Special Issue
Industrial Organization of the Food Industry

Introduction

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The food industry has always been an important area of investigation for researchers both theoretical and empirical Industrial Organization. Intense market dynamics and greater availability of data in this industry have provided the profession with even more research opportunities. In the early 1990's, the Institut D'Economie Industrielle (IDEI) and the Institut National de la Recherche Agronomique (INRA) joined together to organize a bi-annual conference that would bring together world specialists in such topics as imperfect competition and market power, auctions, and contract theory. The purpose of the conferences would be to discuss the lessons to be drawn for agro-food markets from the most recent advances in their fields.[1] This special issue of JEMS puts together a selection of papers most of which were given at the 5th INRA-IDEI conference on "Industrial Organization and the Food-Processing Industry" organized in Toulouse in June 2002.[2] This introduction presents the fundamental ideas explored in these papers and their main implications.

The paper by Diana M. Burton, H. Alan Love, Gokhan Ozertan, and Curtis R. Taylor presents a model that highlights the problems raised by property rights protection

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[1] The IDEI, a research center strongly devoted to theoretical and applied IO, was lead by Jean-Jacques Laffont (who founded it in 1990) and Jean Tirole. Laffont passed away on May 1, 2004. The INRA is a French government-owned organization devoted to research pertaining to agriculture.

[2] We thank Dan Spulber for his editorial help in preparing this special issue of the Journal of Economics & Management Strategy (JEMS). All articles published in this special issue were subject to the full standard JEMS editorial and refereeing process.

of biotechnology innovations, in particular, those of genetically modified seeds, which is currently an important issue in world agriculture. Biotechnology innovations are indeed revolutionizing the agro-food sector and raising new organizational and marketing issues in this industry. Self-replicating biotechnology innovations, such as genetically modified seeds, not only face competition from other innovations but also from possible copies. Burton at al. examine three mechanisms that a Genetically Modified (GM) seeds producer can use to protect its intellectual property rights: short-term contracts (the most common in the industry), long-term contracts, and the use of biotechnological protection methods that make progeny GM seeds sterile (the so-called “terminator technology”). They show that the possibility of piracy intensifies competition generated by the durable nature of the good. Taking piracy, its detection, and its punishment into account, they show that the technology protection system yields seeds producers the highest profits while farmers are better-off under short term or even long-term contracts. In terms of social welfare, the terminator technology is dominated by long-term contracts, while the comparison between short and long term contracts depends on the monitoring cost. An implication is that unless the terminator technology starts to be implemented, one would expect a dramatic modification in the nature of the contractual relationship between seeds producers and farmers, namely, a likely move towards longer term instruments.

In agricultural and food markets where perfect competition is more the exception than the rule, marketing activities often involve auction mechanisms. The paper by Philippe Février, William Roos, and Michael Visser studies a particular auction mechanism often used for flowers in the Netherlands and wine or champagne in France. The mechanism gives the winner the option of buying any available quantity of the good

at the winning bid price in English ascending auctions. The authors develop and estimate a structural model using data from wine auctions at the largest auction house in Paris in 2000 (Drouot). They perform a test of the behavioral auction mechanism modeled and show why the auctioneer willing to sell multiple identical units of a same good may prefer to use this mechanism. They also empirically show that the revenue effect coming from this buyer's option (relative to sequential auctions without such an option) is negligible, but that the large amount of time saved by this mechanism may explain its use. This nice contribution puts emphasis on the role of transaction costs in marketing large quantities of goods and in explaining the use and development of auctions and contracting mechanisms particularly in agro-food markets.

The paper by Porametr Leegomonchai and Tomislav Vukina is an example of recent empirical applications of contract theory to agriculture. Marketing and production contracts between farmers, growers and different sorts of intermediaries are increasingly used in the agro-food industry. In livestock production including broiler chickens and hogs, production contracts are often used between farmers and industry processors in order to provide incentives for efficiency. Moreover, many of these contracts occur repeatedly. Leegomonchai and Vukina study the strategic allocation of inputs by broiler processors facing heterogeneous growers. In a two-period model, two types of dynamic incentives can lead to strategic discrimination, either a career concerns or a ratchet-effect type of incentives. Using panel data on broiler contracts, the authors find no significant input discrimination. This empirical application thus proves very useful for the welfare analysis of common contract practices in agriculture. Agricultural contracts of this kind are observed for livestock, grains, and other commodities and offer

a rare field where many of the ideas and predictions of contract theory seem particularly relevant and can be used and tested.

The paper by Jean-Pierre Dubé combines econometric and simulation methods to assess the competitive and welfare impacts of merger episodes that occupied the debate in the US soft drink industry during the 1980s. Dubé makes the important observation that, typically, households purchase soft drinks in the form of multi-unit as well as multi-variety bundles which makes fitting supermarket aggregate scanned data to standard discrete single-unit choice models inadequate. The author then suggests basing demand-side estimation on a consumer decision model that makes a distinction between purchase and consumption decisions. Estimation then is performed by appending to this multiple-unit-purchase-consistent demand module a supply module that reflects Bertrand competition for differentiated products. This estimated structural model of demand is then used to simulate the impact of the hypothetical mergers which are all found to imply large welfare losses although not all so large price increases.

While Dubé puts emphasis on “realistic” modeling of demand and on the merger policy implications of the estimated structural parameters, Tirtha Dhar, Jean-Paul Chavas, Ronald W. Cotterill, and Brian W. Gould insist on “flexibility” in demand specification when investigating the nature of strategic interaction between the two major players in the soft drink industry, Coca-Cola Co and PepsiCo. In the spirit of the New Empirical Industrial Organization literature, Dhar et al. specify a nonlinear Almost Ideal Demand system for firms’ brands and derive first-order conditions for profit maximization following a conjectural variation (CV) approach. The resulting “generic” model is estimated with full information maximum likelihood using data on four major

brands offered by the two firms and tests of firms' brand-level price conduct are performed. No evidence of price collusion is found in a test of a collusive model against a CV model that nests it. Moreover, the authors reject Bertrand- and Stackelberg-type conjectures and find a high sensitivity of elasticity and market power (Lerner index) estimates to model specification.

Arturs Kalnins makes use of limited dependent variable regression techniques to analyze a data set on 142 international fast-food franchising contracts signed in the U.S. during the period 1982-1999. He finds these contracts specifying a target number of outlets franchisees must deploy, to obtain from franchisors exclusive rights to an assigned market, that are typically not achieved. Moreover, the size of these deployment commitments turns out to be negatively correlated with the actual number of units that remain active. The author discusses possible theoretical explanations for this result, namely, contractors' market potential overestimation, tradeoff between asset risk and return, signaling of quality, and strategic preempting and argues that systematic overestimation of market potential by franchisors and franchisees is the most plausible justification.

These six articles provide a good illustration of the diversity of the research directions that are currently taken to study the industrial organization aspects of the agro-food industry. There remain many new challenges in the analysis of agricultural production, its organization, and the distribution and marketing mechanisms that support it. Such an objective calls for a good understanding by agricultural economists of the role of nonlinear pricing strategies and sophisticated marketing and contracting mechanisms. Normative issues raised by agriculture policies also are expected to be on the future

research agenda. Current advances in Industrial Organization and contract theory and the increasing availability of data on the food distribution and production sectors open many exciting research areas.