The Role of Market Information in a Changing Market Structure

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Introduction

The U.S. Department of Agriculture (USDA) has long been involved in collecting and disseminating market information. In the 1990s, some of the state partners in a federal-state joint market news activity have dropped out or reduced their financial support and participation. The need for continued USDA involvement is being questioned, and some critics argue that private firms could and would take over this function. After all, it is argued, communication is easier than ever. We are in an era where everything is presumably available by internet. Private firms would provide information on a "user fee" basis. The users who benefit directly, not the general taxpayer, would pay for the service. All this leads to an inevitable question: Why is there public involvement in market news collection and dissemination?

Historically, there has always been the notion that public involvement in market news activities is justified because there is a *public good* dimension to those activities. This means that the public receives benefits from market news activities that would not be present if public efforts were not involved. This reason for public involvement was more prevalent in the early discussions than it is today, but it is still very important.

A second, and perhaps even more important, reason for public involvement emerges from the relationship between *the adequacy of the market information base, the effectiveness of price discovery, and the organizational structure of the marketplace*. In the late 1990s, market structure is on everybody's mind. Consolidation and concentration are occurring in virtually every commodity sector, and most producers don't like the trend. But not many of those concerned about the trend recognize the relationship between price discovery and structure. *Market failure due to ineffective price discovery processes prompts moves to concentrated markets and non-price means of coordination.*

This latter issue will be pursued in this brief paper. I believe an important and largely irreversible change in market structure is occurring in substantial part because the traditional price-based exchange systems are failing to achieve inter-level coordination of action in our production-marketing systems. Though important in all food and fiber sectors, in no sector is this issue more important and more visible than the livestock/meat sectors. In pursuing this issue and exploring the importance of adequate market information, my working hypothesis is that the livestock and meat markets will continue to consolidate and move to non-price means of coordination. Further, this trend will occur at least partly because of market failure due to price discovery processes that are less effective and efficient than they could be. One reason price discovery is and will be less effective is the lack of a public willingness to support the gathering and disseminating of important market information.

The Market Structure Connection

The conventional marketing systems for food and fiber products have been open market exchange systems. Prices and pricing signals have been the coordinating mechanism and have, presumably, been the agent of change to ensure that what is produced is consistent with what is in demand at the consumer level. To be effective in this important role, the prices evolving from auctions and one-on-one direct negotiations need to be based on good information. Grades must effectively categorize important value-related product attributes at the consumer level, and the product attributes identified by the grades must be brought into the pricing process. Price signals can be attached to product attributes of importance only if they are identified. Further, both buyer and seller must be negotiating from a common understanding of what constitutes value. And very importantly, the seller--especially the small producer of agricultural products--must have something approaching an equal knowledge of the underlying supply-demand forces that determine the "true" underlying but unobservable market-clearing price. If these conditions are not met, then the price signals are not sharp, the communication effectiveness of the entire system declines, and we face the possibility of what Williamson and others started to identify as early as the late 1960s and early 1970s as a "failure" of the open market price-based systems.

The efforts by Williamson and by Purcell in the 1970s continued a theme, a warning, that other agricultural economists had raised in the 1950s and 1960s: *If the price-based open exchange systems do not improve in terms of inter-level coordination of activity in our production-marketing systems, they will eventually be replaced by contracts or vertical integration which allow the needed inter-level coordination to be ensured by management directives.* Mighell and Jones, in a pioneering effort, had laid out in the 1960s ways to achieve vertical coordination. Included in their matrix were some of the non-price ways (contracts, vertical integration) of achieving coordination that we are seeing today. Purcell and Dunn and Rathwell and Purcell found evidence of goal conflicts and operational inconsistencies that blocked inter-level coordination in the beef systems of the 1970s. Williams and Farris documented efficiencies and lower cost production in integrated production systems compared to systems where each level of activity involved a purchase and later sale in the open market.

In the late 1990s, there is an abundance of evidence to suggest the long-standing warnings are coming true--that price-based markets that are not effective in achieving inter-level coordination across technically related economic functions will be replaced by contractual arrangements and integrated structures. Alchian and Demsetz had put this issue forward in an interesting way over 20 years ago. They discussed types of cooperative action and organizations and advanced the idea *that a **firm**, by bringing a number of the technically related inputs and functions under its control, starts to compete with the conventional markets. The **firm** becomes the coordinating mechanism, and it ensures a level of coordination the price mechanism may be unable to achieve in the presence of limited information and within existing market structures and related profit-center behavior.* The market structure tends to change to earn those benefits of coordination. That is precisely what the pork processors of 1997 are doing as they control genetics, reduce quality variability, schedule slaughter from owned or contracted production programs, and bring on-line low-cost operations which can accomplish an alignment between what is being produced and what modern consumers demand.

In cattle, it is the controversial *captive supplies* that would appear to have developed because of the long-predicted failure of the open market price system. It is true that these approaches to procurement came during the time of packer concentration, but one has to reflect on the *why* of the changes. Some would argue packers use captive supply cattle to drive prices down, but the research evidence (Ward *et al.*) shows no major price impact. It may be that the need to keep costs under control and to achieve inter-level coordination was the motivating force.

Paul, among others, argued many years ago that certain production processes will be combined under a single management (or combined by contract) because of the joint nature of the production process and the related need for joint decision making. The problem a firm faces is one of finding the optimum vertical or inter-level enterprise combination for the firm. Paul identified technological change and the desire for risk-sharing arrangements as factors redefining the vertical scope of firm activity and how firms work with others. The vertical disintegration of the traditional corn-hog, farrow-to-finish farm combination into separate farrowing and finishing functions is a good example. Changing technology resulted in a new vertical enterprise combination and a new industry structure. That process has now taken a turn toward very close working relationships between processors and a few mega-sized hog finishing operations, and industry structure is changing rapidly.

Paul recognized that changing the vertical organization of the production-marketing system may result in new patterns of risk distribution. He emphasized that as the degree of economic specialization changes, new risk-sharing arrangements evolve. A firm might choose to integrate vertically with an adjacent stage even if costs are not reduced so long as the variability of costs and thus rate of return variability was reduced. In fed cattle, packers have said in public interviews that contracting cattle *does* reduce their costs. *There are clearly powerful reasons to move to non-price means of coordinating the technically related stages in the livestock-meat production and marketing system if the traditional price system fails to achieve that coordination.* The traditional price system has failed when price discovery is ineffective, when there is no pricing to value, and when price incentives do not prompt consistent quality and/or the needed regular flow of hogs or cattle into a processing facility.

There is, then, a possibly compelling reason for public involvement in information and outlook, a reason that has not received enough attention. *If society values an atomistic structure in production agriculture made up of many independent producers, then there is reason to seek to improve the performance and effectiveness of the pricing mechanism by improving the information available to buyers and sellers*. That could mean, for example, aggressively reporting the pricing of fed cattle and hogs on a carcass evaluation basis to eliminate the uncertainty that still characterizes liveweight purchases, especially in cattle. Clearly, grades would have to be effective. There could be no significant value differences within grade tied to tenderness or other important determinants of palatability and consumer satisfaction. Critics are calling for an abandonment of public beef grades in early 1997 precisely because there *are* consumer-important value variations within current grades. It *could* mean an even more pervasive and more sophisticated system of market news than now exists. But one can argue investments in market news are worth it because our conventional market systems, which we have valued so highly in other policy arenas, such as rural development and in our farm programs, are clearly at risk.

The critic might again object to all this and argue that the private sector will provide the needed information. Gorham argued some years back that private services tend to "fill in the gaps" rather than compete with USDA and other public sources. He is probably still right today. The need for information might have to reach crisis proportions before the for-profit private sector would overcome all

the discounting for uncertainty and make investments. Even then, a "profit wedge" is driven into the process and would tend to mean private firms would offer less information than do public agencies.[1] And before the crisis swells to proportions such that private firms *do* fill in, it may well be that the large firms in our increasingly concentrated markets become the "market" and eliminate reliance on prices--which is, to repeat, exactly what is happening in pork today. *It does in fact appear that there is a compelling reason for the public to ensure that quality information is available to buyers and sellers in our price-based exchange systems if we value those systems and value the viability of the independent entrepreneurial producers who have long been the hallmarks of those systems.*

In a recent and special research effort specifically designed to estimate the impact of market information on price discovery for fed cattle, Anderson *et al.*, found (1) fed cattle prices became more variable as access to market information was decreased in a controlled experiment, (2) the use of contract (captive supply) arrangements between cattle feeders and packers increased when market information was withdrawn, (3) there was more reliance on cost and break-even information when information on markets and market prices was withdrawn, and (4) there was more tendency for slaughter weights to vary from the level that was most cost effective for the entire sector. There are, based on this important work, clearly negative implications to social well-being from the withdrawal of market information. The increase in variability of fed cattle prices means added risk exposure, a risk that must be paid for by someone. Research shows that when exposure to risk increases, system participants (especially processors) will have to extract a larger margin for their services if they are to stay in business. The result in the cattle sector will be lower fed cattle prices in the short run and reduced supplies of beef, higher prices to consumers, a smaller beef sector in the long run, and pressures to move to non-price means of coordination.

Looking Ahead

The discussions about public involvement in information gathering and dissemination will continue as we move toward the year 2000, and they will intensify. The criticisms of recent months and years will not disappear. We are caught up in an era of change. It behooves us, then, to try to focus attention on the truly important issues and to move the dialogue about policy formation into the arenas where the public interest is or should be most apparent.

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[1] Let

MC = marginal cost of collecting and disseminating market information,
MB = marginal benefit of information to decision markers, and
$\prod$ = profit needs of private firms to make investments in market new activities.

The marginal value of each additional bit of market information declines consistent with the lows of diminishing marginal returns. To society, more information is worth an added public dollar so long as the marginal benefit to society, MB*, exceeds its MC. Thus, information would be collected and disseminated in accordance with the expression:

Collect so long as $MB^* \geq MC$.

But for the private firm, (if we assume $MB \cong MB^*$), the expression is

Collect so long as $MB \geq MC + \prod$.

Thus, a "profit wedge" is driven into the process and less information would be collected and disseminated.

It will not be easy. We need a broad and analytical treatment of an area of activity that has not been, historically, conducive to breadth and analytical rigor. In the collection and dissemination of economic information, the public involvement spans the land grant universities, state agencies, and many agencies within the bounds of the U.S. Department of Agriculture. It is, then, not difficult to see why actions and policies are often fragmented and micro in orientation when a broader, more nearly macro, and analytical approach that ties all the pieces together is what is needed. And it is very difficult to conduct research in this general area that generates empirical measures of the private and/or public benefits to market information.

Having recognized it will not be easy, it is imperative that we get it done. The public interest in the late 1990s goes far beyond the historical thrusts of getting information to the small producer to level the playing field and to try to ensure producers will be protected by at least a modicum of competition between and across the increasingly large buyers. Those were and still are admirable goals and we should not ignore them. But in the late 1990s, the public information efforts are being carried forward in a significantly different operating environment. Markets for food and fiber products are concentrated to an extent without historical parallel. There are huge and powerful players, especially at the processing level, who are becoming increasingly impatient with perceived inadequacies in our traditional exchange-oriented and price-driven marketing systems. They are facing powerful cost and profit-related economic reasons to act. The price-based systems will be replaced as coordinating mechanisms if those systems do not become more effective.

There are numerous and clear signals in our farm and rural development policies that the public is interested in perpetuating an economic structure characterized by a number of aggressive, innovative, and competitive independent entrepreneurs. That type of structure typically relies on transaction prices to move the food and fiber product from the producer as a profit center to the processor as a separate (but technically related) profit center, and on up toward the final consumer. If the large processor in our increasingly concentrated livestock markets gets the raw material inputs it needs from independent producers when needed and at a consistent quality, the incentive to integrate vertically into production and/or control production by closely specified contractual arrangements is diminished. It is reduced to the incentives associated with being more efficient in production, and there are numerous indicators that an independent producer who is large enough to spread fixed costs over at least modest production levels and can put together truckload lots of consistent, high quality hogs or fed cattle, can compete in production efficiency. *It will be the lack of inter-level coordination--the wrong quality, high levels of quality variation, poor or unscheduled timing in the quantity flow into the plants--that will drive the processor towards coordination by non-price means and brings the demise of the traditional price-based systems.* It will be ineffective price discovery, not an overwhelming cost advantage, that will prompt processors to move to non-price means of coordination.

It is essentially a tautology that pricing, price discovery, pricing accuracy, and pricing efficiency are tied closely to the available information base. Price cannot be effective as a coordinating mechanism if the information on which it is based is inaccurate, inappropriate, or comes up short along important dimensions. A pork processor who is fully responding to the fresh pork consumer market by offering a high quality cut of branded fresh pork that reduces preparation times in the kitchen must have the right hogs in terms of quality and timing if brand identification, promotion, and guarantees of satisfaction are to be extended. But if the livestock producer is to meet those needs, what the processor needs must be made clear during the pricing process. *All significant value-related dimensions of the product offering must be brought into the pricing process, and that pricing process must be reported in some depth and detail.*

The need, then, is for quality information along a broad continuum. Grades and product descriptors must be refined and highly specific. If there is still lots of value variation within #1-2 barrows and gilts weighing 230-250 lbs., we need (and we *are* getting) more refined grades, descriptors, and transaction terminology. If the intensity of current dialogue is any indication, the need is much more pressing in beef. *If* there is in fact significant eating quality variation within the Choice grade, *then* it has to be broken out, categorized, and identified. *Effective price discovery is impossible unless those consumer-important traits are identified and reported by market news disseminators. If these things are not done, there are powerful economic reasons (costs, quality assurances, inter-level coordination) for processors to bypass the pricing system and go to non-price means of coordination.*

If we have lacked the public will to make the investment needed when the traditional reasons for public involvement in market news were examined, perhaps the willingness will be there if we recognize that we are also setting the stage for the organizational structures we will see in the decades ahead. We clearly do care, as a collective public, how our markets are structured. And anyone who does not recognize that failures in our pricing mechanisms (traceable at least in part to inadequacies in our market and market-related information base) have contributed to the demise of our pricing systems in many sectors of our livestock economy has not been paying attention to the developments of the 1990s.

For many market-related reasons, then, we *must* have high quality information that is not fraught with error and is not presented in such a way that still allows for widely varying interpretation by users. Pricing to value must be accomplished. Risk associated with significant price volatility and uncertainty that can be traced to the lack of market information must be eliminated or reduced to tolerable levels. Whatever the distribution mechanism, these needs have to be met and we have to do what is necessary to ensure they are met. If there is no other overriding message in the literature, there is one that consistently points to a positive net value for public involvement to help ensure competitive prices and efficient economic activity. If that traditional and persistent message is not sufficient to prompt us to fix a system that appears to be broken along several dimensions, then I hope extending the reasons and the discussion to include helping to ensure the viability of pricing systems and a market structure we have valued as a society will prompt the needed actions and the needed commitment.

References

Alchian, A., and H. Demsetz. "Production Information Costs and Economic Organization," *Amer. Econ. Rev.* 62(1972):777-795.

Anderson, John D., Clement E. Ward, Stephen R. Koontz, Derrell S. Peel, and James N. Trapp. "Estimating the Value of Public Information and Public Information Impacts on the Fed Cattle Market," Miscellaneous Bulletin 1-97, Research Institute on Livestock Pricing, January 1997.

Gorham, Michael. "Public and Private Sector Information in Agricultural Commodity Markets," *Econ. Rev.* (Spring 1978):30-38.

Mighell, R. L., and L. A. Jones. *Vertical Coordination in Agriculture*, USDA, ERS, Agricultural Economics Report No. 19 (1963).

Paul, A. B. "The Role of Competitive Market Institutions," *Agr. Econ. Rev.* 26(1974):41-48.

Purcell, Wayne D., and T. L. Dunn. *Economic Implications of Conflict and Inconsistency in the Beef Marketing System: The Feeder-Packer Subsector*, Oklahoma Agricultural Experiment Station Bulletin B-700 (1972).

Purcell, W. D. "An Approach to Research on Vertical Coordination: The Beef System in Oklahoma," *Amer. J. Agr. Econ. 55(1973):65-68.*

Rathwell, P. James, and W. D. Purcell. *Economic Implications of Conflict and Inconsistency in the Beef Marketing System: The Producer-Feeder Subsector*, Oklahoma Agricultural Experiment Station Bulletin B-704 (1972).

Ward, Clement E., Ted C. Schroeder, Andrew P. Barkley, Stephen R. Koontz. *Role of Captive Supplies in Beef Packing*, USDA, Grain Inspection, Packers and Stockyards Administration, GIPSA-RR 96-3, May 1996.

Williams, Ed, and D. E. Farris. *Economics of Beef Cattle Systems: From Weaning Age to Slaughter*, Texas A&M University, Agricultural Economics Information Report 74-3, Texas Agricultural Experiment Station (1974).

Williamson, O. E. "The Vertical Integration of Production: Market Failure Considerations," *Amer. Econ. Rev., Papers and Proceedings, 61*(1971):112-123.