THE SOCIAL COSTS OF MONOPOLY POWER [1]

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Keith Cowling and Dennis C. Mueller

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In 1954, Arnold Harberger estimated the welfare losses
from monopoly for the United States at 0.1 of one per cent of GNP.
Several studies have appeared since reconfirming Harberger's early
low estimates using different assumptions (e.g. Schwartzman (1960),
Scherer (1970) and Worcester (1973)). These papers have firmly established
as part of the conventional wisdom the idea that welfare losses from monopoly
are insignificant.

The Harberger position has been, almost from the start, subject
to attack however (e.g. Stigler (1956)), Kamerschen (1966) followed
essentially the Harberger methodology, but assumed an elasticity of demand
consistent with monopoly pricing behaviour at the industry level and
obtained welfare loss estimates as high as 6 percent. Posner (1975) made
some rough estimates of the social costs of acquiring monopoly power, but,
using Harberger's calculations, concluded that the real problem was the
social cost imposed by regulation rather than of private market power.

The most sophisticated critique of Harberger's approach has been
offered by Abram Bergson (1973). Bergson criticizes the partial equilibrium
framework employed by Harberger and all previous studies, and puts forward
a general equilibrium model as an alternative. He then produces a series
of hypothetical estimates of the welfare losses from monopoly, some of
them quite large, for various combinations of the two key parameters in this
model, the elasticity of substitution in consumption and the difference
between monopoly and competitive price. Not surprisingly Bergson's
estimates, suggesting as they do that monopoly can be a matter of some
consequence, have induced a sharp reaction (see Carson (1975) and Worcester
(1975)) [2/]

The present paper levels several objections against the Harberger-type approach. It then calculates estimates of the welfare loss from monopoly using procedures derived to meet these objections, and obtains estimates significantly greater than those of previous studies. Although several of the objections we make have been made by other writers, none has systematically adjusted the basic Harberger technique to take them into account. Thus all previous estimates of monopoly welfare losses suffer in varying degrees from the same biases incorporated in Harberger's original estimates.

We do, however, retain the partial equilibrium framework followed by Harberger and all subsequent empirical studies. Although a general equilibrium framework would be preferable, such an approach requires simplifying assumptions, which to our mind, are just as restrictive as those needed to justify the partial equilibrium approach. For example, Bergson must assume that social welfare can be captured via a social indifference curve, and further that this indifference curve is the CES variety. The assumption that the elasticity of substitution (σ) is constant further implies, for a disaggregated analysis, that the elasticity of demand for each product (η_i) is the same, since $\eta_i \to \sigma$ as the share of the $\underline{i}$'th product in total output approaches zero. But, the assumption that η_i is the same for all $\underline{i}$ is the same assumption made by Harberger and most other previous studies. It introduces a basic inconsistency between the observed variations in price cost margins and the assumed constant elasticities in demand, which the present study seeks to avoid. Given such problems, we have adopted the partial equilibrium framework, with all the necessary assumptions it requires (see Bergson (1973)) We present estimates for both the United States and the United Kingdom based on data gathered at the firm level.

1. Theoretical Analysis

We have four substantive criticisms of the Harberger approach:

(1)   In the partial equilibrium formula for welfare loss $\frac{1}{2}$ dp dq, where dp is the change in price from competitition to monopoly and dq is the change in quantity, dp and dg were considered to be independent of each other. Generally low values of dp were <u>observed</u> and low values of dq were <u>assumed</u>. In Harberger's case he assumed that price elasticities of demand in all industries were unitary. This must inevitably lead to small estimates of welfare loss.

(2)   The competitive profit rate was identified with the mean profit rate and thus automatically incorporated an element of monopoly. In fact the underlying approach was a "constant degree of monopoly", one in which distortions in output were associated with deviations of profit rate from the mean, rather than from the competitive return on capital.

(3)   The use of industry profit rates introduces an immediate aggregation bias into the calculation by allowing the high monopoly profits of those firms with the most market power to be offset by the losses of other firms in the same industry. Given assumption (1), a further aggregation bias is introduced, which can easily be shown to result in additional downward bias in the estimates.

(4)   The entire social loss due to monopoly was assumed to arise

from the deviation of monopoly output from competitive levels.

To this should be added the social cost of attempts to acquire

monopoly positions, existing or potential.

We now seek to justify each of these four criticisms.

A   Interdependence of dp_i and dq_i

Assuming profit maximising behaviour we can define the implied

price elasticity of demand for a specific firm by observing the mark-up

of price on marginal cost:

$$\hat{\eta}_i = \frac{p_i}{p_i - mc_i} \qquad\qquad (1)$$

For a pure monopolist or perfectly colluding oligopolist $\hat{\eta}_i$ is the

industry elasticity of demand. In other cases $\hat{\eta}_i$ reflects both the

industry demand elasticity and the degree of rivals' response to a

change in price the ith firm perceives (Cubbin, 1975). Using (1) we shall

obtain welfare loss estimates by individual firms from their price/cost

margins. These estimates indicate the amount of welfare loss associated

with a single firm's decision to set price above marginal cost, given the

change in its output implied by $\hat{\eta}_i$[3]. To the extent other firms also charge

higher prices, because firm i sets its price above marginal cost, the total

welfare loss associated with firm i's market power exceeds the welfare loss

we estimate. To the extent a simultaneous reduction to zero of all price

cost margins is contemplated, however, $\hat{\eta}_i$ overestimates the net effect of

the reduction in p_i on the ith firm's output. What the latter effect on

output and welfare would be is a matter for general equilibrium analysis

and is not the focus here. Rather, we attempt an estimate of the relative importance of the distortions in individual firm outputs, on a firm by firm basis, on the assumption that each does possess some monopoly power, as implied by the price cost margin it chooses, and uses it.

This approach emphasizing the interdependence of observed price distortions and changes in output contrasts with the methodology of Harberger (1954), Schwartzman (1960), Worcester (1973) and Bergson (1973) who observe (or, in Bergson's case, assume) $(p_i - mc_i)/p_i$ and then _assume_ a value of η_i.[4] Harberger observed generally low values of dp_i and yet chose to assume that $\eta_i = 1$, and therefore that dq_i was also very small. But, it is inconsistent to observe low values of dp_i and infer low elasticities unless one has assumed that the firm or industry cannot price as a monopolist, i.e. unless one has already assumed the monopoly problem away. [5] Assuming interdependence we obtain the following definition of welfare loss:

$$dW_i = \frac{1}{2} \cdot \frac{dp_i}{p_i} \cdot \frac{dq_i}{q_i} \cdot p_i \, q_i \qquad (2)$$

where $\quad \dfrac{dp_i}{p_i} = \dfrac{1}{\hat{\eta}_i} \quad$ and $\quad \dfrac{dq_i}{q_i} = \hat{\eta}_i \, \dfrac{dp_i}{p_i} = 1$ [6]

$$\qquad (3)$$

$$\therefore \quad dW_i = \frac{dp_i}{p_i} \cdot \frac{p_i q_i}{2}$$

Assuming constant costs we can rewrite (3) in terms of profits:

$$dW_i = \frac{\Pi_i}{p_i q_i} \cdot \frac{p_i q_i}{2} = \frac{\Pi_i}{2} \qquad (4)$$

This formulation obviously contrasts sharply with Harberger's :

$$dW_i = \tfrac{1}{2}\ p_i \cdot q_i \cdot \eta_i \cdot t_i^{\,2} \qquad\qquad (5)$$

where

$$t_i = dp_i/p_i \ , \quad \eta_i = 1$$

It is obvious that if t_i is small the welfare loss is going to be insignificant. If t_i were a price increase due to tariff or tax then it might be assumed to be independent of η_i [7/], and equation (5) would give a reasonable estimate of welfare loss. But where t_i is a firm decision variable, η_i and t_i must be interdependent, and formulae for calculating welfare losses should take this interdependence into account. Interesting here is the Worcester (1975) critque of Bergson for doing essentially this with his hypothetical general equilibrium calculations when Worcester himself followed the Harberger line without demure (Worcester, 1973) [8/]. In contrast to Harberger and Worcester, Bergson (1973) allowed himself to pick some combinations of t_i and η_i, which implied high values of welfare loss.

Harberger defended his choice of a demand elasticity of 1.0 across all products on the grounds that what was "envisage(d was) not the substitution of one industry's product against all other products, but rather the substitution of one great aggregated of products (those yielding high rates of return) for another aggregate (those yielding low rates of return)" (p.79). Thus, the use of $\eta = 1.0$ was an attempt at

compensating for the disadvantages of employing a partial equilibrium
measure of welfare loss to examine a general equilibrium structural
change. But certainly this is a very awkward way of handling the
problem which neither answers the criticisms raised by Bergson (1973)
against the partial equilibrium approach, nor those we have just
presented. For this reason, we have chosen to define the partial
equilibrium methodology properly, and obtain the best estimates we can
with this approach recognizing that it leaves unanswered the issues raised
by general equilibrium analysis and the theory of second best regarding
the net effect of a simultaneous elimination of all monopoly power.

B   The Measurement of Monopoly Profits

The obvious measure of monopoly profit is the excess of actual
profits over long run completitive returns. For an economy in equilibrium,
the competitive profit rate is the minimum profit rate compatible with
long run survival, after making appropriate allowances for risk.
Monopoly profit is thus the difference between actual profits and profits
consistent with this minimum rate.

Harberger (1954) and all subsequent studies have based their
monopoly profit estimates on the size of the deviation between actual profit
rates and the mean rate. To the extent that observed profits contain
elements of monopoly rent, the mean profit rate exceeds the minimum rate
consistent with long run survival. The deviations between profit rates
above the mean and the mean rate underestimate the level of monopoly

returns, and the estimate of monopoly welfare is biased downwards [9/].

Indeed, if all firms and industries were in long run equilibriu, all
would earn profits equal to or greater than the minimum and the use of
deviations from the mean would minimize the size of the measured monopoly
profits.

But it is unreasonable to assume that the time periods invest-
igated in Harberger's study, the others which followed, or our own, are
long enough or stable enough so that all firms and industries are in
equilibrium. The presence of firms earning profits less than the
competitive norm creates a methodological problem for a study of monopoly
welfare losses. All studies to have have implicitly assumed that a
monopolist's costs are the same as those of a firm in competitive
equilibrium, and that all welfare loss is from the loss of consumers'
surplus from a monopoly price above marginal cost. But, what is the
appropriate assumption to make for a firm experiencing losses? It seems
unrealistic to assume that its costs are at competitive levels and its
prices below them. More reasonable seems the assumption that these firms
are in disequilibrium, probably with costs currently above competitive
levels. When calculating monopoly welfare losses, therefore, we simply
drop all firms (or industries where relevant) with profits below the
competitive return on capital, in effect assuming that they will eventually
return to a position where they are earning normal profits or disappear.
In either case, they represent no long run loss to society. (It is
possible that some of these losses represent expenditures by firms hoping
to secure monopoly positions from other firms in the industry, as discussed

below. These losses are then part of the social costs of monopoly.
We attempt to account for them in one of our welfare loss formulae).

Previous students, to the extent we can ascertain, have followed
Harberger and treated deviations in profits below and above the mean
symmetrically, and added the losses so calculated to obtain their welfare
loss estimates. Thus, these studies have not actually estimated welfare
loss under monopoly using perfect competition as the standard of comparison,
but have effectively compared welfare loss under the present regime with
that which would exist were the degree of monopoly equalized across all
firms and industries. Under their procedures, a constant degree of
monopoly power, however high, would result in no welfare loss. While
such an approach has some theoretical support, it raises practical
difficulties. How is this elusive concept of a constant degree of
monopoly defined and measured? How is such a world created without an
omniscient planner or regulator? In addition, monopoly in product markets
could be expected to induce distortions in factor markets. Finally, as
developed below, the existence of monopoly power in product markets
attracts resources to its acquisition and protection, which are part of
the social cost of monopoly apart from the distortions in output accompanying
it. For these reasons, and because it appears to be most directly in the
spirit of the analysis, we have compared monopoly profits to competitive
returns, and considered only deviations above the competitive rate when
estimating welfare losses [10/].

If we were to concentrate attention on a world in which product
market power had been eliminated, then we also would have to examine its
impact on the aggregative supply of capital and labour. In identifying

the competitive rate of return with the cost of capital we are implicitly

assuming the aggregate supply function for capital is infinitely elastic.

It might seem more reasonable to assume that aggregate saving is determined

by the level and distribution of income and is relatively invariant with

the interest rate. If this were true we could think of a world without

profits as the standard of comparison. In this world all profits would

be regarded as excess profits in aggregate. This assumption is not made

in the present calculations. We limit ourselves instead to a comparison

of the present system with one in which monopoly power is eliminated, by

some as yet undefined means, but in which other capitalist institutions

remain intact. We return to the other alternative when discussing the

implications of our results.

C   The Aggregation Biases from using Industry Data

Previous studies of monopoly welfare losses with the exception

of Worcester (1973) used industry data at a fairly high level of aggregation.

At any point in time some firms in an industry are likely to be earning

profits below the competitive level. We have already discussed the method-

ological issues raised in a study of monopoly welfare losses by firms earning

negative economic profits. If our interpretation of these firms as being

in short run disequilibrium is correct, then they should be dropped from an

industry before calculating the industry's profit rate. Previous studies

which have based their calculations solely on industry data have effectively

combined the negative profits of some firms with the positive profits of

others in estimating the welfare losses from monopoly. Thus, they have

implicitly assumed that the monopoly profits earned by the most profitable

firms in the industry are somehow offset or motigated by those experiencing

transitory losses. But, if there is a monopoly problem in an industry, it

is represented by the positive rents earned by those firms with profits above the norm, and the losses of firms that are temporarily unable to compete successfully in no way alleviates the social costs arising from the monopoly positions of the other firms. The present study measures monopoly welfare losses using firm level monopoly profit estimates, therefore.

A second aggregation bias is introduced into the estimates of all previous studies other than Kamerschen's (1966) through the assumption of a constant elasticity of demand across all industries. This results in the profit margin's appearance as a squared term in the welfare loss formula. The use of average firm profit margins (including firms with negative profits) implicit in the use of industry data, further biases the welfare loss estimates downwards. The extent of this bias is measured below.

D   Welfare Loss in the Acquisition of Monopoly Power

Tullock (1967) and Posner (1975) have argued that previous studies understate the social costs of monopoly by failing to recognize the costs involved in attempts to gain and retain monopoly power. These costs could take the form of investment in excess production capacity, excessive accumulation of advertising goodwill stocks, and excessive product differentitation through R and D. [11/] Efforts to obtain tariff protection, patent protection and other types of preferential government treatment through campaign contributions, lobbying or bribery are parts of the social costs of the existence of monopoly as defined by Tullock and Posner. To the extent that these expenditures enter reported costs in the form of

higher payments to factor owners and legitimate business expenses, firm

costs in the presence of monopoly exceed costs under perfect competition.

Estimates of welfare loss based on those profits remaining net of these

expenditures underestimate the social cost of monopoly in two ways:

first, by understating monopoly rents they understate the distortions

in output monopoly produces; second, by failing to include these additional

expenditures as part of the costs of monopoly.

Three adjustments to the usual welfare triangle measure of

monopoly welfare loss are made to account for the additional expenditures

to redistribute monopoly rents, monopoly power induces.   First, advertising

is added to monopoly profit in caculating the welfare triangle loss to allow

for the understatement of monopoly profit expenditures of this type produce.

Second, all of advertising is added to the welfare loss.   This takes the

extreme view of advertising as merely an instrument for securing market

power.   To the extent advertising provides useful information to consumers,

this measure overstates the cost of monopoly $\underline{12/}$.   Third, all of measured,

after-tax profits above the competitive cost of capital are used as the

estimate of the expenditures incurred by others to obtain control of these

monopoly rents.   Obviously this estimate is but a first approximation.

It is an underestimate, if the firm has incurred expenditures in the

acquisition and maintenance of its monopoly position, which are included

in current costs.   It is an overstatement if actual and potential

competitors can successfully collude to avoid these wasteful outlays.

This type of argument can always be rebutted, however, by carrying the

Tullock/Posner analysis one stage back and positing expenditures of

resources to enter the potential competitor's position, and so on.   The

arguments that after-tax profits underestimate the additional costs

associated with monopoly seem at least as reasonable as those suggesting

overestimation.

The addition of after-tax monopoly rents to the measure of welfare loss can be justified by an independent argument to that put forward by Tullock and Posner. The traditional approach has ignored these rents on the grounds that they involve pure redistribution of no consequence in the estimate of social welfare. Comanor and Smiley (1975) have estimated the amount of redistribution to the highest wealth bracket brought about through the distribution of monopoly rents to be substantial, however. If this redistribution from the bottom upward were not thought desirable, some reduction in the level of social welfare, in proportion to to the amount of monopoly rents would be appropriate.

II. Empirical Estimates

Empirical estimates of the social cost of monopoly power were obtained for both the U.S. and U.K. We provide two sets of estimates, one based on our assumptions (ΔW_{CM}^k), the other based on Harberger type assumptions (ΔW_H^k), both measured at the firm-level. For each approach we give a range of four estimates defined in Table 1.

TABLE 1. Alternative Definitions of Social Cost

k	ΔW_{CM}^k	ΔW_H^k
1	$\Pi/2$	$(R/2).(\Pi/R)^2$
2	$(\Pi + A)/2$	$(R/2\left[(\Pi + A)/R\right]^2$
3	$A + \left[(\Pi + A)/2\right]$	$(R/2)\left[(\Pi + A)/R\right]^2 + A$
4	$\Pi' + A + (\Pi + A)/2$	$R/2\left[(\Pi + A)/R\right]^2 + A + \Pi'$

where

Π = before tax profit

Π' = after tax profit

A = advertising

R = total revenue.

Thus for $k = 1$ we define two alternative estimates of the welfare triangle, the one $\left(\Delta W_{CM}^1\right)$ based on interdependence of dp_i and dq_i, the other $\left(\Delta W_H^1\right)$ based on the Harberger methodology. This latter estimate is included for comparison with previous results especially from the viewpoint of bias due to aggregation. For $k = 2$, the same calculations are performed but in calculating dp_i, advertising expenditure

(A_i) is deducted from cost. For $k = 3$, we add in advertising expenditure as a social cost and for $k = 4$, we also add in monopoly profits after tax as a further element of social cost. It should be noted at this point that in calculating dp_i the appropriate profit measure is before tax profit since the price and quantity choice of a monopolist should not be affected by a tax on profits. Thus, in contrast to most previous studies, we use before tax profits to measure the distortion between price and costs under monopoly (the ΔW's for $k = 1,2,3$). However, it is after tax monopoly profits which provide an inducement to additional expenditures to gain monopoly, and it is these that are added in to obtain our fourth measure of welfare loss.

To estimate monopoly profits, an estimate of the return on capital for firms in competitive industries is needed. We took as our choice of a competitive industry, the stock market. We use as our estimates of the return on capital for the U.S., the Fisher-Lorie index of returns on a fully diversified portfolio of listed corporate stocks for the same period for which our monopoly profit estimates are made (1963-66). For the U.K. we use the post-tax real cost of capital as calculated by J.S.Flemming et al [13]. The returns on corporate stock include monopoly rents to the extent that they become capitalized over the period for which the rate is estimated. The use of these returns is, therefore, equivalent to assuming that (1) all existing monopoly rents are fully capitalized at the beginning of the period, and (2) the average increases in monopoly rents over the period are accurately anticipated.

The firms in our samples include companies operating in both

intermediate and final goods markets. To justify the addition of
triangular type measures of welfare loss for final and intermediate
products, we must assume that the demand schedule for an intermediate
profuct represents a derived demand schedule as in traditional Marshallian
analysis. Under this assumption, triangular measures of welfare loss
calculated from interm-diate product demand schedules fully capture the
loss in consumer welfare monopoly distortions in the intermediate markets
cause, as Wisecarver (1974) has recently demonstrated. Assuming advertising
and other efforts to obtain monopoly power are as wasteful when undertaken
in intermediate markets as in final goods markets, the formulae presented
in Table 1 can be applied for both intermediate and final good producers.

A   U.S.Estimates

        The range of welfare loss estimates for the U.S. are presented
in Table 2. They refer to the 1963-66 period and the sample comprises the
734 firms on the COMPUSTAT tape with useable information [14/]. The firms
are ranked according to the size of welfare loss as measured by ΔW_{CM}^4.
General Motors leads the list with an annual welfare loss of over $1\frac{3}{4}$
billion, which alone is over $\frac{1}{4}$ of one percent of average GNP during the
period, and exceeds Harberger's original welfare loss estimate for the
entire economy. Most of the other members of the top 20 are names one
also might have expected. One possible exception is AT & T. AT & T's
gross profit rate was, in fact, less than our estimate of the cost of
capital ($\overset{\sim}{} 0.12$). Its advertising entry on the COMPUSTAT tape (and in
this case we did have a COMPUSTAT figure, see appendix) was $\frac{3}{4}$ billion,
and it is AT & T's advertising which leads to the high ΔW_{CM} estimate we

have for it. Advertising also weighs heavily in the ΔW_{CM}^4 estimates

for Unilever, Proctor and Gamble, Sears Roebuck, Genesco, Colgate-Palmolive,

Pan Am and Pacific Tel. At first sight this might seem surprising,

particularly with respect to regulated firms like AT & T and Pacific Tel.

But, as Posner (1975) has argued, this is precisely what one expects to

find in industries with high market power, and, as Posner himself stresses,

firms under regulatory constraint can be expected to engage, if anything,

in more wasteful dissipation of their monopoly rents than non-regulated

firms through expenditures like advertising. It is interesting to note

in this regard that 6 of the 40 largest welfare losses are accounted for

by regulated firms (3 telephone companies and 3 airlines) in which advert-

ising made up all or most of the losses.

At the bottom of Table 2 the losses are summed over the firms

with positive profit margins as defined for the ΔW^1 and ΔW^2 measures

(see table notes), and then expressed as a proportion of our estimate of

the Gross Corporate Product originating in the 734 firms in the sample.

If we see product market power as a ubiquitous characteristic of the

economy, then it might be reasonable to assume that this estimate of

monopoly welfare loss could be generalized to the entire economy. To

the extent one believes monopoly power is more (e.g. see again Posner

(1975)) or less pervasive in other sectors our estimates must be raised

or lowered. Assuming the social costs of monopoly are the same across all

sectors, we obtain estimates for our preferred model (ΔW_{CM}^k) ranging between

4 and 13 percent of GCP. Thus, all losses are significant, but the range

TABLE 2   Monopoly Welfare Losses by Firm (yearly averages in $ millions) : U.S. 1963/66

Company	ΔW^1_{CM}	ΔW^2_{CM}	ΔW^3_{CM}	ΔW^4_{CM}	ΔW^1_H	ΔW^2_H	ΔW^3_H	ΔW^4_H
1. General Motors	1060.5	1156.3	1347.8	1780.3	123.4	146.2	337.8	770.2
2. AT & T	0.0	257.3	1025.0	1025.0	0.0	13.4	781.1	781.1
3. Unilever	0.0	160.0	490.5	490.5	0.0	19.5	350.0	350.0
4. Procter & Gamble	56.7	180.1	427.0	427.0	3.3	33.0	279.9	279.2
5. Dupont	225.1	241.9	275.4	375.3	36.3	41.7	75.2	175.2
6. Ford Motor	160.4	217.5	331.7	331.7	5.2	9.3	123.5	123.5
7. IBM	251.7	264.0	288.7	319.8	36.8	40.5	65.2	96.3
8. Reynolds, R.J.	73.1	138.5	269.3	278.8	10.8	38.5	169.3	178.8
9. Sears Roebuck	36.2	115.0	272.5	272.5	0.5	4.4	162.0	162.0
10. Eastman Kodak	136.3	157.9	201.1	258.5	27.7	36.8	80.0	137.4
11. American Cyanamid Co.	27.6	98.7	240.8	240.8	1.9	23.6	165.8	165.8
12. Genesco, Inc.	0.0	67.5	202.6	292.6	0.0	14.9	150.0	150.0
13. Exxon Corp.	115.6	143.0	197.8	197.8	2.4	3.7	58.5	58.5
14. Colgate-Palmolive Co.	3.9	56.7	160.3	160.3	0.0	7.6	111.8	111.8
15. Chrysler Corp.	39.8	78.4	155.5	155.5	1.1	3.0	80.1	80.1
16. General Electric Co.	83.4	105.2	148.8	148.8	2.6	4.0	47.6	47.6
17. Pan Am Airways	1.1	49.8	147.2	147.2	0.1	7.5	104.9	104.9
18. Pacific Tel. & Tel.	0.0	18.4	138.1	138.1	0.0	0.8	128.5	128.5
19. Gillette Co.	27.8	56.0	112.3	129.2	4.7	18.9	75.3	92.2
20. Minnesota Mining & Mfg.	62.5	77.4	107.1	129.1	8.2	12.6	42.3	64.3
TOTALS ALL FIRMS (1)	4527.1	7454.9	14005.4	14997.6(2)	448.2	897.8	7448.3	8440.1(2)
TOTAL/GCP (3)	.0396	.0652	.1227	.13137	.0040	.0079	.0652	.0739

(1) The ΔW^1's for all firms having monopoly profits (Π) less than zero, were set equal to zero. The ΔW^2, ΔW^3 and ΔW^4's for all firms with ($\Pi+A$) < 0 were set equal to zero. The latter was one on the assumption that these firms would not survive in the long run and hence represent no long run welfare loss to society. There are 421 firms with $\Pi > 0$ and 525 firms with ($\Pi+A$) > 0 in the sample of 734 firms.

(2) When profits, after deducting taxes and the cost of capital (Π') are less than zero, $\Delta W^4 = \Delta W^3$.

(3) The total welfare loss for all firms by each ΔW measure is first divided by the total sales of the 734 firms in the sample, and then multiplied by the ratio of corporate sales to gross corporate product over all industries (2.873) as given in Laffer (1969).

is considerable depending upon what components of social cost one includes.
For the Harberger approach, the range is between 0.4 and 7 percent. The
lowest of these follows the Harberger assumptions most closely, but never-
theless we estimate a welfare loss four times as big as he did. This
difference in large part is explained by the aggregation bias incorporated
into the industry level estimates.

The extent of this bias can be seen by considering Table 3. Its
entries are made by assigning each firm to an industry at the appropriate
level of aggregation, and aggregating over the firms in each industry.
Just as negative profit firms were excluded in calculating welfare losses
at the firm level, negative profit industries are excluded in calculating
welfare losses across industries. For the ΔW_{CM}^k measures aggregation
bias is due simply to the inclusion of losses by some firms in the calcul-
ation of each industry's profits. Table 3 shows how this bias varies with
the level of aggregation and with the choice of measure. Industry estimates
are between 78 and 98 percent of the firm level estimates in aggregate.
For the ΔW_H^k estimates, a further course of bias is introduced by the
squared term, $(\Pi/R)^2$, in the formula. It can be seen from Table 3 that
for the ΔW_H^1 measures, the 2-digit industry estimates aggregate to only
40% of the firm level estimates [15/]. Note, however, that the biases are
much smaller for the ΔW^3 and ΔW^4 measures and in the case of the ΔW_H^3
measure at the 4-digit level the bias goes slightly the other way. This
comes about because of the inclusion in the industry estimates of advertising
for firms earning less than normal profits. Thus in future work along
these lines, when data are limited to industry level observations, the
ΔW^3 and ΔW^4 measures have an additional advantage over the other two
measures.

TABLE 3   Comparison of Firm and Industry Welfare Loss Estimates : U.S. 1963/66.

	ΔW^1_{CM}	ΔW^2_{CM}	ΔW^3_{CM}	ΔW^4_{CM}	ΔW^1_{H}	ΔW^2_{H}	ΔW^3_{H}	ΔW^4_{H}
Summation over Firms	4527.1	7454.9	14,005.4	14,997.6	448.2	897.8	7448.3	8440.1
Summation over 4 Digit Industries	3767.8	6902.5	13,752.6	14,052.8	276.9	628.8	7478.9	7790.2
Summation over 3 Digit Industries	3619.0	6680.5	13,355.4	13,512.8	237.4	577.7	7252.5	7410.4
Summation over 2 Digit Industries	3515.2	6634.5	13,262.7	13,287.9	178.9	485.3	7113.5	7148.8
4 Digit Ind.Est. / Sum Firms Est.	.832	.926	.982	.937	.618	.700	1.004	.923
3 Digit Ind.Est. / Sum Firms Est.	.799	.896	.954	.901	.530	.643	.974	.878
2 Digit Ind.Est. / Sum Firms Est.	.776	.890	.947	.886	.399	.541	.955	.847

B. U.K. Estimates

These have been calculated on the same basis as the U.S. estimates, but since no convenient computer tape was available we contented ourselves with an analysis of the top 103 firms in the U.K. for the periods 1968/69 and 1970/74 [16/]. Over the periods in question these firms were responsible for roughly one-third of GNP and were therefore proportionally more important than the 734 firms samples from the COMPUSTAT tape for the U.S. The time-periods used have been dictated by the availability of data. The basic source has been EXTEL cards but advertising expenditure was estimated by aggregating up from the brand level, using estimates of press and TV advertising contained in MEAL. We can therefore expect that our advertising expenditure figures will be biased down by the amount of non-media advertising, as is true also for the U.S. Table 4 gives the results for 1968/69, with firms again being ranked by ΔW_{CM}^4. The two major oil companies, BP and Shell, dominate the table. The social cost associated with BP alone is roughly one-half of one percent of GNP. The other members of the Top Ten are industry leaders plus British-American Tobacco. Two interesting features of the Top Twenty are the high ranking of Rank Xerox despite its size (explained presumably by its U.K. patent rights) and, in contrast to the U.S., the low ranking of motor-car manufacturers (absent from the Top Twenty in 1970/74). We have computed estimates of welfare loss for the 1970/74 period, but we have not reported these results here. It is well known, that the early seventies was a period of very rapid inflation in the U.K. and this undoubtedly raises problems such as adequately account for stock appreciation and the revaluation of capital. Despite these problems, it is somewhat reassuring to note that the 1970-74 results look very much like

TABLE 4   Monopoly Welfare Losses by Firm (£ Million) : 1968-69.

Company	ΔW^1_{CM}	ΔW^2_{CM}	ΔW^3_{CM}	ΔW^4_{CM}	ΔW^1_H	ΔW^2_H	ΔW^3_H	ΔW^4_H
1. British Petroleum	147.6	147.9	148.6	165.0	20.1	20.2	21.0	37.3
2. "Shell" Transport & Trading.	116.4	117.8	120.6	120.6	11.9	12.2	15.0	15.0
3. British-American Tobacco	53.2	53.4	53.9	87.4	4.1	4.1	4.6	38.0
4. ICI	62.7	63.8	66.1	81.0	6.1	6.3	8.6	23.5
5. Unilever	17.9	26.4	43.3	46.3	0.6	1.3	18.2	21.2
6. Rank Xerox	22.9	23.0	23.1	42.9	9.1	9.1	9.3	29.1
7. Great Universal Stores	18.8	19.3	20.2	36.4	1.9	2.0	3.0	19.1
8. Imperial Group	16.7	22.5	34.0	34.0	0.5	0.9	12.5	10.0
9. IBM(UK) Holdings	17.4	17.4	17.5	33.1	5.4	5.4	5.5	21.1
10. Marks & Spencer	17.9	17.9	17.9	31.3	2.0	2.0	2.0	15.4
11. Ford	16.5	17.0	18.1	30.3	1.1	1.2	2.3	15.7
12. Burmah	14.6	14.8	15.2	28.0	1.8	1.9	2.3	15.0
13. F.W.Woolworth	14.7	14.9	15.2	27.7	1.4	1.5	1.8	14.3
14. Distillers	16.0	16.5	17.5	27.7	1.4	1.5	2.5	12.7
15. Beecham Group	10.3	13.0	18.4	27.4	1.7	2.7	8.1	17.1
16. Rio Tinto Xinc	24.3	24.3	24.3	24.3	3.8	3.8	3.8	3.8
17. Rank Organization	20.9	21.1	21.5	22.7	3.9	4.0	4.4	5.7
18. British Leyland	17.8	18.7	20.5	22.5	0.7	0.7	2.6	4.5
19. J.Lyons	1.3	2.4	4.5	21.2	0.0	0.1	2.2	19.0
20. Courtaulds	16.3	16.8	17.7	20.7	1.1	1.2	2.1	5.1
Total all Firms (102)	970.3	1019.3	1123.5	1424.8	97.2	103.7	205.5	513.2
Total ÷ GCP	0.0972	0.1021	0.1126	0.1427	0.0097	0.0104	0.0206	0.0514

No. of firms with Π (before tax) > 0 = 99

No. of firms with Π (before tax) + A > 0 = 100

the 1968/69 results except that the oil companies become even more dominant [17].

The aggregate estimates of welfare loss for ΔW_{CM}^k range between 9 and 14 percent of GCP for the 1968/69 period. These values are higher than for the U.S. but the range is somewhat narrower. One obvious difference between the two sets of results is the apparent greater importance of advertising in the U.S. Generally, taking direct account of advertising does not significantly change our estimates of welfare loss (compare ΔW_{CM}^2 and ΔW_{CM}^3 with ΔW_{CM}^1)[18]. Using the Harberger approach estimates of welfare loss vary between 1% and 5% of GCP for the U.K. in the same 1968/69 period.

Again, we must conclude that our evidence suggests significant welfare loss due to monopoly power. One other point is also brought out particularly by the U.K. results (e.g. in the case of the oil companies) and that is the international distribution of these social costs. Monopoly power held by U.K. companies in foreign markets may be advantageous to the U.K. economy whilst being disadvantageous in the global sense. Thus the issue is a distributional one and adds an international dimension to the distributional issues already implicit in our analysis. In any national evaluation of the social costs imposed by the actions of a particular company, the international distribution of these costs would presumably gain some prominence.

III   Implications and Conclusions

Previous studies of the social costs of monopoly have generally
(and often unconsciously) assumed that "monopolies" set prices as if they
did not possess market power, that the only important distortions in output
are brought about through the deviations in one firm's market power from
the average level of market power, that the losses of some firms (perhaps
incurred in unsuccessful attempts to obrain monopoly power) legitimately
offset the monopoly rents of others, and that all of the expenditures made
in the creation and preservation of monopoly positions are part of the
normal costs which would exist in a world without monopolies. With the
problem so defined, it is not surprising that most of these studies have
found the welfare losses from monopoly to be small. The present study
has attempted to redefine the procedure for estimating the social cost of
monopoly to make it consistent with the assumption that monopoly power does
(or may) exist. Our results suggest that the existence of positions of
market power does impose heavy social costs. Do we in fact overstate
these costs? We have certainly made some assumptions which arguably might
overstate the case (e.g. the full offsetting of monopoly profits through
the competitive pusuit of monopoly power and the partial equilibrium frame-
work). But we have also ignored important sources of bias in the other
direction. These possible biases are present in the measurement of profits
and thus enter the estimated magnitudes of both dp_i and Π_i itself. We
have already emphasized that reported profits understate true profits to
the extent that firms compete for monopoly power by investing in excess
plant capacity, advertising, patent lawyers, and so on. But much of the
competition for control over monopoly rents may take place within the firm

itself among the factor owners. Such competition will lead to an under-
statement of actual monopoly rents both through the inflation of costs that
wasteful competition among factor owners brings about, and through the
inclusion of part of the winning factor owners' shares of monopoly rents
as reported costs. A large literature now exists on the variety of
objectives managers have and the ways in which these objectives are
satisfied through their discretionary control over company revenues. To
the extent that managerial control over firm revenues is the reward for
successfully competing against other factor groups and potential managers,
reported profits understate the true profitability. By ignorning these
possibilities we err in being conservative when estimating the social cost
of monopoly.

In this respect, it is useful to note an alternative, aggregative
approach to the question. Phillips, in an appendix to Baran and Sweezy
(1966), isolated several categories of expenditure, dependent on the
existence of "Monopoly Capitalism" (e.g. advertising, corporate profits,
lawyers' fees). Their sum came to over 50 percent of U.S. GNP. Although
the assumptions upon which these calculations were made are rather extreme,
they do suggest both an alternative method of analysis and the potential
magnitude of the problem. Here too, it should be noted that our approach
has been essentially micro-oriented and neoclassical in that we have taken
the returns on corporate stocks as our cost of capital. From a more
aggregative view it could be argued that profits are not required at all to
generate the savings required to sustain a given rate of growth, since

alternative macro policies are available. From this perspective, all
profits are excess profits and our estimates of social cost are too
conservative. Still further weight would be added against the position
that monopoly power is unimportant, if the link between the distribution
of income and wealth and the distribution of political power were considered.

What policy implications can be drawn from our results? First,
the relative size of the welfare losses indicates that the static costs of
monopoly power should no longer be regarded as necessarily small. Our
monopoly welfare loss estimates by firm indicate the most significant
contributors to these losses,. The tops of our lists of the largest
welfare losses by firm are logical starting points for intensified enforcement
of anti-trust policy. Our figures and supporting analysis further
demonstrate that "the monopoly problem" is broader than traditionally
suggested. A large part of this problem lies not in the height of monopoly
prices and profits per se, but in the resources wasted in their creation and
protection. These costs of monopoly should be considered when selecting
targets for anti-trust enforcement.

One might argue that the high profits of some firms reflect
economies of scale advantages, and, therefore, these firms should not be
the victims of anti-trust policy. This argument points to some form of
regulatory or public enterprise solution to the monopoly problem. With
respect to this type of policy, our estimates of the losses from monopoly
represent a still further understatement of their potential magnitude.
If a policy were adopted forcing the most efficient size or organizational
structure upon the entire industry, the welfare loss under the existing
structure would have to be calculated using the profit margin of the most

efficient firm and the output of the entire industry, rather than the profit margins of the individual firms and their outputs.

Of course, any public policy has its own sets of costs and inefficiencies. For Tullock-Posner reasons a concerted effort to apply or strengthen the anti-trust laws induces large, defensive expenditures on the part of business. Price and profit regulation leads to efforts to change, influence, or circumvent the application of the rules. The public enterprise solution raises the same sort of problems, with members of the bureaucracy participating in the competition for monopoly rents. A full analysis of the alternatives for dealing with monopoly power is beyond the purview of this paper. What we hope to have done is demonstrate that the social costs of monopoly power are significant, and, therefore, that the search for an appropriate policy remedy is warranted. Beyond that, we have indicated where this search might begin.

Footnotes

1. This paper was started during the summer of 1975 when Keith Cowling visited the International Institute of Management and completed during the summer of 1976 when Dennis Mueller partcipated in the University of Warwick' s Summer Workshop. Thanks are extended to both of these institutions for their support. In addition, special thanks are due to Gerald Nelson, who made the welfare loss calculations for the U.S. and Clive Hicks for making the estimates for the U.K.

2/ In addition to the points Bergson (1975) raises in his own defence, we have serious objections to the arguments made by Carson and Worcester (1975). Some of these are presented below in our critique of previous studies. Others are developed by Cowling (1976).

3/ We need here an assumption of perfect competition everywhere else, of course. We shall ignore problems of the second best, along with the general equilibrium issue more generally throughout the paper.

4/ The Harberger and Schwartzman estimates are at the industry level.

5/ This position is questioned by Wenders (1967) and others who attempt to show how implausible the implied η_i's are. However, their calculations are erroneous because they fail to recognise (a) that the degree of collusion is a variable - we need not assume perfect joint profit maximization and (b) that entry is conditional on the same variables (plus others) that determine $(p_i-mc_i)/p_i$, for example η, the degree of concentration and, for differentiated products, advertising also.

6/ This is true so long as the firm is in equilibrium, i.e. that the firms' expectations about the behaviour of rivals are actually borne out. If this were not the case then the elasticity on which the pricing decision was made would not correspond to the elasticity implied by the change in output. We assume firm equilibrium in our calculations.

7/ But not necessarily so. Taxes and tariffs may be applied according to elasticity expectations.

8/ Worcester (1975) also offers some empirical support. His collection of industry price elasticities is either irrelevant (including many agricultural products and few manufacturing ones), or suspect (no allowance having been made in the studies quoted for quality change over time), and is certainly not comprehensive.

9/ Worcester (1973) makes some allowance for this bias by using 90% of the median profit rate, but this adjustment is obviously rather ad hoc.

10/ One might believe that the losses by firms earning profits below the norm represent a form of factor surplus loss which must be added to the consumer surplus loss to obtain the full losses from monopoly. But, as Worcester (1973) has shown these factor surplus losses, if properly measured, are an alternative way of estimating the consumer surplus losses and should be used instead of the consumer surplus measure, rather than in addition to it, if used at all.

11/ See Spence (1974). It is interesting to note that this type of activity generally dominates the entry-limiting pricing response. Entry limiting pricing can be thought of as having extra capacity because of potential entry and actually using it to produce output. Thus the prodits associated with resctricting output are lost. From this viewpoint we cannot accept Posner's position that the elimination of entry regulation would eliminate waste. As the probability of entry increases so would the optimal degree of excess capacity. Monopoly pricing would be maintained but social waste would still occur.

12/ There will always be an inherent bias in the information provided given the interests of the agent doing the advertising so the argument for advertising as a provider of information should not be taken too seriously. Even if we base our welfare measures on post-advertising preferences it is still possible to demonstrate that monopolies (and a fortiori oligopolies) invest in too much advertising (see Dixit and Norman (1975)).

13/ With respect to the United States, this estimate of the competitive return on capital (approximately .12) was fairly close to the average return on capital earned by the firms in our sample (.143). Thus, its choice rather than the mean profit rate (or 90% of the median rate as used by Worcester (1973)) did not influence the nature of our results significantly. In contrast the difference between the estimated cost of capital and the mean profit rate for the U.K. was relatively large (e.g. .039 versus .090 for the 1968/69 period). It may be argued that because of inflation we are overstating profits and undervaluing capital. The paper by J.S.Flemming et.al. (1976:1) would suggest that in 1968/69 the problem is largely one of the valuation of capital. Stock appreciation is a real problem in the early seventies and it is for this reason that we are not taking the 1970/74 results too seriously. However during the sixties the estimates by Flemming et.al. suggest that the aggregate capital stock for U.K. is undervalued by about 20%. This would imply that we may be overstating excess profits and would be true if our capital measure were based simply on historic cost. This is not true for company data for two sorts of reasons. (1) When mergers take place between companies the acquired assets are given a current market valuation and the old historical cost valuation disappears entirely. To the extent that the premium price paid by the acquiring company reflects the monopoly gains implicit in the merger then our measure of excess profit will be understated. It should be noted that horizontal merger, involving potential monopoly gains, has been a favourite activity of many of the top 100 firms. (2) Revaluations of land and buildings do take place periodically, their frequency being related to the rate of inflation. This element of capital stock is particularly significant in the case of firms involved in retailing but it obviously has general relevance. For these reasons we have decided that there can be no presumption that the bias is working one way or the other.

14/ The Compustat tape contains data on a sample of large firms, mostly in manufacturing, listed on U.S. stock exchanges. The data definitions used in making the estimates are discussed in the appendix.

15/ Worcester (1973) plays down the extent of the bias by focussing on the absolute differences between the measures. Given that the absolute values of losses are small using ΔW_H^1, even very large relative biases result in small absolute distortions, as one would expect.

For additional evidence on the importance of aggregation bias in previous studies, see Siegfried and Tiemann (1974).

16/ The top 100 varies somewhat over time.

17/ Indeed, comparing the results for the two periods indicates the large extent to which oil companies have benefited from the recent "oil crisis". However, this inference has to be qualified by the problems raised for the measurement of profit by stock appreciation during a period of rapid inflation of oil prices.

18/ This does not of course mean that advertising implies no additional social costs, since profit-margins and the level of excess profits may both be partly determined by advertising insofar as elasticities of demand and entry barriers are influenced by the level of advertising in monopolistic industries. We should also note that in some cases our direct adjustment for advertising is very significant (e.g. Unilever, Imperial Group and Beecham Group).

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APPENDIX

Data;Definitions and Sources

U.S.

All data on individual firms with one exception were taken from the COMPUSTAT tape of 1969, and all definitions conform therefore to those given in the COMPUSTAT manual. The numbers in brackets { } refer to the variable numbers assigned on the COMPUSTAT annual industrial file.

The competitive return on capital used in calculating monopoly profits was .1197, the geometric mean of the monthly Fisher-Lorie index of returns on the market portfolio between January 1963-December 1967. The firm's capital was measured as Total Assets/Liabilities and Net Worth less Intangibles (goodwill, patents, etc.) The latter were deducted on the grounds that they largely represent capitalized monopoly rents (see Stigler (1956) and Kamerschen (1966)). Thus, the firm's opportunity cost of capital was estimated as :

$$CC = .1197 \ (DATA \ \{6\} - DATA \ \{33\} \ ).$$

Two estimates of monopoly profits were formed to compute the triangle-type measures. The first is gross profit flow (Net Income + Interest Expense + Income Taxes) less the cost of capital (CC).

$$\Pi = DATA \ \{18\} + DATA \ \{15\} + DATA \ \{16\} - CC$$

The second is the first plus advertising (A = DATA {45}).
For roughly 85% of the sample firms the COMPUSTAT entry for advertising
was missing, however.   The product of the firm's Sales (DATA {12}) and
the industry advertising to sales ratio for the firm's industry as given in
Advertising Age (June 7, 1965, pp.101-03) was substituted for this entry
in these cases.

To calculate the ΔW^4 measures, Income Taxes (DATA {16}) were
subtracted from Π to obtain Π'.

U.K.

All the data on individual firms with the exception of advertising,
has its origin in the data tabulations of the Exchange Telegraph Statistics
Service (EXTEL).   Most of the relevant data in a summarized form was
available in various issues of The Times Review of Industry and Technology.
In the case of advertising the firm data had to be estimated via a process
of aggregating estimates of press and TV advertising of the various products
produced by each firm.   These data were extracted from various issues of
MEAL (Advertisers Annual Analysis of Media Expenditure) and, in the case of
1968, from the Statistical Review of Press and T.V. Advertising, Legion
Publishing Company.   Who Owns Whom was used in the process of aggregation.

Each firm's capital was measured as Total Tangible Assets less
Current Liabilities (excluding bank loans, overdrafts and future tax).
Profit was measured before Interest and Tax and then adjusted for the
estimated cost of capital (taken from J.S.Flemming, et.al.).