



## Agricultural Industry Competitiveness

Enhance the value of Kansas Agricultural goods

# Economic Issues with the Persistence of Profitability in Food Businesses and Agricultural Businesses

The food production, processing, wholesale distribution, and retailing system is an important component of the U.S. economy accounting for 12.8 percent of U.S. gross domestic product (GDP) in 2000. Within the “food economy” there is interest in understanding what drives firm and industry performance by economists, educators, managers, policy makers, and researchers. Many producer alliances have considered investing in value added agricultural processing as a means of extending their farming operations. The objective of this research was to determine whether industry structure or firm-specific components of firm profits are more persistent within the food economy. In other words, why are some industries, such as corn sweetener, able to remain profitable, and other industries, such as flour milling, not been as profitable? Furthermore, why can some corn sweetener firms or flour milling firms repeat superior performance or improve their performance over time and other firms are not able to improve their performance. This information is of value to producers who are contemplating investments to vertically coordinate their farming or ranching operations. MF-2431, *Economic Issues with Vertical Coordination* summarizes these alternatives for producers.

## Data

Data for this study were obtained from the Standard and Poor’s Compustat Business-Segment Reports for business segments in the food economy from 1980 to 2001. Business segment data is available on companies that have at least 15 percent of their business in one industry. For example, Sara Lee, a diversified company, reports its food businesses in segments SIC 2013 (Sausages And Other Prepared Meat Products), SIC 2095 (Roasted Coffee), and 5140 (Groceries and Related Products). SIC refers

to the Department of Commerce’s Standard Industrial Classification (SIC) system for defining an industry. This segment data was aggregated into four industries: retail supermarket, food processing, grocery wholesale, and restaurants. Average sizes and returns of business segments by sectors and year are reported in Table 1. Business segments were classified as high (low) performers if their profitability in a particular year is above (below) the median. Comparing assets and return by sector, the food-processing sector had the highest mean return of 11.4 percent and second highest assets of \$1,060 million. In contrast, the restaurant sector had the lowest mean return of 5.8 percent and lowest assets of \$312.9 million. The data consisted of 5,854 observations, which represented 524 different business segments. These business segments covered 57 industries and 465 corporations, of which 107 were diversified. The mean return on assets for the business segments was 10.39 percent.

## Methodology

The technical aspects of the econometric models can be found in the more technical papers. However, the general philosophy is that return on assets for a firm can be calculated using business segment data. The return on asset in each segment is assumed to be comprised of various effects, which include the average return on assets for the entire industry (“industry effect”), the average return on assets for firms that are diversified (“corporate effect”), and the residual is the average return on assets attributable to that individual firm (“firm effect”). Variations of this methodology have been used to study persistence of profitability in other industries at the Harvard Business School.

Industry effects are related to general conditions in the economy and are external to the firm. They are gener-

ally uncontrollable and unpredictable and affect all firms equally within that industry. Firm effects are internal to a firm and are controllable such as strategy, execution, culture, human capital, leadership, and innovation and are unique to a firm. Corporate effects are controllable to a firm as a firm decides whether it will become diversified.

### **Persistence of Profitability among Firms**

The results suggest that industry effects are greater than corporate effects. Greater persistence in industry effects as compared to corporate effects suggests that the structure of the industry is more important than being a member of a diversified corporation.

A second finding is the retail supermarket sector has greater industry effects than corporate or firm effects. This suggests that retail supermarket industry characteristics that contribute to profits last longer and are more persistent than firm-specific effects. Industry effects in the retail supermarket sector are greater and more long-lasting than similar effects for the food processing, grocery wholesale, and restaurant sectors. Retail supermarket industry characteristics that support this finding include large average firm size (see Table 1), which may contribute to entry barriers. Additionally, consolidation in the retail supermarket industry during the study period may be due to economies of scale, which could contribute to persistent industry effects.

The food-processing sector has greater industry effects over time than the restaurant sector. Additionally, the food-processing and grocery wholesale sectors have greater corporate effects than the restaurant sector. For example, all three of Sara Lee's segments were high performers, which suggests that its diversification pattern has been successful for Sara Lee during this time period and is a positive corporate effect. This suggests that the food-processing sector and firms within it have characteristics that are more stable and long lasting as compared to the restaurant sector. Greater asset capitalization in the food-processing sector as compared to the restaurant sector may explain the larger food-processing sector industry effects. Lower corporate effects in restaurant sector industry effects is, in part, due to little diversification within this sector.

Firm effects for the grocery wholesale and restaurant sectors are greater than industry effects for the grocery wholesale and restaurant sectors. This suggests that firms in the grocery wholesale and restaurant sectors have specific characteristics that contribute to persistent profitability that are longer-lasting than industry effects. Both the grocery wholesale and restaurant sectors require less capitalization due to their lower average asset size, which may reduce barriers to entry (see Table 1). Lower capitalization allows for greater entry and exit within these two sectors, which may cause less stability in industry effects as compared to segment effects.

### **Persistence of Profitability between High Performers and Low Performers**

Given these findings about the industries as a whole (Schumacher and Boland, 2005a and 2005b), the next step was to analyze high-performing firms and low-performing firms (Boland and Schumacher). Industry shocks that affected the food economy between 1980 and 2001 had the same effect on low and high performers. However, the food-processing sector has structural characteristics that are conducive to high-performing firms, and these are likely to be significant barriers to entry for new firms. This suggests opportunities for further research in identifying these structural characteristics. Managers of food-processing firms are likely to undertake strategic decisions that maintain these barriers to entry. These could include making investments in technologies that reduce food-processing costs or undertaking risk-management strategies that enable them to purchase inputs at lower prices. Similarly, some food-processing firms have long-standing relationships with suppliers and buyers that also act as barriers to entry.

On average, high performance has been more sustainable than low performance within the food economy, and positive industry effects have been generally larger for high performers than for low performers. For example, the SIC 2086 (Bottled And Canned Soft Drinks And Carbonated Waters) segment ranked as a high-performer segment for all but one firm at the beginning and end of the time period. The competitive process that causes above- and below-average return on assets to erode toward the median has been slower for high performers than for low performers. High performers were able to maintain a larger portion of positive industry and firm effects. This suggests that benefits from moving first with an innovation or technological breakthrough are more likely to occur from high performers. Managers of high-performing firms are likely to invest more in research and development that enables them to discover these innovations or technological breakthroughs. For example, Welch Foods, a wholly-owned subsidiary of the National Grape Cooperative, has had above-average profits in the fruit-based foods industry. Its competitive advantage is due to its sourcing of superior inputs through its cooperative structure, which results in the majority of Concord and Niagara grapes being processed into juice, ingredient, and other fruit-based products.

Within the entire food economy, the corporate and firm effects were larger for high performers than for low performers. This implies that corporate and firm effects have a larger impact on high performers' return on assets than those of low performers. This was especially true in the restaurant sector. This suggests that the pattern of diversification was more successful for high performers (Schumacher and Boland, 2004). Additionally, it suggests that high performers had other superior business factors, such as better management of inputs or organizational design, relative to low performers. Clearly, managers of high-performing firms are better at achieving the benefits of economies of scope across their business segments.

In contrast, within the retail supermarket sector, there is no significant difference between the industry and firm effects of high and low performers, suggesting that innovations and other means of competitive advantage were easily imitated and had a similar effect on low and high performers in this industry.

## Implications

The results have implications for existing and proposed food economy firms especially those engaged in value added food processing. One consistent finding across all sectors is that industry effects are greater than corporate effects, suggesting that some industries are more conducive to profitability and diversification is not as important. Therefore, it is important that both producers understand the nature of competition in the industry in which vertical coordination is being considered. This knowledge must include information on industry profitability, how competitive advantage is created, the barriers to entry that exist in the industry, the bargaining power of buyers and suppliers,

and the role of substitute products. Some but not all of this information is presented in feasibility studies, business plans, and stock prospectuses. Furthermore, producers should consider diversification efforts (i.e., adding corn sweetener capacity to an ethanol plant) carefully.

In the past 5 years, several major food economy firms have restructured their portfolio of businesses in order to diversify the stream of earnings from their businesses (e.g., American Crystal Sugar Company, CHS, ConAgra Foods, Farmland Industries, General Mills, Koch Agriculture, Land O'Lakes, Sara Lee Foods, Tri Valley Growers, Unilever). Many of these firms have been studied using case research methods and are listed in the references. Many food economy firms are becoming more linked vertically through various methods of coordination and integration rather than horizontally linked through managerial economies of scope. Greater corporate effects are associated with businesses in industries characterized by economies of scope whereby firms can spread fixed costs over other business segments.

Table 1. Business Segment Assets and Profitability by Industry Sector and Year

Sector/ Year	All Business Segments			High Performers <sup>b</sup>			Low Performers <sup>c</sup>		
	N <sup>d</sup>	Avg. Assets (\$mil)	Avg. Profit (%) <sup>a</sup>	N	Avg. Assets (\$mil)	Avg. Profit (%) <sup>a</sup>	N	Avg. Assets (\$mil)	Avg. Profit (%) <sup>a</sup>
All	7,900	763.3	9.11%	3,950	960.08	19.1%	3,950	566.6	-0.9%
Processing	3,746	1,060.0	11.4%	2,154	1,149.3	21.1%	1,592	939.1	-1.6%
Wholesale	910	355.6	8.2%	382	414.0	17.1%	528	313.3	1.8%
Retail	962	1,062.5	8.8%	437	1,400.1	14.9%	525	781.4	3.7%
Restaurant	2,282	312.9	5.8%	977	559.6	17.6%	1,305	128.2	-2.9%
1981	483	224.3	12.7%	308	252.4	19.7%	175	174.7	0.5%
1982	449	244.5	11.6%	266	275.5	19.3%	183	199.3	0.3%
1983	449	298.8	12.4%	264	374.3	20.6%	185	191.0	0.7%
1984	465	307.2	11.1%	262	382.0	20.6%	203	210.6	-1.1%
1985	437	346.5	9.8%	231	435.6	20.5%	206	246.5	-2.2%
1986	416	482.6	8.6%	202	559.6	20.0%	214	409.9	-2.2%
1987	407	857.1	8.2%	200	1,359.4	20.4%	207	371.8	-3.6%
1988	401	653.5	7.9%	190	803.7	19.5%	211	518.2	-2.5%
1989	388	785.8	8.6%	186	890.2	18.6%	202	689.7	-0.7%
1990	386	834.5	9.0%	183	928.5	19.0%	203	749.7	-0.1%
1991	395	855.6	8.3%	206	882.8	17.9%	189	825.9	-2.1%
1992	404	950.4	8.3%	200	1,070.6	17.9%	204	832.7	-1.2%
1993	441	783.1	7.8%	206	1,086.4	18.3%	235	517.1	-1.4%
1994	254	1,035.9	9.5%	123	1,597.2	17.3%	131	508.9	2.2%
1995	302	1,057.4	7.5%	129	1,732.3	17.2%	173	554.1	0.2%
1996	255	1,058.9	7.4%	107	1,610.2	16.8%	148	660.4	0.6%
1997	298	1,176.6	7.6%	135	1,845.3	17.4%	163	622.7	-0.5%
1998	303	1,239.2	8.1%	133	1,660.7	17.5%	170	909.5	0.8%
1999	322	1,232.3	8.3%	145	1,799.3	18.7%	177	767.8	-0.2%
2000	356	1,325.3	6.0%	140	1,914.4	19.5%	216	943.4	-2.7%
2001	289	1,491.0	9.0%	134	1,923.8	20.3%	155	1,116.8	-0.7%

<sup>a</sup>Average ratio of operating income to assets as a percentage.

<sup>b</sup>Business segments with profit above the median.

<sup>c</sup>Business segments with profit below the median.

<sup>d</sup>Number of firms.

The retail supermarket sector has had relatively stable profits during the study period. This suggests that the retail supermarket industry structure is conducive to stable profits and that firms within the industry are differentiated, which also contributes to permanence of profits. For example, retailers differentiate themselves through their own private brand name products, which may be perceived as better values, superior in quality to national brands, and unique to a particular store.

The results suggest that industry structure does not contribute to stable profits in the grocery wholesale and restaurant sectors. However, firms within the grocery wholesale and restaurant sectors typically require less capital on average and there is more entry and exit in these sectors. To obtain a competitive advantage, firms may need to employ resources (i.e., human capital, branding, and processes) that are not easily imitated or substituted.

### Further Research

Currently determinants of profitability in family-controlled and non-family controlled food-processing firms are being analyzed (Pendell and Boland). In general, family-controlled firms have had slightly greater profitability over time. These firms have characteristics that resemble producer-owned cooperatives particularly with regard to governance and control (Boland, 2004). Additionally, similar research looking at the persistence of profitability in local farm supply and marketing cooperatives is being analyzed (Boyd, Boland, Barton, and Dhuyvetter). Investment patterns by farmer-owned cooperatives in various industries are being studied in order to learn if investor-oriented firms tend to enter an industry with greater plant size and scale. The Arthur Capper Cooperative Center is researching case studies of successful local cooperatives in Kansas to better understand why some cooperatives remain great over time and how others improved their performance. Much of this research is being incorporated into director development extension education programs and undergraduate agribusiness courses.

### References

- Amanor-Boadu, V., M. Boland, D. Barton, B. Anderson, and B. Henehan. "Birds Eye Foods." Arthur Capper Cooperative Center Case Study Series 03-05, Kansas State University, Manhattan, Kansas, 2003.
- Amanor-Boadu, V., M.A. Boland, and D. Barton. "Welch Foods." In *Cases in Strategic Management*, Seventh edition, Houghton Mifflin Company, February 2006.
- Boyd, S., M.A. Boland, D. Barton, and K. Dhuyvetter. "Persistence and Determinants of Return on Equity in Local Farm Supply and Grain Marketing Cooperatives." Unpublished manuscript, 2006.
- Boland, M.A. "Governance and Financing of Family-Owned Businesses: Implications for Producer-Owned Businesses." Presented and published in proceedings of *EURESCO Vertical Markets and Cooperative Hierarchies: The Role of Cooperatives in the International Agri-Food Industry*, Crete, September 3-7, 2004.
- Boland, M.A., V. Amanor-Boadu, and D. Barton. "Land O'Lakes: Issues in Portfolio Management." *International Food and Agribusiness Management Review* 7,2(2004): 62-74.
- Boland, M.A. and D. Barton "American Crystal Sugar Company." *Journal of Finance Case Research* 6(2002): 26-47.
- Boland, M.A. and D. Barton. "CHS, Inc. in 2005." Arthur Capper Cooperative Center Case Study Series 05-01, Kansas State University, Manhattan, Kansas, 2005.
- Boland, M.A. and D. Pendell. "Persistence of Profitability in Family-Owned and Non-Family-Owned Food Processing Firms." AgEcon Research: Research in Agricultural and Applied Economics. www.agecon.lib.umn.edu. Selected paper at American Agricultural Economics Association annual meeting, Providence, Rhode Island, July 26, 2005.
- Boland, M.A. and S.K. Schumacher. "The Sustainability of Profitability in the Food Economy." *Agricultural Finance Review* 65,2(2005)
- Schumacher, S. and M.A. Boland. "The Effects of Industry and Firm Characteristics on Profitability in the Food Economy." *Agribusiness* 21,1(January 2005a): 97-108.
- Schumacher, S. and M.A. Boland. "Persistence in Profitability in Food and Agribusiness Firms." *American Journal of Agricultural Economics* 87,1(February 2005b): 103-115.
- Schumacher, S. and M.A. Boland. "Diversification in the Food Economy." AgEcon Research: Research in Agricultural and Applied Economics. www.agecon.lib.umn.edu. Selected paper at Western Agricultural Economics Association annual meeting, Honolulu, Hawaii, July 1, 2004.
- Taylor, M., G. Brester, and M.A. Boland. "General Mills and its Hard White Wheat Contracting Program." *Review of Agricultural Economics* 27,1(spring 2005): 117-129.

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