

# **VALUE CHAINS IN THE AGRICULTURAL INDUSTRIES**

by

Michael D. Boehlje, Steven L. Hofing, and

R. Christopher Schroeder

Staff Paper # 99-10

August 31, 1999

**Department of Agricultural Economics**

**Purdue University**

**Copyright © Ag Education & Consulting, LLC**

*Purdue University is committed to the policy that all persons shall have equal access to its programs and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.*

# **VALUE CHAINS IN THE AGRICULTURAL INDUSTRIES**

by

Michael D. Boehlje\*, Steven L. Hofing\*\* and R. Christopher Schroeder\*\*

## **Preface**

The U.S. agricultural industry is in the midst of major structural change — changes in product characteristics, in worldwide production and consumption, in technology, in size of operation, in geographic location. And the pace of change seems to be increasing. Production is changing from an industry dominated by family-based, small-scale, relatively independent firms to one of larger firms that are more tightly aligned across the production and distribution chain.

And the input supply and product processing sectors are becoming more consolidated, more concentrated, more integrated.

Agriculture in the 21<sup>st</sup> Century likely to be characterized by: 1) adoption of manufacturing processes in production as well as processing, 2) a systems or food supply chain approach to production and distribution, 3) negotiated coordination replacing market coordination of the system, 4) a more important role for information, knowledge and other soft assets (in contrast to hard assets of machinery, equipment, facilities) in reducing cost and increasing responsiveness, and 5) increasing consolidation at all levels raising issues of market power and control.

These profound changes in the agricultural industry present new challenges and new opportunities that require new opportunities that require new ideas and concepts to analyze and implement. They require new learning and thinking. Some of those new ideas and concepts are presented here, not as empirically verified truths, but as “thoughts” to stimulate different and better thinking. They have been developed based on observations, analysis and discussions with numerous managers and colleagues in agribusinesses in North America and Europe. This series focuses on Value Chains in the Food Production and Distribution Industries; companion series are also available on Farming in the 21<sup>st</sup> Century (Staff Paper 99-9), and Financing and Supplying Inputs to the 21<sup>st</sup> Century Producer (Staff Paper 99-11).

Our purpose in sharing these “thoughts” is to invite discussion, dialogue, disagreement — in general to encourage others to develop better “thoughts”.

Keywords: Value chains, value decay, product differentiation, information, structural change

\*Professor of Agribusiness, Center for Agricultural Business, Purdue University, West Lafayette, IN 47907-1145 and Senior Associate, Ag Education & Consulting, LLC;  
boehlje@agecon.purdue.edu

\*\* Partners, Ag Education & Consulting, LLC, Savoy, Illinois 61874, www.centrec.com

## **Critical Dimensions of Value Chains**

The agricultural sector is increasingly characterized by more tightly aligned supply or value chains from genetics through producers and processors to end-users and consumers. The adoption of supply chain and qualified supplier approaches in the agricultural sector is a relatively new phenomena; understanding some of the critical dimensions of a supply or value chain will help us understand the implications of this new way of organizing the food production and distribution system.

The fundamental concept of a supply or value chain is to explicitly specify the value creating activities in the production-distribution process, and to provide an explicit structure for the linkages among these activities or processes. For example, in the grain and oilseed production and distribution industry, the value chain might have the activities or processes and the participants depicted in Figure 1. Thus, the first task in specifying a value chain is to identify the processes or activities that are necessary to create the attributes or products that will be demanded or used by the end-user or consumer.

The second critical dimension of a value chain is the specification of the product flow features of the chain. These features would include the transportation and logistics necessary to move products between processes, the details of flow scheduling to make sure that products are available at various stages of the process without accumulating excessive inventory, the enhancement and maintenance of various quality attributes, and the full utilization of plant and equipment in all stages of the value chain to reduce down-time or bottle-necks. At the same time, a critical issue in managing the product flow in a supply chain is managing slack or flexibility to accommodate unexpected interruptions or events. Concepts of statistical process control, inventory management, and logistics management are critical to understand this product flow dimension of a value chain.

The third important dimension of a value chain is the financial or cash flow across the participants and processes. Recent development of electronic funds transfer technology has improved the efficiency of financial and funds flows compared to earlier systems of billing and check-writing. An additional element of this dimension is the sharing of financial performance information across the stages or processes and participants in the chain. Such information is typically presumed to be proprietary in nature, but more open sharing of financial information between chain participants may be critical to improving the financial and physical performance of that chain.

A fourth critical dimension of a value chain is the information flow across the chain. Important elements of this dimension are the accuracy of messages (whether messages are signals or noise), the strength of these messages, the cost of messaging, the speed of transmitting and receiving messages, and the openness to sharing rather than retaining critical information among participants. The information flow characteristics of a chain are becoming increasingly critical to its performance.

A fifth important dimension of a value chain is the incentive systems that are in place to reward performance and share risk. Such systems might include price premiums, profit sharing, minimum pricing arrangements, window contracts, cash flow or financial assistance contracts, loan guarantees, qualified supplier recognition programs, cost sharing arrangements, long-term commitments, and knowledge or market access. Increasingly, the conflicts encountered with more rigid contract and similar incentive systems that do not adjust with market conditions and consequently result in inequitable sharing of losses and profits are likely to result in the development of more flexible incentive systems such as contribution based percentage sharing of final product gross revenue.

A sixth and final dimension of a value chain is the chain governance/coordination system. Alternative governance or coordination systems might include open access markets and various forms of contracts, strategic alliance, joint ventures, franchising arrangements, networks, cooperatives and vertical ownership. The choice of governance/coordination system will have a significant impact on who has power and control in a value chain and how risks and rewards are shared.

Figure 1 provides a visual representation of these six critical dimensions of a value chain.

**Figure 1. Critical Dimensions of a Value Chain**

