VALUE CHAINS IN THE AGRICULTURAL INDUSTRIES

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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 21st 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. The 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 21st Century (Staff Paper 99-9), and Financing and Supplying Inputs to the 21st 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

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Power and Control In Supply Chains*

More tightly aligned supply or value chains will replace impersonal open markets in much of the industrialized segment of agriculture. These chains will be coordinated by negotiation rather than markets. A fundamental issue in any negotiation based coordinated system is the point (or points) and source of power or control. Who dictates or has the most control over the performance of the system, of the sharing of risk and rewards? Who has the power to resist or encourage change; to influence the acceptance and rate of adoption of new technologies and ways of doing business? And what is the source of that power or control?

In any supply chain, the source of power and control in that chain is to a significant degree a function of the most unique or least substitutable resource. In essence, the owner of the least substitutable resource has the most power to capture rents, transfer risk to others and have significant impact on what the chain does or does not do. A simple way to understand this concept is that the most unique resource is the most indispensable and has the potential to exercise "hold-up" power because of this uniqueness or indispensability.

In food chains where commodities dominate, the most important resources (i.e. those that have the most value and are the least substitutable) are generally those that will generate the lowest cost. Typically, these resources are the traditional capital and labor resources that dominate economic analysis. Assets and people that are properly positioned in terms of location and skills are unique, and provide those individuals or firms that own those assets with significant power in the chain. This is one reason why larger scale merchandising and food processing companies (such as Cargill, IBP, Continental, ADM, etc.) have had such a dominant role in the chain in the past — they have had the most unique or least substitutable resources to generate the lowest cost in the production and distribution of commodities.

As one moves to differentiated products with specific attributes, physical and financial resources become less important relative to information in terms of their uniqueness or indispensability in generating what the end-user of these differentiated products wants. Information about what the consumer wants is unique, and thus gives firms that have that information a unique position of power in the chain. And information about how to produce those attributes, either through processing or through genetics, is also unique and provides firms that have that information a unique position of power in the chain. Thus, the position of power changes in differentiated product markets from those resources that will lower cost to those that add value in the supply chain. The resources that add value in differentiated product markets are more in the form of information, research and development, knowledge, new technology, etc. (the soft assets), rather than the hard assets of plant, equipment and employees that are unique or indispensable and therefore a source of power in the commodity markets.

Thus, there are two fundamental points of control and one fundamental source of power in a negotiation based coordinated food production and distribution system. The first point of control is the end-user or consumer and those firms that have intimate contact with the consumer. Consumers are more discriminating in their food purchases, want a broader spectrum of

*Adapted from Boehlje, Michael and Lee F. Schrader. "Agriculture in the 21st Century", *Journal of Production Agriculture*, 9(3):335-340, 1996.

attributes in their food products, and increasingly have the purchasing power to convert wants into effective demand. It is not news that the consumer is the ultimate determinant of the attributes that food products must contain. And industrial product end-users will be similarly demanding in the attributes they require. Those firms that are close to the consumer and understand the increased specificity of his/her demands have a unique capacity to communicate and/or dictate those demands to the rest of the food chain. This knowledge of consumer wants, needs and purchasing capacity is a source of power and provides one point of control in the food production and distribution system.

The second point of control in the food production and distribution system is the raw material suppliers. But not all raw material suppliers have the same degree of power and control. In essence, the relative control of raw material suppliers depends upon the degree of substitutability for their input or contribution to the production/distribution process. Labor is substitutable for capital (although imperfectly); fertilizer is substitutable for land and vice versa. Machines can substitute (again imperfectly) for chemicals and labor for money. The one input with the fewest substitutes — that is in essence the most essential in the food production/distribution chain — is the genetic material in plant and animal production, the seed and breeding stock. Biotechnology and increased predictability and control of genetic manipulation provides additional power to those who control genetic material. But at the same time processing technology is also advancing such that it can, in some cases, produce those attributes at both a lower cost and with a shorter time to market. Thus, one should be cautious to not conclude that the ultimate source of power on the supply side comes uniquely from genetic material.

Note that the points of control in the food production and distribution chain may be at the beginning and the end — the genetics and the consumer. The source of this control is knowledge in both cases. At the consumption end, it is knowledge of the ultimate consumers' wants and needs which can be communicated through the chain; at the opposite end it is knowledge and information about and the ability to manipulate the genetic material that will produce the specific attributes for which consumers are willing to pay. By the very nature of their business, retailers and genetics companies have better access to information at these points. Given that the source of control is knowledge and information (not physical resources, not capital, not land), then the only way a firm between the end points of the consumer and the genetics company can obtain control is through superior information. The implication is that it is very difficult for those in the intermediate stages including producers and processors to obtain superior information and thus the power base for control of the system.

Presently, food systems coordination in the U.S. is accomplished primarily by processors when not by open markets. Recent indications of weakening brand loyalty have been attributed to a lessening of real product differences and a consequent emphasis on price. This shift positions the retailer for a larger role in non-market coordination. Fast food restaurant firms already exercise extensive system coordination and control for their major supplies reflecting consumer preferences. Diminished brand loyalties may diminish the power of processors to extract extraordinary profits; however, the processor is likely to continue to play an important role even as power shifts to genetics firms and toward the consumer.

The arguments presented here concerning the critical role of knowledge and information as a source of power and control in the food chain are an extension of the asset specificity concepts well understood in strategic management. In essence, unique knowledge and information is a specific asset that facilitates task programmability and encourages contractual/ownership vertical linkages. And the firm/individual with the most unique knowledge and information (with the greatest asset specificity) relative to other firms/individuals in the chain has the most relative power and control of the system.