THE INDUSTRIALIZATION OF U.S. AGRICULTURE: IMPLICATIONS FOR FINANCIAL PERFORMANCE AND FINANCING

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Industrialization has rapidly taken the stage of public attention and debate in the past few years. The subject is not a new one. Indeed, the industrialization of the broiler industry some thirty years ago led a few observers to label similar, more contemporary trends in other agricultural industries, "broilerization." What has propelled industrialization to the center of the agricultural stage more recently is an apparent acceleration in its development and its new inroads into midwestern agriculture, industry segments such as grains and pork that have long been viewed as quintessential commodities produced on family farms.

By changing the way that agriculture does business, industrialization will carry enormous implications for the structure of the industry, for its financial performance, and for its financing. Industrialization will raise new questions about the information flows that we have traditionally monitored. By changing the roles of producers and processors, industrialization will redefine the sector's financial flows. And through new financial relationships, industrialization will redirect the flow of capital.

In my remarks today, I will examine three issues. First, I will explore where industrialization seems headed. Second, I will analyze how industrialization may redefine how we measure the sector's financial performance. And third, I will discuss how industrialization may redirect the sector's demand for and sources of capital. I will conclude that industrialization will ultimately lead to fundamental change in many traditional sources of information on the sector.

WHERE IS INDUSTRIALIZATION HEADED?

Nearly four years ago, we coined the term "quiet revolution" to describe the trend to more vertical coordination in U.S. agriculture. Though the trend is still very much a revolution, it is no longer so quiet. Indeed, the new approach to agricultural products and market relationships is spawning a raucous debate across the countryside. With the

debate heating up, it is useful to define industrialization and examine why it is occurring.

Industrialization has become the most widely used name for this revolution. What exactly is meant by industrialization? Though many changes fall under the term, two stand out as defining features. First, industrialization brings a shift from food *commodities* to food *products*. Second, it leads to a shift from spot auction markets to more direct market channels, such as production contracts.

Why is industrialization happening? At root, it is the result of two powerful forces--a new consumer and a new producer--and the impact these two players have on the markets where they meet (Barkema). The new consumer is a highly demanding sort. The new producer, meanwhile, is armed with prodigious new technologies that increasingly permit food to be engineered from farm, to processor, to consumer. A more demanding consumer and a more capable producer would seem to be a match made in heaven--and it is to a considerable degree. There is one difficulty, however, and that is the general nature of agricultural markets and the market institutions where consumers, producers, and processors meet. Historically, bulk commodities have flowed through commodity markets to food processors, who in turn have marketed standardized products to consumers. But consumers now want tailored foods, and to ensure that they get them, processors want more specific farm products.

In response, processors and producers in many segments of U.S. agriculture have gone around traditional spot markets to more direct market channels. These end runs range from market contracts to outright ownership, or complete vertical integration. This trend was first established in broilers and vegetables, but more commodities have moved in this direction over the past three decades. The move to production contracts and vertical integration is not happening evenly across agriculture, but the past three decades have brought quite a bit of change. Broilers were almost completely "industrialized" thirty years ago, and grains still resist the trend. Today, products where production contracts or direct ownership account for more than half of all production include: vegetables (both fresh and processed), citrus fruit, potatoes, sugar, seed crops, eggs, fluid milk, broilers, and turkeys.

What lies ahead for industrialization? What changes is industrialization likely to bring? Overall, I expect the pace of industrialization to quicken, due both to technology and economic forces. Change will come first to the livestock industry, where the hog industry is already well on its way to being "industrialized." Cattle feeding is probably next, although ranching may never be industrialized, simply because there are too many people for whom ranching is mostly a way of life and for whom market incentives are not decisive in business decisions. Crops will also move toward industrialization, although much will depend here on the future direction of commodity programs. Cuts in these programs would make "government contracts" less attractive to growers. While only a small percentage of the nation's major grain crops are produced under contract to

private firms, the vast majority *are* grown under contract. It just happens that the contractor is the federal government and commodity programs are the marketing vehicle. Moreover, geneticists seem likely to unlock more special-use grains--a development that will almost certainly encourage identity-preserved products.

Industrialization will bring a further polarization to agriculture. Increasingly, the nation will have two agricultures. Even though industrialization is advancing at a faster rate, it does not follow that commodity agriculture is over and done with. One can think of commodity agriculture as the "sea" that covers most of the farm belt. But emerging out of this sea will be an ever-increasing number of islands of specialized production outside traditional markets. Some of the islands will be big, such as the pork industry, while others will be small, such as white corn for corn chips. The big difference between these two agricultures will be profit margins. Commodity agriculture will be low margin, and producers and processors will operate at low cost and high volume. The islands of specialized production will be more profitable, because more value is added. The question will be how the profits are divided between producers and integrators.

INDUSTRIALIZATION AND ASSESSING FINANCIAL PERFORMANCE

Many people are interested in the financial performance of U.S. agriculture--farmers, policymakers, agribusinesses, and agricultural lenders, just to name a few. Because the financial performance of the sector has such broad interest, the U.S. Department of Agriculture has long maintained a series of sector financial statements. As industrialization continues, these traditional measures of financial performance will lose their precision, not because department employees are any less diligent but because old measures will not accurately assess a new industry. Thus, some hard choices lie ahead on *what* information is most useful and *how* to collect it.

What to measure?

Industrialization is redefining the way agriculture does business, and in so doing, is redefining farms. Traditionally, the farm sector financial statements have measured the financial performance of farms. But what is a farm under industrialization? Is the contract grower a farm? Is the contract processor a farm?

Whose performance do we want to measure? By default, it may be necessary to think about the entire food system because the lines that used to separate the various stages of production are blurring. Historically, agriculture was a well-defined series of steps, each separated by a market. Monitoring transactions and prices in those markets told a lot about the performance of the industry. Today, industrialization is blurring the lines separating stages of production, and in some cases removing them altogether. Thus, in a vertically integrated hog operation the traditional "market" price for hogs is gone altogether. What the firm cares about is the price of corn, the price of breeding

stock, and the value of the cutout at retail. The value of the grown hog moving across a scales is merely a shadow price with little decision value to the firm.

How to measure?

Equally difficult may be the matter of securing good measures of farm sector performance. After wrestling with what a farm is, the next problem will be to decide how to acquire information from firms that increasingly view their financial decisions as proprietary information. Industrialization is leading to bigger farms and bigger processors. They will both be reluctant providers of financial information. The problem will carry over to price information. The public may continue to have an interest in monitoring farm prices, whether they are market or shadow prices. But discovering the shadow prices will be extremely difficult.

INDUSTRIALIZATION AND TRACKING CREDIT FLOWS

Just as industrialization will make it more difficult to assess financial performance, it will also make it more difficult to track the sector's financing. Industrialization is characterized by the emergence of large "integrator" firms. In some cases they are input providers, in other cases they are processors, and in still others they might be retailers. Through the course of the 1980s, many of these firms have become bigger (mainly through consolidation) and broader (more diverse line of products).

These firms are capital intense and thus must be adept at managing their risks. Staring at the consumer with one eye and at Wall Street with the other, these firms see industrialization as an effective way to manage risks that are greater and more complex. Industrialization can reduce many types of risks. It reduces supply risk by assuring a steady flow of food inputs. It reduces quality risk by guaranteeing consistent, trait-specific products. It reduces financial risk by reducing the variability in input prices.

A final, key feature of these integrator firms is that they have ready access to capital markets. Whether or not they are publicly traded firms, they usually have quick access to commercial paper and bond markets in addition to syndicated lines of credit. The access of integrator firms to capital markets extends to greater and lesser degrees to the producers with whom they contract. In many cases, the integrator provides operating capital. In other cases, they may provide financing for production facilities and equipment.

Such new credit channels raise new questions about our traditional means of tracking credit flows in the sector. Clearly, data on commercial banks, the Farm Credit System, life insurance companies, and the Farmers Home Administration no longer provide a complete picture of agriculture's credit demands or sources. The problem, of course, is that rounding out the picture will be quite difficult.

Agricultural credit that stays with traditional lenders may migrate toward larger lenders. Industrialization will have the effect of reducing amount of marketing risk that a farmer faces. At the same time, however, it will increase the "relationship" risk. That is, the value of the farm loan will depend critically on the performance of the contractor. Because these contractors will generally be large, complex companies, the task of evaluating the financial quality of the relationship will be difficult. Large farm lenders who can devote special staff to analyzing such risk will have a clear advantage over small lenders.

CONCLUSIONS

Industrialization will continue apace in U.S. agriculture as fundamental economic forces push the industry toward more vertical coordination. Industrialization will increasingly divide agriculture into a "sea" of commodity production and "islands" of specialized contract production. The lowering of the government safety net under agriculture will hasten the emergence of more islands, even in traditional bastions of commodity production like the Corn Belt.

By changing the way agriculture does business, industrialization will also change the way we view the financial performance and financing of agriculture. Defining the "farm sector" is not easy when the lines between farms and processors blur, or even go away. Moreover, obtaining financial information from large firms or their contractees will be difficult. Finally, integrator firms that figure prominently in industrialization have ready access to capital markets, providing new sources of capital to farmers. New credit flow information is needed for a complete picture, but again will be difficult to acquire. Among traditional farm lenders, industrialization may favor large lenders over small ones due to the added cost of evaluating relationship risk.

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