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**PRICING PROBLEMS IN THE FOOD INDUSTRY
(With Emphasis on Thin Markets)**

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THIN MARKETS: SOME CAUSES, CONSEQUENCES, AND REMEDIES

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In this paper, I first offer some views on causes and consequences of thin markets, then identify and discuss some remedies that may be applied to thin markets.

CAUSES

Consider the following scenario. It is required by law that all units of an agricultural commodity be exchanged at a central market. Each supplier (or his representative) and each demander (or his representative) participates in negotiations at the central market and all transactions are made at the central market. Arbitrage is permitted. On each transaction opposite parties are matched and a price is negotiated. Each price may be viewed as comprising (and actually be reported as) a base price for a standard unit of the commodity and one or more price differentials reflecting differences between units of the commodity actually exchanged and a standard unit. Results of the negotiations, and in particular characteristics of the distribution of prices, are publicly reported.

Suppose now that the requirement that all transactions be made at the central market is removed. Individual suppliers and demanders may find it advantageous to bypass the central market. If central assembly of the commodity is required for participation in the central market, then an obvious reason for bypassing it is to avoid additional costs of central assembly. Even if central assembly is not required (i.e., direct movement from seller to buyer is permitted), there may be advantages to both demanders and suppliers if they contract with specific opposite parties or vertically integrate and thus avoid participation in the central market. Caves [1] has summarized several valid incentives for contracting and vertical integration. But even if central assembly is not required and firms do not wish to contract or vertically integrate, they may have incentives to bypass the central market. The reason is that participation in price making is costly. If opposite parties have been identified, firms can reduce or even eliminate negotiation costs by transacting with those opposite parties at prices drawn from the publicly reported central-market price distribution. Even if only base prices from the central market can be used and differentials must be negotiated, negotiation costs likely will be less than costs of participation in the central market (perhaps because differentials may be negotiated infrequently). Thus, the prices made at the central market have the characteristics of a public good, and those firms that use it without participating in, or paying for, its development are free riders. The free riders likely include not only the firms conducting spot exchange outside the central market but also firms that contract or vertically integrate. (See Caves, [1])

As firms respond to these incentives to bypass the central market, participation in price making decreases, although it is likely that at least some firms will continue to participate in price making at the central market. For example, firms that find it difficult or costly to identify opposite parties without the aid of the central market would continue to participate as would suppliers (demanders) who are temporarily unable to sell (buy) needed amounts outside the central market. In addition, some firms may find it to

their advantage to enter the central market to attempt manipulation that would give them advantage in spot transactions (e.g., formula-price contracts) outside the central market, or they may enter to counteract efforts by other firms to manipulate the central market.

But even though exchange in the central market is not eliminated, there may be no reason to expect that, in general, the reservation values on the demand or supply sides in the central market will be representative of aggregate market demand and supply schedules, or to expect that the price distribution from the residual central market would be the same as the price distribution that would result if all suppliers and demanders participated in price determination. It is likely, then, that the set of transactions that would result if all traders participate in price making at the central market would, in general, be different than the set of transactions that would result if only part of the traders participate in price making at the central market and the rest use the prices made in the central market to complete transactions outside the central market.

Eventually, firms trading outside the central market may find central market prices unreliable and discontinue use of them to determine transaction prices. Costs of negotiating prices would increase. But it is not clear that an individual firm would, in response to this development, begin participating in the central market. It seems more likely that use of central market prices would be replaced by negotiations in decentralized submarkets. And arbitrage over time and space in these submarkets may be costly to perform and, thus, ineffective.

The foregoing scenario does not fully and accurately depict what has happened or is happening in any particular agricultural commodity market. It may, however, roughly depict forces operating and resultant pricing problems in several commodity markets. The exclusive use of a central market, such as was assumed at the outset of the scenario, does not guarantee the absence of pricing problems. For example, exchange rules may be such that there is considerable interlot price variation. But, if arbitrage is effective, I would not label this central market a thin market, even if volume is small. The residual central market, the contract market (particularly for nonprice provisions of contracts), and the decentralized submarkets that evolved in the scenario, however, may all qualify as thin markets in my view.

A market is thin if the reservation supply and demand values of only a small proportion of all traders are represented in the market. The existence of a thin market does not guarantee the presence of pricing problems. But pricing problems seem likely if a market is thin and if the included reservation supply and demand values are not representative of aggregate supply and demand conditions. The included reservation supply and demand values would not be representative if, for example, their intersection price level were substantially different from the intersection price level of the aggregate supply and demand curves. The main point to be made by the scenario is that thin markets and associated pricing problems may emerge simply because individual firms legitimately pursue their self interests, either by entering contractual arrangements or vertically integrating, or by using prices made by other firms to reduce spot transaction costs.

CONSEQUENCES

The suggestion that pricing problems may arise if prices are made in thin markets in which reservation values are not representative of aggregate supply and demand conditions is an untested hypothesis.

One approach that may be used to test this and other hypotheses is to examine the impacts of the existence of a thin market on the exchange outcome for a single market session. The focus should be on selected important attributes of the exchange outcome. Sosnick [7] has emphasized the importance of exchange efficiency, the extent to which potential collective net gains to traders are actually realized. Another important attribute of exchange outcomes is the division of collective net gains from trade between buyers and sellers. A third attribute is the dispersion of the distribution of prices. Performance with respect to these and other attributes of exchange outcomes likely would be different if only part of the reservation demand and supply values were represented in price making than if all reservation values were represented. Performance may be affected by the representativeness of the reservation supply and demand values included in price making, as well as by the exchange rules used in price making, and other factors. Information about impacts of existence of thin markets on exchange outcomes for a single market session may provide a basis for assessment of longer-run impacts of thin markets.

So far, research has not to my knowledge provided information about how exchange outcomes or other market results are affected when price making occurs in a thin market. However, there have been a number of studies in which experimental market sessions have been used to examine impacts of exchange rules and other factors on exchange results [2, 4, 6]. This research could be extended to encompass investigation of impacts of price making in thin markets. Exchange results from market sessions involving all participants could be compared with exchange results obtained when selected participants (subsets of the reservation demand and supply values for the market) determine prices for all transactions. Also, results from market sessions in which each bid or offer is exposed to all opposite parties could be compared to results from sessions in which exchange is conducted in decentralized subgroups. A number of questions could be addressed by using this approach. What proportion of the total participants, or what absolute number of participants, must be involved in price making if exchange results are to be the same as if all participants are involved in price making? Do exchange rules used in price making affect results? What effect does the sampling procedure used to select participants in price making have? What characteristics of the price distribution (s) made should be used to establish prices on transactions outside the price-making sub-session?

REMEDIES

Let me now presume that thin markets develop and, perhaps for reasons mentioned earlier, adversely affect exchange outcomes. Given these presumptions it is perhaps appropriate to consider measures that may be applied to prevent or reverse the development of thin markets. In the following discussion of seven types of alternative measures, I have drawn on several ideas offered by other seminar participants.

1. One alternative that deserves consideration is a policy of non-intervention. Is a thin-market problem a temporary one that, if left alone, will resolve itself? I think I am

agreeing with Williams [8] in arguing that it will not. There are incentives for individual firms to avoid participation in spot price making. Further, if markets become thin and spot prices unrepresentative, there is little a firm can do unilaterally to improve the situation.

2. It is often argued that improved market reporting is a solution to various marketing problems. It seems to me, however, that public price reporting may well stimulate the development of thin markets and associated problems. The better the public price reporting the more feasible and convenient it is for firms to use the publicly reported prices and avoid participation in price making. Thus, a second alternative measure might be the elimination of public price reporting.

If there were no public price reporting, private firms may be able to engage in the production and sale of prices and thereby alleviate or eliminate some problems associated with thin markets. For example, a firm may offer the following service. Each day a representative sample of both buyers and sellers of a cash commodity would be selected. Each selected firm would be offered the opportunity to participate in an exchange. The selected firms would be charged less than the cost of providing the exchange or perhaps even paid for their participation. The firm sponsoring the exchange could then sell information about the price distribution made in the exchange to traders not participating in the exchange. The price charged for the information would need to be at least high enough to cover costs of conducting the exchange. An obvious drawback of this proposal is that, while elimination of public market reporting may reduce thin-market problems, it may create or aggravate other problems.

3. Schrader [5] has suggested subsidies for central-market transactions. The effect of this would be to reduce the effective cost of participating in the central market and, thus, reduce or remove the incentive firms have to avoid participation in central market price making. I believe this could be effective, but there are some questions concerning implementation. One question concerns the level of the subsidy. Presumably, participation in the central market would be a positive function of the level of the subsidy. The level of the subsidy should be just high enough to induce the amount of participation in the central market that will result in representative price making. If the subsidy is set too low, then the program would not be effective and the pricing problem may persist. If the subsidy is too high, on the other hand, more participation in the central market than is needed for representative price making would result. This may be wasteful in that inexpensive transactions outside the central market in which the central-market price is simply used (e.g., formula-price contracts) would be replaced by more expensive central-market transactions. A program similar to this was used in the Alberta and Manitoba hog auctions. There, auction fees were charged for all transactions whether hogs were actually marketed through the auctions or not.

4. Another alternative, one mentioned by Williams [8], approaches the problem from the opposite direction. He suggests that all formula-price contracts (which might be viewed as parallel to all transactions outside the central market in the scenario discussed earlier) be prohibited. This is similar to the requirement that has been used in Ontario that all hogs be marketed through the teletype auction. The problem with this proposal, as Williams recognizes, is that it may make price making and exchange needlessly expensive by requiring more participation in the relatively costly price-making process than is really needed. In addition, enforcement of this sort of a prohibition may be an overwhelming task.

5. Still another alternative might involve the establishment of trading in a futures contract for the commodity. Those who have incentive to avoid costs of participating in the central spot market may have incentive to incur the costs necessary to participate in the futures market because they wish to use the standardized futures contracts either to forward price or hedge cash positions or to speculate. With these added incentives the number of participants in price making may well be greater than the number involved if there is only a spot market. But I don't think it is clear that price making will be improved. It may be that price making will be improved only if suppliers and demanders of the cash commodity become involved in futures trading. Consider, for example, a situation in which there exists a thin spot market and trading in a futures contract is introduced. Also, suppose that all parties to transactions in the futures market are speculators without positions in the cash market. If arbitrage can be expected to force cash and futures prices together at the delivery point at contract maturity, the object of the game for futures traders will be to correctly anticipate later spot prices, even if it is clear that the spot price is established in a thin market. If arbitrage at delivery is restricted, the futures price may be relatively unrelated to the spot price and of very little use to spot traders. On the other hand, if suppliers and demanders of the cash commodity participate actively in the futures market because they wish to forward price or hedge, reservation supply and demand values in the futures market may become representative of the aggregate market supply and demand values and price determination in the spot market may be improved. The futures markets for corn and soybeans play a much different role in spot price determination. Perhaps participation in futures trading by cash suppliers and demanders is part of the reason.

6. Exchange systems that utilize telephones, teletypes, computers, or other advanced technology may become an important tool in solving thin market problems because, by permitting centralized pricing in combination with direct movement of the commodity from seller to buyer, they improve upon traditional central market arrangements. The disadvantages are that initial investment costs may be high and, if initial volume is low, costs of participating may discourage firms from participating. In addition, most designs used to date have had the following limitations: there is often considerable lot-to-lot price variation, traders are restricted to a single trading method, and prices are determined only for a standard base unit of the commodity so that differentials for quality and other factors have to be determined outside the system. But these systems do offer promise as a tool for solving thin-market problems if designs (including exchange rules employed) can be improved and if costs of participation can be kept low (perhaps with the aid of subsidies).

7. Committee pricing has been suggested at least occasionally as a technique that may be used to alleviate pricing problems [3]. The appeal of committee pricing is that it can provide for determination at low cost of "fair and reasonable" prices which are stable and can be used on transactions at no cost to traders. Of critical importance, however, are the manner in which the committee is formed and the manner in which prices are determined once the committee is formed. I have some doubt that a committee can objectively appraise market conditions and determine market prices. If committee pricing were to be used I would prefer to have the committee formed by systematically sampling demanders and suppliers and have prices determined by conducting an actual exchange among these participants by using carefully selected exchange rules.

SUMMARY

Thin markets are quite likely an important and pervasive phenomenon in agricultural commodity price making and exchange. They arise as firms pursue their self interests in attempting to reduce transaction costs and capitalize on advantages of contracting and vertical integration. Problems seen most likely to arise if the supply and demand schedules formed by those participating in price making are not representative of aggregate supply and demand schedules. There are no research results available concerning the impacts of thin markets on exchange outcomes but it should be possible to conduct research that would provide some results about these impacts.

Thin market problems seem unlikely to self destruct. Improved market reporting does not appear to be an effective way to combat these problems and may even aggravate them. Establishment of organized spot exchanges, which permit centralized pricing and direct movement of the commodity, seems to be a promising way to attack these problems. If need be these systems could be subsidized, perhaps with check-off funds, or their use could be required. The former approach seems preferable. The role, if any, that futures markets may play in improving spot-price making is not clear.

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