of monopolies by using different estimation techniques. The measure most frequently used to calculate the welfare losses has been consumer surplus. In 1950s and 1960s monopoly was not thought to be a big problem. The estimations showed that it only generated a loss equal to 1% of GNP. However, in 1970s and 1980s this thought has changed, and it has been accepted that monopolies are a real bad.

ÖZET

Bu çalışma, monopol yapının neden olduğu refah kayıpları için bir literatür taraması sağlamaktadır. 1954 yılından beri iktisatçılar, farklı tahmin teknikleri kullanarak monopolün sosyal maliyetlerini ölçmeye çalışmışlardır. Refah kayıplarını hesaplamak için en sık kullanılan ölçme metodu tüketici artığı olmuştur. 1950'lerde ve 1960'larda monopol büyük bir problem olarak düşünülmemiştir. Yapılan hesaplamalar göstermiştir ki refah kayıpları GSMH'nın yalnızca %1'ine eşittir. Bununla beraber, 1970'lerde ve 1980'lerde bu düşünce değişmiş ve monopollerin kötü olduğu kabul edilmiştir.

*İstanbul Üniversitesi, İktisat Fakültesi, İngilizce İktisat Bölümü, İngilizce İktisat Politikası Anabilim Dalı.

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The common thought about the main effects of monopoly is the misallocation of resources, which leads to a reduction in welfare, and redistribution of income in favour of monopolists. Harberger[1] was the first one who tried to calculate the welfare losses caused by the existence of monopoly. He assumes constant long-run average costs for both the firm and the industry. Once he set the average cost constant he could use the fact that marginal and average costs are the same. To find the places where resources are misallocated under the assumptions of constant long-run costs and cleared markets Harberger looks at the rate of return on capital. Higher (lower) return than average means that those industries have too few (many) resources. If price were set equal to unit cost including cost of capital then the competitive level of output would be demanded and supplied. If, however, one firm can set a price higher than the unit cost and produce a lower level of output, it obtains monopoly profit.
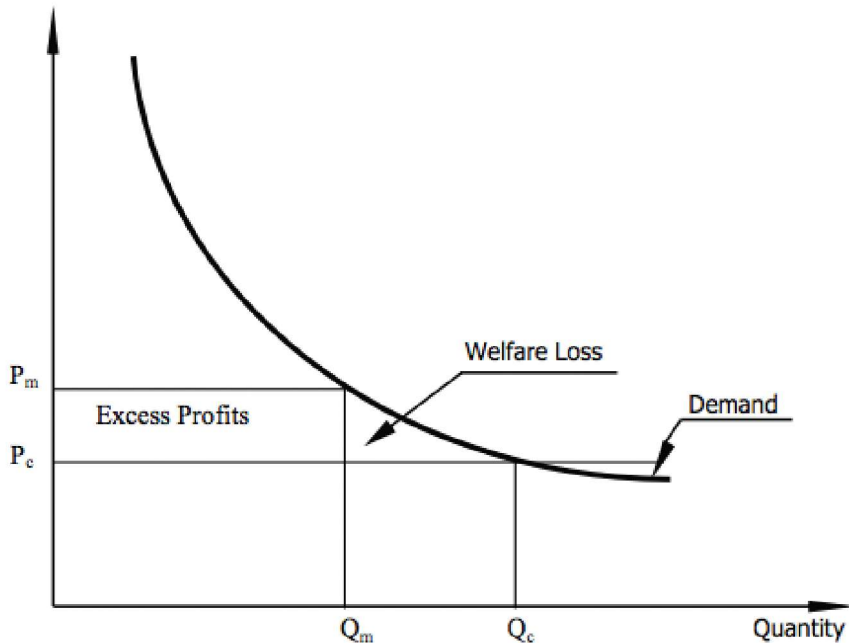

Figure 1: Welfare loss due to monopoly.

1 Harberger, A. C. (1954), "Monopoly and Resource Allocation". *The American Economic Review,* 45:77-87, May 1954.

Under perfect competition the price and the quantity supplied in an industry are P_c (=marginal cost) and Q_c. In this case consumers' surplus is measured by the area under the demand curve above the marginal cost. If one firm is able to obtain control of the entire industry the price and quantity become P_m and Q_m, respectively. Now the consumers' surplus is the area under the demand curve above P_m. Loss in this surplus consists of two parts; excess profits and welfare loss.

The excess profit is a transfer of wealth from consumers to the monopolist. However, during the process of transfer some resources vanish. This waste is represented by the area called loss in the Figure 1. It is in neither consumers' surplus nor producers' surplus. Harberger estimated how much should be transferred from low profit to high profit industries to obtain equilibrium. He used Hotelling's expression for the welfare loss, which is:

$$DWL = \frac{1}{2} \sum dp_i dq_i \quad (1)$$

where p_i and q_i are the price and quantity of the ith commodity. If DWL expression is multiplied and divided by dp_i and p_i/q_i:

$$DWL = \frac{1}{2} \sum \frac{(dp_i)^2}{p_i} q_i \frac{dq_i}{dp_i} \frac{p_i}{q_i} \quad \text{(DWL: Dead Weight Loss)} \quad (2)$$

Multiplying and dividing by p_i, DWL becomes

$$DWL = \frac{1}{2} \sum \left(\frac{dp_i}{p_i}\right)^2 p_i q_i \frac{dq_i}{dp_i} \frac{p_i}{q_i} \quad \text{or} \quad (3)$$

$$DWL = \frac{1}{2} \sum r_i^2 s_i \eta_i \quad (4)$$

where $r_i = dp_i/p_i$ (percentage divergence of actual price from cost), $s_i = p_i q_i$, and $h_i = (dq_i/dp_i)p_i/q_i$ (elasticity of demand).

Since Harberger assumes unit elasticity of demand for industry's product the welfare loss from each commodity can be estimated from the following formula:

$$DWL = \frac{1}{2} \sum r_i^2 s_i \quad (5)$$

Harberger calculated average profit rates for 2046 corporations in 73 industries, which accounted for some 45 percent of the sales and capital in manufacturing industry in the United States for the period 1924-28. He found an estimate of by how much consumer welfare would have been improved if resources had been optimally allocated which was less than one tenth of 1% of the national income, or $1.50 per person at 1953 prices.

In the paper, Harberger mentions some problems of evaluation. Firstly, he says long-run costs are increasing rather than decreasing in American industries. Since increasing costs would lower the increase in consumer welfare resulting from the transfer (smaller loss), the basic assumption of constant long-run costs is a good approximation. Secondly, the profit rate used is an underestimate of the actual profit rate on real capital because of patents, goodwill and etc. However when he takes this into account he reaches a welfare loss just over a tenth of 1% of the national income. The conclusion from Harberger's study is that monopoly is not a serious problem in the United States economy.

Stigler (1956) had the following three objections to Harberger's procedure to estimate the monopoly profits: "i-) monopoly profits are capitalised, so earning statements tend to report only competitive profit rates. ii-) the average profit rate in manufacturing is above the competitive level, since monopoly is concentrated in manufacturing. iii-) monopoly profits paid out to factors other than capital are not included"[2].

Schwartzman tries to measure the effect of monopoly in such a way that the new estimate overcomes the objections made by Stigler. He derives a measure from census data on gross value product (=total revenue) and on direct cost (=total variable cost) in Canadian concentrated industries and in matched unconcentrated industries in the USA. R_{con} stands for p/AVC (the ratio of gross value product to direct cost) for any concentrated industry in Canada. R_{uncon} is the equivalent in the USA. To eliminate the variations in this ratio due to differences in costs and demand curves between industries

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2 Schwartzman, D. (1960), "The Burden of Monopoly". *Journal of Political Economy*, 68:627-630, December 1960.

Schwartzman divides each R_{con} by the corresponding R_{uncon}. To remove the effect of national differences in wage levels, interest rates etc. He uses the following procedure: "The p/AVC ratio for any Canadian unconcentrated industry, R_{can}, is divided by the p/AVC ratio for the corresponding and unconcentrated industry in the US, R_{us}."[3].

To find the monopoly effect he subtracts the unweighted average of R_{can}/R_{us} from R_{con}/R_{uncon}. For welfare losses Schwartzman multiplies the increase in price by "elasticity times the monopoly profits" and divides by 2.

For constant marginal cost and elasticity of demand (equal to 2 rather than unity) he found a welfare loss in 1954 less than 0.1% of the national income, i.e. welfare loss from monopoly was small.

In Kamerschen (1966)[4] modifies Harberger's theoretical model to incorporate more recent and improved data. He assumes constant costs of production and an average rate of return for all industries. He uses industry-by-industry elasticity instead of an overall elasticity of one (as in Harberger's study) or two (as in Schwartzman's study). He ignores redistributional effects and takes intangibles, royalties and advertising expenditures as purely monopoly elements. Furthermore Kamerschen assumes a high substitutability among the products supplied by different firms in the same industry and low substitutability among the goods and services of different industries. Long-run excess profits are due to monopoly.

Kamerschen calculated the welfare losses during 1956 -1961 for the American economy and applied unit elasticity as well as the industry-by-industry elasticity based upon Lerner's index of monopoly power [(p-MC)/p].

$$Z = \frac{p^m - p^c}{p^m} = \frac{1}{n} \quad (6)$$

If both the numerator and the denominator on the left hand side of the equation are multiplied by the quantity demanded and the terms are rearranged the following expression is obtained:

3 Schwartzman, D. (1960), "The Burden of Monopoly". *Journal of Political Economy,* 68:627-630, December 1960.
4 Kamerschen, D. R. (1966), "An Estimation of the Welfare Losses from Monopoly in the American Economy". *Western Economic Journal,* 4:221-236, Summer 1966.

$$\eta = \frac{p^m q^m}{(p^m - p^c)q^m} = \frac{R}{\Pi} \quad (7)$$

where R is the total receipts of the industry or firm (revenue) and P is the monopoly profits.

Kamerschen proposes that the elasticity of demand can be estimated by using revenue and profits data. To calculate the Dead Weight Loss those elasticities can be taken into account. This procedure, unlike Harberger's, assumes that firms are profit-maximizing firms. The estimated losses using Lerner's elasticity exceed those based on the unit elasticity. The welfare losses ranged from 1 to 8 percent of the mean national income and these figures were far larger than Harberger-Schwartzman estimates that ranged between 1/13 to 1/10 percent of national income.

Siegfried and Tiemann in 1974 compute the welfare in the USA for 1963 in mining and manufacturing industries. Their assumptions are constant variable costs, no price discrimination, unique price for each commodity and linear demand curve in the region of actual output. Each producer also produces at lowest possible cost. To calculate the Dead Weight Loss they use the following approach.
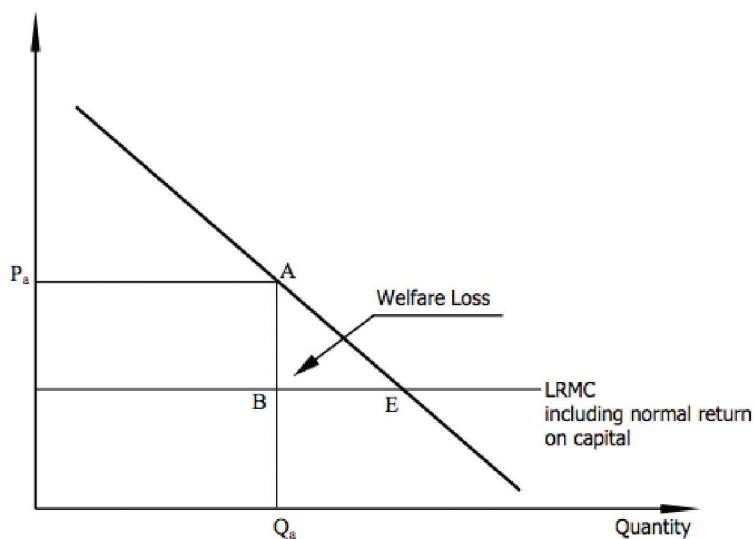

Figure 2:

LRMC = Long run marginal cost.

Q_a = Quantity.

P_a = Actual price.

$$Dead\ Weight\ Loss = \frac{1}{2}(A\overline{B})(B\overline{E}) \qquad (8)$$

AB is the difference between price and long-run marginal cost. The value of AB can be written as

$$A\overline{B} = \left(\frac{TR}{Q_a}\right) - LRMC \qquad (9)$$

where TR = Total revenue.

Since they assume capital costs as a social cost in the long run and firms do not take these costs into account in the short-run, to estimate normal profits they subtract those costs from the total revenue as well as long-run variable costs. Hence

$$A\overline{B} = \frac{TR - LRVC - \rho A}{Q_a} \qquad (11)$$

where LRVC = Long-run variable cost.

A = Book value of assets.

r = The average rate of return.

Here $A\overline{B}$ shows the profits per unit of output. "Unfortunately equation (11) can not be estimated directly from available data, since Q is unobservable"[5]. Therefore they multiply the expression by P_a/P_a, where P_a equals the actual price at which output is sold. Equation (11) becomes

5 Siegfried, J. J. and Tiemann, T. K. (1974), "The Welfare Cost of Monopoly: An Inter-Industry Analysis". *Economic Inquiry,* 12:192, June 1974.

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$$dP = A\bar{B} = \dfrac{\dfrac{TR - LRVC - \rho A}{TR}}{P_a} \qquad (12)$$

If the demand curve is linear $B\bar{E} = A\bar{B}(dQ/dP)$ is the reduction in quantity resulting from the monopoly. This reduction can be rewritten as follows

$$dQ = B\bar{E} = A\bar{B}(\eta)\left(\dfrac{Q_a}{P_a}\right) \qquad (13)$$

Here they accept a constant elasticity of demand across the industries. Now we can write the welfare loss for each industry, W:

$$W = \dfrac{1}{2}(A\bar{B})(B\bar{E})$$

$$W = \dfrac{1}{2}\left(\dfrac{TR - LRVC - \rho A}{TR}\right)^2 (TR)(\eta) \qquad (14)$$

By using this equation they found 0.0734 percent of national income as the total welfare loss in mining and manufacturing industries in 1963, which supports the Harberger estimate.

In 1975 unlike the previous studies Posner, in his paper[6], assume that competition to get a monopoly situation creates social costs equivalent to expected monopoly profits. He claims that dead weight loss underestimate the social costs of monopoly. The opportunity costs of attracted resources from other activities to obtain monopolies are social costs, as well.

Furthermore he says that firms spend money to obtain a monopoly up to the point where the costs of obtaining monopoly equals the expected profit of being a monopolist. This implies that there are no intra-marginal monopolies, i.e. the expected monopoly profits do not exceed the total supply price of inputs used to obtain the monopoly situation. This assumption is criticised by F. M. Fischer. He claims that this statement is not true if

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6 Posner, R. A. (1975), "The Social Cost of Monopoly and Regulation". *Journal of Political Economy,* 83(4):807-827, August 1975.

one is interested in obtaining a particular monopoly rather than obtaining monopolies generally. Successful monopolists enjoy infra-marginal rents because in equilibrium the costs of taking over the monopoly situation need not be equal to the monopoly rents since the monopoly can be achieved before the present value of a monopoly is spent to secure the monopoly. Profits are considered as welfare losses by Posner because firms compete for monopoly profits and hence waste resources. Also in this industry of chasing monopoly profits only normal profits are obtained on the average. In his model long-run supply of all inputs used to get monopolies is perfectly elastic and those extra social costs do not generate any positive externalities.

Posner's model to describe the social costs of monopoly is as follows: Social costs of monopoly involves two components. Dead weight loss (D) and a transfer from consumers to monopolist (L).
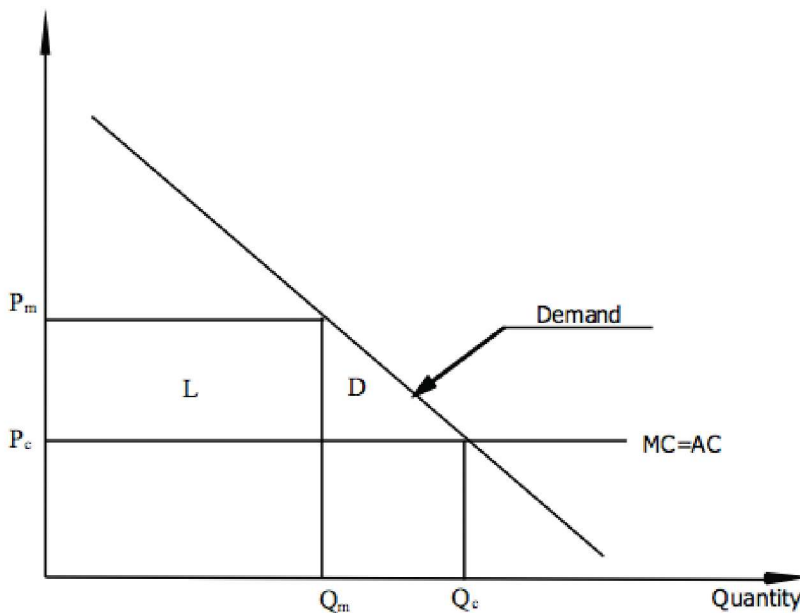

Figure 3:

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$$D = \frac{1}{2}\Delta P \Delta Q$$

$$L = \Delta P(Q_c - \Delta Q)$$

$$\frac{D}{L} = \frac{\Delta Q}{2(Q_c - \Delta Q)} \qquad \text{or}$$

$$\frac{D}{L} = \frac{P_m - P_c}{2P_c\left(\dfrac{P_m - P_c}{\Delta Q}\dfrac{Q_c}{P_c} - \dfrac{P_m - P_c}{P_c}\right)} = \frac{(P_m - P_c)/P_c}{2\left(\dfrac{1}{\varepsilon} - \dfrac{P_m - P_c}{P_c}\right)}$$

where $\varepsilon = \dfrac{\Delta Q}{\Delta P}\dfrac{P_c}{Q_c}$. It is assumed that DQ is a positive number. Hence e is also positive

By defining $s = \dfrac{P_m - P_c}{P_c}$ (percentage increase in price), D/L can be rewritten as

$$\frac{D}{L} = \frac{s}{2\left(\dfrac{1}{\varepsilon} - s\right)}$$

Then, the partial derivatives are

$$\frac{\partial(D/L)}{\partial \varepsilon} = \frac{2s/\varepsilon^2}{\left(\dfrac{2}{\varepsilon} - 2s\right)^2} = \frac{2s}{4 - 8s\varepsilon + 4s^2\varepsilon^2}$$

$$\frac{\partial(D/L)}{\partial \varepsilon} = \frac{2s}{(2 - 2s\varepsilon)^2} \rangle 0$$

D/L is smaller, the less elastic demand for the industry's product.

$$\frac{\partial(D/L)}{\partial s} = \frac{2\left(\frac{1}{\varepsilon} - s\right) + 2s}{4\left(\frac{1}{\varepsilon} - s\right)^2} = \frac{1}{2\varepsilon\left(\frac{1}{\varepsilon} - s\right)^2}$$

If D is a smaller fraction of L, then the percentage increase in price over the competitive level is smaller.

The total social costs of monopoly is the sum of dead weight loss (D) and monopoly profits (L).

$$D + L = \frac{1}{2}\Delta P\Delta Q + \Delta P(Q_c - \Delta Q) = \frac{1}{2}\Delta P\Delta Q + \Delta PQ_c - \Delta P\Delta Q = \Delta PQ_c - \frac{1}{2}\Delta P\Delta Q$$

$$D + L = (P_m - P_c)Q_c - \frac{1}{2}\Delta P\Delta Q = \left[\frac{P_m - P_c}{P_c}\right]P_cQ_c - \frac{1}{2}\Delta P\Delta Q = sR_c - \frac{1}{2}\Delta P\Delta Q$$

$$D + L = sR_c - \frac{1}{2}\left[\frac{\Delta P}{P_c}\right]^2 P_cQ_c \frac{P_c}{Q_c}\frac{\Delta Q}{\Delta P} = R_c\left(s - \frac{1}{2}s^2\varepsilon\right)$$

where R_c is total sales revenues at the competitive level ($R_c = P_cQ_c$). The partial derivatives are:

$$\frac{\partial(D + L)}{\partial R_c} = s - \frac{1}{2}\varepsilon.s^2 \rangle 0 \qquad iff \qquad \varepsilon.s \langle 2$$

$$\frac{\partial(D + L)}{\partial s} = R_c(1 - \varepsilon.s) \rangle 0 \qquad iff \qquad \varepsilon.s \langle 1$$

$$\frac{\partial(D + L)}{\partial \varepsilon} = -\frac{1}{2}s^2 R_c \langle 0$$

The partial derivatives show that the social costs of monopoly will be larger, the bigger the industry's sales revenues and the greater the percentage price increase. The costs will be higher, the less elastic the demand.

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By using the assumption of linear demand curve Posner calculated the social costs of cartelisation and regulation. He found that the burden of monopoly was underestimated by the previous studies and the costs of monopoly are bigger in the regulated industries than unregulated ones. He computed 25% of the rubber industry's revenue as social costs. It is a much bigger figure than Harberger's study (2.5%) for the same industry

In 1978 Cowling and Mueller[7], follow Harberger's partial equilibrium approach but apply an alternative estimating technique for measurement of social costs stemmed from monopoly. They have several criticisms against Harberger-type estimation.

-       Harberger assumed independent price and quantity changes, dp and dq respectively, in his partial equilibrium analysis. Cowling and Mueller observe that the industry demand elasticity is equal to the inverse of the price-cost margin.

$$\frac{\partial \Pi_i}{\partial P_i} = 0 \qquad \Rightarrow \qquad \eta_i = \frac{P_i}{P_i - MC_i}$$

where subscript 'i' indicates that the values are based on firm level. h_i also reflects the industry elasticity of demand for a monopolist or perfectly colluding oligopolist.

They obtain the following formula for welfare loss by assuming inter-dependence of dp and dq:

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7 They based their studies on firms rather than industry.

$$DWL_i = \frac{1}{2} \frac{dP_i}{P_i} \frac{dq_i}{q_i} P_i q_i$$

where $\quad \dfrac{dP_i}{P_i} = \dfrac{P_i - MC_i}{P_i} = \dfrac{1}{\eta_i} \quad$ and $\quad \dfrac{dq_i}{q_i} = \eta_i \dfrac{dP_i}{P_i} = 1$. Hence

$$DWL_i = \frac{dP_i}{P_i} \frac{P_i q_i}{2} = \frac{P_i - MC_i}{P_i} \frac{P_i q_i}{2} \qquad \text{or}$$

$$DWL_i = \frac{(P_i - MC_i)q_i}{2} = \frac{\Pi_i}{2}$$

Harberger ignored the relationship between h_i and price cost margins. His expression for DWL was:

$$DWL_i = \frac{1}{2} \left(\frac{dP_i}{P_i} \right)^2 P_i q_i \eta_i$$

It can be rewritten as:

$$DWL_i = \frac{1}{2} \frac{dP_i}{P_i} P_i q_i = \frac{\Pi_i}{2}$$

Since h_i does not enter into the calculation there is no need to have independent estimations of elasticities. Cowling and Mueller evaluate "the use of h=1.0 (in Harberger's study) as an equilibrium measure of welfare loss to examine a general equilibrium structural change"[8] .

-       Harberger and the fallowing studies have equated the normal profit rate to the average profit rate earned, but Cowling and Mueller emphasize that the mean profit rate involves an element of monopoly rent. Thus the

8 Cowling, K. And Mueller, D. (1978), "The Social Costs of Monopoly Power". *The Economic Journal,* 88:730, December 1978.

difference between actual profit rates (above the average) and the mean rate underestimates the welfare loss.

The existing of firms making losses (compared to normal profits) generates a methodological problem. It is assumed that the costs of the monopolist are the same as those of a competitive firm. Hence the welfare loss results from monopoly price above marginal cost. Cowling and Mueller think that this is an unrealistic assumption. The more reasonable one is that the loss making firms are in disequilibrium with costs above the competitive level. They are excluded from the calculation since they will return to a position where they earn normal profits or they will disappear.

All previous studies have estimated welfare loss under the assumption of a constant degree of monopoly power, which is high and equalised across all firms. This procedure resulted in almost no welfare loss.

Another objection raised by Cowling and Muller is the aggregation biases from using the industry data. Harberger and all other authors introduced a bias because the industry data combined the negative profits of some firms with the positive profits of some others. They eliminated each other in the calculation. Secondly further aggregation bias in the estimates of all previous studies except Kamerschen's (1966) was caused by the use of a constant elasticity of demand across all industries.

Lastly Cowling and Mueller indicate Posner's argument that the costs to obtain or retain the monopoly position should be added to the social costs of monopoly. The studies done before have ignored these expenditures such as investment in excess production capacity, excessive advertising and product differentiation through research and development expenses. This situation biased the estimations downwards. Cowling and Mueller correct the measure of the loss by employing three adjustment processes. First, they add advertising to monopoly profits. Second, advertising is added to the welfare loss assuming that advertising is a social cost. Thirdly, after-tax profits are included in the measurement of the loss since they are used to gain the control of the monopoly rents. Therefore, the alternative definitions of social cost can be written as P/2, (P+A)/2, A+(P+A)/2, P'+A+(P+A)/2 where P' indicates the after-tax profits and A is the advertising expenditure.

Cowling and Mueller adjusted Harberger's technique to be able to compare his results with theirs. They tried to make estimates for both the USA and the UK. Their study revealed that General Motors alone caused a welfare loss for the period 1963-1966, of over 1/4 of 1% of average GNP, which exceeds Harberger's estimate for the entire economy. The social costs of monopoly ranged between 4 and 13% for the USA and Between 3.9 and 7.2% of the Gross Corporate Product for the UK.

Littlechild (1981) claims that DL can be smaller than what Cowling and Muller (1978) estimated. They ignore the price discrimination. Firms extensively use price discrimination, which may increase output, hence reduces welfare loss. If a monopolist produces at perfect competition level there will be no welfare loss where welfare is equal to the sum of consumers' and producer's surplus. The loss in consumers' surplus is transferred to producer's surplus. Also companies operating abroad or exporting large quantities do not cause welfare losses in their countries. Therefore Cowling and Mueller's model overestimates the loss.

Littlechild argues that the role of advertising in the long run appears to be unclear in Cowling-Mueller analysis. They admit that advertising expenditures are purely social costs since they are used to secure the market power. Cowling and Mueller do not take the positive effects of advertising into account. Advertisements provide useful information about new or improved products to the consumers, i.e. they generate socially useful by-products. Therefore Cowling and Mueller again overestimate the welfare loss by accepting all advertising expenditure as social costs.

Cowling and Mueller point out that firms use some resources to obtain a monopoly position as long as expected monopoly rents are positive and this is also a welfare loss. If the monopoly is gained by bribery or any other transfer of income it should not be counted as a welfare loss. On the other hand initial resource owners get some part of monopoly profits as well. Hence post-tax profits overstate the social wasteful expenditure to obtain the monopoly.

To compute economic profits Cowling-Mueller as well as Harberger corrects the reported profits upwards to the extent that some firms have book-keeping assets such as patents, stock of good will and etc., which

represent the capitalisation of monopoly rents. Therefore the accounting profits understate the actual profit rates. On the contrary Littlechild argues that reported profits need to be adjusted downwards rather than upwards. Because advertising and research and development expenditures are taken as current expenses although they generate income in the future, they should be accepted as intangible assets.

Other misleading calculations arise from uncertainty. Because firms operate under uncertainty, some of them cannot succeed. Cowling and Mueller pick up only successful firms and assume their excess profits as social costs and do not pay any attention to the loss making firms, which also introduce some welfare losses. Their error results from the firm based data rather than industry based ones.

Moreover, since some industries are riskier than others the firms operating there, pay a risk premium to attract resources, i.e. they need to pay higher dividends. Cowling and Mueller attach a common cost of capital and misinterpret the cost of risk as monopoly profit. (Littlechild, 1981).

Littlechild also sketches the view of competition of the Austrian School. An entrepreneur charging a higher price than the marginal cost level for his new discovery generates a welfare gain given by his profit plus consumer surplus, although he restricts his output. When other entrepreneurs enter into the market a further gain is obtained. The entry pulls the price down to the marginal cost level. As a result entrepreneurial profit is converted into consumers' surplus. The area called welfare loss in the figure depicted earlier is the further gain. This implies that monopoly is not a bad all the time.

Masson and Shaanan, in 1984, follow a different approach to the problem of social costs of monopoly. They base their study on actual and potential monopoly social costs. The difference between actual and potential costs reveals the value of competition in markets.

Unlike Cowling and Mueller study they use an industry demand approach for the elasticities. Since most competition policy in the UK and the USA concerns about achieving workable competition rather than breaking up any individual firm. (Masson and Shaanan, 1984: 521) They state that if there is a dominant profit maximising firm and others are fringe competitors acting

as price takers then the demand curve for competitive firms can be used to get the marginal social value of one additional unit of output. In this case the industry and firm demand approaches give the same results. (Masson and Shaanan, 1984:521). Because they use price cost margin (PCM) formula for industry demand elasticity they first estimate monopoly PCM.

Masson and Shaanan consider the outcomes of entry since the opportunity to obtain profits attracts new entries. Limit pricing policy of incumbent firms deters entry. Incumbent firms in an industry act jointly to maximise their joint profit. They apply a simultaneous equations approach to test the limit the limit-pricing hypothesis. They estimate monopoly profits in the cases of i-) optimal limit pricing, ii-) no threat of entry and iii-) unobserved entry forestalling.

They assume that potential entrants take price cost margins into account in their responses. They have got two separate equations, one for incumbent firms and the other for potential entrants. (Masson and Shaanan, 1984:522

$$PCM^a_{t-1} = PCM^a(G_{t-1}, B_s, B_k, B_a, C_{t-1})$$

$$E_t = E(PCM^a_{t-1}, G_{t-1}, B_s, B_k, B_a)$$

The actual price-cost margin in the industry in period t-1 (PCM^a_{t-1}) is a function of the industry growth in period t-1 (G_{t-1}), the industry economies of scale entry barrier (B_s) and capital-cost entry barrier (B_k), advertising entry barrier (B_a) and finally the 4 firm concentration ratio in period t-1. On the other hand (PCM^a_{t-1}) actual PCM, industry growth, economies of scale, capital-cost and advertising entry barriers are the explanatory variables of the cumulative market share of entrants at the end of period t (E_t).

They drive an entry deterring PCM-obtained by using highest price attainable without attracting entry- from the entry equation. It is assumed that entry is a positive function of the difference between the actual price-cost margin in the industry in period t-1 (PCM^a_{t-1}) and entry-deterring price cost margin (PCM^f_{t-1}). In their model they claim that entry is negatively related

to B_s, B_k and B_a. They also claim that the effect of growth is positive.

Masson and Shaanan define another PCM ($PCM°$) which is chosen by incumbents taking the threat of entry into account and which is larger than PCM^f. The intuition behind larger $PCM°$ is as follows: if the incumbents raise their PCM above PCM^f by a small amount, the expected costs of entry rise by a very small amount. However the rise in profits is significant. In other words, increase in the expected costs of entry is smaller than the increase in profits. Entry becomes profitable. At the blockaded level of barriers $PCM^f = PCM° = PCM^m$ where PCM^m is the monopoly level of PCM.

The authors furthermore assume that as the concentration ratio increases the ability to obtain a $PCM°$ increases. At 100% of concentration the firm reaches to $PCM°$. Since $PCM°$ is unobservable they convert $PCM°$ to PCM^a.

They estimated E_t and PCM_{t-1} of 37 manufacturing industries in the USA using Ordinary Least Square (OLS) method and found significant coefficients for independent variables except the capital requirements barrier. B_k was insignificant both in E_t and PCM_{t-1} equations. They also checked the assumption $PCM° > PCM^f$ and found significant results.

Having had the significant results in the estimation of price-cost margins they moved onto welfare estimations. In Masson-Shaanan model the objective function of joint profit maximising firm is

P(Q, A) = [P(Q, A)- m] Q – A

where P is industry profits, A is industry expenditure on advertising, Q is industry output and P is the price level. From $\partial P/\partial Q$ they find the monopoly elasticity as a function of PCM_m. PCM_m is calculated by using marginal production costs rather than average total costs as in PCM^m. The average and marginal production costs are constant at level m and a=A/Q ratio is constant, as well. Therefore average costs are m+a.

They use the formula DWL = |DQ| DP/2 where DQ and DP are deviations of quantity and price from zero profit equilibrium level.

Masson and Shaanan calculated actual demand elasticity h_a, actual welfare loss W_a, monopoly demand elasticity h_m and potential welfare loss W_m as a percent of industry value of shipment for the 37 manufacturing industries.

They found a weighted average welfare loss 2.9% at the actual prices. If the industries were joint profit maximisers facing no potential entry the welfare loss would be 11.6% of their value of shipments. They also estimated the same values by ignoring B_k measure. By doing so elasticities usually fell. W_a became 1.7% while W_m rose to 15.8%.

They also modified Cowling-Mueller estimates to be able to compare with their results. Cowling-Mueller elasticities were far larger as well as their welfare estimates –7.8%.

The differences between monopoly and actual estimates can be taken as a measure of the social benefits of competition. This benefit is 8.7% for the 37 industries.

Masson and Shaanan also consider profits and advertising expenditure as social costs. They estimate W_a and W_m again by taking those social costs into account. However they point out that some of these expenditure create some social benefits as well. In their predictions they use different proportions of profits, advertising and profit plus advertising expenditures. Obviously this procedure leads to higher welfare losses.

Since 1954 economists have been trying to measure the social costs of monopolies by using different estimation techniques. The measure most frequently used to calculate the welfare losses has been consumer surplus. In 1950s and 1960s monopoly was not thought to be a big problem. The estimations showed that it only generated a loss equal to 1% of GNP. However, in 1970s and 1980s this thought has changed, thus monopolies are accepted as a real bad.

However the ultimate aim has mostly remained to work towards theoretically well-grounded empirical estimates of actual losses in different industries, sectors or economies.

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