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## **Emerging Issues and Challenges in Applied Commodity**

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## **Emerging Issues and Challenges in Applied Commodity Price Analysis<sup>1</sup>**

This organization (NCR-134) began 20 years ago to serve as a meeting ground for applied commodity price analysts in academic, business and government positions. The primary objective was to foster interaction, and discuss recent applied research and extension applications, and emerging related issues that might warrant attention. The interchange of ideas has continued for 20 years, and your participation over the years has made it the success that it is today.

My focus today will not be on history, however. Rather, it is a set of observations about how I see the world in which we operate, and some challenges and opportunities that deserve more thought and attention as we serve our various customers for our professional expertise. My goal is to provide one useful idea to each of you.

### **What we value**

Let me begin by arguing that many of us in the academic world too often focus on other academics as our primary customers, especially the graduate students, assistant and associate professors who must meet professional contribution hurdles that often are interpreted as peer-reviewed publications in high quality journals. While this is often realistic, the end result often is a narrow perspective on what is worth working on, and what is a valuable contribution from our colleagues. Certainly, quality control is important, and communication among ourselves is essential for our profession to make progress. But, the needs of the ultimate customers in government, agribusiness, or in the public at large too often are relegated to lower priority (in favor of the less important topics involving newer techniques and readily accessible data that have high probabilities for journal articles). Yet, the ultimate customers provide the political support necessary for public funding for agricultural economics programs in universities (and government agencies), and that continues to be threatened by our own valuation systems in the academic world. We need to rebalance our academic valuation systems and collective research portfolios for greater long-term effectiveness.

### **Structural evolution or revolution**

Examining the changing horizontal and vertical structure of the food and agricultural system here and abroad is one of my continuing interests. But that structure requires some careful attention by the applied price analysts as well, as the nature of the beast being studied is evolving, sometimes at a dramatic pace that forces reexamination of the issues that deserve attention, the assumptions employed in our economic and statistical

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<sup>1</sup> I extend my appreciation to a dozen business, government and academic professionals who participated in my short survey regarding challenges in applied price analysis. Their ideas helped stimulate my thinking on this subject, and some elements of their responses will be found here, especially when they reinforced my own thinking. Since the results were quite diverse from a small sample, I chose not to summarize the survey responses. Critical reviews and suggestions by Ted Schroeder, B. Wade Brorsen and David Hennessy are greatly appreciated.

models, and the underlying sources and meaningfulness of the data that we try to analyze to answer emerging questions and issues.

Increased consolidation and concentration continues at all levels of the food sector in the U.S. and most developed countries. Others are involved in substantial or dramatic transitions in the form of private sector and government interaction in the industries and commodity markets we analyze. Two points emerge. Imperfect markets are more often the norm than are recognized in our modeling efforts, and that needs to be addressed explicitly and more effectively, both in studying potential impacts of that structural change, and in analyzing the data forthcoming from these changing regimes. Yet we do not know what the competitive threshold is—how few firms is too small to achieve a workably competitive result, and under what structural conditions. We don't know where the market power becomes great enough to warrant public policy remedies or different modeling approaches in applied price analysis. Second, the changing nature of the industries and markets forces a reexamination of our focus on long time series of data to meet the demands of statistical tests assuming no structural change. We need to acknowledge the reality of change, both recently and likely in the future. We need to develop improved methods to deal with short time series or changing regime models, and be more willing to tackle issues that don't have convenient data series adaptable to our conventional tools. Further, we should become more forward looking in determining likely directions and, more heroically and unlikely, rates of change in the future that will affect the size of the economic impact multipliers that should be used in subsequent applications of our results, as well as the forecast precision that should be expected by our customers.

One issue that I consider overblown, but is continually raised in many agricultural industries whenever commodity prices change a lot (especially when they drop at the farm level), is the increasing share of the consumer food dollar going to retailers, processors, and *not to farmers*. Maybe the increasing concentration and size in the retail and food service sectors makes this issue more important now than in the past. Why don't agricultural economists spend more time really understanding the dynamics of food processing, wholesaling, retail and food service ever-changing product and service mix, cost structures, bargaining strength, competitive behavior and profit margins? We need to do more to educate ourselves and our students on the food chain linkages, the “bargaining against” versus “cooperating or contracting with” approaches to food chain management, along with those persons and groups raising these outcries and too often quickly assigning blame for low prices to others in the food chain (seldom themselves!). And we need to apply these insights to our price analysis and our communication to the parties involved and the public the next time these issues are raised—and they will be!

### **Contract agriculture and thin markets**

In the United States, we are moving rapidly toward contract agriculture being the dominant form of organization of the food system. The open markets that we knew and valued highly in theory have become supplanted by more effective means of linking

customers to the original specialized input suppliers. Even the grain and livestock markets will be undergoing rapid transformation in the near future in response to the issues being raised (e.g. GMO free grain, value-added grains, etc.) and payoffs from traceability, enhanced food safety, lower supply chain and market access risks. This results in differentiated new products displacing undifferentiated commodities. It also results in thinly traded markets as vertical integration, contract links and/or new product forms move products out of the “commodity” streams.

Now keep in mind that contracts that are often the focus of controversy are longer-term contracts displacing the short-term contracts that we call spot or cash market transactions. So we are replacing one form of contract with another, and changing the functional responsibilities, product characteristics and risk-reward structures from typical spot market arrangements.

Yet, there are implications for our work, both in the issues we sometimes are asked to address or the issues we unilaterally find interesting. For example, at what point does a thinly traded commodity market become problematic from a regulatory standpoint (subject to manipulation too easily?) or as an index of value guiding checks paid to contract suppliers, or as a factor influencing investment decisions by farmers or agribusiness managers? How do you deal effectively with changing product characteristics, services, and risk profiles with changing contract links, with short time series, in your modeling, data choices, model assumptions, tests for changing regimes, etc.? The recent Congressional mandatory livestock cash market and contract reporting initiative will provide a useful experiment (likely to be a less than successful government exercise) to meaningfully describe the value implications of changing contract markets terms and conditions.<sup>2</sup>

**But how can we more effectively monitor contract market dynamics and competitiveness? Estimating values for changing service, product, risk and other contract term characteristics should become a major focus of applied price analysts. Determining more effective methods of communicating multiple product-service-risk characteristics and indices of value (not just price!) will become the focus of government, industry and outreach economists and “price reporting agencies”. Economists will also be interested in estimating the impacts of changing coordination system linkages (e.g. traceable products liked by contracts) on the responsiveness of the various stages of the system to changing demands. How do we**

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<sup>2</sup> Why? Because people expect too much—government price/contract reporting changes will not deal with the market power concerns that were the primary concerns of producer groups. Packers (the perceived adversary with power) are likely to find the reports more useful than producers. Further, the most useful information for livestock producers would be the long-term contract terms are being offered today, so a producer can know the competition for future production, not prices received from deliveries made under contracts begun several years ago, and use that information to guide producers’ contracting and investment decisions.

**measure the extent and rate of change of these multi-dimensional food system performance characteristics?**

**Dealing more effectively with transitional market structures will become more important, as traditional time series analysis becomes much less useful in many industry and market settings. Analyzing short time series or cross sectional data will become essential to deal with many issues, and the information will more often be held by private firms than public agencies. This will require a greater ability to talk industry language and communicate how your research will be mutually beneficial, to get the information you need.**

### **Event analysis**

Many issues arising from various events become hot issues deserving attention by price analysts for public education, executive branch policy analysis, and the judicial system as the blame and the price tag for the losses are determined. Examples quickly come to mind such as price impacts of: mad cow disease in the international beef markets; price fixing by industry groups; biotech fiascos like Starlink; captive supplies in the beef and pork industries; unfair import competition on domestic producer prices and profits, etc. Many of these are short term events that have few statistical degrees of freedom available, and/or little time for analysis, yet estimates of impacts are required.

Perhaps we need to forego the standard statistical tests where they obviously are impractical or inappropriate with one shot events, sparse time series or changing regimes. What would we replace them with? Consider the judicial standard of a “reasonably confident professional estimate” (more likely than not) that is used in civil trials when economic damages must be estimated. Alternatively, why not describe as clearly as possible, in laymans’ language, the estimated probability of type 1 or type 2 error associated with a specific point estimate, based on some combination of empirical and/or subjective professional appraisal appropriate to the situation. Yet, would (or should) our journals be accepting of such novel approaches? I believe we need to be more accepting of innovative, effective analyses, even if they are unconventional.

### **Short term price analysis/forecasting**

In the business world, price forecasters and risk managers deal most often with short term price behavior—what is likely to happen to prices in the next days, weeks or months? This involves estimating values of key factors that in turn influence price for fundamental analysts, or looking at price history for technical analysts. Both approaches are used by many practical risk managers. Focusing simply on the fundamentalists, most academic and government price analysis is backward-looking, using actual data. But the practitioner is trying to get early indications of likely supply, demand or policy changes to determine likely changes in price, and appropriate market positions to enhance their position versus competitors and their internal budget targets. Seldom do academic price analysts deal with the real-life situations where early forecasts of production, imports,

etc., are used in price forecasting model estimation procedures, and forecast accuracy measures take into account the problem of imprecise input data forecasts used in making subsequent price forecasts. Neither do many price analysts deal with the most interesting extreme market situations when shortages crop up, and analogous situation analysis must be employed in the absence of many observations of similar ilk in prior history. Clearly typical impact multiplier estimates fly out of the window in such situations, or when unique events unfold (e.g. mad cow or Starlink events). Yet these situations may be where the greatest payoffs are from good estimates. Yet standard statistical procedures may not be applicable to the situation. How do we deal more effectively with these types of problems?

In addition, forecasting precision is often not disclosed or the degree of accuracy is either never evaluated or it is exaggerated by some professionals. I note that financial planning programs are now offering estimates of likely financial status based on Monte Carlo techniques. Why can't forecasters providing estimates based upon statistical forecasting models with known historical error distributions and input data with known historical error distributions do likewise? Truth in forecasting might become an advertising slogan, perhaps, though the actual degree of imprecision might be scary to users of these forecasts. While the direction of price change is often most critical to risk managers, the potential type 1 and 2 errors in "my position" versus "my competitors' positions" are often critical factors considered by sophisticated agribusiness risk managers.

## **Risk management**

Having worked at understanding and developing improved methods for commodity risk managers over the years, I want to offer a few comments. We have too many optimum hedging studies focusing on price alone, when most agribusinesses are multi-commodity with both volume and price risk, with different risk tolerances than postulated in most standard models. So we're suboptimizing using the wrong utility index too often.

In the processing and distribution system, their risks are for baskets of commodity inputs and baskets of products with prices often linked to commodity markets (i.e. their margins or, preferably, net revenues for the business, not just the prices paid or received per unit). They have volume risks too, sometimes as much as farmers. The recent development of (gross) revenue insurance products for farmers is a big step in the right direction. We need to develop and analyze a variety of long term net revenue stream insurance measures (via swaps or other creative devices) which insure against adverse cost, gross revenue or, even better, net revenue swings from multi-input, multi-product commodity production, processing or merchandising operations. Is this complicated? Certainly. But there are likely to be new, more realistic insights developed into how commodity-related risk management can and should be handled in complex businesses that industry participants and our students need to be aware of. We need to be focusing our analysis on the real big-picture, bottom line problems faced by managers.

## **Some concluding thoughts**

The shelf life of the research from markets and industries in transition will be much more limited. Accordingly, our entire professional peer-review and publication process needs to be speeded up to keep results from being stale. Internet staff papers, conference proceedings (like NCR-134, quickly on the web) and peer-reviewed journals with quick, yet rigorous reviews should become the primary outlets, with rapid dissemination of topical studies displacing the stodgy review and publication system that takes a year or more before something is seen in print. Delay is costly, reducing our effectiveness with our customers and slowing our collective professional progress! We should consider having the original papers submitted to our journals quickly made available on the web, followed by any critical reviews (handled via e-mail), authors' rebuttals and revisions, as one way of maintaining quality control within the profession while enhancing our responsiveness to our customers (and probably expanding our audience).

With the strong and varied opinions on the actual or potential impact of food system organization changes by industry member, policy makers, and economists, you can be sure that someone won't like hearing an economist offering analysis and insights that do not agree with their preconceived opinions. We have probably been too reluctant to take on some controversial issues (though discretion might be the smartest strategy in some situations -- moving in front of a moving freight train can be painful). Further, we ought to be focusing our discussion on the emerging knowledge base from solid research, rather than speculative hypotheses or what might be termed "economic politics".

Remember that most jobs for advanced graduates knowing something about price analysis are not academic. The demand for commodity price forecasts and risk management continue to be a major market for price analysts, and social welfare is not the objective being served in most of those positions -- rather it is increasing "my share of the pie". In government, policy analysis remains important, and social welfare is only incidentally considered in a political setting; rather, forecasting the budget implications of weather and policy changes are more often in the position descriptions linked to the policy process.

How can we enhance the demand for our services? Consider these strategies. Become more knowledgeable about the industries and markets that you analyze. Pick important industries and markets that are more likely to have more customers for your analysis. Talk to the industry members and government agencies. Find out their problems and questions. Find out how the industries and markets behave. Then define the useful question and how to answer it. Avoid "have tool, will travel". Train your students to do the same for at least one market or industry. Give them practical exercise (and serve as a positive role model) in communicating their thinking process, analytical results, appropriate interpretations, uses and cautions, in language that truly reaches their audience. Those skills are absolutely essential for success in business or government, and it should become more important for academic success as well. Otherwise we have too many academics communicating with each other, and not necessarily serving the broader public well.

