



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



*International Food and Agribusiness Management Review*  
Vol 5 Iss 4 2003

## **Measuring Industry and Firm Effects in Food and Agribusiness Firms<sup>☆</sup>**

Sara Schumacher and Michael Boland<sup>a ①</sup>

<sup>a</sup> Both authors are of Kansas State University. The address for Michael Boland is 342 Waters Hall, Kansas State University, Manhattan KS 66506, U.S.A.

---

### **Abstract**

Managers craft strategies that, if successfully implemented, can improve profitability and financial performance over time. Can firms repeat their performance over time? If so, then a manager who crafted a successful strategy could expect her/his firm to achieve greater profitability relative to other firms within its industry. The objective of this study was to compare business performance (accounting profitability) for publicly traded and cooperatively-owned food and agribusiness firms. We used the Standard and Poors Compustat database using the methodology of McGahan and Porter's paper which used on 4,112 manufacturing firms. Return on investment for each SIC code in each year was calculated. A regression equation with return on investment as the dependent variable and the average returns on the right hand side were used in a weighted least squares regression. The data was broken out into processing, wholesaling, restaurants, and retail supermarkets. Industry effects are greatest across all business segments and the processing sector. The retail supermarket sector has had relatively stable profits due to both industry and firm effects over time. This would suggest that the retail industry structure is conducive to stable profits and that firms within the industry are able to differentiate themselves, which also contributes to permanence of profits. Our results suggest that industry structure does not contribute to stable profits in the wholesale and restaurant sector. Industry effects are more persistent than corporate effects. These implications are

---

<sup>☆</sup> The authorship on this article is shared. Funding for this research is from the Agricultural Marketing Resource Center.

① Corresponding author: Tel: + 785-532-4449

Fax: + 785-532-6925

Email: [mboland@agecon.ksu.edu](mailto:mboland@agecon.ksu.edu)

*Peer reviewed and accepted paper for presentation at the 2003 World Food and Agribusiness Symposium*

© 2003 International Food and Agribusiness Management Association (IAMA). All rights reserved.

also of interest to land grant universities. Agribusiness economics research and extension programs exist at many land grant universities to educate producers and management about producer-owned businesses. Finally, persistence of profitability in certain firms has long been noted by economists. Further research is needed on identifying characteristics of those firms that contribute to their persistent profits.

#### Measuring Industry and Firm Effects in Food and Agribusiness Firms

In recent years, the level of vertical coordination (contracting and integration) has intensified in certain U.S. agriculture sectors, with farmers actively participating in this phenomenon (Harris et al.). Some specific examples of these efforts by producers include Dakota Growers Pasta Company (Boland et al.), ProGold (Boland and Barton, 2002a), South Dakota Soybean Process Company (Boland and Barton, 2002b), and Ocean Spray Cranberries (Amanor-Boadu, Boland, and Barton). Many of these businesses have been formed based on the assumption that a producer-owned business can perform certain functions at a lower cost than a privately or publicly held business. This concept can be thought of as firm-specific resources that enable a producer-owned business to achieve economic rents (Barry, Soka, and Lajili). Additionally, these producer-owned businesses are formed with the concept that firms engaged in food processing, distribution, marketing, and retailing earn persistent economic profits. Other producer-owned businesses such as Land O'Lakes (Boland, Barton, and Katz), CHS Cooperatives (Boland, Stroade, and Barton) and Farmland Industries have reorganized their business portfolio in an effort to diversify. The objective of this study was to compare business performance (accounting profitability) for publicly traded and cooperatively-owned food and agribusiness firms in various parts of the United States.

---

© 2003 International Food and Agribusiness Management Association (IAMA). All rights reserved.

---

### **Background Information**

The ability of some firms to persistently earn higher returns has been widely studied. Industry structure and firm specific resources have been used to explain this finding. The industry structure proponents (e.g., Caves and Porter; Waring; Schmalensee) argue that these returns are more or less persistent due to industry characteristics such as firm concentration, economies of scale, barriers to entry, and degree of product differentiation among firms. The firm specific resource proponents (Mahoney and Pandian; Rumelt; Brush, Bromiley and Hendrickx) argue that these returns are more or less persistent due to firm specific factors such as superior strategy execution and human capital, and unique input endowments. Prior literature also suggests that both industry structure and business specific factors are important drivers of firm profitability (Besanko, Dranove, and Shanley; McGahan and Porter).

Prior empirical studies that have analyzed the source of firm profitability have focused primarily on the manufacturing sector. Results from prior studies,

including Schmalensee; Rumelt; Waring; Brush, Bromiley and Hendrickx; and McGahan and Porter are not entirely consistent. Some of these prior studies support the industry view, while others support the firm-efficiency view. This study is unique from prior work in that it focuses on firms in the food and agribusiness sector rather than the manufacturing sector.

### **Data**

We used the Standard and Poors Compustat database using the methodology of McGahan and Porter's paper which used on 4,112 manufacturing firms. The screened data set contains 8,224 observations, across 82 industries, each defined by a four-digit SIC code. The data set contains the returns of 1,416 different business segments, which comprise 1075 corporations. One-hundred ninety seven of these corporations participate in more than one industry, which we refer to as diversified corporations. Diversified corporations report returns for approximately 2.7 different business segments on average. The data were divided into three digit SIC codes and separated by year. Average return on investment for each SIC code in each year was calculated. A regression equation with return on investment as the dependent variable and the average returns on the right hand side were used in a weighted least squares regression. The data was broken out into processing, wholesaling, restaurants, and retail supermarkets.

Persistence is defined as the percentage of a firm's return in a previous period that systematically remains in the current period. A business-segment is defined as the portion of a company's operations which is reported under a single four-digit SIC code. Thus, industries and corporations are sets of business-segments; and can have one or more business segments. In addition to estimating average persistence rates across all food and agribusiness segments, we estimate average persistence rates by four major food and agribusiness industry sectors which we define as processing, wholesale, retail, and restaurant. These four sectors are chosen because they comprise the principal components of the food economy and its supply and demand chains.

### **Theoretical Background and Framework**

In order to distinguish the various components of firm profitability, we propose that the profits of a business segment of a firm in each year can be modeled as:

$$(1) \quad \Pi_{i,k,t} = \mathbf{m} + \sum_t \mathbf{g}_t d_t + \sum_{i,t} \mathbf{a}_{i,t} d_{i,t} + \sum_{k,t} \mathbf{b}_{k,t} d_{k,t} + \mathbf{f}_{i,k,t},$$

where,  $\Pi_{i,k,t}$  is the ratio of operating income to identifiable assets of the business segment in industry  $i$ , corporation  $k$  at time  $t$ ;  $\mathbf{m}$  is the average profit over all business segments in all years;  $\mathbf{g}_t$  is the increment to profit shared by all business segments in year  $t$ ;  $d_t$  is a binary variable equal to 1 if the observation applies to year  $t$ , 0 otherwise;  $\mathbf{a}_{i,t}$  and  $\mathbf{b}_{k,t}$  are industry and corporate effects respectively;  $d_{i,t}$ ,

is a binary variable equal to one if the variable applies to industry  $i$  at time  $t$ , 0 otherwise;  $d_{k,t}$  is a binary variable equal to one if the variable applies to corporation  $k$  at time  $t$ , 0 otherwise; and  $f_{i,k,t}$  is the residual that represents the increment to profit that is specific to the segment. If a corporation has only one segment, we assume there is no corporate effect.

Following McGahan and Porter, we estimate the coefficients in equation (1), by partitioning profitability into means by year, industry, and corporate effects. We partition the data using two different methods, which are distinct by the order in which means are obtained. To obtain the first set of estimates (method 1), we first estimate  $m$  as the average profitability of all business-segment observations. Second, we obtain estimates of the year effects,  $g_t$ , from the averages of the residual profitability of business-segments at time  $t$  after subtracting  $m$ . Industry effects,  $a_{i,t}$ , are the averages of the profitability of business-segments at time  $t$  after subtracting both  $m$  and  $g_t$ . Corporate effects,  $b_{k,t}$ , are obtained from the averages of the profitability of segments at time  $t$  after subtracting,  $m$ ,  $g_t$ , and  $a_{i,t}$ . Segment effects are the residual after subtracting all of the previously estimated effects,  $m$ ,  $g_t$ ,  $a_{i,t}$ , and  $b_{k,t}$ . Hence, the order in which means are obtained using the method 1 is year, industry, corporate, and business-segment.

The partitioning of profit using method 2 is obtained by estimating the means in a different order: year, corporate, business-segment, and industry, with the residual added to the business-segment effect. The estimates for the mean,  $m$ , and the year effects,  $g_t$  are estimated similar to the first set of estimates. The corporate effects,  $b_{k,t}$ , are the averages off the business-segment profitability after subtracting the mean and year effects. The stable segment effects are the averages over all years for a segment after subtracting the mean, year effects, and corporate effects. Yearly industry effects are the average of the business segment profitability after subtracting the mean, year, corporate and stable segment effect. Finally, the residual profits are added to the stable segment effects to obtain the overall segment effect.

We characterize each of the effects in equation (2) as consisting of a fixed component and an incremental component. Using the same method as in McGahan and Porter, we examine the first-order regressive process in the incremental components of the year, industry, business-segment, and corporate effect and denote the estimated autoregressive rates as the persistence of the incremental effects. Further explanation and complete derivation of the estimated model can be obtained from the authors.

To estimate persistence rates for each business segment we use OLS, however this results in biased estimates because the errors in yearly observation may not be

independent. To correct for this bias, we add back the estimated amount of bias using Nickell's formula (his equation 17) to obtain unbiased estimates. Additionally, due to the interest in the major food and agribusiness industry sectors, we calculate average effects by the four major industry sectors previously described. Since rates of persistence are estimated for each business segment in our data set, we calculate an average across all business segments and across each of the four sectors in the food and agribusiness industries.

### **Estimated Effects**

The estimated effects for the all business segments within the food and agribusiness industry and by the four major sectors are reported in table 2 (method 1) and table 3 (method 2). These two sets of estimates represent bounds on industry, corporate, and segment effects. Table 2 reports effects that are estimated in an order that is most consistent with the industry view, and table 3 shows effects that are estimated in an order that is most consistent with the firm view. The estimated effects are obtained from the partitioning of equation (1) by the order described in the titles of the tables. The averages are obtained by classifying segments as either low performers or high performers. Segments are classified as high (low) performers if their total profitability in a particular year is above (below) the mean, . When calculating effects under method 2, a similar relationship between total segments effects and combined year, industry, and corporate effects holds. Total segment effects of 7.19% (calculated using method 2) are again larger than year, industry, and corporate effects combined, as shown in table 3. Again, in all sectors, segment effects are the largest when estimated under method 2. Industry effects are larger and segment effects are smaller as compared to effects estimated under method 1. This is as expected, since earlier introduced effects tend to capture the increment that is jointly determined. Again, year effects are the smallest effects across all sectors. In table 3, the difference in the method of introduction in estimating the effects, contributes to larger corporate and segment effects and smaller industry effects on average, compared to the effects in table 2.

### **Results and Discussion**

Incremental industry effects are more persistent than incremental corporate effects for total business segments and within each of the four sectors. Greater persistence in industry effects (INDUSTRY view) as compared to corporate effects suggests that the structure of the industry is more important than being a member of a diversified corporation as suggested by the FIRM view. This result is consistent with McGahan and Porter.

A second finding of note is that retail supermarket industry persistence rates are greater than retail corporate or segment persistence rates. This suggests that retail industry characteristics that contribute to profits last longer and are more

persistent than firm-specific effects. Industry persistence rates in the retail sector are greater and more long-lasting than similar persistence rates for processing, wholesale, and restaurant sectors. The retail sector has the largest industry persistence rates with ranges of 57.11% to 79.53% under the first approach and 41.11% to 58.74% under the second approach. Greater persistence in retail (as compared to processing and wholesale) industry persistence rates is consistent with structural characteristics of the retail industry that contribute to persistence in firm profitability as explained by INDUSTRY view proponents. Retail industry characteristics that support the industry view include large average firm size (see table 1), which may contribute to barriers of entry. Additionally, consolidation in the retail industry during the time period under study may be attributable to economies of scale, which could contribute to persistence in industry effects (Harris et al.). These results are consistent with Waring who found that capital intensity and economies of scale are significant factors in industry persistence rates. Segment persistence rates for the retail and restaurant sector are greater than similar persistence rates for the wholesale and processing sectors. Firms within these two sectors have characteristics similar to the FIRM view. The retail and restaurant sector are "closer" to the consumer than both the wholesale and processing sectors, which may provide them greater ability to differentiate themselves as perceived by consumers.

Industry effects in the processing sector are more persistent over time than industry effects for the restaurant sector. In addition, corporate persistence rates for processing and wholesale are greater than similar rates for the restaurant sector. This suggests that industry characteristics of the processing sector and the characteristics of firms within that sector that contribute to profitability are more stable and long-lasting than those of the restaurant sector. Greater asset capitalization in the processing sector as compared to the restaurant sector may be attributable to larger processing industry persistence rates. Lower persistence in restaurant industry effects is, in part, due to little diversification of business segments within this sector. Only 15% of the business segments within the restaurant sector were members of a diversified corporation as compared to 41%, 40% and 25% for the processing, wholesale and retail sectors, respectively. Firms within the restaurant sector have a low percentage of diversified firms since firms with multiple restaurants only report results in one SIC classification and therefore are not considered to be members of a corporate parent.

Segment persistence rates for the wholesale and restaurant sectors are greater than their respective industry persistence rates for the wholesale and restaurant sectors. This is a FIRM view result which suggests that firms in the wholesale and restaurant sectors have specific characteristics that contribute to persistent profitability that are longer-lasting than industry effects. Both the 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 industries which may cause less stability in industry effects as compared to segment effects.

## **Implications**

The results have implications for proposed and existing value added ventures. Industry effects are greatest across all business segments and the processing sector. It is important, therefore, that producers understand the nature of competition in the industry in which vertical integration 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. For example, an alliance of beef producers interested in investing in a beef processing operation requires knowledge of the beef processing industry, how entry of a new firm within this industry would affect industry profits, and how the new operation would fit in the altered structure of the beef processing industry. Furthermore, the steering board of directors in these value added businesses need a solid understanding of the industry. Some, but not all, of this information is often presented in a business prospectus. Producers can also obtain such knowledge through hiring a manager that has intimate knowledge and a great deal of experience in this industry.

The retail supermarket sector has had relatively stable profits due to both industry and firm effects over time. This would suggest that the retail industry structure is conducive to stable profits and that firms within the industry are able to differentiate themselves, which also contributes to permanence of profits. Another way in which food retailers are differentiating themselves is 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. Using their own brand name allows retailers to build customer loyalty and maintain a unique identity (Kinsey). Incumbent firms within the retail sector must differentiate themselves from rival firms in order to develop a unique competitive advantage.

Our results suggest that industry structure does not contribute to stable profits in the wholesale and restaurant sector. However, potential firms within the wholesale and restaurant sectors would require less capital on average and there is more entry and exit in these sectors. New firms would need to analyze the market to determine what type of unique resources or offerings they have compared to existing rivals. For example, a group of North Dakota farmers is investing in a restaurant called "Agraria" that is to be located in Washington DC (Kolpak). Clearly a focused strategy is needed to ensure its success.

Industry effects are more persistent than corporate effects. In the past five years, several major food and agribusiness firms have restructured their portfolio of businesses in order to diversify the stream of earnings from their businesses (e.g., CHS Cooperatives, ConAgra, Farmland Industries, Koch Agriculture, Land



O'Lakes, Tri Valley). Thus far, the results have not been all that successful with several large bankruptcies in recent years. Kinsey suggests that many food economy firms are becoming more integral and vertical rather than horizontal and modular due to changes in industry. Greater corporate effects are associated with businesses in industries characterized by horizontal and modular activities. These implications are also of interest to land grant universities. Agribusiness economics research and extension programs exist at many land grant universities to educate producers and management about producer-owned businesses. Training and education programs aimed at producer-owned businesses should include information on how to analyze an industry, understand the competition within an industry, and assess the unique resources of firms within an industry that allow them to earn persistent profits.

Finally, persistence of profitability in certain firms has long been noted by economists. Further research is needed on identifying characteristics of those firms that contribute to their persistent profits.

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

	All Business Segments			High Performers <sup>b</sup>			Low Performers <sup>c</sup>		
	N	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>
<b>Sectors</b>									
All	7900	763.3	9.11%	3950	960.08	19.1%	3950	566.6	-0.9%
Processing	3746	1,060.0	11.4%	2154	1,149.3	21.1%	1592	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	2282	312.9	5.8%	977	559.6	17.6%	1305	128.2	-2.9%
<b>Year</b>									
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.

**Table 2.** Pooled Estimated Effects in Percentage under the First Approach (Order of Introduction: Year, Industry, Corporate, Segment)

	Year $g_t$	Industry $a_{i,t}$	Corporate <sup>a</sup> $b_{k,t}$	Segment $f_{i,k,t}$	Sum $r_{i,k,t}$
<b>All sectors:</b>					
Mean <sup>b</sup>	0.10	1.88	0.96	6.10	9.04
Standard Deviation <sup>c</sup>	1.74	7.01	4.41	10.42	10.69
Avg. Fixed Component <sup>d</sup>	0.93	2.14	2.03	4.12	9.98
Avg. Incremental Component <sup>d</sup>	-0.83	-0.26	-1.07	1.98	-0.94
<b>Processing:</b>					
Mean <sup>b</sup>	0.02	3.78	1.32	5.70	10.82
Standard Deviation <sup>c</sup>	1.75	9.03	4.99	11.58	12.25
Avg. Fixed Component <sup>d</sup>	1.81	4.18	3.41	2.07	13.21
Avg. Incremental Component <sup>d</sup>	-1.79	-0.41	-2.09	3.63	-2.39
<b>Wholesale:</b>					
Mean <sup>b</sup>	0.20	1.04	0.70	4.06	6.00
Standard Deviation <sup>c</sup>	1.70	6.31	3.59	7.93	7.75
Avg. Fixed Component <sup>d</sup>	-0.56	1.47	0.80	0.01	5.71
Avg. Incremental Component <sup>d</sup>	0.76	-0.42	-0.10	4.05	0.30
<b>Retail:</b>					
Mean <sup>b</sup>	0.00	0.20	0.13	4.46	4.79
Standard Deviation <sup>c</sup>	1.80	2.32	2.62	4.70	4.26
Avg. Fixed Component <sup>d</sup>	-0.52	0.21	0.92	7.90	5.14
Avg. Incremental Component <sup>d</sup>	0.52	-0.01	-0.79	-3.44	-0.35
<b>Restaurant:</b>					
Mean <sup>b</sup>	0.25	-0.03	0.84	8.13	9.19
Standard Deviation <sup>c</sup>	1.69	3.25	4.28	10.72	10.19
Avg. Fixed Component <sup>d</sup>	0.74	0.05	0.81	7.12	8.60
Avg. Incremental Component <sup>d</sup>	-0.49	-0.08	0.03	1.01	0.59

<sup>a</sup>Corporate effects are means of all corporations and not just diversified corporations.

<sup>b</sup>Pooled mean of estimated effects for business segments with returns above the mean with the negative of the estimated effects for business segments with returns below the mean.

<sup>c</sup>Standard deviation of the estimated difference from the mean.

<sup>d</sup>The mean fixed and incremental components are derived using equations from which equations (3) through (7) are derived. Both the fixed and incremental components are means of all corporations and sum to the overall mean.

**Table 3.** Estimated Effects in Percentage under the Second Approach (Order of Introduction: Year, Corporate, Segment, Industry)

	Year $g_t$	Industry $a_{i,t}$	Corporate <sup>a</sup> $b_{k,t}$	Segment $f_{i,k,t}$	Sum $r_{i,k,t}$
<b>All Sectors:</b>					
Mean <sup>b</sup>	0.10	0.47	1.33	7.14	9.04
Standard Deviation <sup>c</sup>	1.74	3.26	5.03	10.60	10.69
Avg. Fixed Component <sup>d</sup>	0.93	0.46	1.42	7.04	9.98
Avg. Incremental Component <sup>d</sup>	-0.83	0.01	-0.09	0.10	-0.94
<b>Processing:</b>					
Mean <sup>b</sup>	0.02	0.81	2.06	7.92	10.82
Standard Deviation <sup>c</sup>	1.75	4.22	5.94	11.93	12.25
Avg. Fixed Component <sup>d</sup>	1.81	0.83	1.84	7.57	13.21
Avg. Incremental Component <sup>d</sup>	-1.79	-0.02	0.23	0.36	-2.39
<b>Wholesale:</b>					
Mean <sup>b</sup>	0.20	0.52	0.87	4.42	6.00
Standard Deviation <sup>c</sup>	1.70	4.05	3.21	7.40	7.75
Avg. Fixed Component <sup>d</sup>	-0.56	0.44	1.49	4.23	5.71
Avg. Incremental Component <sup>d</sup>	0.76	0.08	-0.62	0.18	0.30
<b>Retail:</b>					
Mean <sup>b</sup>	0.00	0.12	0.11	4.56	4.79
Standard Deviation <sup>c</sup>	1.80	1.40	2.52	4.72	4.26
Avg. Fixed Component <sup>d</sup>	-0.52	0.06	1.15	4.86	5.14
Avg. Incremental Component <sup>d</sup>	0.52	0.06	-1.04	-0.30	-0.35
<b>Restaurant:</b>					
Mean <sup>b</sup>	0.25	0.09	0.86	7.99	9.19
Standard Deviation <sup>c</sup>	1.69	0.92	4.65	10.85	10.19
Avg. Fixed Component <sup>d</sup>	0.74	0.08	0.86	8.14	8.60
Avg. Incremental Component <sup>d</sup>	-0.49	0.00	0.01	-0.16	0.59

<sup>a</sup>Corporate effects are means of all corporations and not just diversified corporations.<sup>b</sup>Pooled mean of estimated effects for business segments with returns above the mean with the negative of the estimated effects for business segments with returns below the mean.<sup>c</sup>Standard deviation of the estimated difference from the mean.<sup>d</sup>The mean fixed and incremental components are derived using equations from which equations (3) through (7) are derived. Both the average fixed and average incremental components are means of all corporations and sum to the overall mean.**Table 4.** Persistence Rates in Percentage (Order of Introduction: Year, Industry, Corporate, Segment)

	Year $r_{YR,ik}$	Industry $r_{IN,ik}$	Corporate <sup>a</sup> $r_{CP,ik}$	Segment $r_{BS,ik}$	Sum $r_{i,k}$
<b>All Sectors:</b>					
Avg. Estimate:					
Unbias., OLS <sup>b</sup>	22.98, 40.30	22.33, 38.08	5.64, 10.02	19.66, 35.07	27.41, 44.36
Standard Error:					
Unbias., OLS <sup>c</sup>	25.17, 23.57	31.11, 30.36	9.36, 9.15	31.41, 3.068	28.99, 28.00
Avg. R-squared <sup>d</sup>	0.52	0.24	0.21	0.25	0.33
<b>Processing:</b>					
Avg. Estimate:					
Unbias., OLS <sup>b</sup>	22.89, 40.14	21.62, 37.58	7.43, 13.27	16.00, 30.86	24.38, 40.59
Standard Error:					
Unbias., OLS <sup>c</sup>	25.20, 23.60	30.20, 29.46	12.55, 12.26	31.59, 30.94	28.64, 27.75
Avg. R-squared <sup>d</sup>	0.52	0.23	0.21	0.23	0.30

<b>Wholesale:</b>						
Avg. Estimate:						
Unbias., OLS <sup>b</sup>	21.80, 39.29	9.09, 22.61	7.07, 12.13	11.39, 25.81	26.66, 45.83	
Standard Error:						
Unbias., OLS <sup>c</sup>	25.84, 24.27	33.82, 33.38	12.05, 11.88	34.54, 33.90	32.13, 30.91	
Avg. R-squared <sup>d</sup>	0.48	0.146	0.15	0.20	0.31	
<b>Retail:</b>						
Avg. Estimate:						
Unbias., OLS <sup>b</sup>	36.78, 55.70	57.11, 79.53	4.35, 7.79	30.47, 46.59	30.57, 46.77	
Standard Error:						
Unbias., OLS <sup>c</sup>	23.35, 21.58	22.15, 20.20	7.35, 7.22	29.01, 28.18	28.82, 27.94	
Avg. R-squared <sup>d</sup>	0.59	0.64	0.20	0.32	0.32	
<b>Restaurant:</b>						
Avg. Estimate:						
Unbias., OLS <sup>b</sup>	18.29, 35.03	14.95, 28.65	2.89, 5.13	24.13, 40.49	31.12, 46.86	
Standard Error:						
Unbias., OLS <sup>c</sup>	25.58, 24.02	34.95, 34.53	4.25, 4.14	30.92, 30.05	28.44, 27.35	
Avg. R-squared <sup>d</sup>	0.51	0.13	0.27	0.27	0.35	

<sup>a</sup>Corporate effects are means of all corporations and not just diversified corporations.

<sup>b</sup>The estimates are means of the estimates on each segment.

<sup>c</sup>The standard error is the mean of the standard error of each segment estimate.

<sup>d</sup>This measure is the mean R-square in the OLS regression on each segment.

**Table 5.** Persistence Rates in Percentage (Order of Introduction: Year, Corporate, Segment, Industry)

	Year	Industry	Corporate	Segment	Sum
Symbol	$r_{Y R i, k}$	$r_{I N i, k}$	$r_{C P i, k}$	$r_{B S i, k}$	$r_{i, k}$
<b>All Sectors:</b>					
Avg. Estimate:					
Unbias., OLS <sup>b</sup>	22.98, 40.30	9.77, 23.22	6.86, 11.41	19.03, 34.39	27.41, 44.36
Standard Error:					
Unbias., OLS <sup>c</sup>	25.05, 23.57	32.11, 31.62	8.85, 27.92	30.51, 29.76	28.99, 28.00
Avg. R-squared <sup>d</sup>	0.52	0.13	0.08	0.25	0.32
<b>Processing:</b>					
Avg. Estimate:					
Unbias., OLS <sup>b</sup>	22.89, 40.14	7.28, 20.39	8.26, 14.33	12.33, 26.29	24.38, 40.59
Standard Error:					
Unbias., OLS <sup>c</sup>	25.20, 23.60	31.36, 30.85	11.68, 27.84	30.24, 29.65	28.64, 27.75
Avg. R-squared <sup>d</sup>	0.52	0.15	0.11	0.21	0.30
<b>Wholesale:</b>					
Avg. Estimate:					
Unbias., OLS <sup>b</sup>	21.80, 39.29	3.82, 16.93	9.41, 14.67	13.77, 29.64	26.66, 45.83
Standard Error:					
Unbias., OLS <sup>c</sup>	25.84, 24.27	34.15, 33.66	11.09, 27.43	34.64, 33.89	32.13, 30.91
Avg. R-squared <sup>d</sup>	0.48	0.15	0.08	0.21	0.31
<b>Retail:</b>					
Avg. Estimate:					
Unbias., OLS <sup>b</sup>	36.78, 55.70	41.11, 58.74	7.79, 11.48	31.85, 48.16	30.57, 46.77
Standard Error:					
Unbias., OLS <sup>c</sup>	23.35, 21.58	32.47, 31.70	7.59, 30.28	28.99, 28.13	28.82, 27.94
Avg. R-squared <sup>d</sup>	0.59	0.30	0.07	0.32	0.32
<b>Restaurant:</b>					
Avg. Estimate:					
Unbias., OLS <sup>b</sup>	18.29, 35.03	3.78, 16.28	3.44, 5.73	26.31, 43.27	31.12, 46.86
Standard Error:					
Unbias., OLS <sup>c</sup>	25.58, 24.02	32.39, 32.02	4.20, 27.21	30.01, 29.05	28.44, 27.35
Avg. R-squared <sup>d</sup>	0.51	0.04	0.04	0.30	0.35

<sup>a</sup>Corporate effects are means of all corporations and not just diversified corporations.<sup>b</sup>The estimates are means of the estimates on each segment.<sup>c</sup>The standard error is the mean of the standard error of each segment estimate.<sup>d</sup>This measure is the mean R-square in the OLS regression on each segment.

## References

- Amanor-Boadu, V., M.A. Boland, and D. Barton. "Ocean Spray Cranberries." Book Chapter in *Strategic Management: Concepts and Cases*, edited by A. Thompson and T. Strickland, McGraw-Hill Publishing, 14<sup>th</sup> edition, In press.
- Barry, P.J., S.T. Sonka, and K. Lajili. "Vertical Coordination, Financial Structure, and the Changing Theory of the Firm." *Amer. J. Agr. Econ.* 74,5(December1992): 1219-1225.
- Besanko, D., D. Dranove, and M. Shanley. *Economics of Strategy*. New York: John Wiley & Sons, 2000.
- Boland, M.A. and D. Barton. "American Crystal Sugar Company." *J. Finance Case Research*, 4, (Spring 2002).
- Boland, M.A. and D. Barton. "South Dakota Soybean Processors." Arthur Capper Cooperative Center Case Study #18, Kansas State University, Manhattan, KS, November 2002 (Farmer Cooperatives 2002 case study).
- Boland, M.A., D. Barton, and J. Katz. "Land O'Lakes." *Academy of Management Executive*, August 2003, forthcoming.
- Boland, M.A., J. Stroade, and D. Barton. "CHS Cooperatives: Business Portfolio Analysis." Farmer Cooperatives 2003 case study, November 2003.
- Boland, M.A., C. Freberg, D. Barton, and J.Katz. "Dakota Growers Pasta." *Case Research Journal*, 21,2(Spring 2001): 35-56.
- Brush, T.H., P. Bromiley, and M. Hendrickx. "The Relative Influence of Industry and Corporation on Business Segment Performance: An Alternative Estimate." *Strategic Management Journal* 20(1999):519-547.
- Caves, R.E. and M.E. Porter. "From Entry Barriers to Mobility Barriers: Conjectural Decisions and Contrived Deterrence to New Competition." *The Quarterly Journal of Economics* 91(May 1977):241-262.
- Conner, K. "A Historical Comparison of Resource-based Theory and Five Schools of Thought within Industrial Organization Economics: Do We Have a New Theory of the Firm?" *Journal of Management* 17(1991):121-154.
- Harris, J.M., P. R. Kaufman, S.W. Martinez, and C. Price. "The U.S. Food Marketing System, 2002. Competition, Coordination, and Technological Innovations Into the 21<sup>st</sup> Century." *USDA, Economic Research Service*. June 2002. Available at <http://www.ers/usda.gov>.

- Kinsey, J.D. "The New Food Economy: Consumers, Farms, Pharms, and Science." *American Journal of Agricultural Economics* 83,5(2001):1113-1130.
- Kolpak, D. "Agraria Selects Washington as Restaurant Site." *AgWeek*, March 10, 2003.
- Mahoney, J.T. and J.R. Pandian. "The Resource-Based View within the Conversation of Strategic Management." *Strategic Management. J.* 13,5(June 1992): 363-380.
- McGahan, A.M., and M. Porter. "The Persistence of Shocks to Profitability." *The Review of Economics and Statistics* 81(February 1988):143-153.
- Mueller, D.C. "The Persistence of Profits Above the Norm." *Economica* 44(November 1977):369-380.
- Nickell, S. "Biases in Dynamic Models with Fixed Effects." *Econometrica* 49(November 1981):1417-1426.
- Rumelt, R.P. "How Much Does Industry Matter?" *Strategic Management Journal* 12(1991):167-185.
- Schmalensee, R. "Do Markets Differ Much?" *American Economic Review* 75(June 1985):341-351.
- Schumacher, S. and M.A. Boland. "Industry and Business Segment Effects in Food and Agribusiness SIC Industries." NCR 194 Research on Cooperatives, November 2002.
- U.S. Department of Commerce-Bureau of Economic Analysis. *Contributions to Percent Change in Real Gross Domestic Product*. January 14, 2002.  
Available at:  
<http://www.bea.doc.gov/bea/dn/nipaweb/TableViewFixed.asp#Mid>
- Waring, G.F. "Industry Differences in the Persistence of Firm-Specific Returns." *The American Economic Review* (December 1996):1253-1265.