

## **Beef Producer Choice in Cattle Marketing**

Jeffrey Gillespie  
Dept. of Agricultural Economics & Agribusiness  
101 Ag Administration Building  
Louisiana State University  
Baton Rouge, LA 70803  
(225) 578-2759

Aydin Basarir  
Gaziosmanpasa University  
Agricultural Faculty  
Department of Agricultural Economics  
60250 Tokat, Turkey  
(356) 252 1616 Ext. 2266

Alvin Schupp  
Dept. of Agricultural Economics & Agribusiness  
101 Ag Administration Building  
Louisiana State University  
Baton Rouge, LA 70803  
(225) 578-2722

Selected paper prepared for presentation at the Southern Agricultural Economics Association  
Annual Meeting, Tulsa, Oklahoma, February 15-18, 2004.

## **Beef Producer Choice in Cattle Marketing**

Jeffrey Gillespie, Aydin Basarir, and Alvin Schupp

### **Abstract**

In addition to the conventional auction method of cattle marketing, alternative marketing arrangements include sale by private treaty, video auction, retained ownership, and use of strategic alliances. This study examines use of alternative marketing arrangements and types of producers using each. Thirty-nine percent of producers used alternative arrangements.

Key Words: cattle marketing, video auction, private treaty, conventional auction, strategic alliance

## **Beef Producer Choice in Cattle Marketing**

Faced with a declining share of the U.S. domestic demand for meat, beef industry stakeholders have considered an array of strategies to increase their competitiveness. Some researchers have suggested that increased coordination from the cow-calf production phase to the slaughter phase would lead to increased efficiency and reduced costs. Ultimately, consumers would be provided with lower priced, more uniform products that consistently meet their preferences (Gillespie et al., Lamb and Beshear). Two phases whose linkage has been primarily spot-market based have been the cow-calf / stocker phase and the feedlot phase. Traditionally, U.S. cow-calf producers have marketed calves via local conventional auctions. These animals would eventually be shipped to feedlots in Texas and the U.S. High Plains states for feeding. More recently, a number of alternative marketing strategies have been developed that facilitate efficient transfer of market signals from the feedlot phase to the cow-calf production phase. This study examines the extent of adoption of these strategies in Louisiana, as well as the types of producers who have adopted them.

The traditional conventional auction method of marketing has provided cattle producers with a central location where multiple buyers could bid on their cattle. Most conventional auctions operate one or two days per week. Local cattle producers haul animals to the facility where they are bid upon by various types of buyers (primarily order buyers), with the highest bidder purchasing the cattle. The conventional auction is a useful marketing option for most types of beef animals: weaned calves, backgrounded animals, and cull bulls, cows and heifers. Assuming sufficient cattle volume, competition among the buyers, and good information on animal value by both buyer and seller, this marketing method is efficient. Potential drawbacks of using this method of marketing for all cattle on the farm are the following. (1) The number of buyers bidding on animals on a particular day may be small, reducing competition. Oligopsony power may result, reducing the price received by the seller. (2) Buyers may base value more on perception than true animal value. (3) Some buyers' primary goal is to fill a truck to capacity. These buyers are unlikely to pay premium prices for top quality animals. (4) Producers who

have added “unobservable” value to animals, such as specific vaccinations or creep feeding for calves, may not receive higher prices for these animals, even though their expected performance and survivability in the next phase is greater. (5) Commission fees must be paid to the conventional auction sale facility, typically on a per-animal basis. (6) Transportation costs to and from the sale facility are incurred. (7) After transporting to the sale facility, the seller has already incurred costs associated with transporting animals from the farm or ranch, “no sale” may not be a viable auction for the seller. Finally, (8) significant shrink is likely as the animal is hauled to and kept at the conventional auction prior to selling. Thus, revenue declines with animal weight.

The presence of (5) through (8) suggests that transaction costs incurred by the cow-calf producer are significant with the conventional auction method of marketing. The result of issues (2) through (4) is that many producers are less likely to utilize the conventional auction for selling higher quality stock. If consumer preferences are not efficiently transferred to cow-calf producers via the pricing mechanism, producers are not likely to produce the types of animals required to meet consumer demand and, thus, successfully vie with competitor meats. Several additional marketing alternatives include video auctions, sale by private treaty, use of strategic alliances, and retained ownership.

Producers selling via video auction gather animals to be sold and the marketing agent videotapes them. Videos are sent to one or more remote locations where a number of different kinds of buyers bid on the lot of animals. Advantages of this method relative to the conventional auction are: (1) a larger number of buyers generally bid on the animals, as discussed by Bailey and Peterson, increasing competition; (2) buyers who purchase via video auction are typically interested in specific types of animals, and are more likely to pay premium prices for specific animal traits; (3) commission fees are typically lower; and (4) since the animals remain on the farm or ranch, the seller can “no sale” if offers are inadequate. The major disadvantage is the large volume of animals needed to effectively use video auctions, limiting this option to larger producers or alliances of smaller producers. However, the larger volumes tend to attract buyers

searching for larger quantities of consistent quality animals. If these buyers' preferences are based upon feedlot operator preferences, then pricing efficiency has been gained.

Commercial cattle producers who sell via private treaty (direct to order buyer) generally have enough animals for sale to fill at least one truck. As with the video auction, buyers who purchase using private treaty are typically interested in specific animal types, and will pay premium prices for animals with specific, consistent traits. Neither private treaty nor video auction marketing have as a goal the more efficient transfer of price signals from feedlot to cow-calf producer, but both generally do have more efficient transfer since they provide access to buyers who are interested in specific animal types. Both also have the potential to reduce transaction costs since hauling to the conventional auction is avoided and a sales commission is not charged via private treaty. Private treaty sales are also frequently used by purebred producers, generally for smaller numbers of animals.

Retained ownership is a marketing agreement whereby the seller maintains ownership of cattle through the feedlot phase. A contract between the feedlot and cow-calf producer specifies that the producer is paid when the animals are marketed and slaughtered. Retained ownership in custom feedlots was introduced when economies of size left small, individually owned feedlots less competitive than large, commercial lots. Custom feeding allowed cattle producers be involved in the feeding segment, often securing access to cheaper feed and other inputs available to commercial feedlots (White and Chesnick). A number of retained ownership arrangements exist, reflecting the array of grazing and feeding alternatives available to them. Retained ownership offers cow-calf / stocker producers an opportunity to increase their average returns, though the profitability of cattle feeding varies from year to year, depending upon the market (Peel). Producers receive valuable feedback on how their animals grade, as well as a price that reflects quality. Thus, they are able to make production decisions that ultimately lead to improved animals, and thus, carcass quality.

Cattle producers have formed or joined existing strategic alliances for a number of different reasons, with the most common being to receive higher prices for animals with specific

traits. Examples of three such alliances include the following. The Farmland Supreme Beef Alliance, through Farmland Industries, is organized as a cooperative. Their goal is to secure high quality animals for which producers are paid premium prices. All animals must be at least 50 percent Black Angus, and dairy and Brahman crossbreeds are not allowed. Cattle are finished at Supreme Cattle Feeders, Inc., and sold via value-based marketing to Farmland National Beef Packing Company. Producers receive incentives for carcasses that quality grade higher than USDA Select. Producers may retain ownership, partnership, or direct-sale feeder calves. Those who retain ownership receive carcass information about their animals for future decision making. Bradley Natural Beef, on the other hand, has 100 producers in 18 states who supply feeder calves to three feedlots (Davis). Bradley uses a grid pricing system based on carcass weight, marbling scores, yield grades and brand location. No implants or added growth hormones are allowed. A smaller strategic alliance is the Vernon Beef Alliance, located in Vernon Parish, Louisiana. This group of 20 to 25 cattle producers was formed with the help of a county agent with the Louisiana Cooperative Extension Service, with the goal of improving returns to local beef producers. Producers in the Alliance use similar breeding stock and management strategies to produce premium quality animals. With higher quality and quantity of animals for sale, producers can market the animals at premium prices using a video auction or private treaty sales. The common theme among each of these alliances is the production of consistently high quality animals that can be produced in large quantities such that they may receive premium prices. In each case, the type of animals to be produced and marketed is ultimately determined by consumer demand.

The objectives of this study are to determine the extent of adoption of each of these alternative marketing systems and the types of producers most likely to utilize each. Limited previous literature has examined the extent of adoption of alternative marketing practices in the U.S. cattle industry, though discussion of previous work is included in the discussion of the variables included in the econometric models.

## **Data and Methods**

Data for the analysis were collected via mail survey during Summer, 2001. A total of 1,472 Louisiana producers were surveyed, with 25 percent of the sample coming from the each of the following four size categories: 1-19 animals, 20-49 animals, 50-99 animals, and 100 or greater animals. Using a modified Dillman's Total Design Method approach, producers were initially sent the survey, followed by a postcard reminder two weeks later. Finally, a second copy of the survey was sent to non-responders two weeks after the postcard reminder. Including producers who indicated they were no longer in business, the final response rate was 36 percent, with 495 respondents. The response rate would likely have been greater had those with no beef cattle been asked to return their surveys indicating such, and if first class rather than bulk mail had been used such that non-deliverables had been returned to us.

Binomial logit analysis is used to determine the types of producers most likely to adopt each of the following marketing arrangements: conventional auction, private treaty, video auction, and retained ownership. Many producers who use private treaty, video auction or retained ownership to sell cattle also utilize the conventional auction or another arrangement to sell some of their animals. Thus, binomial logit analyses are run for each arrangement. An additional model is run to determine the types of producers being members of beef marketing strategic alliances or cooperatives.

The binomial logit model allows for determination of the probability of a producer of a specific description utilizing a marketing arrangement (Greene):

$$(1) \quad \Pr(Y = 1) = \frac{e^{b'x}}{1 + e^{b'x}} = \Lambda(\mathbf{b}'x)$$

where Pr(.) represents probability, Y=1 indicates that marketing arrangement Y has been adopted, x represents the variables influencing the adoption of the marketing arrangement, and  $\beta$  represents the parameters to be estimated. Since a stratified sample is used, data are weighted according to stratification in the regression model.

Variables of interest that could affect the producer's marketing arrangement selection decision may be categorized under the following headings: farm type, farmer characteristics, and animal type. Farm type variables categorized include the number of animals in inventory on the farm (ANIMALS), whether stockers are produced (STOCKER), and the number of farm enterprises other than beef production (DIVERSE). Farmer characteristic variables include age (AGE), whether the producer holds a college Bachelor's degree (COLLEGE), number of contacts with an Extension Service County Agent over the past year (COUAGENT), and percentage of income from off-farm sources (OFFFARM). Variables categorized as animal type include the average weaning weight of calves produced (WEANING), number of vaccines from the following that are administered prior to calves being sold: blackleg, respiratory complex, bangs, and vibrio (VACCINES), and the percentage of cows in the operation that are purebred (PURECOWS).

It is expected that larger producers are more likely to market cattle via video auction and/or private treaty; thus, ANIMALS is expected to have a positive sign in both of these models. In the case where a large number of animals is to be sold, both marketing options have the potential to reduce average variable costs per animal sold since transportation costs to the



conventional auction are not incurred, and marketing commission is not paid under private treaty. Buyers are more willing to purchase animals via these marketing agreements if there are at least a minimum number of animals to be purchased (generally one truckload). Otherwise, the marginal transportation and transaction costs associated with procuring animals via numerous producers would be greater than the marginal benefits associated with obtaining consistent quality animals. STOCKER is included to account for any differences in marketing if the producer is involved in this production phase. Given the greater uniformity often achieved via stocker operations, it is expected that stocker producers would be more likely to sell via video auction or private treaty.

It is expected that risk averse producers are more likely to sell animals via a marketing arrangement other than the conventional auction. Conventional auctions are used by many order buyers to fill remaining slots in feedlots or slaughterhouses after utilizing other means to procure cattle. As such, the conventional auction is particularly subject to daily fluctuations in cattle pricing, depending upon feedlot and slaughter plant needs. An additional concern is that lower than expected prices could be paid for cattle on a particular day due to a small number of buyers. Lower prices could occur due to monopsony or oligopsony power, or the possibility of animals being bought for a purpose other than their best use. The producer who hauls cattle to the conventional auction incurs transportation costs that would be lost if he chooses not to sell. Several of the alternative marketing arrangements may reduce risk to the seller.

Lesser explains that direct sales (private treaty) may reduce price uncertainty, but the amount of uncertainty reduced depends upon the specific negotiation. For instance, if price is

agreed upon during the negotiation process, uncertainty is reduced. This may be for delivery at some point in the future, so that the buyer can schedule use of facilities more effectively. Such agreements enable the producer to reduce price risk and the uncertainty of transporting animals to the conventional auction and experiencing a “no sale.” Video auctions reduce price risk in that a price is agreed upon without the producer incurring the risk associated with transporting animals to the conventional auction and experiencing “no sale.” As with some private treaty sales, video auctions often involve the sale of animals at some point in the future (say, one month). Thus, a price may be agreed upon ahead of the time that the animal is delivered, therefore, reducing risk. In cases of both private treaty and video auction sales, the seller can opt not to sell if the price offered is too low, without incurring transportation costs and transaction costs associated with marketing via conventional auction. Retained ownership may reduce price risk if the producer uses futures or options to lock in a base price ahead of time, with formula pricing used to determine premiums based on grade and yield.

Diversification is a strategy agricultural producers have used to reduce risk (Robison and Barry). If level of diversification indicates a producer’s risk preference, then one would expect the more diverse producer to be more risk averse. Due to the reduced risk associated with video auction, private treaty, and retained ownership arrangements, it is hypothesized that DIVERSE is positively associated with the adoption of these arrangements.

The effect of age (AGE) on marketing arrangement choice is indeterminate. On the one hand, one would expect older, more experienced cattle producers to recognize the advantages of alternative marketing arrangements and, thus, to adopt them. On the other hand, those who have

been in the business longer may be slower to adopt newer marketing procedures; an analog is the reluctance of older producers to adopt technology (Feder, Just and Zilberman).

Producers who are more informed are expected to be more likely to adopt alternative marketing practices as their awareness of the advantages of alternative marketing arrangements is greater. Thus, college educated producers (COLLEGE) and those who have more frequent contact with county agents (COUAGENT) are expected to be the greater users of alternative marketing arrangements.

Producers who receive a higher percentage of their income from an off-farm job (OFFFARM) are expected to be less likely to enter into alternative marketing arrangements, since the importance of the farm as a primary source of income is lower.

It is expected that producers who are better managers will more likely sell via an alternative marketing arrangement. Producers who follow more extensive vaccination programs can receive premiums for better quality animals, quality traits that may be unobservable in the sale ring of the conventional auction. Thus, VACCINE, indicating the number of vaccines provided to calves prior to marketing (blackleg, respiratory complex, bangs, and vibrio), is expected to be positively associated with alternative marketing methods. Likewise, producers with heavier weaning weights (WEANING) are generally considered better managers, and are expected to be more likely to utilize alternative marketing arrangements. Purebred producers (PUREBRED) are expected to more likely market via private treaty, where the seller can have access to the buyer's ear.

## **Results**

Percentages of producers in each size category using alternative marketing practices are shown in Table 1. The majority of producers (91 percent) use conventional auctions for marketing some cattle, indicating the importance of this market outlet even among those who use alternative markets. Those who use alternative markets for calves may use the conventional auction for some calves, cull breeding stock, or other animals. Video auctions were used by only about three percent of the population, though 17 percent of the producers with greater than 100 animals used this method of marketing. This shows the importance of size in the ability to effectively use this marketing practice. Twenty-six percent of the producers used private treaty to sell animals. Smaller producers may use this marketing practice for the sale of a few animals of specific traits, such as a steer for showing through 4-H programs. Those with more than 100 animals are likely utilizing this marketing practice for selling larger lots of cattle. Retained ownership was used by about seven percent of the population, and approximately 14 percent of producers were members of a strategic alliance or cooperative. Overall, 39 percent of the producers used one or more of the alternative marketing arrangements, with 65 percent of the producers with greater than 100 animals using them. These results do, however, indicate the continued prevalence of conventional auctions for selling cattle, with private treaty being used by a substantial percentage of the producers. Video auction, retained ownership, and strategic alliances are newer methods and not as well known as conventional auction or private treaty.

Logit results indicate that producers without a college education or who derived a higher portion of their income from off-farm sources were more likely to utilize the conventional auction for marketing their cattle (Table 2). It is not surprising that this model had a relatively poor fit (McFadden's R-squared) since the majority of producers used the conventional auction to market at least a portion of their cattle. The more educated farmers or those who derived greater percentages of their income from the farm were less likely to utilize the conventional auction.

Producers who utilized more vaccinations, had heavier calf weaning weights, were larger, or who had a smaller percentage of purebred cows in their herds were more likely to utilize video auctions. These results indicate that the larger, better managed, commercial operations are more likely to utilize video auctions.

Producers who had heavier calf weaning weights, were less specialized, younger, had a smaller percentage of their income from off-farm sources, or had greater contact with their extension county agent were more likely to utilize private treaty sales. These results point to the more risk averse producer who is more dependent on farm income and is a better manager as the more likely seller via private treaty. Contact with the county agent may be particularly useful in cases where purebred animals are sold directly to persons involved in 4-H programs.

Younger farmers or those who had greater contact with the county agent were more likely to retain ownership of cattle through the feedlot stage. The Louisiana State University Agricultural Center has run the Calf-to-Carcass program with which a number of Louisiana producers have been involved in recent years. Through this program, producers retain ownership

of cattle through the feedlot and receive information on the animals' performance while in the feedlot. Producers can use that information in making future management decisions. Thus, it is not surprising that the county agent variable is significant.

Producers who had a higher percentage of purebred cows, did not hold a 4-year college degree, whose calves had higher weaning weights, or who had greater contact with a county agent were more likely to be involved in a strategic alliance or cooperative. These results indicate the importance of the Extension Service in encouraging involvement in strategic alliances.

A logit run was made such that, if any of the alternative marketing arrangements were used, the dependent variable was coded as "1", and "0" if not. Producers with more animals, a higher percentage of purebred cows, who had higher weaning weights, used more vaccinations, were more diverse, were younger, consulted more often with a county agent, or had a lower percentage of their income from off-farm sources were more likely to use one of the alternative marketing arrangements.

### **Conclusions**

Results of this analysis indicate widespread continued use of the conventional auction by the vast majority of producers. This result was expected, especially given that some animals, such as cull cows, are unlikely to be suitable for the other marketing arrangements. We were somewhat surprised at the low level of usage of video auctions by cattle producers, though the larger producers were much more likely to utilize this marketing practice than the smaller ones.

Private treaty sales were also more heavily utilized by the larger producers, though small producers also utilized them, likely for selling single animals, rather than larger lots of animals.

Results underscore the use of private treaty and retained ownership by younger producers, indicating that older producers are more traditional in their marketing practices, likely the result of years of marketing through traditional outlets. This suggests that, as new, younger cattle producers enter the industry, greater use of alternative marketing arrangements can be expected. Signs for other alternative marketing practices were also negative, though non-significant. Surprisingly, results of the College Degree variable were somewhat mixed, with those holding college degrees using the conventional auction less, but also using strategic alliances less. Though signs for the other arrangements suggest greater use by college educated producers, the signs are not significant.

Results of this study suggest that the more risk averse producers (using degree of diversification as a proxy for risk aversion) have greater interest in alternative arrangements, especially private treaty sales. Results also show reduced utilization of alternative marketing practices by producers who receive a greater percentage of their income from off-farm jobs, noting especially the reduced utilization of private treaty sales by these producers. These results likely indicate reduced interest in marketing issues by producers whose main source of income is from another source, or whose primary interest in farming is as a hobby.

County Extension Agents appear to influence cattle marketing practices. The Louisiana State University Agricultural Center has been instrumental in its research and extension programs in improving calf marketing programs. Working in cooperation with the Louisiana

Cattlemen's Association, the Louisiana Cooperative Extension Service has given producers the opportunity to retain ownership through the Calf-to-Carcass program, encouraging improved production and marketing activities. Extension has also been involved in relatively small-scale strategic alliances such as the Vernon Beef Alliance. These results indicate that university extension programs may be effectively used to educate producers about alternative marketing practices that can provide greater returns for producers.



## References

- Bailey, D. and M.C. Peterson. "A Comparison of Pricing Structures at Video and Traditional Cattle Auctions." *Western Journal of Agricultural Economics* 16(2): 392-403.
- Davis, E.E. "Are You a Member of a Beef Alliance ... Yet?" Mimeo, Texas Agricultural Extension Service, College Station, TX 1999.
- Dillman, D.A. "The Design and Administration of Mail Surveys." *Annual Review of Sociology* 17(1991): 225-49.
- Feder, G., R.E. Just, and D. Zilberman. "Adoption of Agricultural Innovations in Developing Countries: A Survey." World Bank Staff Working Paper No. 542, The World Bank, Washington, D.C., 1985.
- Gillespie, J., C. Davis, A. Basarir, and A. Schupp. "A Comparative Analysis of the Evolution of the Three Major U.S. Meat Industries." Bulletin No. 877, Louisiana State University Agricultural Center, November 2000.
- Greene, W.H. *Econometric Analysis*, 4<sup>th</sup> Edition. Prentice-Hall, Upper Saddle River, NJ, 2000.
- Lamb, R.L. and M. Beshear. "From the Plains to the Plate: Can the Beef Industry Regain Market Share?" *Economic Review* 83,4(Fourth Quarter 1998): 49-66.
- Lesser, W. *Marketing Livestock and Meat*, New York, Food Products Press, 1993.
- Peel, D.S. "Retained Ownership Opportunities for Oklahoma Cattle Producers." *Oklahoma Current Farm Economics* 67,3(September 1994): 14-34.
- Robison, L.J. and P.J. Barry. *The Competitive Firm's Response to Risk*. New York: MacMillan Publishing Co., 1987.

White, T.F. and D. Chesnick. "Holding On: Retained Ownership Helps Beef Co-Ops Adjust to Rapidly Changing Industry." *Farmer Cooperatives* (July 1993): 10-12.

Table 1. Numbers and Percentages of Responding Producers Using Alternative Marketing Practices.

Measure	Conventional Auction	Video Auction	Private Treaty	Retained Ownership	Strategic Alliance	Alternative Markets
----- 1-19 Animals, 67 Observations -----						
Number	58	1	18	7	9	27
Percent	87	1	27	10	13	40
----- 20-49 Animals, 98 Observations -----						
Number	94	0	19	3	12	31
Percent	96	0	19	3	12	32
----- 50-99 Animals, 104 Observations -----						
Number	101	6	29	2	15	41
Percent	97	6	28	2	14	39
----- 100+ Animals, 223 Observations -----						
Number	210	39	92	21	46	146
Percent	94	17	41	9	21	65
----- Weighted Percentages -----						
Percent	91	3	26	7	14	39



Table 2. Logit Analyses of Choice of Marketing Practices of Louisiana Cattle Producers.

Variable	Conventional Auction	Video Auction	Private Treaty	Retained Ownership	Strategic Alliance	Alternative Markets
Constant	1.1746 *	-3.8878 ***	-0.2098	-0.4806	-1.8213 ***	-0.2122
	(0.6147)	(0.0016)	(0.4700)	(0.6958)	(0.4747)	(0.4670)
ANIMALS	0.0006	0.0016 ***	0.0004	0.0004	0.0003	0.0007 *
	(0.0007)	(0.0005)	(0.0003)	(0.0004)	(0.0003)	(0.0004)
STOCKER	0.5626	-0.3127	0.3151	-0.2292	0.3000	0.0354
	(0.6341)	(0.6016)	(0.3069)	(0.4854)	(0.3263)	(0.3168)
PURECOWS	0.0000	-0.7225 *	-0.0000	-0.0897	0.1784 ***	0.2369 ***
	(0.0000)	(0.4092)	(0.0000)	(0.2036)	(0.0013)	(0.0011)
WEANING	-0.0003	0.0025 **	0.0017 ***	-0.0004	0.0012 *	0.0015 ***
	(0.0007)	(0.0012)	(0.0006)	(0.0008)	(0.0007)	(0.0006)
VACCINE	-0.0085	0.3328 ***	-0.0014	-0.0045	-0.0020	0.1025 *
	(0.0107)	(0.1213)	(0.0060)	(0.0374)	(0.0109)	(0.0525)
DIVERSE	0.1119	0.0602	0.1320 **	0.0003	0.0598	0.1859 ***
	(0.0854)	(0.1112)	(0.0608)	(0.0874)	(0.0693)	(0.0607)
AGE	0.0030	-0.0002	-0.0233 ***	-0.0216 **	-0.0018	-0.0198 ***
	(0.0074)	(0.0117)	(0.0057)	(0.0088)	(0.0050)	(0.0056)
COLLEGE	-0.3319 *	0.2161	0.1143	0.0899	-0.4486 ***	0.0419
	(0.1763)	(0.2547)	(0.1234)	(0.1930)	(0.1451)	(0.1208)
COUAGENT	0.0286	0.1230	0.1544 *	0.5003 ***	0.3395 ***	0.2670 ***
	(0.1261)	(0.1955)	(0.0898)	(0.1456)	(0.1049)	(0.0895)
OFFFARM	0.2978 *	-0.2578	-0.2442 **	-0.1240	0.1108	-0.2876 ***
	(0.1572)	(0.2791)	(0.1147)	(0.2160)	(0.1290)	(0.1115)
McFadden's R <sup>2</sup>	0.0349	0.2522	0.0945	0.0717	0.0580	0.1673
% Corr Predicted	94.309	91.260	68.496	93.496	83.333	68.089

\*, \*\*, and \*\*\* indicate the variable is significant at the 0.10, 0.05, and 0.01 levels, respectively. Numbers in parenthesis are standard errors.

