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Factors Influencing Tennessee Adults' Craft Hard Apple Cidery Visit Expenditures and Travel Distance

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Abstract

The craft hard apple cider industry is emerging in many areas of the United States, including Tennessee. Few studies exist regarding consumer preferences for visiting hard apple cider facilities (cideries). This study used a representative statewide survey of Tennessee alcoholic beverage consumers to examine their prior cidery visits, factors influencing cidery purchases, and expected expenditures and preferred travel distance to cideries. Most respondents had not visited a local cidery, but among those who had, most made hard apple cider purchases. Respondents stated they would travel about 61 miles to visit a cidery and spend about $38 annually while visiting cideries.

Keywords: hard cider, cidery, visitors, expenditures, travel, distance

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Background

Hard Cider Markets

Hard apple ciders have historic roots in American colonial culture (Smith and Lal, 2017) and have experienced a resurgence in popularity in the past decade. In 2019, the U.S. Alcohol and Tobacco Tax and Trade Bureau (ATTTB) reported production of 47.6 million gallons of bottled hard apple cider, compared with only 7.6 million gallons in 2010 (ATTTB, 2011, 2020). In addition, the number of cideries (facilities where cider is made) has grown rapidly across the United States, increasing to more than 800 in 2018, which is more than double the amount three years prior (Nurin, 2018).

Small craft ciders sold locally and regionally have gained a larger share of hard apple cider sales in the United States in recent years (The CiderJournal, 2017; Nurin, 2018).[1] Despite this rapid growth, little research exists regarding consumer preferences for hard apple ciders, visits to cideries, or preferences regarding cidery visits. This information is important because, for many cideries, on-site sales of hard apple ciders are an important component of their marketing strategy. In a survey of United States and Canada hard apple cideries, Snyder (2018) found that the majority of cideries are marketing their hard apple ciders on-site. In particular, among small-scale cider makers, about 60% sold hard apple ciders in their own tasting room by the glass and between 60%-70% sold bottles or cans at retail. Also, larger scale cideries were much more likely to use bottled/canned or kegged wholesale market outlets than were smaller scale cideries. Snyder's (2018) findings suggest craft cideries may be more reliant on sales at the cellar door compared with larger cideries. Hence, understanding influences on cidery visits and expenditures at cideries is of particular interest to smaller craft hard apple cider makers.

Roughly 40% of United States cideries are concentrated in just a few states (New York, California, Michigan, and Washington) (Conway, 2018). While other states have experienced less growth in their hard apple cider industry, they still have the potential for industry development based on promising hard cider apple growing conditions or significant tourism industries. For such areas where the cider industry is emerging, information about factors that may influence consumers' decisions regarding visiting a cidery is of particular interest. Examining consumer demographics and attitudes can help marketing efforts for cidery products and services. Information about the distance consumers would travel to a cidery can help with projecting market draw areas, while frequency of visits and expenditure information can assist with assessing potential market size for craft cideries in terms of sales.

Tennessee is an example of a state where small craft ciders are only recently emerging. The state only had seven cideries as of 2018. However, Tennessee lies within southern Appalachia, a region with a rich apple growing tradition (Veteto et al., 2011). Furthermore, tourism is an important contributor to the state's economy (Tennessee Department of Tourist Development, 2020). In 2019, the state's tourism expenditures were about $23 billion, and the state had 126 million domestic

[1]Some have suggested that craft hard apple ciders are those from smaller, independently owned facilities, making ciders pressed from fresh fruit not concentrates (CiderJournal, 2014).

person-stays. The state is home to 644 agritourism venues (USDA/NASS 2017). Tennessee has 70 wineries (TFWGA, 2020), 108 craft breweries (U.S. Brewer's Association, 2019), and 53 distilleries (American Distilling Institute, 2019).

Study Objectives

The purposes of this study were to ascertain alcoholic beverage consumers' past visits to hard apple cideries, factors influencing their decision to purchase hard apple ciders when visiting, and total cidery expenditures. Among those interested in visiting a cidery, factors that influence consumers' anticipated annual expenditures at cideries, and travel distance to a cidery were measured. These potential factors include demographics, alcoholic beverage expenditures and frequency of purchase, past hard cider purchases and cidery visits, preferences for amenities and services at cideries, and preferences for local foods.

Prior Studies of Cidery, Winery, and Brewery Visitors

Visitor Demographics

While prior studies of cidery visits are relatively few (Hughes and Wright, 2017; Smith and Lal, 2017), findings from studies of winery visits (Kolyesnikova and Dodd, 2008; Woods, Yang, and Nogueira, 2013; Stoddard and Clopton, 2014; Harrison, 2015; Lee, McCole, and Holecek, 2020) and brewery visits (Plummer et al. 2005; Kraftchick et al., 2014; Carr, Shin, and Severt, 2019) can also provide useful insights into factors influencing cidery visits and expenditures.

Results regarding the possible effects of gender on visiting a cidery, brewery, or winery have been mixed. Several studies have found that winery visitors were more likely to be female (Harrison, 2015; Lee, McCole, and Holecek, 2020). However, Woods, Yang, and Nogueira (2013) found that males were more likely to have made a visit to a local (in-state) winery within the past three years. Smith and Lal (2017) found that among cidery visitors, a larger percentage were female. However, studies of visitors to craft breweries have suggested that visitors tended to be composed of more males than females (Plummer et al., 2005; Kraftchick et al., 2014).

Mitchell and Hall (2006) profiled the typical winery visitor as 30-50 years old, while other studies have found the average winery visitor to be in their 40s (Geide, Harmon, and Baker, 2008; Stoddard and Clopton, 2014). Similarly, Kraftchick et al. (2014) and Plummer et al. (2005) both found that microbrewery visitors tended to be between 30 and 59 years old. Woods, Yang, and Nogueira (2013) found age to have a negative effect on the probability of respondents having made a visit to a local winery within the past three years, while Smith and Lal (2017) found that the majority of cidery visitors were under the age of 42.

In general, visitors to wineries, cideries, and craft breweries tend to have higher incomes and are college educated (Mitchell and Hall, 2006; Geide, Harmon, and Baker, 2008; Stoddard and Clopton, 2014; Harrison, 2015; Smith and Lal, 2017). Woods, Yang, and Nogueira (2013) found a nonlinear (positive, then negative) effect of income on the probability of respondents having visited a local winery within the past three years. They did not find significant effects of education

level on the probability of winery visits. Furthermore, they did not find significant effects of income or education on the post-winery visit purchase of the local wine.

Several studies have suggested a negative relationship between winery visits and urban visitors. Woods, Yang, and Nogueira (2013) found that rural consumers were more likely to visit a winery than urban consumers. Smith and Lal (2017) found that the majority of the visitors, nearly 56%, came from in-state.

Woods, Harmon, and Nogueira (2013) found that preferences for buying local foods had a positive influence on the probability of respondents having made past visits to a local winery. Prior research has shown that Tennessee consumers' preferences for local foods positively influenced local muscadine wine and other local wine purchases (Everett et al., 2017, 2018).

Woods, Yang, and Nogueira (2013) linked winery visits to the frequency of wine purchases. Their results showed that among those who purchased wine at least once per week, about 61% had visited a local winery, but among those who purchased only once per year, only 38% had visited a local winery.

Several studies have also investigated drivers of visits to craft breweries (Plummer et al., 2005; Kraftchick et al., 2014; Carr, Shin, and Severt, 2019). Kraftchick et al. (2014) found that brewery visitors tended to be male, educated, and middle-aged. They found that the most important reasons for visiting the brewery were to taste new beer, experience the local beer, increase their beer knowledge, visit with family/friends, and to buy beer. They noted that about 82% of the brewery visitors surveyed were from in-state. Plummer et al. (2005) studied beer tourism in Canada associated with an ale trail. They found similar demographics among ale trail visitors as those found by Kraftchick et al. (2014) for craft brewery visitors. They found nearly 62% of visitors were male, with more than 60% falling between the ages of 30 and 59. Carr, Shin, and Seavert (2019) reported that brewery visitors who identified as microbrewery beer drinkers were more likely to visit microbreweries. This finding is suggestive of repeat purchase behaviors. Like Kraftchick et al. and Plummer et al., their data showed that microbrewery visitors tended to be of higher income (more than $40,000 annually), positing that this could be due to product costs. Carr, Shin, and Seavert (2019) also found, in examining factors that were important to visitors, that a strong sense of local identity was nearly as important to microbrewery visitors as beer taste/quality.

Travel Distance, Frequency of Visits, and Expenditures

Smith and Lal (2017) showed that for the cider product to be considered locally grown, 74.3% of the respondents stated it would need to be produced within 100 miles. Furthermore, more than 60% of the respondents said they had traveled under an hour to visit the cidery. Smith and Lal's (2017) findings were that visitors went to cideries, breweries, or wineries about one to three times per year, with 14% stating it was their first time visit, 42% visiting one to three times per year, and 27.2% visiting four to eight times per year. In a study of Virginia winery visitors, Harrison (2015) showed that the largest percentage of respondents had visited a local winery one to three times in the past year. Their results also showed that of those visiting wineries, 32.5% planned to spend

$25 or less, and about 47% planned to spend $25-$100 at the winery. Trechter, Hadley, and Parks (2008) surveyed wineries and cideries and found that the typical visitor was estimated to spend between $25 and $35 per visit. Woods et al. (2015) reported that local wine expenditures were most likely cited as less than $20 per month. They found fruit wine consumption had a positive effect on local wine expenditures, suggesting a possible linkage between preferences for fruit wines and local wines. Smith and Lal (2017) found that more than 70% of the respondents were first-time visitors to the cidery location, and 60% were first-time visitors to any cidery in the Hudson Valley region.

Relationship between Time and Travel in the Tourism Experience

As noted by Smith and Lal (2017), most visitors will either likely visit cideries on a day outing, or will make their cidery visit as part of a larger tourism trip. A small craft cidery in an emerging hard apple cider industry is not likely to be the primary reason for a multi-day tourist outing. In-state consumers are more likely to take a day trip to visit a cidery. Hence, costs incurred by cidery visitors are primarily from travel and expenditures on hard apple ciders at the cidery facility. Other agri-tourism research by Mellstrom and Murphy (2017) found that destination location is a strong influence on agritourism visits. They reported that single-day destinations near metropolitan areas tended to attract more visitors compared with destinations farther away. Their results are suggestive that agritourism visitors, for example those to cideries, may prefer venues that are perhaps far enough from metro areas to experience rural landscapes, but within driving distance for a day visit.

Travel costs include not only explicit expenditures (e.g., fuel) but also time (Prideaux, 2002). Travel to tourism sites is also determined by the situation of the traveler since higher income travelers may face higher opportunity costs of travel because of foregone earned income opportunities but also may have access to faster means of travel (Prideaux, 2002). On the other hand, some travelers may see getting to a tourism destination as part of the experience, especially if time devoted to the effort has a low opportunity cost. This relationship is particularly important since many households' work time has increased since the 1980s (Castells, 2000; Echtelt, Glebbeek, and Lindenberg, 2006).

Studies of the Visitor Perceptions of Overall Visit Experiences

A visitor to a cider-making facility may come to sample and purchase the product offered by the venue. However, they may also travel to the facility to experience the on-site amenities and the overall trip experience. Gomez and Kelley (2013) examined winery customer satisfaction with the tasting room experience. They found that wine knowledge and helpfulness of pourers, as well as speed of pours, influenced wine purchases. They also reported that food items for sale and sounds in the pouring room had little influence. A tasting room, however, is but one part of a winery tourist's experience. The term "winescape" has been used to describe the overall atmosphere associated with a winery experience, such as the vineyard and associated landscapes, facilities for tasting, winemaking facilities, etc. (Hall et al., 2000). Prior research has shown that while the primary motivations for wine tourists are to taste wines and purchase wines, other important

motivations include learning more about wine, having a day out in rural setting, and experiencing the atmosphere (Bruwer and Alant, 2009; Bruwer and Lesschaeve, 2012; Back, Bufquin, and Park, 2018). Hence, not only would cidery visitors taste and buy hard apple ciders, but they would also visit to learn more about hard apple ciders, tour cider-making facilities, and perhaps enjoy a variety of other amenities associated with the cidery. Carmichael (2005) notes that both physical elements (such as wine tasting facilities) and services (such as tours) are important to the winery tourism visitor experience. McDonnell and Hall (2008) list several factors that may influence wine cellar visits, including outside attractiveness, inside attractiveness, ambience, staff, the product itself, merchandise, and brochures. Ratz and Dryer (2014) added guided visits/tours, seminars and courses, and culinary offerings as other factors influencing wine cellar visits. In their study, they found that wine quality was rated as most important, followed by service and advice, staff friendliness, and attractiveness of the region.

The term "beerscape" has also been used in reference to brewery atmosphere (Carr, Shin, and Seavert, 2019). Studies of microbrewery visitors' preferences for beerscape attributes have focused on a variety of beers, embodiment of local culture, beer cost, and facilities. Missing from their beerscape is the notion of the facility visited being co-located with the crop used in making the beverage (barley and hops for beer, grapes for wine or apples for hard ciders) where it is produced. Hall et al. (2003) applied a similar context to food tourism, particularly where focused on local foods production and the ties to agricultural production, customs, and cuisines.

Due to the emerging nature of hard apple cideries in many regions, visitor perceptions of "ciderscapes" or the overall hard apple cidery visit experience are lacking. However, if the cideries are located on or nearby orchard land to produce the apples used in cider making, the venue takes on aspects of agri-tourism, where visitors might come to see apple orchards either located on the property or nearby. Research by Gao, Barbieri, and Valdivia (2014) on agri-tourism visitors found that landscape features associated with farms were important to visitors. Carpio, Wohlgenant, and Boonsaeng (2008) found that U.S. agri-tourism visitors tended to visit agri-tourism venues about 10 times annually at a cost of $88 per trip with an average distance traveled to the farm of 126 miles. They found that those who were older and lived in urban areas were less likely to have visited farms recreationally, whereas those who had young children in the household and larger household sizes were more likely to have visited. The number of recreational trips to farms was influenced negatively by trip cost and residing in an urban area. The number of trips was positively influenced by income, male gender, older age, and importance of the rural landscape.

Research Design: Survey Instrument, Data Collection, and Model

Survey Instrument and Data Collection

A panel of Tennessee residents aged 21 years or older who at least occasionally consumed alcohol was recruited by Qualtrics for this survey. The online survey was conducted by Qualtrics in July 2019. The sample was drawn using response quotas to represent Tennessee's percentages of female (50.8%) and age categories (27.0% aged 21-34; 35.1% aged 35-54; and 37.9% aged 55 or older) (Census Bureau, 2019). Before the online survey was fielded, an online pretest with 50

responses was conducted, and the survey instrument was revised based upon these pretest results. A total of 1,261 Tennessee residents responded to the online survey. Appropriate human subjects protocols were followed and approved by the Institutional Review Board under UTK-IRB-17-03525-XM.

The survey instrument contained several sections, including questions about hard ciders, past cidery visits, interest in visiting a cider-making facility, travel distance, expenditures, cidery attributes, attitudes toward locally produced foods, and demographics. The survey instrument defined hard cider as cider made from apples that are fermented into an alcoholic beverage.

Regarding cidery visits, respondents were asked whether they had visited or would be interested in visiting a cidery in the future. Past cidery visitors were also asked about whether they purchased hard ciders and, if so, how much they spent. They were also asked about the importance of factors that influenced their decision to purchase ciders when they visited a cidery. These possible factors included cider taste, price, reputation, container types, expert advice, cidery visits before purchasing, samples before buying, ability to support a local business, the cider being made on-site, and the cider apples being grown on-site.

Those who had visited a cidery or were interested in doing so in the future were asked the farthest distance they would travel to visit a cidery, how many times a year they would visit, how much they would spend per visit on hard apple cider, and the importance of amenities and services on future hard apple cidery visits.

In addition, the respondents were asked their agreement with the importance of local foods. They were also asked about alcoholic beverage purchase frequency (i.e., beer, wine), willingness to try new beverage types and brands, and demographics and household characteristics.

To help identify amenities or services that might attract cidery visitors, several questions were asked about possible cidery services. Respondents were asked to rate the importance of visiting a cidery that had a tasting room, an apple orchard on-site, educational tours about how hard apple cider is made, cider on-site being offered for purchasing and consumption, live music or other special events, food and cider sample pairings being offered, and restaurants on-site or nearby. A copy of the survey instrument is available from the authors upon request.

Future Cidery Visits Model

In this study, two dependent variables are modeled for the i^{th} consumer, $Travel\ Distance_i$ and $Annual\ Expenditures_i$. In each case, the dependent variable is hypothesized to be influenced by a vector of respondent demographics, past cider purchases and cidery visits, alcoholic beverage purchases, expenditures, local foods attitudes, and preferences for services and amenities at hard apple cideries, $\boldsymbol{X}_i$. The equations can be expressed as:

$$i. \quad Travel\ Distance_i = f(\boldsymbol{X}_i) \tag{1}$$

$$ii. \quad Annual\ Expenditures_i = f(\boldsymbol{X}_i) \tag{2}$$

where $\mathbf{X}_i$ = (Female$_i$, College Graduate$_i$, Age$_i$, Age Squared$_i$, 2018 Household Income$_i$, Middle$_i$, West$_i$, Rural/Small Town$_i$, Suburb$_i$, Farm Background$_i$, Have Purchased Hard Cider$_i$, Have Visited Cidery$_i$, Purchase Local Foods$_i$,Weekly Beer Purchaser$_i$, Weekly Wine Purchaser$_i$, Alcohol Beverage Expend$_i$, Try New Types$_i$, Try New Brands$_i$, Tasting Room$_i$, Orchard$_i$, Educational Tours$_i$, Purchase and Consume$_i$, Events$_i$, Pairings$_i$, Restaurant$_i$). The definitions for each of these variables are contained in Table 1.

Table 1. Variable Names, Definitions, and Means for the Seemingly Unrelated Regression Model of Tennessee Consumers' Expected Travel Distance to Hard Apple Cideries and Expected Annual Hard Apple Cider Expenditures at Cideries

Variable Name	Definition	Mean (N = 1,055)
Dependent Variables		
Ln travel distance	Natural log of distance in miles would travel to visit a cidery (untransformed value)	3.842 (61.354)
Ln annual expenditures	Natural log of expected annual expenditures at cideries (untransformed value)	2.901 (38.461)
Explanatory Variables		
Female	1 if female, 0 otherwise	0.524
College graduate	1 if college graduate, 0 otherwise	0.432
Age	Age in years	47.427
Age squared	Age squared	2507.939
2018 household income	Household income for 2018 in $10,000	70.076
Middle	1 if located in Middle Tennessee, 0 otherwise	0.389
West	1 if " " West Tennessee, 0 otherwise	0.183
East	1 if " " East Tennessee, 0 otherwise (omitted)	0.428
Rural/small town	1 if reside in a rural area or small town, 0 otherwise	0.428
Suburb	1 if " " suburban area, 0 otherwise	0.438
Metro	1 if " " urban area, 0 otherwise (omitted)	0.134
Farm background	1 if have farm background, 0 otherwise	0.271
Have purchased hard cider	1 if have purchased hard cider before, 0 otherwise	0.643
Have visited cidery	1 if have visited cidery, 0 otherwise	0.188
Purchase local foods	Try to purchase local foods whenever possible, 1 = strongly disagree, …, 5 = strongly agree	4.068
Weekly beer purchaser	1 if purchase beer weekly, 0 otherwise	0.282
Weekly wine purchaser	1 if purchase wine weekly, 0 otherwise	0.187
Weekly alcoholic beverage Expend	Weekly alcoholic beverage expenditures in dollars	18.313
Try new brands	Likelihood of trying new brands of alcoholic beverages, 1=extremely unlikely, …., 5 = extremely likely	4.161
Try new types	Likelihood " " new types alcoholic beverages, 1 = extremely unlikely, …., 5 = extremely likely	4.017

Table 1. (continued)

Variable Name	Definition	Mean (N = 1,055)
	Importance of services to visiting a cidery (1 = not important at all, …5 = extremely important):	
Tasting Room	Tasting room	3.980
Orchard	Apple orchard on-site	3.518
Educational Tours	Educational tours about how hard apple cider is made	3.608
Purchase and Consume	Ability to purchase and consume on-site	3.851
Events	Live music or other special events	2.874
Pairings	Food and cider sample pairings offered	3.580
Restaurants	Restaurant on-site or nearby (within 15-minute drive)	3.413

A seemingly unrelated regression (SUR) model with correlated error terms is used (Greene, 2018). The model equations can be expressed as:

$$iii. \quad Travel\ Distance_i = \boldsymbol{X_i \beta^{TD}} + \varepsilon_i^{TD} \tag{3}$$

$$iv. \quad Annual\ Expenditures_i = \boldsymbol{X_i \beta^{YE}} + \varepsilon_i^{YE} \tag{4}$$

where $\boldsymbol{\beta^{TD}}$ and $\boldsymbol{\beta^{YE}}$ are vectors of parameters to be estimated and ε_i^{TD} and ε_i^{YE} are error terms. The correlations between the error terms are measured by $\rho_{TD,YE}$. The model is estimated in the Stata statistical software package, StataSE Version 16.0 (StataCorp, 2019). The conditional mixed process estimator with multilevel random effects and coefficients (CMP) algorithm is used to estimate the model.

The models are tested for multicollinearity among the explanatory variables using a Variance Inflation Factor (VIF) statistic, where a value exceeding 10 indicates multicollinearity (Chatterjee and Hadi, 1986) and the Condition Index (CI), where a value exceeding 30 indicates multicollinearity (Belsley, 1991). The models are also tested for heteroscedasticity using a Breusch-Pagan test (Breusch and Pagan, 1979).

Results

Of the 1,261 respondents, 103 (8.17%) had not visited a cidery in the past and had no interest in visiting a cidery in the future. About 10.71% had visited a cidery in the past, whereas 81.13% had not visited a cidery but were interested in doing so in the future. Smith and Lal (2017) found that about 70% were first-time visitors to the cideries where their surveys were conducted. The lower percentage of visitors in this study likely reflects the low number of cideries in the state. Among the 1,126 who had visited or had a future interest in visiting a hard apple cidery, a total of 1,055 answered all the questions to estimate the models as shown in Table 1.

Prior Cidery Visitors

Among those who had visited a cidery, notably 82.96% purchased hard apple cider when they visited the cidery. This finding could potentially suggest that if cideries attract visitors on-site, a large percentage of these visitors would make a hard apple cider purchase when at the facility. However, it should be noted that given the low numbers of cideries located in Tennessee, those who have visited a cidery in the state may be more cider-involved consumers than cidery visitors in states where many are located. As cidery numbers expand in Tennessee, the facilities may draw a wider range of visitors, and this percentage purchasing could be lower. Gomez and Kelley (2013) found that among winery visitors, about 95% said they had or would be buying wine after tasting. The lower rate among hard apple cidery visitors compared with winery visitors may in part be due to less familiarity with hard apple ciders than wines. Among those who had visited a cidery, the visitors indicated they had spent about $11.07 on average per visit.

Those who had visited a cidery were asked what factors were important influences on them choosing to spend money at the cidery, with 1 being not important at all, and 5 being extremely important. The mean ratings of importance of each factor are shown in Table 2. Means comparison *t*-tests were also calculated to evaluate which means were statistically different from each other at the 95% confidence level. Table 2 shows that among those who had visited a cidery in the past, the cider taste was the most important influence on purchasing decision. The importance rating for this factor was statistically greater than any of the other factors. This factor was followed in importance by being able to sample before you buy, good reputation of the ciders, and the chance to help support a local business. Statistically, the least important factor was that the hard cider apples were grown on-site. It should be noted that this reason was statistically less important than the cider being made on-site. If each of the reasons is compared with the importance of price, statistically, hard apple cider taste was rated as more important. However, cider apples being grown on-site was statistically rated as less important.

Table 2. Importance Ratings of Factors Influencing Hard Apple Cider Purchase Decisions at Tennessee Hard Apple Cideries Among Consumers Who Have Visited Tennessee Hard Apple Cideries in the Past

Factors Influencing Decision to Purchase Hard Apple Cider	**Mean Rating (1 = not at all important, …, 5 = extremely important) (N = 112)***	
Cider tastes good	4.375	
Sample before buy	3.991	b
Good reputation	3.875	b,c
Help support local business	3.866	b,c,d
Price	3.768	c,d,e
Cider is made on-site	3.705	c,d,e
Container types available on-site	3.679	d,e
On-site expert cider advice	3.670	d,e
Experience visiting cidery first	3.625	e
Apples grown on-site	3.313	

*Note: Like letters represent means that are not found to be statistically different at the 95% confidence level.

Future Cider Visits Travel Distance and Annual Expenditures

The means of the dependent and explanatory variables are presented in Table 1. Notably, the respondents would travel just over 61 miles on average to visit a cidery. This finding is similar to those by Smith and Lal (2017) and Woods, Yang, and Nogueira (2013). On average, the visitors expect to spend around $38.46 per year. Note that this was about $16.48 per visit with just over 2.3 visits per year. The annual visits finding is similar to Smith and Lal's (2017) findings regarding visits per year. The expenditure per visit ($16.48) is lower than prior findings for the typical winery and cidery visitors' spending at least $25 to $35 (Trechter, Hadley, and Parks, 2008; Harrison, 2015); however, that number is higher than the $11.07 that past visitors in this study indicated they had spent on prior visits. This discrepancy could suggest some potential overstatement of what people expect they would spend compared to what prior visitors indicated they actually spent. The number of anticipated annual visits is comparable to that found by Smith and Lal (2017) and Harrison (2015). In our study, about 64.3% of respondents had tried a hard apple cider previously. However, less than 11% of our respondents had visited a hard apple cidery in the past. This value is considerably lower than Smith and Lal's (2017) findings for visitors to Hudson Valley, New York, where 40% of cidery visitors had visited cideries in the region previously. This latter difference could, in part, be driven by the relatively small number of cideries in Tennessee compared with New York. Snyder (2016) found that about 16% of mid-Atlantic cider consumers purchase cider at tasting rooms. Approximately 40% indicated they would travel between 30 and 60 minutes to visit a new tasting room.[2]

The mean Likert ratings for possible cidery amenities are shown in Table 1. While *Tasting Rooms* received the highest Likert ratings at 3.98, having special *Events* received the lowest Likert rating at 2.87.

The estimated SUR model for distance traveled and annual expenditure is shown in Table 3. The dependent variables were evaluated for non-normality and found to be skewed. Furthermore, Breusch-Pagan tests for heteroscedasticity were conducted for both the *Travel Distance* and *Annual Expenditures* models and were found to exhibit heteroscedasticity based on the Breusch-Pagan calculated statistics (χ^2 = 34.84, 1 df and χ^2 = 1,911.03, 1 df). A natural logarithm transformation of the dependent variables was then used in estimating the model to correct for these issues. The Breusch-Pagan test for heteroscedasticity was conducted after the natural log of the dependent variable was taken for *Travel Distance,* and heteroscedasticity was no longer found to be an issue. However, it remained for the *Annual Expenditures* model but at a reduced level. Therefore, robust estimators were used in the SUR model. As can be seen by the LLR Test against an intercept-only model, the estimated model is significant overall. Furthermore, the estimated correlation coefficient between the two equations (*Ln Travel Distance* and *Ln Annual Expenditures*) is significant, suggesting the use of the SUR approach is appropriate. To test for possible multicollinearity issues, variance inflation factor (VIF) and Condition Index analyses were conducted for the explanatory variables. The mean VIF was 5.12, which does not suggest serious issues with multicollinearity among the explanatory variables. Furthermore, the Condition

[2]A comparison of the respondent demographics with the Tennessee population is provided in Jensen et al. (2019).

Index was 18.57, which was below 30, and hence did not suggest multicollinearity to be a serious problem.

Table 3. Estimated Seemingly Unrelated Regression Model of Tennessee Consumers' Expected Travel Distance to and Annual Hard Apple Cider Expenditures at Tennessee Hard Apple Cideries and Estimated Effect of Variables on Percent Change in Expected Travel Distance to and Annual Expenditures at Tennessee Hard Apple Cideries

	Estimated Coefficients[a]		Effect on Percent Change in[b]	
Variable Name	**Log Travel Distance**	**Log Annual Expenditures**	**Travel Distance**	**Annual Expenditures**
Intercept	1.164***	1.224***		
Female	0.177***	-0.018	19.357***	-1.830
College graduate	0.085	-0.185***	8.888	-16.891***
Age	0.039***	-0.026*	3.979***	-2.538
Age squared	-0.000***	0.000**	-0.033***	0.029**
2018 household income	0.003***	0.002*	0.338***	0.153*
Middle	0.016	-0.150**	1.569	-13.958**
West	0.258***	-0.109	29.481***	-10.296
Rural/small town	0.320***	0.357***	37.651***	42.857***
Suburb	0.216***	0.143	24.154***	15.344
Farm background	0.072	0.077	7.480	8.032
Have purchased hard cider	0.136***	0.149**	14.596**	16.042*
Have visited cidery	-0.289***	0.274***	-25.084***	31.459**
Purchase local foods	0.027	0.076*	2.772	7.945*
Weekly beer purchaser	0.032	0.142*	3.287	15.211*
Weekly wine purchaser	-0.160**	0.088	-14.763***	9.234
Weekly alcoholic beverage expend	0.027***	0.012***	0.524***	1.232***
Try new brands	0.042	0.004	4.285	0.417
Try new types	0.029	0.149***	2.949	16.065***
Tasting room	0.026	0.033	2.601	3.360
Orchard	0.019	-0.060	1.884	-5.848
Pairings	0.018	-0.025	1.850	-2.512
Educational tours	0.088***	0.049	9.233***	4.988
Purchase and consume	-0.005	0.118***	-0.461	12.534***
Events	-0.032	0.049	-3.143	5.020
Restaurant	0.003	0.020	0.344	1.998
ρ_{TDYE}	0.163***			
LLR Test (df = 50) = 389.35***				
N = 1,055				

[a] ***denotes significance at α = .001, **denotes significance at α = .05, *denotes significance at α = .10.
[b]Standard errors were calculated using the Delta method (Oehlert, 1992) in STATA 16.0 Lincom module.

The estimated coefficients for the explanatory variables in the *Ln Travel Distance* and *Ln Annual Expenditures* models are shown in the second and third columns of Table 3. The estimated effect of a 1-unit change in each explanatory variable on the percentage change in the untransformed dependent variables (*Travel Distance* and *Annual Expenditures*) is shown in columns 4 and 5 of Table 3. These values are calculated as $(\exp(\beta_k) - 1) \times 100$ using the estimates in columns 2 and 3.

Several of the consumer demographic characteristics influenced *Travel Distance* and *Annual Expenditures*. Shown in column 4, compared with their male counterparts, female consumers would travel 19.4% farther to visit a cidery. This result is similar to prior studies that have found positive effects of female gender on winery or cidery visits (Harrison, 2015; Smith and Lal, 2017; Lee, McCole, and Holecek, 2020;). As can be seen in column 5, however, female gender (*Female*) did not significantly influence anticipated annual expenditures at cideries. Recent Nielsen statistics report that hard cider drinkers are about evenly split across genders (51% male and 49% female) (Newhart, 2019).

Being a college graduate (*College Graduate*) did not significantly influence the distance the respondent would travel to visit a cidery; however, college graduates indicated they would spend about 16.9% less at cideries in a year than those without a college degree. Although Woods, Yang, and Nogueira (2013) found no effect of income on post-winery purchases of local wines, this finding is somewhat surprising, as other studies have found that winery and cidery visitors tended to be college educated (Mitchell and Hall, 2006; Geide, Harmon, and Baker, 2008; Stoddard and Clopton, 2014; Harrison, 2015; Smith and Lal, 2017).

The results in Table 3 show household income (in 2018 thousand dollars) has positive and significant effects both on *Travel Distance* and on *Annual Expenditures*. As household income increases by $10,000, the respondent indicated they would travel 0.34% farther and spend 0.15% more. Hence a $100,000 increase in household income would result in 3.4% greater distance that the respondent would travel to visit a hard apple cidery and 1.5% greater hard cider expenditures annually. This finding is similar to prior research showing winery and cidery visitors to have higher incomes (Mitchell and Hall, 2006; Geide, Harmon, and Baker, 2008; Stoddard and Clopton, 2014; Harrison, 2015; Smith and Lal, 2017).

A squared term for *Age* was included in both equations, and the effect of *Age* on distance traveled and expenditures is calculated as $\frac{-\beta_{Age}}{2*\beta_{Age\ Squared}}$. In the case of *Travel Distance*, the coefficient sign on *Age* is positive, but the coefficient sign on *Age Squared* is negative (Table 3). Hence, age of respondent has a positive effect on travel distance up to a certain age (59.05 years) and then begins to diminish. The turning point of the effects of *Age* in *Annual Expenditures* is 44.83 years, with age having a negative effect up to that age, and then a positive effect. Combined, these results suggest that those who are more likely to travel farther and spend more money annually at cideries are in the 44-60 year old age category. They are similar to findings by Mitchell and Hall (2006). However, it is dissimilar to findings by Smith and Lal (2015) that the majority of cidery visitors were under age 42. According to 2018 statistics, about 25% of hard apple cider consumers are aged 30-49 years old (Statista, 2019).

Region within the state and urbanization of residence influenced *Travel Distance* and *Annual Expenditures* (Table 3). Compared with residents in the *East*, residents in the *West* were willing to travel 29.48% farther to visit a cidery. This finding may reflect differences in expectations about travel distances to cideries in the western part of the state. Consumers may be basing their expectations on where wineries, breweries, and distilleries are currently located, the majority of which are located in the middle or eastern parts of the state. In addition, according to the 2017 Census of Agriculture, Tennessee had 644 agritourism operations, but less than 25% of these are located in the western part of the state (USDA/NASS, 2017).

No significant effect on distance the respondent would travel to a cidery was found for Middle Tennessee. However, residents in the middle part of the state were willing to spend about 13.96% less annually at cideries than those in the East. Being a resident of a rural area or small town (*Rural/Small Town*) increased the distance the respondents would travel to visit a cidery by about 15.34%, compared with metro area respondents. Likewise, suburban residents would travel 24.15% more miles than metro area residents. These results may reflect the fact that more rural or suburban residents may expect to travel farther distances to services, such as cideries, than metro residents. Prior research has found that rural consumers were more likely to visit a winery than urban consumers (Woods, Yang, and Noguiera, 2013). Interestingly, residents of rural areas or small towns anticipated spending about 42.86% more annually than metro residents.

Having purchased hard apple cider (*Have Purchased Hard Cider*) before positively influenced both expected travel distance to cideries and annual expenditures (Table 3). Those who had purchased hard apple ciders before would travel 14.60% farther to visit a cider than those who had not, and they would spend about 16.04% more than those who had not. These findings could reflect revealed preferences and signal that once consumers have tried hard apple ciders, they may be more interested in traveling to cideries and purchasing local craft hard apple ciders while visiting them. This result could signal the importance of getting alcoholic beverage consumers to try hard apple ciders beyond the cidery door. Once a consumer has tried hard apple ciders, they are willing to travel farther and spend more once they are at cideries. However, to fully measure the effects of prior hard apple cider purchases on visits to hard apple cideries and on-site expenditures, additional research should include data from surveys of cidery visitors conducted on-site.

Surprisingly, the effects of having visited a cidery before (*Have Visited Cidery*) were mixed. Those who had visited a cidery previously were willing to travel 25.08% fewer miles; however, they anticipated spending 31.46% more than those who had not visited a cidery before. One possible explanation is that the novelty of visiting the cidery may hold the most effect on willingness to travel more miles to visit the facility. However, prior visitors may be more familiar with the product and willing to spend more on hard apple ciders when they do visit the cidery.

While those respondents who indicated they tried to purchase local foods whenever possible (*Purchase Local Foods*) were neither more or less likely to travel farther distances to visit a hard apple cidery; the preference for local foods positively influenced expected annual expenditures at hard apple cideries (Table 3). Each level of agreement that the respondent tried to purchase local foods when possible increased their expected annual cider expenditures by 7.94%. Hence,

compared with a person who strongly disagreed that they tried to purchase local foods when possible, a person who strongly agreed with this statement indicated they would spend about 31.76% more on hard apple ciders at cideries annually. Preferences for local foods have been linked to preferences for local wines and beers in previous research (Woods, Yang, and Nogueira, 2013; Everett et al., 2017, 2018).

Weekly purchases of beer and wine (*Weekly Beer Purchaser, Weekly Wine Purchaser*) were included in the model to examine possibly complementary and substitution effects across beverages that might influence willingness to travel farther distances to visit cideries and annual expenditures at hard apple cideries. Findings regarding the effects of regular beer and wine purchases on distance travel and expected expenditures were mixed (Table 3). Weekly beer purchasers would spend 15.21% more annually on hard apple ciders at cideries compared with more infrequent beer purchasers. This result is suggestive of complementarity of craft beer and craft cider expenditures. Snyder's (2016) survey of cider consumers showed that about 41% most often drink beer when they select an alcoholic beverage. Interestingly, Snyder's (2016) study of hard apple cider makers found that 72% of cider makers were marketing to beer drinkers, but 90% were marketing to wine drinkers. In this study, while being a weekly wine purchaser had no effect on anticipated expenditures, it did influence the distance the respondents would travel to visit a cidery. Notably, if the respondent was a weekly wine purchaser, they would travel 14.76% fewer miles than those who are not weekly wine purchasers. While beyond the scope of this study, this finding could suggest that more wine-involved consumers would perhaps only be willing to travel shorter distances to visit hard apple cideries.

As expected, greater weekly alcoholic beverage expenditures (*Weekly Alcoholic Beverage Expend*) had a positive effect both on *Travel Distance* and *Annual Expenditures*. For each dollar spent per week on alcoholic beverages, the distance the respondents would travel to visit a hard apple cidery increased by 0.52%, and the amount they expected to spend on hard apple ciders at cideries increased by 1.23% (Table 3). Although greater willingness to try new brands of alcoholic beverages (*Try New Brands*) had no effect on *Travel Distance* or *Annual Expenditures*, greater willingness to try new types (*Try New Types*) positively influenced anticipated annual expenditures by 16.06%. This result, taken together with the positive effects of alcoholic beverage expenditures, may suggest that consumers who are greater alcoholic beverage spenders and who are willing to try new types of beverages will spend more on hard apple ciders at cideries.

Several questions were asked about the importance of services the cidery may offer in order to ascertain how cidery services may influence distance consumers would travel or their hard apple cider spending. Educational tours (*Tours*) about how the ciders are made positively influenced *Travel Distance* (9.23% for each level of importance of *Tours*) (Table 3). The importance of ability to purchase and consume hard apple ciders on-site (*Purchase and Consume*) positively influenced projected annual hard cider expenditures at cideries by 12.53% for each level of importance. Hence, these results suggest that information about facility tours and informational programs about how the cider is made can influence consumers to travel farther to cideries. Gao, Barbieri, and Valdivia (2014) suggest that agritourism venues can have natural features, agricultural features, and cultural features, with the latter resulting from the interaction between human activity and the environment,

such as the value-added process associated with the making of hard apple ciders. However, the results also suggest that ability to consume and purchase cider on-site will increase cider expenditures. Visitors may be drawn by learning experiences on-site, whereas expenditures may be driven by ability to purchase and consume the product as part of and subsequent to a tour. Notably, Stoddard and Clopton (2014) found that returning winery visitors were more likely to place a greater emphasis on their ability to buy wine, whereas new winery visitors were more motivated by winery tours.

Conclusions, Discussion, and Implications

As in many other parts of the United States, Tennessee's hard apple cider industry is emerging and there are only a handful of cideries in the state. The state is well positioned to have a growing craft hard apple cider industry because much of the state is suitable for growing cider apples and Tennessee has a sizable tourism industry. In an emerging craft hard apple cider industry, cellar-door sales will comprise an important component of the small craft cideries' marketing. Hence, building a better understanding of influences on cidery visitorship and hard apple cider spending on-site provides information to facilitate industry growth.

The results from this study suggest that while few Tennessee alcoholic beverage consumers had visited a hard apple cidery, most visitors had purchased hard apple cider on-site, and there was considerable interest in visiting hard apple cideries in the future. Among those who had visited, cider taste held the most influence on purchasing hard apple ciders at the cidery. This finding reflects the importance of having tasting rooms and the ability to purchase hard apple cider on-site. However, least important was that the apples were grown on-site. This result could indicate a need for more information for hard apple cider consumers about history of the location and orchard and about local, heirloom, and other specialty apple varieties used in the hard apple ciders to build interest in purchasing ciders with apples grown onsite. However, it also seems to suggest that consumers might be as willing to purchase hard apple cider if the apples are not grown onsite and are instead purchased from local or regional apple growers. While our results showed that apples being grown on-site was less important to purchasing decisions than other attributes among those who had previously visited a cidery, additional research could investigate opinions about the importance of apples being grown on-site among those who have not yet visited a hard apple cidery but are interested in doing so in the future.

Among those who indicated they had visited or were interested in visiting a hard apple cidery in the future, factors influencing how far they would travel to visit a cidery and how much they anticipate spending at the cideries in a year were examined. Travel distance is of interest for assessing the market draw area for hard apple cideries. This study shows that, on average, in-state visitors would be willing to travel about 61 miles to visit a hard apple cidery. This result suggests that cideries should anticipate most of their in-state customer base will likely come from within about an hour's drive of their facility. In addition, visitors anticipate spending just over $38.46 a year on hard apple ciders at cideries. A further break down of the expenditure variable reveals that this would occur over two to three visits per year, with visitors spending about $16.50 per visit.

Additional future research regarding out-of-state visitor travel distance and expenditures could complement these estimates.

Household income had a positive effect both on distance visitors would travel and also on anticipated expenditures. This finding suggests that cideries might market to middle and higher-income consumers. The study results also suggest marketing ciders and cidery visits to alcoholic beverage consumers in the 44- to 60-year-old age group. Many of the demographics having a positive influence on distance traveled to and expenditures at craft hard apple cideries are similar to those found in studies of craft brewery visitors (Plummer et al., 2005; Kraftchick et al., 2014; Carr, Shin, and Severt, 2019). Furthermore, weekly beer purchasers were likely to spend more on hard apple ciders than less frequent beer purchasers. While beyond the scope of this study, these results suggest some potential synergy between craft brewery and craft cidery experiences and product expenditures. Interestingly, residence in a rural/small town positively influenced both expected travel distance to and expenditures at hard apple cideries. While it is likely that cideries should locate within an hour's drive of population centers, this result also suggests that consumers in smaller towns and suburbs may be willing to travel farther and also spend more than their metro counterparts.

Those who had purchased hard apple ciders in the past were both willing to travel farther to visit a cidery and also spend more on craft hard apple ciders. Hence, getting alcoholic beverage consumers to try hard apple ciders is likely to be an important contributor to them traveling to the cidery and spending more. Some craft cideries have been able to get hard apple ciders into craft brewpubs, on menus, and even in grocery stores. Marketing ciders beyond the cellar door to encourage consumers to try hard ciders can potentially help increase cidery visits and visitor expenditures.

Furthermore, the types of amenities offered by the cidery that attract visitors to travel farther distances differed from those that influenced their spending. While educational tours about how the cider is made would draw visitors to travel farther distances to come to the cidery, once there, ability to purchase and consume on-site would add to expenditures. The former result suggests that marketing of the cidery should include information about available tours at the facility. The latter result suggests that cideries should have facilities where consumers can sample and consume some of the hard cider they purchase at the cidery.

This study had several limitations. First, it represents a single snapshot in time. Second, with an emerging craft hard apple cider industry, many product development and marketing questions remain. For example, hard apple cider attribute preferences, such as preferences for packaging type, cider sweetness/dryness, sparkling/still, and other attributes. The effects of demographics on these preferences should be studied. Third, this study was limited to Tennessee consumers. Other regions with emerging craft hard apple cider industries should also be investigated. Furthermore, this study did not encompass surveys of visitors coming from out of state, which could be an important customer base for hard apple cideries, particularly in a state like Tennessee, where tourism is an important industry (Tennessee Department of Tourist Development, 2020). Consumer preferences for visiting cideries and purchasing locally hard apple ciders could vary

across regions. For example, it might be expected that preferences for cidery visits and hard apple cider expenditures might differ across traditional apple production regions compared to those with periphery production. It is also important to note that because there are only a few cideries located in the state, part of this research focused on hypothetical or planned future cidery visit behaviors, rather than actual prior visits. As the industry grows, a confirmatory study among the cideries' actual visits and visitor expenditures on hard ciders at the cellar door would extend this research. Additional research might investigate how cidery visits relate to other alcohol beverage tourism since there are winery, brewery, and distillery tourist sites across the state.

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