Farm Business Goals and Competitive Advantage

by

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Introduction

Michael Porter revolutionized thinking about competitive strategy 20 years ago with the development of three generic strategies firms can adopt to outperform industry rivals: overall cost leadership, differentiation, and focus (Porter, 1980). These strategies are often applied in agribusiness management (e.g., Gloy and Akridge, 1999), but have received little attention within the farm gate. Both farmers and the agribusinesses that serve them are faced with the challenge of remaining profitable in an environment characterized by low commodity prices, increased competition, new forms of rivalry, and a growing rural population. Moreover, the potential for reduced government support to agriculture begs exploration of other paradigms for success for farm businesses beyond reliance on program payments.

The objective of this paper is to investigate empirically the relationship between both farm business goals and sources of competitive advantage, and various farm and producer characteristics, technology adoption, and other factors. More specifically, the analysis is aimed at better understanding the relationship between farm business goals and farm characteristics such as size, tenure level, proximity to urban or exurban areas, off-farm income, other financial characteristics, and enterprise diversification. Farmers' use of various management tools, adoption of computer technology, and participation in e-commerce opportunities are also explored in this context.

The study is based on new primary data collected from a recent survey of Ohio farmers located in both rural and exurban areas and with diverse characteristics. The relationships of interest are analyzed using appropriate regression techniques.

Results will explore anecdotal suggestions that: (i) cost leadership strategies reside with larger and less diversified farming operations, (ii) farmers adopting focus strategies are most apt to be using the Internet and/or located near urban markets, (iii) differentiation strategies may be most closely aligned with participation in value-added activities, and (iv) government payments have contributed to a strategic

environment in which few producers have an explicit or implicit farm business strategy beyond "working the program."

This study will contribute to our understanding of the extent to which farmers recognize sources of competitive advantage and implement strategy within and beyond reliance on program payments and traditional risk management tools. This understanding is becoming unambiguously more important as the characteristics of both farming operations and farm programs continue to evolve. The paper will conclude with suggestions for additional research.

Related Literature

This study draws from the literature relating to farm profitability and performance, technology adoption in agriculture, and competitive strategy toward its primary objectives. Porter (1980) transformed the theory, practice, and teaching of business strategy. He described competitive strategy as taking offensive or defensive actions to create a defendable position in an industry, to cope successfully with the five competitive forces and thereby yield a superior return on investment for the firm. His three generic business strategies include cost leadership, differentiation, and focus. When engaging in cost leadership, the firm produces products or services for a wide customer group with lower costs resulting from economies of scale. When following a differentiation strategy a firm attempts to differentiate the product or service offered to one that is perceived industry-wide as unique, thereby increasing demand and/or capturing consumers who have relatively inelastic price elasticity of demand. The third generic strategy is the focus (or niche) strategy in which the firm targets a particular buyer group, segment of the product line, or geographic market. Many companies have ignored strategy all together (Porter, 2001; Barney, 1997) or have defined price as the primary and in many cases sole competitive variable.

Structural changes in agriculture are leading to a tri-modal distribution of farm types among smaller or limited resource farms, large commercial operations, and integrated units. Additional drivers include advances in information technology, biotechnology, trade liberalization, evolving agricultural programs, environmental concerns, and consumer demands for safe, nutritious, and convenient products. Many producers are confronted with decisions regarding new identity-preserved products and

participation in value-added, vertically aligned supply chains. Additionally, commodity prices are near record lows posing additional challenges for farm income.

In combination, these factors will continue to challenge farmers to consider new and innovative approaches to sustainable competitive advantage either within or outside of traditional paradigms for success. Yet farmers may find alien the idea of strategy formulation in that they have historically functioned as price takers, have been supported by government farm programs, and often deal with the complexities of family involvement in their farming operations (Brester and Penn, 1999). Like Porter, Brester and Penn suggests that farms firms may react by gravitating toward one of two production structures. Either one in which the undifferentiated commodity products will continue to be produced or one in which differentiated, identity-preserved products that focus on certain product attributes and consumer demands will be produced. The average size of these firms may not be as large as the low-cost producers, however an ability to negotiate contracts, manage risk, and use information technology may be essential.

Evidence suggests that rural and farming households are increasingly adopting technology. The gap between households in rural areas and households nationwide that access the Internet has narrowed from 4.0 percentage points in 1998 to 2.6 percentage points in 2000 (U.S. Dept. of Commerce, 2000). In 2000, 38.9% of rural households had Internet access, a 75% increase from December 1998. Urban areas had the highest rate of computer ownership (51.5%), though rrural areas increased 9.7 percentage points to reach a household ownership level of 49.6% in 2000. A total of 43% of U.S. farms now have Internet access, compared to 29% in 1999. Nearly 55% of U.S. farms had access to a computer in 2001, compared to 47% in 1999. Farmers using computers for their farm business increased from 24% in 1999 to 29% in 2001 (NASS, 2001). This study demonstrated that Internet and computer usage is highest among younger, more educated, larger farmers. A 1999 survey of high-income farmers found that 38% of those surveyed used the Internet for e-mail, business, or to obtain information. While only a small fraction (less than 5%) made purchases online, 41% expected that they would do so in the future. Other research indicated that 40% of farm households in both Canada and the U.S. used the Internet with about 30% of

the use being specific to farming operations and the remaining 70% for general information and entertainment purposes (Thompson, Hayenga, and Hayes, 2000).

Thompson, Hayenga, and Hayes (2000) suggest two scenarios regarding how e-business will affect agriculture. First, firms that supply inputs will be working directly with farmers and the farmer or producer will establish direct contact with retailers. Once this link is established, consumer signals will flow directly to the producer. This will result in more branded and identity-preserved products, and can lead to a differentiation or focus strategy which rewards farmers with valuable brand equity. The second scenario views any competitive advantage from e-business as transitory. Farmers and agribusinesses will have substantial competition and will earn first mover advantages for being part of a successful branded supply chain, but will quickly revert to normal competitive returns.

Ernst and Tucker (2001) studied technology adoption among Ohio fruit and vegetable growers. They found that one-third of growers agreed that the Internet would expand their markets but admitted a lack of time, expertise, and perceived market opportunities as reasons for non-adoption. Only 6% of respondents sold products over the Internet. However, neither education, age, nor gross sales were significant indicators of adoption. In contrast, Gloy and Akridge (2000) found that age and education were important drivers of adoption among large U.S. farmers. Other studies suggest that education, age, household income, profession, farm size, farm complexity, and specific enterprise types influence Internet and computer adoption (Tweeten and Amponsah 1996; Batte, Jones and Schnitkey, 1990; Lake, 1999).

Farm performance has been studied extensively by agricultural economists (Sonka, Hornbaker, and Hudson, 1989; Lins, Ellinger, and Latz, 1987; Plumley and Hornbaker, 1991; Ellinger and Barry, 1987; Purdy, Langemeier, and Featherstone, 1997; Mishra, El-Osta, and Steele, 1999). Results suggest that debt-to-asset ratio, age, soil productivity, farm size and diversification, use of risk management tools (e.g., crop insurance), tenure level, management ability, and controlling variable costs of production are important predictors of various measures of farm performance.

Data and Empirical Model

Data were obtained from a December 2001 survey of 1,896 Ohio farmers who are patrons of a regional cooperative. The survey included questions relating to personal and farm business characteristics, computer and Internet use, the use of management tools, farm financial characteristics, farm business goals, and sources of competitive advantage. A total of 302 farmers replied to the survey for an overall response rate of approximately 16%.

This study explores the role of various farmer and farm business characteristics, technology, environment, and management tools on farm performance and strategic choice. More specifically, we suggest that farm business goals may be represented as follows:

(1) $GOAL_i = f\ (AGE_i, TENURE_i, SCROPS_i, POP_i, MGT_i, EDUC_i, WORKOFF_i,$

$NETW_i, STRATEGY_i\ )$

AGE is the farmer's age, TENURE is tenure level (acres owned divided by total acres operated), SCROPS is the percent of specialty or value-added crops grown to total acres, and POP is the proximity of the farm to an urban center of varying population (categorical variable). MGT refers to the number of management tools used by the farmer, EDUC is a categorical variable representing the level of formal education attained, WORKOFF is a binary variable indicating if the farmer works off the farm, NETW is net worth, and STRATEGY represents one of four strategies the farmer is reportedly following (0=cost leadership, 1=differentiation, 2=focus, and 3=other). The dependent variable is a categorical representation of the farmer's reported farm business goal, either to maximize profitability/efficiency, to maximize free time for leisure, to preserve the farming operation to pass on to a child who farms, or to maintain a rural or farming lifestyle. We expect MGT, TENURE, and NETW to have a positive influence on the probability that the farm business goal is one of maximizing profitability/efficiency. WORKOFF may relate negatively to the goal of maximizing free time. We might expect that older farmers may wish to preserve the farm to pass on, and that farmers with operations located in more populous regions (i.e.,

ex-urban areas) might be less inclined or able to preserve their operations. Finally, rural lifestyle farmers are expected to reside in areas of increased population and may be more highly educated and wealthier.

We suggest further that farmers' reported sources of competitive advantage may be explained as follows:

(2) $ADVANT_i = f(AGE_i, ACRES_i, SCROPS_i, LIF_i, INT_i, TENURE_i, EMPLOY_i,$

$DtoA_i, LIVESTOCK_i)$

ACRES is total acres farmed, LIF is land in farms divided by total land area in the farmer's county , INT is a binary variable describing use of the Internet as part of the farming operation, EMPLOY is the number of farm employees, DtoA refers to debt-to-asset ratio (a categorical variable), and LIVESTOCK is the percent of gross sales derived from livestock. We predict that ACRES will positively influence the probability that farmers engage in cost leadership strategies as a source of competitive advantage while LIVESTOCK, SCROPS, LIF, and INT may motivate differentiation or focus strategies. Diversification advantages may be positively related to LIVESTOCK, EMPLOY, and SCROPS. Finally, lower DtoA is expected to increase the probability that the farmer's perceived source of competitive advantage is as a low debt producer.

A third empirical model, though not explicitly stated here, investigates the role of numerous variables on farmers' reported net profit. Most notably, dummy variables for farm strategy are included. We expect ACRES to be positively related and DtoA to be negatively related to farm performance, while the potential role of competitive strategy remains intriguing.

Results and Discussion

Summary Statistics

Selected descriptive statistics for the farmer sample are presented in Tables 1 through 7. The average age of the respondents is 54 years. About 34 percent worked off the farm in 2001 for an average of 38.56 hours per week. About 35.10% are high school graduates, 20.20 are graduates of a four-year college, and 9.60% have graduate or professional degrees. The Ohio farmers sampled demonstrate a

variety of experience with various lease types, crops grown, types of farming operations, and use of technology.

Characteristics of their farming operations are summarized in Table 1. Respondents farm a total of 718.17 acres on average, have an average tenure ratio (acres owned to total acres operated) of 28.85%, and have a variety of experience with various lease types. Most produce corn and soybeans on a rotating basis though 8.09% produce wheat, forage crops, and/or other crops. While corn and soybeans are the two predominant crops grown, there were a total of 14,765 acres of specialty/value-added crops grown by 15.23% of the farmer's surveyed.

Most respondents are located in the west half or Cornbelt region of in a 15 county area. About 62% of farms are located within five miles of a population center of between 0 and 14,999 people – in other words, they are located in a predominantly rural area. Another 16.89% are situated within 5 miles of a town with a population of 15,000 to 49,999, while 9.61% of respondents report that they farm within 5 miles of a population center in excess of 50,000 people.

Though not reported in tabular form, selected financial characteristics of farmers were collected. About 25.83% earned less than $25,000 in off-farm income in 2001, 24.84% earned from $25,001 to $49,999, and 30.47% earned over $50,000. Farmers reported an average of $189,241.98 of commodities produced of which 13.22% are attributed to livestock. Net worth is quite evenly distributed in this sample. While 17.22% of farmers are in the less than $100,000 net worth range, another 17.22% have a net worth of more than $1,000,000. About 32.45% report debt-to-asset ratios of less than 0.15., while average net farm profit for 2001 is $30,151.44. Average net farm profit for 2001 was $30, 151 and ranged from about -$100,000 to $500,000.

Respondents also report a variety pf experience with the use of technology. For example, 38.41% currently use variable rate technology (primarily for phosphorus, potassium and lime application) and 43.71% use precision farming technology (primarily geo-referenced grid soil sampling and combine yield monitors). About 62.25% use a computer for their farm business for an average of 3.09 hours per week, while 54.97% use a computer for personal matters for 3.63 hours per week. Only 31.13% use email or

the Internet for their personal use while 42.38% use the Internet as part of the farm business. This compares to only 29% of farmers nationally (NASS, 2001). About 18.21% have no computer, while the rest are concerned with inadequate service, security, or simply do not know how to use the Internet.

The most common farm business use of the computer is for keeping financial records. This is followed by using the Internet to access information other than commodity prices, e-mail, and word processing (Table 2). Note that 32.45% of farmers do not use a computer for financial record keeping and 43.38% do not use one for keeping production records. Further, few respondents sell farm products or buy farm inputs over the Internet and most (85.10%) do not have a web site for their farming operation.

Farmers were asked to both rate the importance of and rank various farm business goals. The results are reported in Tables 3 and 4. Farmers rated maximizing profitability as their most important farm business goal, followed by maximizing efficiency and maintaining a rural or farming lifestyle. Respondents also reported numerous idiosyncratic goals such as improving farm structures, selling land for development, enjoyment, stewardship, and preserving small or family farms.

Farmers were asked to identify their sources of competitive advantage (Table 5). Most reported conventional sources related to traditional agricultural production paradigms, versus the more management-oriented business strategies suggested by Porter (1980). For example, being a low-debt producer is the advantage rated as most important, followed by having off-farm income to support the farm business, and having a diversified farming operation. Mean importance levels for cost leadership, differentiation, and focus strategies are relatively low. In fact, more farmers reported that they were either at the mercy of markets and government farm programs (so competitive advantage was meaningless), or that they had never given it any thought. This traditional paradigm is further buttressed by farmers' perception of various means of sustaining their source of competitive advantage (Table 6). Not surprisingly given the stated sources of competitive advantage, taking advantage of government farm programs is the most highly rated means of sustaining competitiveness. Farm programs is followed by reducing input costs and pricing commodities more effectively, reducing fixed costs, maintaining good

landlord relationships, maintaining good lender relationships, and leasing additional farmland under favorable terms.

Though note reported herein, farmers were asked to indicate the use of various management tools in their farm businesses. Tools used, in order of predominance, are a will (63.91%), forward contracting of crops (55.96%), a cash flow plan (52.65%), advisory services (43.71%), written leases for real estate leased from others (39.07%), futures markets (37.08%), and an estate plan (32.77%). Less than 30% of farmers use options (26.16%), have a written business plan (23.51%), use trusts (25.50%), have a risk management plan (22.18%), have a succession plan (17.55%), have a formal commodity marketing plan (17.22%), have written leases for real estate leased to others (11.59%), and have an e-commerce/e-business plan (0.99%).

Regression Analysis

Results of the OLS regression analysis of net profit are reported in Table 8. As anticipated, the size of the farming operation in total acres has a positive and significant influence on farm performance. Livestock production and debt-to-asset ratio are negatively and significantly related to net profit, while the number of employees has significant explanatory power. Aggressive use of labor resources appears to bolster profitability. Interestingly, farmers who engage in cost leadership strategies are more profitable. This may simply reflect pursuit of the traditional paradigm for success in farming (i.e., "bigger is better") over other or more innovative strategic options.

Table 9 reports the marginal effects for the logistic regression analysis of the farm goals model. Farmers who suggest that the goal of their operation is to maximize profitability/efficiency appear to use more management tools. Working off the farm decreases the probability that the farm goal will be one of maximizing free time for leisure. Older farmers are more likely to want to pass on their farming operations to the next generation, though those that are located in close proximity to urban centers with larger populations are less likely to wish to preserve their operations to pass on. Perhaps high market values for transitional land are too attractive an exit strategy. Farmers who operate near larger urban

centers and who are more highly educated are more likely to be lifestyle farmers. However, the use of management tools and net worth are negatively related to the probability that lifestyle is the farm goal.

Results of the regression analysis exploring farmers' sources of competitive advantage are shown in Table 10. As anticipated, larger farmers are more likely to support a cost leadership strategy as their competitive advantage over rivals. Farmers with higher debt-to-asset ratios and a greater percentage of their gross sales from livestock are more likely to suggest either a differentiation or focus strategy. Smaller farmers and those that produce specialty or value-added crops are more likely to report that they focus on a particular niche market. Interestingly, the use of the Internet as part of the farming operation does not influence the probability of engaging in any of Porter's generic strategies, but Internet use does enhance the probability that farmer's report diversification as their source of competitive advantage. The reason for this relationship remains unclear. Finally, low debt producers are more likely to view this characteristic this as their competitive edge over rivals.

Conclusions and Implications

This paper investigates empirically the relationship between both farm business goals and sources of competitive advantage, and various farm and producer characteristics using new primary data collected from a survey of Ohio farmers located in both urban and exurban areas and with diverse characteristics. Evidence demonstrates that most farmers do not recognize nor do they feel empowered by sources of competitive advantage and strategy implementation beyond reliance on longstanding paradigms for success within the context of government farm program support and the use of traditional risk management tools.

However, several key insights emerge. Farmers who engage in cost leadership strategies are more profitable. Farmers who suggest that the goal of their farming operation is to enhance profitability/efficiency use more management tools, while lifestyle farmers use fewer. Larger farmers are more apt to engage in a cost leadership strategy, while those with higher debt-to-asset ratios and those that are more livestock oriented are more likely to engage in differentiation or focus strategies. Smaller

farmers and those that produce specialty or value-added crops are more likely to focus on a particular niche market. Lastly, the use of the Internet as part of the farming operation does not influence the probability of engaging in any particular business strategy.

It is apparent that the government farm program has contributed to a strategic environment in production agriculture where few producers have an explicit or implicit farm business strategy beyond "working the program" and acting as price takers. Or if a strategic option is apparent, it rests primarily with cost leadership. This constraint will becoming unambiguously more important with the structural changes shaping production agriculture and as farm programs continue to evolve.

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Table 1   Characteristics of Respondents' Farming Operations

Farm Arrangement	Mean	Max	Min	Percent	St. Dev.
Owned	245.38	1,800	0	28.85	306.30
Fixed cash lease	281.76	3,170	0	33.13	446.77
50-50 cropshare lease	105.46	3,898	0	12.40	331.43
Other cropshare lease*	13.52	1,300	0	1.59	104.25
Cash/share lease	18.18	1,296	0	2.14	110.14
Variable cash lease	16.66	1,350	0	1.96	120.12
Other**	0.96	100	0	0.11	9.28
Custom farmed	36.23	3,500	0	4.26	238.23
Total	718.17	5105	4		

*Cropshare lease- 3/4-1/4, 2/3-1/3, 20%.

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Table 2   **Use of Computer in the Farm Business**

	(% of Respondents)					Unk-nown (%)	Total (%)	Mean
	Never	Sometimes			Often			
	1	2	3	4	5			
Keeping financial records	32.45	5.96	6.95	4.97	31.46	18.21	100	2.96
Keeping production records	43.38	7.28	9.60	6.62	12.58	20.53	100	2.22
Word processing	33.77	10.60	15.89	9.93	9.60	20.20	100	2.39
E-mail	34.77	9.60	11.59	10.60	15.23	18.21	100	2.53
Commodity price tracking on Internet	45.03	8.61	9.93	5.63	11.26	19.54	100	2.12
Accessing the Internet for other information	30.13	8.28	13.91	13.58	15.23	18.87	100	2.70
Selling farm products on Internet	70.53	5.96	0.66	0.66	2.65	19.54	100	1.25
Buying farm inputs over the Internet	64.90	11.59	3.31	0.66	1.32	18.21	100	1.31
Online banking or bill paying	67.88	6.29	3.31	1.66	1.99	18.87	100	1.32
Filing regulatory reports	74.83	4.30	0.66	0.00	0.99	19.21	100	1.12
Computerized tax filing	68.21	3.64	1.99	1.99	4.97	19.21	100	1.41
Other*	33.33	33.33	0.00	0.00	33.33	-	100	2.67

* Tax preparation, contact bank and insurance company, shop for machinery.

Table 3   Importance of Various Farm Business Goals

Goals	(% of Respondents)							
	Importance							
	Low				**High**			
						Unk-nown (%)	**Total (%)**	
	1	**2**	**3**	**4**	**5**			**Mean**
Maximize profitability	2.65	2.98	8.28	15.23	55.30	15.56	100	4.39
Maximize efficiency	3.64	3.31	9.27	21.85	45.69	16.23	100	4.23
Maximize free time for leisure	6.29	7.95	22.19	20.53	25.83	17.22	100	3.62
Preserve operation to pass on	13.91	8.28	16.23	16.23	27.81	17.55	100	3.43
Maintain a rural or farming lifestyle	4.97	5.30	11.59	21.19	41.72	15.23	100	4.05
Other 1*	0	0	0	20.00	80.00	-	100	4.75
Other 2**	0	0	0	0	100	-	100	5.00

*Keep farming, investment to pass on or for development, improve farm structures,

  retirement income, enjoyment, satisfaction.

**Larger business, good steward of land, maintain small farms.

Table 4   **Farmers' Rankings of the Importance of Farm Business Goals**

Goals	RANKING (% of Respondents)		
	1st	**2nd**	**3rd**
To maximize profitability	42.05	16.89	11.59
To maximize efficiency	5.96	28.14	19.21
To maximize free time for leisure	3.64	14.57	19.87
To preserve the operation to pass on	10.60	9.93	12.25
To maintain a rural or farming lifestyle	17.22	10.26	14.90
Other	2.32	0.99	0.99
Total	**81.79**	**80.79**	**78.81**
Unknown %	**18.20**	**19.20**	**21.20**

Table 5   **Farmers' Ratings of their Source of Competitive Advantage**

Competitive Advantage	(% of Respondents)							
	Strongly Disagree				Strongly Agree			
	1	**2**	**3**	**4**	**5**	**Unk-nown (%)**	**Total (%)**	**Mean**
Large scale, low cost producer	31.79	17.55	20.20	8.28	3.31	18.87	100	2.18
Offer unique or differentiated product/service	34.77	16.89	17.22	7.29	5.30	18.54	100	2.16
Focus on a certain market or customer type	28.81	19.21	17.55	9.60	6.29	18.54	100	2.33
Have a diversified farming operation	21.85	17.88	21.19	16.22	5.96	16.89	100	2.60
Superior commodity marketing skills	6.22	5.04	5.35	2.05	0.55	19.21	100	2.25
Low debt producer	5.96	8.61	23.51	19.20	25.50	17.22	100	3.60
Have off-farm income	18.87	6.29	11.92	15.56	30.13	17.22	100	3.38
Haven't thought about it	18.88	11.59	29.14	8.61	12.91	18.87	100	2.82
Doesn't matter - am at mercy of markets and farm program	18.87	10.93	21.86	10.60	19.21	18.54	100	3.00
Other*	0	0	12.50	25.00	62.50	-	100	4.43

* Relationship with larger farmer, low cost land available, high quality products, efficient use of machinery and tools.

Table 6   Farmers' Rankings of the Importance of Source of Competitive Advantage

Competitive Advantage	RANKING (% of Respondents)		
	1st	2nd	3rd
Am a large scale, low cost producer	6.29	6.29	5.30
Offer unique or differentiated product/service	4.97	4.30	5.30
Focus on a certain market or customer type	5.30	8.94	10.60
Have a diversified farming operation	8.28	7.95	8.94
Superior commodity marketing skills	4.30	7.62	4.64
Am a low debt producer	21.19	16.89	8.94
Have off-farm income to help contribute	17.22	14.57	10.60
Haven't thought about it	1.66	3.64	7.28
Doesn't matter - am at mercy of markets and the government farm program	6.95	5.30	6.62
Other	1.99	0.00	0.33
Total	**78.15**	**75.50**	**68.54**
Unknown	**21.90**	**24.50**	**31.50**

Table 7   **Importance of Various Practices in Sustaining Competitive Advantage**

	(% of Respondents)							
	Importance							
	Low				High			
	1	2	3	4	5	Unk-nown (%)	Total (%)	Mean
Purchase farmland at an attractive price	27.15	9.27	15.56	14.90	14.24	18.87	100	2.75
Maintain good relationships with current landlords	18.87	3.31	7.62	14.90	33.78	21.52	100	3.53
Provide new landlords with a menu of lease options	29.80	14.57	20.20	7.62	5.63	22.19	100	2.29
Lease additional farmland under favorable terms	23.84	5.30	14.24	17.22	18.21	21.19	100	3.01
Convert cash leases to share	43.05	15.89	13.91	1.99	1.32	23.84	100	1.72
Convert share leases to cash	40.40	12.25	17.22	3.31	2.65	24.17	100	1.89
Reduce crop input costs	8.28	3.31	14.57	25.83	24.83	23.18	100	3.72
Reduce fixed costs	8.28	2.65	21.52	24.17	22.19	21.19	100	3.63
Take advantage of government farm program	7.62	3.97	13.24	23.18	29.80	22.19	100	3.82
Maintain good relationship with lender	17.88	4.97	13.91	15.89	25.50	21.85	100	3.33
Price farm commodities at high end of market	9.60	3.31	13.25	26.16	26.82	20.86	100	3.72

Table 7 (Continued)

	(%of Respondents) Importance							
	Low				**High**			
	1	**2**	**3**	**4**	**5**	**Unk-nown (%)**	**Total (%)**	**Mean**
Obtain contracts with buyers of my products	20.20	9.93	21.85	17.22	9.60	21.19	100	2.82
Use Internet to sell commodities	50.66	13.25	8.61	2.98	0.33	24.17	100	1.54
Use Internet to access markets to sell unique products	53.31	11.59	7.95	2.98	2.32	21.85	100	1.58
Use Internet to sell directly to consumers	53.65	11.26	7.95	2.32	2.98	21.85	100	1.59
Have own website (to provide information)	59.61	9.27	5.63	1.66	2.32	21.52	100	1.44
Have own website (to sell products/services)	56.95	9.93	5.63	2.32	2.32	22.85	100	1.48
Access information via Internet	31.13	6.95	21.19	10.60	8.61	21.52	100	2.47
Access decision-making tools on the Internet	32.78	9.93	19.20	9.27	6.29	22.52	100	2.31
Access communities on the Internet (share ideas)	41.39	13.25	14.90	5.96	2.98	21.52	100	1.93
Other*	0	0	0	25.00	75.00	-	100	4.75

* Consider non-farm development potential.

Table 8   OLS Regression Results – Net Profit of Farm Business

Explanatory Variable	Coefficient Estimate[A]
Intercept	7699.94 (0.70)
Acres farmed	28.76*** (6.05)
Tenure	7284.78 (0.81)
Management tools	1098.31 (0.92)
Debt-to-asset ratio	-8634.42*** (-3.23)
Livestock	-268.51*** (-2.16)
No. employees	4144.77*** (9.04)
Cost leadership strategy	25665.00* (1.85)
Focus strategy	8335.09 (0.65)
Differentiation strategy	17411.00 (1.11)

Adjusted R^2 = 0. 0.6414, Prob >F = 0.0001. t-statistics are in parentheses.

[A] Asterisks indicate significance at the 10% (*), 5% (**), and 1% levels (***), respectively.

Table 9   Logistic Regression Results – Farm Business Goals

	Farm Business Goal				
	Maximize Profitability/ Efficiency	**Maximize Free Time**	**Preserve Operation to Pass On**	**Maintain Rural/Farming Lifestyle**	
Explanatory Variable	**Marginal Effect[A] (S.E.)**	**Marginal Effect (S.E.)**	**Marginal Effect (S.E.)**	**Marginal Effect (S.E.)**	**Mean of X**
Constant	0.4143 (0.2784)	-0.0975 (0.0847)	-0.0781 (0.1690)	-0.2386 (0.2275)	--
Age	-0.0039 (0.0034)	-0.0003 (0.0009)	0.0031* (0.0019)	0.0011 (0.0029)	51.5860
Tenure	-0.1468 (0.1106)	0.0132 (0.0341)	0.0359 (0.0627)	0.0978 (0.9358)	0.4945
Specialty crops	0.1028 (0.2160)	0.0326 (0.0529)	-0.0426 (0.1223)	-0.0928 (0.1887)	0.0689
Proximity to urban center	0.0348 (0.0534)	0.0174 (0.0141)	-0.1227*** (0.0430)	0.0705* (0.0420)	1.4624
Management tools	0.0254* (0.0136)	0.0059 (0.0042)	0.0038 (0.0076)	-0.0350*** (0.0122)	5.8172

Table 9   (Continued)

Explanatory Variable	Farm Business Goal				
	Maximize Profitability/ Efficiency	Maximize Free Time	Preserve Operation to Pass On	Maintain Rural/Farming Lifestyle	
	Marginal Effect[A] (S.E.)	Marginal Effect (S.E.)	Marginal Effect (S.E.)	Marginal Effect (S.E.)	Mean of X
Education	-0.0294 (0.0230)	0.0007 (0.0075)	-0.0132 (0.0133)	0.0420** (0.0190)	4.7527
Work off farm	0.1291 (0.0858)	-0.0632** (0.0292)	-0.0773 (0.0498)	0.0114 (0.0728)	0.4570
No. employees	-0.0010 (0.0073)	0.0003 (0.0010)	-0.0012 (0.0066)	0.0019 (0.0060)	2.5376
Net worth	0.0770*** (0.0256)	-0.0063 (0.0078)	-0.0220 (0.0139)	-0.0487** (0.0223)	2.3763
Business strategy	-0.0417 (0.0442)	0.0031 (0.0130)	0.3057 (0.2527)	0.0080 (0.0399)	2.5108

LogL = -168.7815, Chi-squared = 65.0368***

[A] Asterisks indicate significance at the 10% (*), 5% (**), and 1% levels (***), respectively.

Table 10   Logistic Regression Results – Competitive Advantage of the Farm Business

	Competitive Advantage						
	Cost Leadership	Different-iation	Focus	Diversified Operation	Superior Marketer	Low Debt	
Explanatory Variable	M.E.[A] (S.E.)	M.E. (S.E.)	M.E. (S.E.)	M.E. (S.E.)	M.E. (S.E.)	M.E. (S.E.)	Mean of X
Constant	-0.2177 (0.2079)	-0.1616 (0.1543)	-0.4164 (0.2631)	-0.0812 (0.3381)	-0.1134 (0.1384)	0.6985 (0.4040)	--
Age	0.0021 (0.0024)	0.0004 (0.0017)	0.0005 (0.0023)	-0.0033 (0.0038)	0.0009 (0.0015)	0.0009 (0.0045)	51.7721
Acres	0.0001** (0.0001)	0.0000 (0.0000)	-0.0001* (0.0001)	0.0000 (0.0000)	0.0000 (0.0000)	0.0001 (0.0001)	777.80
Specialty crops	-0.0721 (0.2371)	0.1461 (0.1113)	0.3125* (0.1644)	0.0918 (0.315)	0.0118 (0.1140)	0.3255 (0.4115)	0.0597
Population density	0.0158 (0.1767)	-0.1138 (0.1302)	0.1386 (0.2217)	-0.2309 (0.2949)	0.0295 (0.1237)	0.1779 (0.3870)	0.7217
Use the Internet	0.0528 (0.0531)	0.0066 (0.0342)	0.0277 (0.0580)	0.1653* (0.0906)	-0.0674 (0.0448)	-0.1081 (0.1065)	0.5735
Tenure	-0.0512 (0.0778)	0.0203 (0.0553)	0.0961 (0.0969)	0.0629 (0.1274)	0.0161 (0.0528)	-0.1728 (0.1580)	0.5488

Table 10   (Continued)

Explanatory Variable	Competitive Advantage						Mean of X
	Cost Leadership	Different-iation	Focus	Diversified Operation	Superior Marketer	Low Debt	
	M.E.[A] (S.E.)	M.E. (S.E.)	M.E. (S.E.)	M.E. (S.E.)	M.E. (S.E.)	M.E. (S.E.)	
No. employees	-0.0108 (0.0129)	0.0148 (0.0095)	0.0196 (0.0146)	0.0466** (0.0204)	-0.0030 (0.8458)	-0.0180 (0.0282)	2.9191
Debt-to-asset	0.0074 (0.0238)	0.0358* (0.0297)	0.0666** (0.0307)	0.0195 (0.0412)	0.0221 (0.0182)	-0.2353*** (0.0636)	2.0147
Livestock	0.0000 (0.0014)	0.0015* (0.0008)	0.2119* (0.0011)	0.0037** (0.0016)	-0.0019 (0.0013)	-0.0039 (0.0028)	14.4783

LogL = -180.7300, Chi-squared = 112.1130***

[A] M.E. is marginal effect. Asterisks indicate significance at the 10% (*), 5% (**), and 1% levels (***), respectively.