IV. Graphical Formulation and Proof

The good student presents the following graphical solution to the problem: First, he adds the average product curves horizontally; then he intersects the resulting curve with an inelastic labor supply schedule. The intersection gives him the common wage level and from the original individual curves he deduces the initial labor allocations and products. To get the terminal allocations, he adds the individual marginal product curves horizontally, again he finds the intersection of the vertical labor supply curve with this new aggregate curve, thereby getting the new common wage and so forth. (All this is rather like the Yntema-Wickson-Wickard diagram of Fig. 1 is even more convenient, and of course straight lines are not necessary.)

V. Mathematical Formulation

To illustrate the power of economic intuition, one might present the following equivalent problem to an expert mathematician to see how rapidly he can solve it.

**Theorem:** We are given \( n \) non-negative strongly-concave monotone and smooth functions \( Q_i(x) \) each with the property

\[
Q_i''(x) < 0, \quad x > 0.
\]

where \( w^* = Q_i'(x_i^*) \), \( x_i^* = \frac{Q_i'(x_i^*)}{x_i^*} \), \( 0 < x_i^* + \ldots + x_i^* = x = x_i^* + \ldots + x_i^* \), and

\[
w^{**} = Q_i'(x_i^{**}) = Q_i'(x_i^{**}) = \ldots = Q_i'(x_i^{**}) = x_i^{**} > 0.
\]

The mathematical problem would look even more formidable if we replaced the above equalities by the following type of inequalities of modern programming type \( w^{**} \geq Q_i'(x_i^{**}) \), \( x(w^{**} - Q_i'(x_i^{**})) = 0 \), and so forth. Yet the theorem and proof would still be valid.

VI. Final Word

I draw no deeper welfare implications in this paper. Some may wish to note that here is one of the innumerable examples that can show the arbitrariness of those old new-welfare arguments which used to say: "If situation II could be better than situation III for everyone with proper compensating redistributions being made, then whether or not [1] such redistributions (or bribes) are made, society should always select II over III.” Pareto-optimality is never enough.

Competitive Pricing and the Centralized Market Place

WILLIAM J. BAUMOL

Many economists have for some time been vociferous in urging increased freedom of competition upon the securities industry. Until recently this was advocated almost exclusively for the benefit of the general investing public. But it becomes increasingly apparent that such measures have become important and perhaps even critical for the welfare of the securities industry and some of its leading institutions. Paradoxically, the industry is in danger of becoming the most potent victim of the arrangements which many of its constituents have defended so adamantly.

On the slightest provocation mankind always seems prepared to attempt to improve upon the prices and the allocation of resources that would otherwise be produced by an unhampered market mechanism. We set ceilings on rents and interest rates and floors on farm and public utility prices. We attempt to eliminate all latitude on railroad fares and brokerage commissions, presumably setting them at levels that represent a compromise between some ideal of justice and the economic pressures and necessities.

The issues raised by the attempt to impose "just prices" in brokerage and elsewhere have long been with us, and most economists since the last decades of the eighteenth century have generally taken the view that except under very special conditions, usually in times of some sort of emergency, attempts to improve on the market's pricing is very likely to fail, and that whether they fail or not they are likely to impose heavy costs on the community.

In sum, we economists believe that supply and demand generally takes its revenge upon those who would defy it. Moreover, the punishment often falls on the crime. For example, ceilings on prices imposed to protect the consumer all too often transfer much of the supply activity into the hands of the black marketeer who, since he must be paid for bearing the risk of punishment in addition to his other supply costs, ends up charging prices higher than those which would have prevailed in the absence of intervention. Rent controls, designed to make housing more accessible, in the long run succeed only in drying up the supply. As was once remarked by a noted Swedish economist (not by any means right wing in his persuasion) "rent control is not quite as effective as bombing in destroying a city, but the two come remarkably close.” A major theme of this discussion is the nature
of the revenge the market mechanism is taking upon the securities industry.

1. Social Costs of Interference With the Market Mechanism

However, the interests of the general public continue to be the prime concern of economists predisposed against interference with the market mechanism. We believe that there is a long list of evils usually following in the train of such an attempt. It will perhaps be useful to begin by reviewing these unfortunate consequences in general terms, leaving the remainder of the discussion to show the forms taken by each of these problems in the case of the securities industry.

Specifically, we believe that at least six types of unfortunate attributes or consequences can be ascribed to interference with the market mechanism:

i) Unforeseeability. Whatever an industry is characterized by a large number of suppliers, particularly where entry by new suppliers of the product or of reasonably close substitutes is not too difficult, attempts to control prices are almost certain to fail. Either one can expect the emergence of black or gray markets in which freedom of pricing seems quite uncheckered, or some firms will be found to the legitimate sector of the market to make adjustments in price, sub rosa or through institutionalized channels of evasion. But the effect is essentially the same. Something akin to the free market price will generally manage to re-emerge, but with a difference: Since the evasion mechanism, whatever its form, will have some operating costs, those costs must be borne by someone. Of course that someone will be the consumer.

ii) Auxiliary Restrictions. The danger of breakdowns in due course inevitably leads to a series of secondary regulations designed to shore up the shaky edifice. Consumers are told when and from whom they are permitted to buy. Attempts are made to prevent the entry of new types of suppliers, sometimes making full use of the powers of the police and the courts. Occasionally, an intricate system of market subdivision is imposed, creating a cartel-like structure for the industry. An example is provided by the new capital market in which investment banks, savings banks, and savings and loan associations have each been assigned a territory at least partly protected by regulation from incursions by others.

iii) Discounts in Unusual Forms. Where price floors are imposed, regulation prohibits competition among suppliers in disfavoring the customers want most: direct price reductions. (If these were not what the customers preferred, the regulations would presumably be unnecessary in the first place.) Hence, there is frequent recourse to second-best sorts of inducement. Banks give away cameras and power tools rather than offering higher interest rates. Airlines offer attractive vacations displayed by stewardesses instead of lower fares. But how many dollars is the display of that Pacific outfit really worth to the passenger?

iv) Limitation of Volume of Transactions. To the extent that the control mechanism does succeed in affecting price it can be expected to lead to a corresponding reduction in the volume of transactions. Curiously, this is true whether the regulated price is above or below the market price. If it is above, the price that would entice supply and demand we can expect demand to be restricted by its imposition. On the other hand, if the imposed price is below the free-market level, supply will be cut down. Since sales volume cannot exceed either the quantity supplied or the quantity demanded, a reduction in volume can accordingly be expected.

v) Encouragement of Inefficiency. A price which is above the equilibrium level permits the survival of firms whose high operating costs would prevent them from competing in an unrestricted market. This invitation to continued inefficiency becomes all the more pressing when entry of new suppliers is prevented as part of the program of enforcement of price regulations. Moreover, with the penalties for inefficiency severely restricted, the motivation for continued economy of operation by any firm is reduced.

vi) Misallocation of Resources. Economists emphasize that departures from true market prices are likely to produce resource misallocations directly. For, by breaking the connection between production costs and prices, consumers are induced to switch their demands from commodities which satisfy their desires at a low cost in real resources to other items which are more costly to the economy. Thus, shippers use trucks or barges over routes where the resource costs of rail transportation are lower because artificial restrictions impose floors on railroad rates.

But, in addition, the secondary regulations introduced to help enforce the imposed prices themselves are likely to lead to serious waste in the use of resources. More complex books lead to investment in more sophisticated bankruptcy tools. Complex regulations lead to the diversion of increased resources to their avoidance and evasion. New jobs are created for executives, lawyers, and economists. It may well be conjectured that at least some of the services could otherwise have been used more productively elsewhere.

Having described the problems many economists expect to accompany most attempts to regulate prices, let us see what forms they appear to take in the securities industry.

2. Entry in the Brokering Industry and Enforceability of Pricing Rules

Any particular stock exchange can adopt more or less restrictive rules limiting its membership as severely as it wishes. The history of the exchanges is a tale centered about that sort of restriction, and the attempts by those outside the club either to gain entry or to find a modus vivendi outside its doors. If entry into the industry could be limited as effectively as entry into an exchange, there might be no difficulty in enforcing pricing rules.

However, persons excluded from dealing directly on one exchange can always adopt alternatives. They can set up new exchanges that will operate in competition with the one from which they have been excluded, or they can avoid the use of organized exchanges altogether, seeking to bring together individual buyers and sellers without benefit of a market on which many traders must simultaneously.

The history of the stock markets in the United States is a tale of the rise and fall of exchanges organized by those who had been condemned to outer darkness by the established institutions. Today, the regional exchanges and the "third market" serve to provide an outlet for those who are unhappy about doing business on the terms called for by the major exchanges.

Effectively, this has already served to undermine the regulation of brokerage commissions. The institutionalization of "give-ups," "commissions," "reciprocal deals," are ways of maintaining mental and physical dependence to the regulations while effectively circumventing them where they hurt most. So far, the large institutions, the mutual funds, the insurance companies, and even government agencies—about which I will say more presently—have proved most effective in finding ways to obtain prices more appropriate to their market power and the lower unit transactions costs permitted by their volume. However, these are signs that the present system of price controls is in itself inadequate to their needs. As a result, they are beginning to find ways to serve the small customer at lower prices.
3. Auxiliary Restrictions
To enforce their brokerage pricing rules the exchanges have predictably been forced to have recourse to a number of auxiliary restrictions. Large financial institutions have been excluded from membership in order to prevent them from saving on brokerage costs. For, certainly until recent modifications in the rules on the pricing of large transactions, the costs of carrying out large transactions were reportedly well below the corresponding brokerage fees, and this disparity has probably survived the change in rules. Another example of such an auxiliary restriction is the rule, in force before March 1972, prohibiting members of the New York Stock Exchange from giving discounts to nonmember broker dealers. A discount of up to 40 percent has been permitted since March of 1972, but apparently this has not proved sufficient to eliminate the attractiveness of the regional exchanges to nonmembers. Similarly, regulation 38th of the New York Stock Exchange makes it very difficult to effect a transaction in a listed security off the Exchange with a nonmember market maker. Permission is required for each such deal, and it involves complicated procedures.

But perhaps a more remarkable example of an auxiliary rule designed to shore up the regulated rates was the provision that limited the distribution of giveaways. In effect, mutual funds and others were permitted to receive volume discounts from member brokers, but were precluded from passing these discounts back to the customers who had invested in them! These giveaways enabled mutual funds to offer additional rewards to brokers who sold their shares and thus, in effect, permitted the funds to use a portion of their commission dollars to pay for selling expenses. While the propriety of the give-up mechanism in this situation is questionable—mutual fund salesmen were receiving more compensation for selling fund shares than the public realized—the point is that give-ups lowered effective commission rates. And the rule limiting give-ups actually decreed that low prices are all right, provided the consumer does not get the benefit!

4. Substitution of Services for Price Reductions
The bundling of services is a well known phenomenon in the brokerage industry. The customer is offered, in addition to the carrying-out of transactions, a variety of services including research and advice based on that research, record keeping, storage of securities, and even the use of the long distance telephone free of charge. I will not dwell upon the questions that have been raised in recent years by economists and statisticians about the quality of the research and the advice offered by the securities industry, particularly since they have been discussed elsewhere. Rather, the question is whether, regardless of its quality, the customer should be forced to purchase and pay for such research each time he effects a transaction, whether or not he wants the information? Usually, we are not prepared to argue on paternalistic grounds that he ought to be forced to buy information for his own good. Are those who take this view also prepared to require a customer to subscribe to "Consumer Reports" before he is permitted to buy a car or a refrigerator?

5. Encouragement of Inefficiency
It is dangerous to make charges of inefficiency without careful study and documentation, and it is my purpose neither to make nor imply such charges. But a few questions can be raised in passing—questions which I do not intend to be considered rhetorical. For questions have been raised in recent years about the relatively limited or inefficient use of computerization in carrying out and recording transactions in the securities industry. The continued issue of negotiable securities which could largely be replaced by a recorded datum in a computer memory may be justified by the feasibility of computers or by investors' predilection for a tangible embodiment of their holdings, but one wonders whether full price competition might not force some changes in this and in other related matters. The fact that only a few years ago the stock exchange had to be closed at regular intervals to permit offices to catch up with their paper work may perhaps be ascribed partly to the same influence. One wonders, finally, whether the vulnerability of a number of brokerage firms to a relatively small change in the state of the economy, which manifested itself rather dramatically just a few years ago, does not suggest that fixed commissions have retained in the field a number of firms which might otherwise have been forced to "shape up or ship out." I repeat, these are questions which should be asked, but our asking them should not be taken to imply that we think the answers.

6. Resource Misallocation and Fixed Commissions
Much of what has already been said indicates how fixed commissions may result in non-optimal use of society's resources. For example, the supply of services to customers whose money equivalent they might otherwise prefer to receive, represents a diversion of resources from the uses in which they might most effectively serve the desire of the community, and that is precisely what we mean by a misallocation of resources.

However, there are other manifestations of this phenomenon which have not been mentioned yet. Artificially high rates encourage participation in the industry to adapt themselves in a number of ways, all of which are likely to introduce inefficiencies of one form or another.

(a) They encourage, as already implied, an excessively large number of firms, i.e., a number of brokerage houses greater than that which would be sufficient to transact the nation's investment business at minimum cost to the community. One suspects that this has happened, though it probably cannot be proved.

(b) It has led financial institutions to seek entry into the brokerage business, a diversion of resources and a diversification of functions which might otherwise not have proved attractive to them.

(c) More generally, high fees have encouraged a combination of brokerage and money management functions which may not be in the public interest. For example, brokers may become affiliated with mutual funds or pension funds and may be tempted to "channel" their accounts when transactions are not called for by the clients' interest.
is not alleged here that such churning actually occurs in any significant volume, but that it does not serve the public interest to offer this temptation to those who are responsible for the money management.

(d) Such broker-dealer arrangements may introduce artificial differences in the various firms' ability to compete. For example, life insurance companies have complained that when bidding for a money management assignment they find themselves at a competitive disadvantage vis-à-vis the broker-dealers who can quote lower fees because they do not have to pay the fixed commissions. This can produce a misappropriation of resources because it means the money management task is not necessarily assigned to the organization that can carry it out at the lowest cost to society.

A second major category of resulting resource reallocation involves about the creation and survival of a considerable number of exchanges and the growth of the third market. To the extent that these exchanges' existence or volume is to be ascribed simply to the desire to escape the brokerage commission regulations, a variety of significant types of waste are introduced by these pricing policies:

(a) The cost of operation and administration of exchanges that would otherwise be superfluous is obviously wasteful;

(b) more important, it means fragmentation of the market, reducing its efficiency as an instrument for the bringing together of buyers and sellers, and decreasing its depth and stability. In sum, fixed commission rates become a prime instrument making for fragmentation of the financial market, and thereby threatening to undermine its effectiveness as an instrument for the effective conduct of the nation's security transactions and the allocation of its financial capital.

This development is more than a little ironic, because preservation of the depth and stability of the money markets is one of the grounds on which fixed commission rates have been defended. It has been argued that if rates are not kept high enough to attract brokers to do business on the major exchanges, there is little inducement for them to continue to bring their transactions there. The argument is not convincing on its own grounds, since the actual market place, if it is not more expensive, offers all sorts of advantages; accessibility to a large number of customers, any economies of scale that are available and, perhaps, fuller and more immediate information, (though modern data transmission methods have largely eliminated the last of these differential). But even if brokers want to bring their business to the central exchange because of the higher commissions it offers, what can they do if consumers prefer to go somewhere else—some place where costs are lower?

7. The Threat to the Major Exchanges

So much for the costs of price fixing to society as a whole—where it requires the customer to pay more than he otherwise would, and gives him in exchange a less efficient allocation of resources. However, it should be clear by now that this same set of consequences contains within it a serious threat to the major exchanges themselves. For, by definition, every diversion of business means a corresponding loss in their own volume of transactions. With many stocks that are listed on the New York and the American Stock Exchanges now traded on regional exchanges and on the third market, with the progress of information technology making generally available information on at least some of the securities traded on the major markets, the temptation to go elsewhere to seek savings in their operations becomes overwhelming. This is encouraged further by a number of court decisions which have held, in effect, that it is the obligation of mutual funds, and perhaps of others in a fiduciary capacity, to avail themselves of all proper means to recover commissions for their customers.

Private organizations such as mutual funds, insurance companies, and private pension funds have not been the only ones to respond in this manner. Thus, the State of Connecticut has recently been accepted as a member of the PBW exchange, and several other states and city governments have recently expressed interest in seats in order to save on commissions. One of the dangers is that business lost in this way will never be regained. Thus, time may not be on the side of the major exchanges. The longer they resist full and unhampered competitive processes the harder they may find it to retrieve what they have lost.

The changes in the past few years that have permitted negotiated rates on transactions involving larger volumes no doubt go some way toward protecting the major exchanges from the loss of their larger customers. But every restriction on pricing is an invitation to someone to go elsewhere, to some place where the freedom of action is greater. Even small investors may be a source of such movement if innovative brokerage firms can compete with them more effectively by taking their own operations elsewhere.

8. Proposed Prohibition of the Third Market

Predictably, some of the representatives of the exchanges have advocated an alternative remedy—the prohibition of activities that are most effective in undermining their pricing rules. Rather than making it unprofitable to go to the third market by permitting investors to operate on the exchanges as cheaply as they can outside it, they seek that the alternative be foreclosed.

I have already granted the argument that the fragmentation of the market is undesirable, and that the carrying out of transactions outside the main supply-demand mechanism should not be encouraged. Moreover, I agree that secrecy is not desirable—that full and prompt disclosure of all third market transactions and their terms is most desirable. However, the way to deal with this is not to force the third market to join the central exchange and to subject it to its rules and regulations. Instead, it should be allowed to operate according to its own rules and regulations including those on freedom of competition such a solution is not in the interests of society. It is, to repeat an earlier phrase, just another device to shore up the shaky edifice of just pricing.

9. Negotiated Commissions and Problems to Which They May Give Rise

The difficulties we have been discussing can be solved by prompt institution of a system under which all commission rates are subject to negotiation and competition, and in which entry is free, subject to several minor limitations which I will discuss presently. It seems highly likely that if this were done the New York and the American Stock Exchanges would quickly regain much of what they have lost to the third market, to over-the-counter transactions, and to the regional exchanges. The fragmentation problem would rapidly be reduced to minor proportions.

This does not mean, however, that every use will necessarily gain from this innovation. As with every economic change there are likely to be groups who lose out, and their position in the matter merits some discussion. Specifically, it has been suggested that with the introduction of negotiated
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The positions taken in this paper are quite unequivocal. It speaks out unreservedly in favor of fuller competition and freedom from barriers against it. The cure for the problems that arise from inappropriate regulation is not more regulation designed to patch up the structure. Rather, it calls for the elimination of the source of the difficulty with all deliberate speed. It should be emphasized again that time is not on the side of the major exchanges, nor is it on the side of the general public for that matter. If the fragmentation of the market is permitted to go too far and to ossify, it will not be easy to undo the damage.

11. Concluding Comment

For his own protection. But in the long run it is from friends who would help him in this way that the consumer needs to be defended.

In any event, I do believe firmly that with free and full competition the issue of institutional membership will quickly be reduced to secondary importance. If the institutions find that they can purchase brokerage services about as cheaply as they are able to provide them for themselves, we can be confident of a considerable dampening in the strength of their desire for membership status. After all, there are advantages to specialization in economic activity, and vertical integration is not always an economic blessing.