

Analysis of Factors Influencing Agritourism Businesses Perceptions about Expansion

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Abstract

Agritourism can provide both on-farm recreational activities for visitors and educational activities showing how food is produced. It can help farmers diversify and add income to their operations. This study assesses how characteristics of agritourism operations and perceived barriers may influence future plans to expand using a logit model. This information will be useful to policymakers and economic development professionals, as they look for contributors to future growth in the agritourism sector, as well as special assistance needs by expansion-minded firms.

Keywords: agritourism, expansion, barriers

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Background

Tennessee is a state characterized by many small farms, with 76,000 farms overall and an average farm size of 146 acres. With the prevalence of small farms and the importance of tourism to the state's economy (\$15.36 billion in economic impact to the state's economy in 2011), a niche market for agritourism enterprises has evolved in the state (Tennessee Department of Tourist Development 2012). From the 2002 Census of Agriculture to the 2007 Census of Agriculture, the number of operations with income from agritourism increased from 292 to 510 (USDA 2002, 2007). This growth in the number of agritourism enterprises may have recently been tempered by an overall slowdown in the state's economy, with 2008-2009 showing a 3.8 percent loss in real Tennessee GDP (BEA 2012, 2013) and a decline in travel expenditures in the state between 2005 and 2009 (Tennessee Department of Tourist Development 2012). Despite a recently slowed economy and uncertainty about future growth, results from this study suggest that some agritourism operators plan to expand.

Objective

The purpose of this study is to ascertain how characteristics of agritourism operations, such as size, type, and years in business, county characteristics, as well as potential business problems, may influence plans to expand operations via a logit model. Perceived barriers that operations may face are analyzed using factor analysis to develop factor scores which are then included in the logit model. This information will be useful to agritourism decision makers, including policy makers and economic development professionals, as they look for contributors to future growth in the agritourism sector.

Prior Research

Findings from several studies highlight the importance of location near population centers as influential on agritourism. Bagi and Reeder (2012) find that farms near central cities were more likely to participate in agritourism. Bernardo, Valentine, and Leatherman (2004) also note the geographic advantages of agritourism being located near urban areas. However, Brown and Reeder (2007) find that as the distance between the farm and a city of at least 10,000 in population increases, there is a greater likelihood of a farmer operating an on-farm recreation business. Conversely, they find that county population density had a positive impact on income from farm-based recreation.

Several studies note that farm size impacts agritourism. Bagi and Reeder (2012) note that agritourism participation should increase with farm size. However, in a Washington state study, they find that the size of farms involved in agritourism tends to be smaller than other types of agricultural production, with about 40 percent of the agritourism farms operating on 20 acres or less (Galinato et al. 2011). In dollar terms, findings by Brown and Reeder (2007) suggest that farms with farm-based recreation tended to have a higher net worth. Schilling, Sullivan and Komar (2012) find participation in agritourism varied across farm size as measured by sales volume of New Jersey farmers. Large farms are much more likely to report hosting agritourism than small farms. Small agritourism farms are, however, more likely to earn all of their farm income from agritourism activities.

Bagi and Reeder (2012) find that age has a positive influence on participation in agritourism activities. However, Brown and Reeder (2007) find that years of experience operating a farm does not significantly affect farmer participation in on-farm recreation or income from on-farm recreation.

Brown and Reeder (2007) observe that farms with in areas with high natural amenities scores (based on climate, topography, and water area) tend to be more likely to be involved in farm-based recreation. They also find that a higher recreation score for the county (recreation-related income, employment, and seasonal housing) has a positive influence on on-farm recreation based income.

Rainey et al. (2010) find that several business factors influenced Arkansas farmers' and landowners' attitudes toward participation in the agritourism industry. Three primary areas are identified including state's government support on training, certainty on laws and regulations, and state government's support on marketing and promotion. Their findings suggest that state promotion and agricultural extension agencies can play an important role in the future industry development. In a study of Montana farmers, researchers find that additional income, better use of resources, fluctuations in agricultural income, and employment of family members are listed as some of the more important reasons for diversifying into agritourism (Polovitz Nickerson, Black and McCool (2001). They find that larger farms view fluctuations in agricultural income, meeting the needs of a recreation/vacation market, tax incentives, and consumer education, as stronger motivations to diversify into agritourism than those with smaller farms Galinato et al (2011) note that state regulations or rules and land use rules or zoning concerns are common among agritourism operations in Washington State. Liability issues also created concerns for the agritourism operations.

Ollenburg and Buckley (2007) find that different farm tourism operators may have very divergent reasons for starting farm tourism enterprises, even if the resulting farm tourism products appear similar to users. They note for part-time farmers' reasons for starting a farm tourism businesses are primarily income-centered, providing an alternative to off-farm employment. In contrast, retirement farmers seek to gain social opportunities coupled with a less labor-intensive way to earn income.

Results from a survey of Missouri agritourism farms suggest that agritourism firms' goals may include capturing new customers, educating the public about agriculture, enhancing the family quality of life, better serving current customers, keeping the farmer active, and increasing direct sale of value-added products (Tew and Barbieri 2012). Years in agritourism business and number of marketing methods used have positive influences on the perceived importance of agritourism to the goal of farm profitability. Off-farm employment and number of marketing methods used positively influence the importance of using agritourism for the purposes of creating new market opportunities. Older operator age, years in business, number of employees, and number of marketing methods used significantly influence the overall goal of using agritourism to improve family connections (quality of life, keeping farm in the family, and providing family employment).

Data and Methods

Data

To obtain information for the study, a mail survey of Tennessee agritourism business operators was conducted in early 2013. Tennessee agritourism businesses were identified through the Tennessee Department of Agriculture's Pick Tennessee Products listings and/or referrals from County Extension agents across the state. A total of 450 contacts were identified for the survey. The first survey mailing occurred January 4, 2013, with a follow-up reminder postcard mailed January 15, 2013. A second mailing to those contacts who had not responded was conducted January 24, 2013. Of the contacts, 9 percent were bad addresses or the contact was deceased or out of business, leaving 429 viable contacts. In total, 171 responded, for an overall response rate of 39.9 percent. It should be noted that only businesses that were currently engaged in an agritourism enterprise were included in the analysis.

The survey contained questions about several topics. The respondents were asked about their current agritourism status and information regarding the characteristics of the agritourism operations, such as type of operation, sales, and years in business. Respondents were asked about the types of issues their business has faced during the past three years. They were also asked about their expectations regarding growth and expansion. A copy of the survey instrument is available upon request from the study authors.

Analysis of Barriers to the Agritourism Business

Several opinions about problems affecting agritourism businesses' start-up or operations during the past three years were examined using factor analysis to find common factors among these potential business barriers. The scales regarding opinions about problems were ordered 1=Not a Problem, 2=Somewhat of a Problem, 3=A Moderate Problem, and 4=A Serious Problem. The potential barriers, displayed in Table 1, were analyzed using principal factor analysis to look for factors with Eigenvalues of one or greater, the Kaiser-Guttman rule (Gorsuch 1983). Once the number of factors was determined based upon the Kaiser-Guttman rule, the factors analysis was conducted using that number of factors and then rotated with an orthogonal varimax rotation to examine the factor loadings (Thompson 2004). A coefficient of .5 or greater was used as the decision criterion for deciding which barriers would load onto a factor.

Factor Analysis of Barriers

The agritourism operators were asked to rate the importance of 23 barriers they may have experienced during the past three years of operating their business. The descriptions of the barriers and mean ratings of importance of these barriers are shown in Table 1. In order to identify commonalities among the barriers displayed in Table 2, a principal factor analysis was conducted. Four factors emerged as having Eigenvalues of one or greater. As shown in Table 2, rotated principal factor analysis revealed that the first factor explained 30.14 percent of the total variance, while the second factor explained 27.61 percent of the variation. Factors 3 and 4 explained 20.96 and 10.70 percent, respectively. The likelihood ratio test statistic for independent versus saturated was statistically significant at the 99 percent level.

Table 1. Potential Barriers Affecting the Start-Up or Operation of Agritourism Business over the Past Three Years

Potential barrier	Mean rating of seriousness of problem ^a (N=109)
Having enough capital for infrastructure, operation and marketing	2.257
Attracting customers	2.248
Deciding how to promote the business to target customers	2.165
Developing advertising and promotion materials	1.972
Obtaining permission for roadside signage	1.963
Identifying target customers	1.817
Staying current with new promotion methods	1.817
Finding/hiring employees	1.817
Obtaining liability insurance	1.716
Keeping and evaluating records	1.697
Dealing with increased competition	1.661
Obtaining financing	1.578
Training and managing employees	1.569
Maintaining visitor safety	1.495
Obtaining required permits or licenses	1.431
Understanding labor requirements	1.431
Scheduling employees	1.422
Scheduling groups for tours or parties	1.385
Facing challenges with local zoning	1.339
Providing excellent service	1.312
Meeting health department requirements	1.275
Maintaining good relationships with neighbors	1.229
Working with family members	1.211

Note: ^a1=not a problem, 2=somewhat a problem 3=moderate problem 4=serious problem

Table 2. Eigenvalues for Rotated Factors from Potential Barriers Using Principal Factor Analysis

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	3.35076	0.28131	0.3014	0.3014
Factor2	3.06946	0.73921	0.2761	0.5776
Factor3	2.33025	1.14070	0.2096	0.7872
Factor4	1.18955		0.1070	0.8942

N=109

LR test: independent vs. saturated: $\chi^2(253) = 982.16$ Prob> $\chi^2 = 0.0000$

The rotated factor loadings and uniqueness variances are shown in Table 3. Of the 23 barriers present to the business operators, all but nine loaded onto common factors. The factor loadings are shaded for each barrier. Four barriers, identifying target customers, deciding how to promote the business to target customers, developing advertising and promotion materials, and attracting

customers loaded onto the first factor. Hence, this factor was entitled as “Marketing”. The second factor, named “Regulatory” showed five loadings including local zoning, obtaining required permits or licenses, maintaining visitor safety, meeting health department requirements, and understanding labor requirements. The third factor showed three loadings, finding/hiring employees, training and managing employees, and scheduling employees and was entitled “Labor”. Lastly, obtaining financing and having enough capital for infrastructure, operation and marketing loaded onto a common factor called “Financial”. The nine barriers which did not load onto any of the five factors included obtaining permission for roadside signage, obtaining liability insurance, dealing with increased competition, providing excellent customer service, staying current with new promotion methods, scheduling groups for tours or parties, recordkeeping, maintaining visitor safety, maintaining good relationships with neighbors, and working with family members.

Table 3. Rotated Factor Loadings and Unique Variances for Potential Barriers

Potential Barrier (N=109)	Marketing	Regulatory	Labor	Financial	Independence
Obtaining permission for roadside signage	-0.002	0.380	0.030	0.493	0.612
Obtaining liability insurance	0.146	0.158	0.020	0.248	0.892
Obtaining financing	0.088	0.094	0.055	0.608	0.611
Facing challenges with local zoning	-0.231	0.650	0.063	0.133	0.503
Dealing with increased competition	0.288	0.082	0.114	-0.075	0.892
Identifying target customers	0.751	0.095	-0.010	0.010	0.427
Deciding how to promote the business to target customers	0.870	0.024	0.080	0.112	0.224
Developing advertising and promotion materials	0.741	-0.008	0.162	0.143	0.405
Attracting customers	0.840	0.006	-0.015	-0.057	0.290
Providing excellent customer service	0.231	0.448	0.162	-0.102	0.709
Staying current with new promotion methods	0.308	0.294	0.237	0.126	0.747
Obtaining required permits or licenses	-0.049	0.718	0.094	0.176	0.443
Finding/hiring employees	0.132	0.050	0.702	0.040	0.486
Training and managing employees	0.064	0.215	0.869	0.069	0.190
Scheduling employees	-0.015	0.102	0.762	-0.042	0.407
Scheduling groups for tours or parties	0.251	0.224	0.017	0.177	0.855
Having enough capital for infrastructure, operation and marketing	0.348	0.054	0.084	0.565	0.549
Maintaining visitor safety	0.153	0.560	0.199	-0.020	0.623
Meeting health department requirements	0.217	0.657	0.285	0.013	0.440
Understanding labor requirements	0.052	0.600	0.334	0.021	0.526
Keeping and evaluating records	0.370	0.467	0.315	0.027	0.546
Maintaining good relationships with neighbors	0.024	0.331	-0.008	-0.142	0.870
Working with family members	0.208	0.325	0.133	-0.132	0.816

Expansion Plans by Agritourism Businesses

As can be seen in Table 4, about 90 percent somewhat or strongly agreed they had set attracting more customers as a goal (N=130). About 82.31 percent expected their sales to increase. Hence most business operators expected some type of business growth. About 66.15 somewhat or strongly agreed that they planned to expand the number of products or attractions they offered. The statement with which the operators were in least agreement was that they planned to hire more employees. Only about 35.38 percent somewhat or strongly agreed with this statement. These results suggest that among the growth and expansion indicators that hiring more employees is the most limiting indicator.

For this study, if a firm strongly agreed or agreed both that they planned to expand their number of products and hire more employees, they were considered expanders (*Expand*=1), otherwise not (*Expand*=0). Hence, to be included in the category of “expanding” the operator had to agree to the last two statements in Table 4. While the first two statements in Table 4 were considered to be expectations about growth, the last two actually indicated plans to adjust resources to expand the business. As can be seen in the first row of Table 5 (see Appendix), the percentage of firms that agreed or strongly agreed that they planned to both expand their number of products and hire more employees (*Expand*=1) was close to 31 percent.

Table 4. Attitudes Regarding Future Growth and Expansion among Agritourism Operators

Growth and Expansion Perceptions	Percent (N=130)				
	Strongly Disagree	Disagree	No Opinion	Somewhat Agree	Strongly Agree
My goals include attracting more customers	4.62	1.54	3.85	16.92	73.08
I expect my sales to increase	2.31	3.85	11.54	32.31	50.00
I plan to expand the number of products	6.92	6.15	20.77	29.23	36.92
I expect to hire more employees	14.62	12.31	37.69	22.31	13.08

Model of Probability of Expansion Plans

Each operator is hypothesized to have an expected utility from expanding the agritourism business or not expanding which is not directly observable. The unobserved utility, U_{Expand} , is a function of observed characteristics, X , such that

$$(1) U_{Expand} = \beta'X + \varepsilon$$

where ε is the random component, β is a vector of parameters, and X is a matrix of the observed characteristics (see Table 5 and the discussion below for variable descriptions). Though the utility from choosing business expansion, *Expand*, cannot be observed, whether the business operator indicates their intention to expand is observable (*Expand* = 0, 1). The dependent variable, probability of choosing *Expand*=1, can be written as $Pr\{U_{Expand} = 1 \geq U_{Expand} = 0\} = \beta'X$

$F(\beta'X)$ (Greene 2012). If the logit model is chosen to estimate this probability, then F follows the logistic distribution, and probability of choosing expansion is

$$(2) \Pr(\text{Expand} = 1) = \frac{e^{(\beta'X)}}{1+e^{(\beta'X)}} \Pr(\text{Expand} = 1) = e^{(\beta'X)} / [1+e^{(\beta'X)}]$$

(a) *Hypothesized Effects of Explanatory Variables*

Following Bagi and Reeder (2012) and Brown and Reeder (2007), the value of sales from agritourism is hypothesized to have a positive effect on expansion plans. Therefore the sales dummies (*Sales1-Sales4*) compared with the largest sales category (*Sales 5*) are hypothesized to negatively influence plans to expand. While Brown and Reeder (2007) did not find experience significantly affects farmer participation in on-farm recreation or income from on-farm recreation, Tew and Barbieri (2012) find years in agritourism business has a positive influence on the perceived importance of agritourism to the goal of farm profitability. Given these mixed findings the sign on *YrsBus* is not hypothesized *a priori*. The coefficient on *DaysOpen* is hypothesized to be positive, with businesses that are open more days of the year being more willing to commit sufficient time resources toward expansion.

If a farmer has no off-farm income, this may signal that a larger share of their income earning efforts is focused on the farming operation, including their agritourism operation. In this case, it would be expected that *NoOffInc* would have a positive influence on expansion plans.

Effects of the types of agritourism attractions on the farms cannot be hypothesized *a priori*. However, some attractions were grouped that often occur together. Examples of these attractions would include animal exhibits and petting zoos (*AnimalExhib*), events including birthdays or other parties (*Events*), fall fun activities including pumpkin patches, corn mazes, hayrides, or haunted attractions (*FallFun*), on-farm food service or gift shops (*Food*), outdoor activities including day camps, overnight camping, horseback riding, fishing, or ziplines (*Outdoor*), and school or other tours (*Tours*). Other types of attractions included on-farm retail markets (*Retail*), pick-your-own operations (*PickYourOwn*), and classes or workshops (*FarmWork*). Recent attendance at workshops offered (*Workshops*) will likely have a positive influence on expansion plans. This hypothesis is based in part upon findings by Rainey et al. (2010).

It is anticipated that counties with interstate access (*Interstate*) would have a positive effect on expansion plans. Bagi and Reeder (2012) and Bernardo, Valentine, and Leatherman (2004) suggest there are geographic advantages of agritourism being located near urban areas. However, if an agritourism is located within a metropolitan area itself, there could be more limitations to expansion. Hence the sign on *Metro*, a dummy variable based on USDA/ERS's rural-urban continuum code (USDA/ERS 2013), will likely be negative.

Brown and Reeder's findings that higher recreation index scores influence farm-based recreation income would suggest that farmers' markets, agritourism operations, and travel expenditures all per 1,000 county population would positively influence perceptions about growth and expansion (*FmrMktPop1000*, *AgtourPop1000*, *TravExpPop1000*). However, these other attractions (farmers markets, other agritourism businesses, other tourist businesses) could also act as a

measure of competition intensity. Hence, the a priori signs on these variables are viewed as ambiguous. Similar logic would hold for the number of grocery stores (*GrocPop1000*) and full service (*FSResPop1000*) restaurants per 1,000 county population. The number of farmers markets (2012), agritourism operations (2007), grocery stores (2009), and full service restaurants (2008) are derived from the USDA/ERS Food Environment Atlas. The travel expenditures are derived from the U.S. Travel Association Research Department (2011) while 2012 county population data came from the Census Bureau.

The natural amenities scale (*NatAmen*) developed by USDA/ERS (USDA/ERS 1999) is expected to have a positive influence on expansion plans as it represents a measure of environmental qualities people prefer. Household income (*MedHHInc*) is hypothesized to have a positive effect. Prior research about the characteristics of visitors to Tennessee agritourism attractions suggests that the household income of adult visitors was higher than the median household income for Tennessee (Jensen et al. 2006). Results from that study also suggest the majority of adult visitors to these attractions were college graduates (Jensen et al. 2006). This would suggest expansion might be more likely in counties with higher percentages of Bachelor’s degree graduates (*BSGrad*).

With respect to the barrier factors, *Marketing*, *Regulatory*, *Labor*, and *Capital*, a positive sign on the barriers could reflect that these are barriers more often experienced by expansion-minded agritourism businesses, while a negative sign could indicate that the barrier is an impediment to expansion. Other barriers that did not load onto factors, included *Signs* and *LiabIns*. Again for these potential problems, the same hypotheses would apply.

(b) Marginal Effects

The estimated coefficients from the model cannot be interpreted directly as slopes, hence the marginal effects must be calculated. The marginal effect of a given continuous variable, X_n , from the X matrix is

$$(3) \frac{\partial EXPAND}{\partial X_n} = \frac{e^{(\beta'X)}}{[1+e^{(\beta'X)}]^2} \beta_n \quad \partial Expand / \partial x_n = (e^{(\beta'X)} / [1+e^{(\beta'X)}]^2) \beta_n$$

An example of such a continuous variable would be years in business (*YrsBus*) from Table 5. The marginal effects are calculated for each observation and then averaged.

If the variable X_n is dichotomous, the marginal effect is calculated using equation 2 with the variable X_n vary set at 0 and then 1 and all the other explanatory variables set at their means. Then the difference between the two probabilities is taken

$$(4) \Pr(Expand = 1 | x_n = 1) - \Pr(Expand = 1 | x_n = 0)$$

$\Pr(EXPAND = 1 | X_n = 1) - \Pr(EXPAND = 1 | X_n = 0)$. An example of a dichotomous explanatory variable would be whether the operator has off-farm income (*NoOffInc*) from Table 5 (see Appendix).

The overall fit of the model can be evaluated with log likelihood ratio test $LLR = -2(\log \text{likelihood model as coefficients set to zero but the intercept} - \log \text{likelihood full model} - \log \text{likelihood model})$. The test statistic LLR is distributed as χ^2 with the degrees of freedom being the number of coefficients restricted to zero. Another measure of fit is the percent of observations correctly classified by the model as *Expand=0* or *Expand=1*.

Results

Logit Model for Expansion

The estimated logit model and marginal effects are displayed in Table 6. Using the log-likelihood ratio test (LLR), the model was found to be significant overall. The logit model correctly classified 90.91 percent of the observations. Variables with significant negative estimated coefficients included *Sales1*, *Sales2*, *YrsBus*, *Food*, *Metro*, *FmrMktPop1000*, and *MedHHInc*. The estimated marginal effects for each of these variables are significant. The marginal effect on *AnimalExhib* was also significant.¹ These results suggest that smaller sized agritourism operations in terms of sales (*Sales1* and *Sales2*) are less likely to be expanders than firms with sales of \$50,000 and over. These findings are similar to those of Bagi and Reeder (2012) and Polovitz Nicerson, Black, and McCool (2001). In addition, as the businesses have been operating longer (*YrsBus*), the owner is less likely to plan expansion. This result could reflect that the business is in the resource maturity phase rather than the establishment or growth phases (Churchill and Lewis 1983). The negative sign on having on-farm food, concessions, or gift shops (*Food*), and on animal exhibits (*AnimalExhib*) may indicate these are not growth areas for agritourism businesses. However, to empirically answer this question would require further research. The negative sign on *Metro* indicates that agritourism businesses are more likely to indicate expansion in suburban or rural areas, unlike Brown and Reeder's findings about the population density's positive effect on participation in agritourism. However the results may support their finding regarding positive effect of distance between farm and city of at least 10,000. The number of farmers markets per 1,000 population (*FmrMktPop1000*) was negative, suggesting farmers markets may serve as competition for agritourism operations selling directly on-farm. In addition, the farmers markets may serve as another outlet for these farms' produce. Hence, more farmers markets might draw away on-farm sales and lessen the operator's wishes to expand the on-farm retail market component. An unexpected finding was that median household income of the county (*MedHHInc*) had a negative effect.

¹ For some variables the marginal effect was significant, while the estimated coefficient was not. There are two hypotheses tests used. The coefficient in the logit model gives the effect of the variable on the latent variable, while the marginal effect provides the effect on the probability of a positive outcome. The marginal effects are non-linear. The size of the effect and its significance depends on values of the explanatory variables. The method used computes the average effect rather than the effect at average values of the explanatory variables. Hence, each observation has its own effect on the probability, which depends on the values of all its individual explanatory variable values.

Table 6. Estimated Logit Model and Marginal Effects for Expansion Plans by Tennessee Agritourism Businesses^a

	Est. Coeff.	Std. Err.	Z		Marg. Eff.	Std. Err.	Z	
Intercept	-10.313	7.563	-1.36					
Sales1	-9.952	4.485	-2.22	**	-0.641	0.243	-2.64	***
Sales2	-11.646	5.203	-2.24	**	-0.750	0.279	-2.69	***
Sales3	10.783	5.771	1.87	*	0.695	0.334	2.08	**
Sales4	7.564	4.303	1.76	*	0.487	0.252	1.93	*
YrsBus	-0.749	0.314	-2.39	**	-0.048	0.016	-2.93	***
DaysOpen	0.021	0.013	1.62		0.001	0.001	1.77	*
NoOffInc	-2.359	1.815	-1.30		-0.152	0.111	-1.37	
Retail	-1.995	2.201	-0.91		-0.129	0.139	-0.93	
PickYourOwn	4.926	2.966	1.66	*	0.317	0.176	1.80	*
AnimalExhib	-4.988	3.118	-1.60		-0.321	0.187	-1.72	*
Events	-1.923	1.635	-1.18		-0.124	0.101	-1.22	
FallFun	4.376	2.978	1.47		0.282	0.179	1.57	
Food	-6.684	3.089	-2.16	**	-0.431	0.168	-2.56	***
Outdoor	-1.202	2.443	-0.49		-0.077	0.156	-0.50	
Tours	4.628	2.399	1.93	*	0.298	0.137	2.18	**
FarmWork	4.332	2.700	1.60		0.279	0.159	1.75	*
Workshops	7.974	3.478	2.29	**	0.514	0.184	2.80	***
Interstate	8.843	5.070	1.74	*	0.570	0.296	1.92	*
Metro	-5.168	2.965	-1.74	*	-0.333	0.172	-1.94	*
FmrMktPop1000	-282.952	140.804	-2.01	**	-18.232	7.856	-2.32	**
AgtourPop1000	29.521	18.233	1.62		1.902	1.076	1.77	*
TravExpPop1000	0.824	0.587	1.40		0.053	0.036	1.48	
GrocPop1000	1.098	7.642	0.14		0.071	0.492	0.14	
FSResPop1000	-19.657	16.143	-1.22		-1.267	0.992	-1.28	
NatAmen	0.767	0.967	0.79		0.049	0.061	0.81	
MedHHInc	-0.368	0.202	-1.82	*	-0.024	0.012	-2.05	**
BSGrad	0.415	0.281	1.48		0.027	0.017	1.60	
Marketing	-0.433	0.873	-0.50		-0.028	0.056	-0.50	
Regulatory	-1.034	1.186	-0.87		-0.067	0.075	-0.89	
Labor	3.112	1.267	2.46	**	0.201	0.067	3.01	***
Capital	-1.831	1.597	-1.15		-0.118	0.099	-1.19	
Signs	3.833	1.845	2.08	**	0.247	0.104	2.38	**
LiabIns	2.320	1.165	1.99	**	0.150	0.066	2.27	**
LLR Test 82.96 w 33 df***				Pseudo R ² =0.67				
Percent Correctly Classified= 90.91								

Variables with significant positive estimated coefficients included *Sales3*, *Sales4*, *PickYourOwn*, *Tours*, *Workshops*, *Interstate*, *Labor*, *Signs*, and *LiabIns*. The estimated marginal effects for each of these variables are also significant. In addition, marginal effects on several other variables are positive and significant. These include *DaysOpen*, *FarmWork*, and *AgtourPop1000*. The positive signs on the two sales categories suggest that those with sales of \$10,000 to \$50,000 are more likely to plan on expanding than those with sales of greater than \$50,000. Firms that were open more days of the year were more likely to indicate expansion plans. *PickYourOwn*, *Tours*, and *FarmWork* each appear to have a positive influence on expansion, suggesting these may be growth areas in agritourism. Workshops and classes (*FarmWork*) on the farm can inform visitors about how to use the products offered by the agritourism operation and can be offered to groups of visitors. Examples include gardening classes to inform visitors on how to grow plants sold from the farm or food preparation classes for produce sold from the farm. The positive sign on *Workshops* suggests that educational workshops can encourage agritourism operators to consider expansion.² Location factors positively influencing expansion plans are *Interstate* and *AgtourPop1000*. An interstate can provide access to additional customers, both from the local area and travelers passing through. Business operators may view having a cluster of agritourism businesses, as well as areas with high travel expenditures, as advantageous and more likely to attract visitors to their attractions. The positive coefficients *Signs* and *LiabIns* suggest that both of these are considered as serious problems for expanders. While other potential barriers that did not load onto common factors were considered in the logit, only *Signs* and *LiabIns* were significant. As firms are expanding they may wish to obtain more road signs, and encounter “red tape” or difficulties in dealing with the appropriate agencies. In addition, as firms expand, they will need to expand their liability coverage, hence the potential for greater issues with obtaining the correct level of insurance. As Galinato (2011) notes liability issues are of concern for agribusiness.

Conclusions

The results from this study suggest that several firm characteristics, including firm size, years in business, business type, and location factors influence plans for expansion. Firms more likely to plan expansion include newer firms, firms with medium sales, located in more rural counties, with interstate access. More established firms may be mature businesses for which expansion is not anticipated. Being among the smallest firms in terms of sales has a negative influence on expansion plans. These operations may be part-time lifestyle farms where expansion is not an objective. This result is bolstered by the positive influence of the number of days the operation is open. Presence of other agritourism operations in the county appears to have a positive influence on growth plans. This result could reflect that agritourism operators see the benefit of having several attractions in an area to draw visitors and travel expenditure levels in their county also had a positive influence on expansion plans.

² The attendance at workshops variable could potentially pose an endogeneity problem. For example operators who are expansion-minded might be more likely to attend workshops. Given this potential problem, we performed a Wu-Hausman test for endogeneity by regressing number of workshops attended on set of exogenous variables, calculating the errors, and then including these errors in the logit for expanders (Greene 2012). The calculated value for **H**, the Hausman statistic, does not exceed the critical value of χ^2 at the 95 percent confidence level, therefore the hypothesis of exogeneity of *Workshops* could not be rejected.

The results also show that several potential barriers influenced plans for expansion. Labor issues, which include training and managing employees, influenced expansion plans. Educational efforts focusing on how to manage an expanding workforce and train employees to effectively operate within the agritourism business might be of special importance to expanding firms. The issue of obtaining roadside signage influenced expansion plans also. Assistance connecting the firm with the appropriate agencies and completing needed paperwork may be of particular importance for expanding firms. Educational efforts focusing on business growth might focus on ways to mitigate these problems. Obtaining liability insurance also influenced plans for expansion. Insurance workshops that provide education assistance regarding the types and level of insurance needed to protect the agribusiness might be of interest to firms planning expansion.

The results from this study suggest that certain types of agritourism attractions appeared to be more likely for expansion and some less likely. Additional research should examine identification of the types of agritourism attractions that may be most viable candidates for future growth, as well as programs to best assist agritourism businesses as they expand into offering these attractions. Future research might also examine what factors lead to sustained agritourism business growth.

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Appendix

Table 5. Variable Names, Definitions, and Means for Model of Probability of Expansion

Variable Name	Definition	Mean (N=99)
Expand	1 if plan increase the number of employees, and products/attractions offered, 0 otherwise	0.31
<i>Farm Characteristics</i>		
Sales1, Sales2, Sales3, Sales4, Sales5	Agritourism gross sales revenues in 2012, 1 if in sales category, 0 otherwise: 1=Less than \$2,500,2=\$2,500 - \$9,999, 3=\$10,000 - \$24,999, 4=\$25,000 - \$49,999 (omitted 5=\$50,000 or greater)	0.15, 0.16, 0.19, 0.11,0.39
YrsBus	Years in current agritourism business	10.56
DaysOpen	Number of days of the year business is open	171.97
YrsBus	Years in current agritourism business	10.56
NoOffInc	1 if have no off-farm income, 0 otherwise	0.42
Retail	1 if have an on-farm retail market that sells farm products, 0 otherwise	0.46
PickYourOwn	1 if have an on-farm retail market that sells farm products, 0 otherwise	0.33
AnimalExhib	1 if have animal exhibits or a petting zoo, 0 otherwise	0.24
Events	1 if host weddings, birthdays, or other events, 0 otherwise	0.39
FallFun	1 if have corn maze, hay ride, haunted attraction, or pumpkin patch, 0 otherwise	0.32
Food	1 if have on-farm food service, concessions, café, or restaurant or an on-farm gift shop, 0 otherwise	0.27
Outdoor	1 if offer outdoor oriented activities (day camps, overnight camping, horseback riding, fishing, or ziplines), 0 otherwise	0.15
Tours	1 if offer school or other tours, 0 otherwise	0.47
FarmWork	1 if offer workshops or classes, 0 otherwise	0.17
Workshops	1 if attended workshop, conference or tour sponsored by the Tennessee Department of Agriculture, Center for Profitable Agriculture and/or Tennessee Farm Fresh Program in the last three (3) years, 0 otherwise	0.69
<i>County Characteristics</i>		
Interstate	1 if have county has interstate access, 0 otherwise	0.67
Metro	1 if in metropolitan area population 250K or greater, 0 otherwise (based on USDA Rural Continuum Codes)	0.52
FmrMktPop1000	Farmers' markets per 1000 population in county, 2012	0.02
AgtourPop1000	Number of agritourism businesses from 2007 Agricultural Census per 1000 population in county	0.14
TravExpPop1000	Travel expenditures in county per 1000 population, 2011	1.87
GrocPop1000	Grocery stores per 1000 population, 2009	0.20
FSResPop1000	Full service restaurants per 1000 population, 2009	0.62
NatAmen	USDA/ERS Natural Amenities Scale, 1999	-0.14
MedHHInc	Median household income, 2009-2012, in \$1,000	42.35
BSGrad	Percent of population over 25 with a Bachelor's degree, 2008-2012	18.12

Table 5. Continued

Variable Name	Definition	Mean (N=99)
Expand	1 if plan increase the number of employees, and products/attractions offered, 0 otherwise	0.31
<i>Perceived Barriers</i>		
Marketing	Factor analysis score for marketing issues being problems for business in past three years	-.001
Regulatory	Factor analysis score for regulatory issues being problems for business in past three years	0.05
Labor	Factor analysis score for labor issues being problems for business in past three years	0.03
Financial	Factor analysis score for financial issues being problems for business in past three years	-0.02
Signs	Obtaining permission for roadside signage, 1=not a problem, 2=somewhat a problem 3=moderate problem 4=serious problem	1.92
LiabIns	Obtaining liability insurance, ^a 1=not a problem, 2=somewhat a problem 3=moderate problem 4=serious problem	1.74