IV

Although I had maintained an active interest in applied welfare economics since graduate-school days, the following article, which appeared in *The American Economic Review* in 1954, was my first published piece on the subject. In many respects it sets the format for my subsequent work in this area, especially in terms of its adherence to a general-equilibrium, multisectoral approach. My debt to Harold Hotelling's pioneering article in the area of welfare cost measurement, which is reiterated in each of my subsequent writings on the subject, is stated in footnote 2. I must confess, however, that at the time of its writing, my appreciation of the nature and power of the analytical apparatus being used was somewhat rudimentary and intuitive.

As is pointed out in Chapters 1, 2, and 3, when one thinks of introducing distortions sequentially into an economy, the change in welfare induced by each added distortion (T_i^*) will consist of a triangle $1/2\ T_i^* \Delta X_i$ plus a series of rectangles $\sum_{j<i} T_j^* \Delta X_j$, where $\Delta X_j = \int_{T_i^*=0}^{T_i^*} (\partial X_j)/(\partial T_i)\, dT_i$. Yet my formulation in "Monopoly and Resource Allocation," as well as Hotelling's famous $1/2 \sum dp_i\, dq_i$, consists just of a set of triangles.

What happened to the rectangles? The answer is that they are still there (in the sense that the areas they represent are not being neglected), but recognizing this fact also affects the interpretation of the results. In Figure 4A1 is presented the standard triangle-rectangle analysis of a pair of distortions in a two-sector economy with constant unit costs. The introduction of the first distortion T_1^* generates a welfare cost equal to the triangle *ABC*, while the introduction of T_2^* in the presence of T_1^* generates an addition to welfare cost equal to the triangle *GHJ* plus the rectangle *BCDE*. On the other hand, the Hotelling measure that I employed would

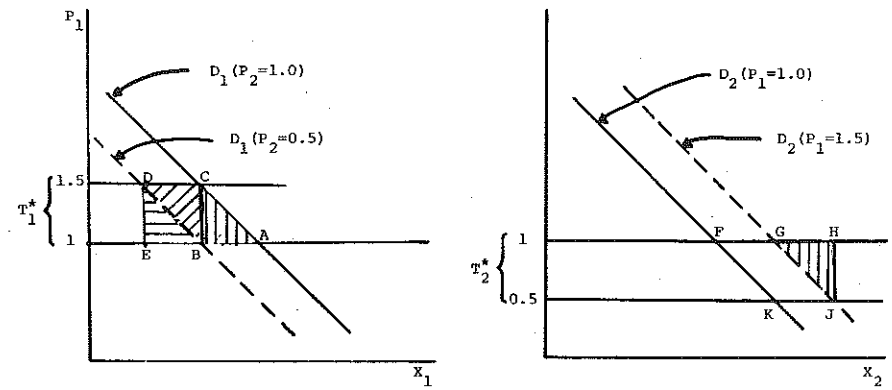

FIGURE 4A1

take triangles *ADE* plus *FHJ* of Figure 4A2 as the measure of welfare loss. But it is easy to see that base *AE* of *ADE* is equal to the sum *AB* plus *CD* of the bases of triangles *ABC* and *BCD*. Since the heights of all three triangles are the same, we have that the areas of *ABC* and *BCD* sum to that of *ADE*. Less easy to see, perhaps, is the fact that the areas *GHJ* plus *BDE* add up to that of *FHJ*. But *FG* is equal to $[\partial X_2/\partial T_1] \cdot T_1^*$, and *EB* is equal to $[\partial X_1/\partial T_1] \cdot T_1^*$. And given the linear production constraint here assumed, this means that *FG* is equal to *BE*. Since, moreover, the height *HJ* equals *DE* by construction in this example, we conclude that *BDE* plus *GHJ* equals *FHJ*.[1]

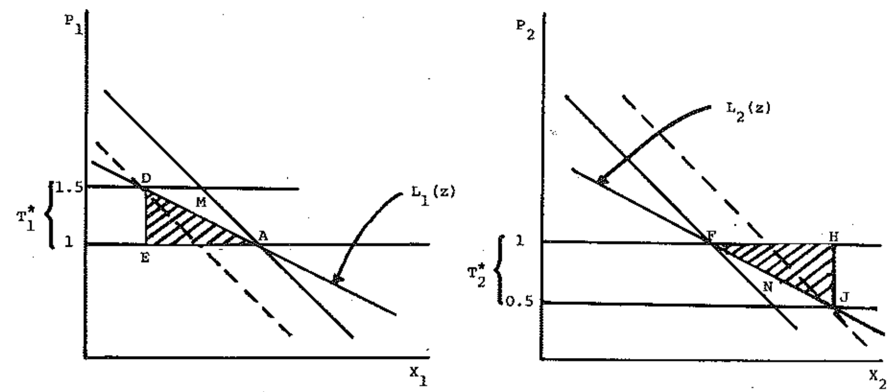

FIGURE 4A2

[1] When the two distortions are not equal in magnitude one has to use the symmetry property $\partial X_1/\partial T_2 = \partial X_2/\partial T_1$ to complete the geometric proof. *BDE* is equal to $(\partial X_1/\partial T_2) \cdot T_2^* T_1^*$. But *FGK* is equal to $(\partial X_2/\partial T_1) \cdot T_1^* T_2^*$. Given the symmetry property $\partial X_1/\partial T_2 = \partial X_2/\partial T_1$, *BDE* must

Thus the functions that are relevant for measuring welfare costs of a set of two or more distortions "without rectangles" are different from ordinary demand functions. They are instead loci [in this case $L_1(z)$ and $L_2(z)$] of potential equilibrium points, generated in principle by the package of distortions [$zT_1^*, zT_2^*, \ldots, zT_n^*$], as one varies z. At points A and F, z is equal to zero; at points D and J, it is equal to one. The points M (the midpoint of AD) and N (the midpoint of FJ) are simultaneously generated by the distortion pattern $T_1 = 0.25 = 1/2\ T_1^*$; $T_2 = -0.25 = 1/2\ T_2^*$. It is important to note that one value of z generates points on both L_1 and L_2 in our example and on these plus $L_3, L_4, \ldots, L_n$ in the general case.

Turning now, perhaps belatedly, to the substantive conclusion to which all this leads, it is that if, as I state in "Monopoly and Resource Allocation," the elasticities of *demand* for the various products are unity, then the estimates there presented are on this ground understatements. Viewed conversely, the estimates presented there would be approximately right for a typical elasticity of demand somewhat less than unity.

It is difficult to estimate precisely the adjustment that would be necessary to take into account unit-elastic *demand* functions as against unit-elastic *loci*, L_i, but I believe one can say with some assurance that the actual adjustment is unlikely to be nearly as high as the factor of two suggested in the diagram.

A heuristic "proof" follows. Suppose there were in the economy depicted an additional substitute commodity X_3, with no distortion in its market. How would that change the picture? First, the rightward shift FG caused by the imposition of T_1^* would be smaller, because part of the reduction AB of demand for X_1 would go to X_3. Similarly the leftward shift BE in X_1, caused by the introduction of the negative distortion T_2^* would be smaller. Hence the rectangle $BCED$ — which we have shown to be the source of the differences between ABC and ADE on the one hand and between GHJ and FHJ on the other — is reduced in size relative to the "demand-curve triangles" ABC and GHJ.

Alternatively, consider a rectangular distribution of distortions among sets of commodities, each having equal weight. Then let $T_N^* = -T_1^*$, $T_{N-1}^* = -T_2^*$, etc., with $T_1^* > T_2^* > \cdots > T_{N-1}^* > T_N^*$. Consider now putting on the distortions in a specified order — first T_1^* and T_N^*, next T_2^* and T_{N-1}^*, etc., always pairing each positive distortion with its "opposite number" negative distortion. When T_1^* and T_N^* were imposed, something like what is depicted in Figure 4A1 would happen, except that now BE would be very small relative to the movement in X_N corresponding to GH, for most of the substitution into X_N would come from commodities $X_2, \ldots, X_{N-1}$. Now take the next step and impose T_2^* and T_{N-1}^*. Now if X_1 responds in essentially the same way to changes in P_2 and in P_{N-1}, the simultaneous imposition of T_2^* (a positive distortion on X_2) and T_{N-1}^* (a negative distortion on X_{N-1}) will have offsetting effects, and no additional rectangle corresponding to $BCDE$ will be produced in the market for X_1. There would, however, be such a rectangle (once again small) in the market for X_2 as a consequence of the introduction of T_{N-1}^*. Proceeding in this fashion, and recalling that we cannot get "rectangles" of the type we are speaking until a market is distorted, one finds that there would be $N/2$ rectangles, each associated with the reaction of a positively distorted market to the imposition of its "partner" distortion. And the order of magnitude of each of these rectangles would be $1/N - 1$ times the distortion cost calculated from the two "partner" triangles.

Viewed in this light, the differences between the demand schedules and the L_i loci are probably negligible in the case of the calculations in "Monopoly and Resource Allocation," considering the large number of sectors in the breakdown that was used. I have entered into this material not so much to point out a possible minor new bias, but to call attention to an important conceptual distinction (that between demand curves and $L_i(z)$) that is relevant not only to the problem of measuring the welfare costs of monopoly but to many other problems in applied welfare economics as well.

It is curious to note that in the plethora of discussion about this article, whether in published form, in correspondence, or in conversation, the above distinction has to my knowledge not been recognized. At the opposite extreme in terms of frequency is one comment that I cannot refrain from responding to here. "How can you assume a demand elasticity of unity when that implies a marginal revenue of zero?" The important distinction here is that between the firm and the industry. If the elasticity of demand for a product is -1.25, and it is produced at constant costs by a full monopolist, its selling price would be five times cost. Yet few if any products sell at prices five times cost, and if so probably not for long. There are actual competitors (not in the sense of the textbook version of perfect competition, but in the sense of other firms producing similar products) as well as potential

equal FGK. For further discussion of this and similar matters see Chapter 2, section II and Chapter 3, sections II and III.

competitors in the form of new entrants (often through diversification). A firm's pricing policy must be geared to the threats entailed in both actual and potential competition, both from within and without the nation's boundaries. While responding to or anticipating these threats, firms may well still be able to charge prices in excess of costs including a normal return to capital. In that sense they are exercising monopoly power. But it would be the rarest of cases in which an individual firm would find it in its interest to take the industry-demand curve as the relevant demand curve facing it. Yet for purposes of welfare-cost measurement it is the industry demand curve which is relevant, for it is along that demand curve that market clearing takes place. Thus, I hope, the paradox of a 10 or 20 percent "monopoly markup" coexisting with an assumed unit elasticity of industry demand has been explained.

Chapter 4

Monopoly and Resource Allocation

One of the first things we learn when we begin to study price theory is that the main effects of monopoly are to misallocate resources, to reduce aggregate welfare, and to redistribute income in favor of monopolists. In the light of this fact, it is a little curious that our empirical efforts at studying monopoly have so largely concentrated on other things. We have studied particular industries and have come up with a formidable list of monopolistic practices: identical pricing, price leadership, market sharing, patent suppression, basing points, and so on. And we have also studied the whole economy, using the concentration of production in the hands of a small number of firms as the measure of monopoly. On this basis we have obtained the impression that some 20 or 30 or 40 percent of our economy is effectively monopolized.

In this paper I propose to look at the American economy, and in particular at American manufacturing industry, and try to get some quantitative notion of the allocative and welfare effects of monopoly. It should be clear from the outset that this is not the kind of job one can do with great precision. The best we can hope for is to get a feeling for the general orders of magnitude that are involved.

I take it as an operating hypothesis that, in the long run, resources can be allocated among our manufacturing industries in such a way as to yield roughly constant returns. That is, long-run average costs are close to constant in the relevant range, for both the firm and the industry. This hypothesis gives us the wedge we need to get something from the data. For as is well known, the malallocative effects of monopoly stem from the difference between marginal cost and price, and marginal costs are at first glance terribly difficult to pin down empirically for a wide range of firms and industries. But once we are ready to proceed on the basis of constant average costs, we can utilize the fact that under such circumstances marginal and average costs are the same, and we can easily get some idea of average costs.

Reprinted with permission from Arnold C. Harberger, "Monopoly and Resource Allocation," *The American Economic Review* (May, 1954), pp. 77–87. Footnotes are renumbered.

t that does not solve all the problems, for cost and profit to the economist ot the same things as cost and profit to the accountant, and the accountants our data. To move into this question, I should like to conjure up an ized picture of an economy in equilibrium. In this picture all firms are ating on their long-run cost curves, the cost curves are so defined as to each firm an equal return on its invested capital, and markets are cleared. nk it is fair to say that this is a picture of optimal resource allocation. , we never see this idyllic picture in the real world, but if long-run costs n fact close to constant and markets are cleared, we can pick out the es where resources are misallocated by looking at the rates of return on tal. Those industries which are returning higher than average rates have ew resources; and those yielding lower than average rates have too many rces. To get an idea of how big a shift of resources it would take to equalize t rates in all industries, we have to know something about the elasticities emand for the goods in question. In Figure 4.1, I illustrate a hypothetical . The industry in question is earning 20 percent on a capital of 10 million rs, while the average return to capital is only 10 percent. We therefore d a 10 percent return into the cost curve, which leaves the industry with llion in excess profits. If the elasticity of demand for the industry's product ity, it will take a shift of 1 million in resources in order to expand supply gh to wipe out the excess profits.

he above argument gives a general picture of what I have done empirically. first empirical job was to find a period which met two conditions. First, ad to be reasonably close to a long-run equilibrium period; that is, no

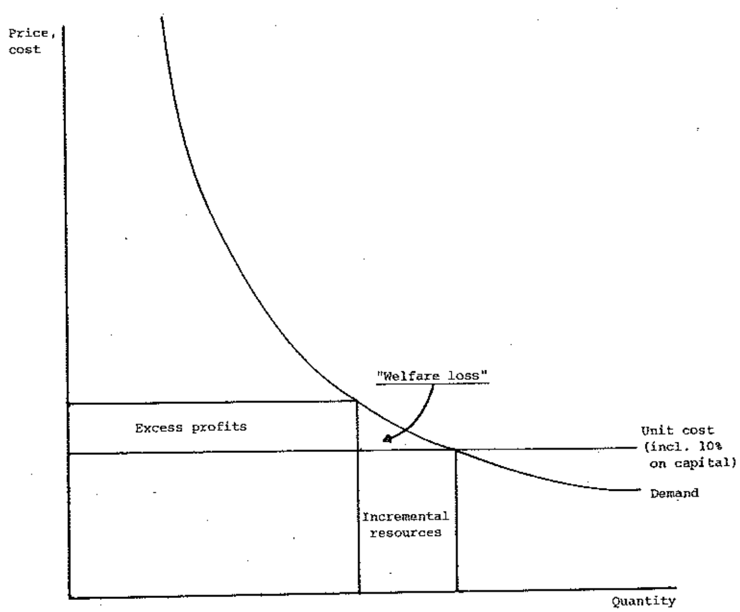

FIGURE 4.1

violent shifts in demand or economic structure were to be in process. And second, it had to be a period for which accounting values of capital could be supposed to be pretty close to actual values. In particular, because of the disastrous effect of inflation and deflation on book values of capital, it had to be a period of fairly stable prices, which in turn had been preceded by a period of stable prices. It seemed to me that the late twenties came as close as one could hope to meeting both these requirements.

The late twenties had an additional advantage for me — because my choice of this period enabled me to use Professor Ralph C. Epstein's excellent study, *Industrial Profits in the United States* (National Bureau of Economic Research, 1934), as a source of data. Professor Epstein there gives, for the years 1924–1928, the rates of total profit to total capital for seventy-three manufacturing industries, with total capital defined as book capital plus bonded indebtedness and total profit defined as book profit plus interest on the indebtedness. To get rid of factors producing short-period variations in these rates of return, I average the rates, for each industry, for the five-year period. The results are given in column 1 of Table 4.1. The differences among these profit rates, as between industries, give a broad indication of the extent of resource malallocation in American manufacturing in the late-twenties.

Column 2 presents the amount by which the profits in each industry diverged from what that industry would have obtained if it had gotten the average rate of profit for all manufacturing industry. In column 3, these excesses and shortages of profit are expressed as a percent of sales in the industry. By analogy with Figure 4.1, you can see that this column really tells by what percentage prices in each industry were "too high" or "too low" when compared with those that would generate an optimal resource allocation.

Now suppose we ask how much reallocation of resources it would take to eliminate the observed divergences in profit rates. This depends, as you can see in Figure 4.1, on the demand elasticities confronting the industries in question. How high are these elasticities? It seems to me that one need only look at the list of industries in Table 4.1 in order to get the feeling that the elasticities in question are probably quite low. The presumption of low elasticity is further strengthened by the fact that what we envisage is not the substitution of one industry's product against all other products, but rather the substitution of one great aggregate of products (those yielding high rates of return) for another aggregate (those yielding low rates of return). In the light of these considerations, I think an elasticity of unity is about as high as one can reasonably allow for, though a somewhat higher elasticity would not seriously affect the general tenor of my results.

Returning again to Figure 4.1, we can see that once the assumption of unit elasticity is made the amount of excess profit measures the amount of resources that must be called into an industry in order to bring its profit rate into line. When I say resources here I mean the services of labor and capital plus the materials bought by the industry from other industries. In many ways it seems preferable to define resources as simply the services of labor and capital. This

TABLE 4.1

Industry	*Rate of profit on capital (1924–1928)* (1)	*Amount by which profits diverged from "average" (millions)* (2)	*Column (2) as percent of sales* (3)	*Welfare cost of divergence in column (2) (millions)* (4)
Bakery products	17.5%	$17	5.3%	$.452
Flour	11.9	1	0.4	.002
Confectionery	17.0	7	6.1	.215
Package foods	17.9	7	3.3	.116
Dairying	11.8	3	0.7	.010
Canned goods	12.4	1	0.6	.003
Meat packing	4.4	−69	−1.7	.596
Beverages	5.8	−2	−4.0	.080
Tobacco	14.1	27	0.3	.373
Miscellaneous foods	8.1	−13	−2.4	.164
Cotton spinning	10.0	−0	0	0
Cotton converting	8.0	−1	−0.6	.008
Cotton weaving	4.7	−15	−5.5	.415
Weaving woolens	2.6	−16	−9.5	.762
Silk weaving	7.9	−3	−2.3	.035
Carpets	9.8	−1	−1.3	.006
Men's clothing	11.4	1	0.5	.002
Knit goods	12.9	3	1.9	.028
Miscellaneous clothing	13.1	1	1.1	.006
Miscellaneous textiles	9.2	−2	−0.9	.008
Boots and shoes	15.8	9	3.8	.172
Miscellaneous leather products	7.7	−3	−2.1	.032
Rubber	7.6	−23	−2.5	.283
Lumber manufacturing	7.8	−6	−3.9	.118
Planing mills	13.1	1	3.2	.016
Millwork	7.3	−1	−2.9	.014
Furniture	13.4	2	2.2	.022
Miscellaneous lumber	12.9	4	1.7	.034
Blank paper	6.6	−17	−6.2	.524
Cardboard boxes	13.6	2	3.1	.031
Stationery	7.5	−2	−3.0	.030
Miscellaneous paper	9.3	−1	−1.1	.005
Newspapers	20.1	37	8.5	1.570
Books and music	14.6	2	4.3	.042
Miscellaneous printing and publishing	18.6	1	5.6	.028
Crude chemicals	10.2	−0	0	0
Paints	14.6	5	3.3	.082
Petroleum refining	8.4	−114	−3.6	2.032
Proprietary preparations	20.9	25	11.7	1.460
Toilet preparations	30.4	3	15.0	.225
Cleaning preparations	20.8	15	5.5	.413

could be done by applying to the value added in the industry the percentage of excess profits to sales. The trouble here is that adding to the output of industry X calls resources not only into that industry but also into the industries that supply it. And by the time we take all the increments in value added of all these supplying industries that would be generated by the initial increase in output of industry X, we come pretty close to the incremental value of sales in industry X. Of course, the movement to an optimal resource allocation entails some industries expanding their output, like X, and others, say Y, contracting their output. If we really traced through the increments to value added which are required in their supplying industries, say Z, we would often find that there was some cancellation of the required changes in the output of

TABLE 4.1 *continued*

Industry	*Rate of profit on capital (1924–1928)* (1)	*Amount by which profits diverged from "average" (millions)* (2)	*Column (2) as percent of sales* (3)	*Welfare cost of divergence in column (2) (millions)* (4)
Miscellaneous chemicals	15.6%	$45	8.8%	$.197
Ceramics	10.8	1	1.0	.005
Glass	13.5	4	2.6	.052
Portland cement	14.3	10	8.4	.420
Miscellaneous clay and stone	17.6	14	8.0	.560
Castings and forgings	5.6	−234	−7.7	8.994
Sheet metal	10.5	0	0	0
Wire and nails	11.6	1	1.2	.006
Heating machinery	13.3	3	1.6	.024
Electrical machinery	15.7	48	5.3	1.281
Textile machinery	13.6	3	6.1	.092
Printing machinery	9.7	−0	0	0
Road machinery	17.3	10	6.8	.374
Engines	13.7	2	5.9	.059
Mining machinery	11.0	1	0.7	.004
Factory machinery	11.7	33	3.0	.045
Office machinery	16.1	7	5.6	.194
Railway equipment	6.0	−24	−9.6	1.148
Motor vehicles	18.5	161	4.4	3.878
Firearms	12.9	1	2.0	.010
Hardware	12.8	8	2.3	.092
Tools	11.6	1	1.1	.006
Bolts and nuts	15.4	1	3.1	.016
Miscellaneous machinery	12.6	3	2.2	.032
Nonferrous metals	11.9	15	1.4	.106
Jewelry	10.6	0	0	0
Miscellaneous metals	12.5	14	2.0	.140
Scientific instruments	21.2	20	11.6	1.163
Toys	15.0	1	3.2	.016
Pianos	9.9	−0	0	0
Miscellaneous special manufacturing	12.0	4	1.4	.027
Job printing	13.8	4	2.2	.044

Col. (1) — from Ralph C. Epstein, *Industrial Profits in the United States* (N.B.E.R., 1934), Tables 43*D* through 53*D*. Entries in column (1) are the arithmetic means of the annual entries in the source tables.
Col. (2) — divergences in the profit rates given in column (1) from their mean (10.4) are here applied to the 1928 volume of capital in each industry. Total capital is the sum of book capital (Epstein, Appendix Table 6*C*) plus bonded debt (Epstein, Appendix Table 6*D*).
Col. (3) — 1928 figures were used for sales (Epstein, Appendix Table 6*A*).
Col. (4) — measures the amount by which consumer "welfare" fell short of the level it would have attainedif resources had been so allocated as to give each industry an equal return on capital. It assumes that the elasticity of demand for the products of each industry is unity and approximates the area designated as "welfare loss" in Figure 4.1.

Z. Hence by using sales rather than value added as our measure of resource transfer, we rather overstate the necessary movement.

Keeping this in mind, let us return to the data. If we add up all the pluses and all the minuses in column 2, we find that to obtain equilibrium we would have to transfer about 550 million dollars in resources from low-profit to high-profit industries. But this is not the end. Those of you who are familiar with Epstein's study are aware that it is based on a sample of 2046 corporations, which account for some 45 percent of the sales and capital in manufacturing industry. Pending a discussion of possible biases in the sample a little later, we can proceed to blow up our 550 million figure to cover total manufacturing. The result is 1.2 billion. Hence we tentatively conclude that the misallocations of resources which existed in United States manufacturing in the period

1924–1928 could have been eliminated by a net transfer of roughly 4 percent of the resources in manufacturing industry, or 1 1/2 percent of the total resources of the economy.

Now let us suppose that somehow we effected these desired resource transfers. By how much would people be better off? This general question was answered in 1938 for an analogous problem by Harold Hotelling.[1] His general formula would be strictly applicable here if all our industries were producing products for direct consumption. The question thus arises, how to treat industries producing intermediate products. If we neglect them altogether, we would be overlooking the fact that their resource shifts and price changes do ultimately change the prices and amounts of consumer goods. If, on the other hand, we pretend that these intermediate industries face the consumer directly and thus directly affect consumer welfare, we neglect the fact that some of the resource shifts in the intermediate sector will have opposing influences on the prices and quantities of consumer goods. Obviously, this second possibility is the safer of the two, in the sense that it can only overestimate, not underestimate, the improvement in welfare that will take place. We can therefore follow this course in applying the Hotelling formula to our data. The results are shown in column 4 of Table 4.1. This gives, opposite each industry, the amount by which consumer welfare would increase if that industry either acquired or divested itself of the appropriate amount of resources. The total improvement in consumer welfare which might come from our sample of firms thus turns out to be about 26.5 million dollars. Blowing up this figure to cover the whole economy, we get what we really want: an estimate of by how much consumer welfare would have improved if resources had been optimally allocated throughout American manufacturing in the late twenties. The answer is 59 million dollars — less than one-tenth of 1 percent of the national income. Translated into today's national income and today's prices, this comes out to 225 million dollars, or less than $1.50 for every man, woman, and child in the United States.

[1] Harold Hotelling, "The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates," *Econometrica*, July, 1938, pp. 242–269. The applicability of Hotelling's proof to the present problem can be seen by referring to pp. 252 ff. He there indicates that he hypothecates a transformation locus which is a hyperplane. This is given us by our assumption of constant costs. He then inquires what will be the loss in moving from a point Q on the hyperplane, at which the marginal conditions of competitive equilibrium are met, to a point Q' at which these conditions of competitive equilibrium are not met. At Q' a nonoptimal set of prices P' prevails. These are, in our example, actual prices, while the equilibrium price-vector P is given by costs, defined to include normal profits. Hotelling's expression for the welfare loss in shifting from Q to Q' is $1/2\ \Sigma dp_i\, dq_i$ where p_i and q_i are the price and quantity of the ith commodity. We obtain this by defining our units so that the cost of each commodity is $1.00. The equilibrium quantity of each commodity under the assumption of unit elasticities is then equal to the value of sales of that commodity. If we call r_i the percentage divergence of actual price from cost, we may write the total welfare loss due to monopoly as $1/2\ \Sigma r_i^2 q_i$ if the elasticities of demand are unity, and as $1/2\ \Sigma r_i^2 q_i k_i$, if the elasticities of demand are k_i. In column 4 of Table 4.1, I attribute to each commodity a welfare loss equal to $1/2\ r_i^2 q_i$. This measure of the welfare loss due to monopoly abstracts from distributional considerations. Essentially it assumes that the marginal utility of money is the same for all individuals. Alternatively, it may be viewed as measuring the welfare gain which would occur if resources were shifted from producing Q' to producing Q, and at the same time the necessary fiscal adjustments were made to keep everybody's money income the same.

Before drawing any lessons from this, I should like to spend a little time evaluating the estimate. First let us look at the basic assumption that long-run costs are constant. My belief is that this is a good assumption, but that if it is wrong, costs in all probability tend to be increasing rather than decreasing in American industry. And the presence of increasing costs would result in a lowering of both our estimates. Less resources would have to be transferred in order to equalize profit rates, and the increase in consumer welfare resulting from the transfer would be correspondingly less.

Industry	*Adjusted profit rate**	*Adjusted rate of excess profit*	*Adjusted amount of excess profits (millions)*	*Adjusted welfare loss (millions)*
Confectionery	21.1%	10.7%	$11	$.530
Tobacco	19.0	8.6	66	2.225
Men's clothing	14.9	4.5	5	.068
Stationery	8.8	—	—	—
Newspaper publishing	27.9	17.5	67	5.148
Proprietary preparations	27.8	17.4	42	4.121
Toilet preparations	50.8	40.4	6	1.400
Printing machinery	12.9	2.5	2	.064
			199	13.556
Less previous amount of excess profit or welfare loss			−100	−3.845
Net adjustment			99	9.711

* Epstein, *op. cit.*, p. 530.

On the other hand, flaws in the data probably operate to make our estimate of the welfare loss too low. Take for example the question of patents and good will. To the extent that these items are assigned a value on the books of a corporation, monopoly profits are capitalized, and the profit rate which we have used is an understatement of the actual profit rate on real capital. Fortunately for us, Professor Epstein has gone into this question in his study. He finds that excluding intangibles from the capital figures makes a significant difference in the earnings rates of only eight of the seventy-three industries. I have accordingly recomputed my figures for these eight industries.[2] As a result, the estimated amount of resource transfer goes up from about 1 1/2 percent to about 1 3/4 percent of the national total. And the welfare loss due to resource misallocations gets raised to about 81 million dollars, just over a tenth of 1 percent of the national income.

There is also another problem arising out of the data. Epstein's sample of firms had an average profit rate of 10.4 percent during the period I investigated, while in manufacturing as a whole the rate of return was 8 percent. The reason for this divergence seems to be an overweighting of high-profit industries in Epstein's sample. It can be shown, however, that a correct weighting procedure

[2] Following is a breakdown of the adjustment for the eight industries in question.

would raise our estimate of the welfare cost of equalizing profit rates in all industries by no more than 10 million dollars.[3]

Finally, there is a problem associated with the aggregation of manufacturing into seventy-three industries. My analysis assumes high substitutability among the products produced by different firms within any industry and relatively low substitutability among the products of different industries. Yet Epstein's industrial classification undoubtedly lumps together in particular industries products which are only remote substitutes and which are produced by quite distinct groups of firms. In short, Epstein's industries are in some instances aggregates of subindustries, and for our purposes it would have been appropriate to deal with the subindustries directly. It can be shown that the use of aggregates in such cases biases our estimate of the welfare loss downward, but experiments with hypothetical examples reveal that the probable extent of the bias is small.[4]

Thus we come to our final conclusion. Elimination of resource misallocations in American manufacturing in the late twenties would bring with it an improvement in consumer welfare of just a little more than a tenth of a percent. In present values, this welfare gain would amount to about $2.00 per capita.

Now we can stop to ask what resource misallocations we have measured. We actually have included in the measurement not only monopoly misallocations but also misallocations coming out of the dynamics of economic growth and development and all the other elements which would cause divergent profit rates to persist for some time even in an effectively competitive economy. I know of no way to get at the precise share of the total welfare loss

[3] Epstein's results in samples from small corporations (not included in his main sample) indicate that their earnings rates tend to be quite close, industry by industry, to the earnings rates of the large corporations in the main sample. This suggests that the average rate of profit in the main sample (10.4 percent) was higher than the average for all industry (8 percent) because high-profit industries were overweighted in the sample rather than because the sampled firms tended to be the high-profit firms within each industry. The overweighting of high-profit industries affects our estimate of the welfare cost of resource misallocations in two ways. First, quite obviously, it tends to overstate the cost by pretending that the high-profit industries account for a larger share of the aggregate product of the economy than they actually do. Second, and perhaps not so obviously, it tends to understate the cost by overstating the average rate of profit in all manufacturing, and hence overstating the amount of profit which is "built in" to the cost curves in the present analysis. The estimated adjustment of 10 million dollars presented in the text corrects only for this second effect of overweighting and is obtained by imputing as the normal return to capital in the Epstein sample only 8 percent rather than 10.4 percent and recomputing the welfare costs of resource misallocations by the method followed in Table 4.1. It takes no account of the first effect of overweighting, mentioned above, and thus results in an overstatement of the actual amount of welfare cost.

[4] The extent of the bias is proportional to the difference between the average of the squares of a set of numbers and the square of the average, the numbers in question being the rates of excess profit in the subindustries. Consider an industry composed of three subindustries, each of equal weight. Assume, for an extreme example, that the rates of excess profit (excess profit expressed as a percent of sales) are 10 percent, 20 percent, and 30 percent in the three subindustries. The average rate of excess profit of the aggregate industry would then be 20 percent, and, by our procedure, the estimate of the welfare loss due to that industry would be 2 percent of its sales. If we had been able to deal with the hypothetical subindustry data directly, we would have estimated the welfare loss associated with them at 2 1/3 percent of the aggregate sales.

that is due to monopoly, but I do think I have a reasonable way of pinning our estimate down just a little more tightly. My argument here is based on two props. First of all, I think it only reasonable to roughly identify monopoly power with high rates of profit. And secondly, I think it quite implausible that more than a third of our manufacturing profits should be monopoly profits; that is, profits which are above and beyond the normal return to capital and are obtained by exercise of monopoly power. I doubt that this second premise needs any special defense. After all, we know that capital is a highly productive resource. On the first premise, identifying monopoly power with high profits, I think we need only run down the list of high-profit industries to verify its plausibility. Cosmetics are at the top, with a 30 percent return on capital. They are followed by scientific instruments, drugs, soaps, newspapers, automobiles, cereals, road machinery, bakery products, tobacco, and so on. But even apart from the fact that it makes sense in terms of other evidence to consider these industries monopolistic, there is a still stronger reason for making this assumption. For given the elasticity of demand for an industry's product, the welfare loss associated with that product increases as the square of its greater-than-normal profits. Thus, granted that we are prepared to say that no more than a third of manufacturing profits were monopoly profits, we get the biggest welfare effect by distributing this monopoly profit first to the highest profit industries, then to the next highest, and so on. When this is done, we come to the conclusion that monopoly misallocations entail a welfare loss of no more than a thirteenth of a percent of the national income. Or, in present values, no more than about $1.40 per capita.

Before going on, I should like to mention a couple of other possible ways in which this estimate might fail to reflect the actual cost of monopoly misallocations to the American consumer. First, there is the possibility that book capital might be overstated, not because of patents and good will, but as a result of mergers and acquisitions. In testing this possibility I had recourse to Professor J. Fred Weston's recent study of mergers. He found that mergers and acquisitions accounted for only a quarter of the growth of seventy-odd corporations in the last half-century (*The Role of Mergers in the Growth of Large Firms*, pages 100–102). Even a quite substantial overstatement of the portion of their capital involved in the mergers would thus not seriously affect the profit rates. And furthermore, much of the merger growth that Weston found came in the very early years of the century; so that one can reasonably expect that most of the assets which may have been overvalued in these early mergers were off the books by the period that I investigated.

The second possibility concerns advertising expenditures. These are included as cost in accounting data, but it may be appropriate for our present purpose to include part of them as a sort of quasi-monopoly profit. I was unable to make any systematic adjustment of my data to account for this possibility, but I did make a cursory examination of some recent data on advertising expenditures. They suggest that advertising costs are well under 2 percent of sales for all of the industries in Table 4.1. Adjustment of our results to allow for a maximal distorting effect of advertising expenditures would accordingly make only a slight difference, perhaps raising our estimate of the welfare cost of monopoly in present values to $1.50 per capita, but not significantly higher.[5]

I should like now to review what has been done. In reaching our estimate of the welfare loss due to monopoly misallocations of resources we have assumed constant rather than increasing costs in manufacturing industry and have assumed elasticities of demand which are too high, I believe. On both counts we therefore tend to overstate the loss. Furthermore, we have treated intermediate products in such a way as to overstate the loss. Finally, we have attributed to monopoly an implausibly large share — 33 1/3 percent — of manufacturing profits, and have distributed this among industries in such a way as to get the biggest possible welfare loss consistent with the idea that monopolies tend to make high profits. In short, we have labored at each stage to get a big estimate of the welfare loss, and we have come out in the end with less than a tenth of a percent of the national income.

I must confess that I was amazed at this result. I never really tried to quantify my notions of what monopoly misallocations amounted to, and I doubt that many other people have. Still, it seems to me that our literature of the last twenty or so years reflects a general belief that monopoly distortions to our resources structure are much greater than they seem in fact to be.

Let me therefore state the beliefs to which the foregoing analysis has led me. First of all, I do not want to minimize the effects of monopoly. A tenth of a percent of the national income is still over 300 million dollars, so we dare not pooh-pooh the efforts of those — economists and others — who have dedicated themselves to reducing the losses due to monopoly. But it seems to me that the monopoly problem does take on a rather different perspective in the light of present study. Our economy emphatically does not seem to be monopoly capitalism in big red letters. We can neglect monopoly elements and still gain

[5] I was unable similarly to take account of selling costs other than advertising expenditures, even though some of such costs may be the price paid by firms to enhance market control or monopoly position. In principle, clearly, some share of selling costs should be taken into account, and it is a limitation of the present study that no adjustment for such costs was possible. Scrutinizing Table 4.1, however, I should suggest that such selling costs are important in only a few of the industries listed, and that an allowance for them would almost certainly not alter the general order of magnitude of the estimates here presented. It should be pointed out, also, that the general conclusions reached in this paper are not closely dependent on the precise data used. Suppose, for example, that we had observed the following situation: industries accounting for half the output of American manufacturing were charging prices which yielded them a 10 percent "monopoly profit" on sales, while the remainder of industries earned a constant rate of profit on capital (here called normal profit) but no more. If we were, in this situation, to reallocate resources so as to equalize profit rates in all industries, the prices of competitive products would rise and those of monopolistic products would fall. If demand for the product of each sector were assumed to be of unit elasticity, we would estimate the gain in welfare incident upon the reallocation of resources at .125 percent of total industrial sales. This would be just about a tenth of a percent of the national income if the ratio of manufacturing sales to national income approximated its 1924–1928 figure. The estimated welfare gain is obtained as follows: Under our elasticity assumption, prices would rise by 5 percent in the competitive sector and fall by 5 percent in the monopolistic sector, and quantities would change inversely by an equal percentage. Taking 100 as the aggregate sales of manufacturing, the change in output in each sector will be 2.5, and taking 1 as the index of initial prices in each sector, the change in price in each sector will be .05. According to the Hotelling formula, the welfare gain coming from each sector will be 1/2 (2.5) (.05), and when these gains are added together the aggregate gain turns out to be .125.

a very good understanding of how our economic process works and how our resources are allocated. When we are interested in the big picture of our manufacturing economy, we need not apologize for treating it as competitive, for in fact it is awfully close to being so. On the other hand, when we are interested in the doings of particular industries, it may often be wise to take monopoly elements into account. Even though monopoly elements in cosmetics are a drop in the bucket in the big picture of American manufacturing, they still mean a lot when we are studying the behavior of this particular industry.

Finally I should like to point out that I have discussed only the welfare effects of resource misallocations due to monopoly. I have not analyzed the redistributions of income that arise when monopoly is present. I originally planned to discuss this redistribution aspect as well, but finally decided against it. All I want to say here is that monopoly does not seem to affect aggregate welfare very seriously through its effect on resource allocation. What it does through its effect on income distribution I leave to my more metaphysically inclined colleagues to decide. I am impelled to add a final note in order to forestall misunderstandings arising out of matters of definition. Resource misallocations may clearly arise from causes other than those considered here: tariffs, excise taxes, subsidies, trade-union practices, and the devices of agricultural policy are some obvious examples. Some of these sources of misallocation will be discussed in a forthcoming paper. Suffice it to say here that the present paper is not concerned with them.