Food Distribution Research Society

Journal of Food Distribution Research
Volume 48, Issue 3

Consumer Willingness to Pay for Local Wines and Shopping Outlet Preferences

Connie Everett,[a] Kim Jensen,[b]Ⓘ David Hughes,[c] and Chris Boyer[d]

[a]*Territory Business Manager, Cattle and Equine, Zoetis Inc.,*
10 Sylvan Way, Parsippany, NJ 07054 USA

[b]*Professor, Department of Agricultural Economics,*
University of Tennessee, 302 Morgan Hall, 2621 Morgan Circle,
Knoxville, TN 37996 USA

[c]*Professor and Greever Chair of Excellence, Department of Agricultural Economics,*
University of Tennessee, 302 Morgan Hall, 2621 Morgan Circle,
Knoxville, TN 37996 USA

[d]*Associate Professor, Department of Agricultural Economics,*
University of Tennessee, 302 Morgan Hall, 2621 Morgan Circle,
Knoxville, TN 37996 USA

Abstract

Tennessee recently changed its wine-marketing laws to allow wine sales in food-retailing facilities, and industry implications are still emerging. Using data from 500 wine consumers in Tennessee, this study measures willingness to pay for a Tennessee-labeled wine sold from the anticipated retail outlet. Results show consumers would pay a premium for a Tennessee red or white wine. Older females are more likely to anticipate purchasing Tennessee wine at grocery stores, convenience-oriented lower-income consumers at big box stores, and price-conscious consumers at warehouse clubs.

Keywords: consumer, food shopping outlets, local wines, multivariate probit, probit, willingness to pay

Ⓘ Corresponding author: Tel: 865-974-7481
Email: kjensen@utk.edu

Background and Objectives

According to a recent Nielsen Newswire Report (2015), the number of U.S. grocery stores selling wine expanded from fewer than 28,000 in 2010 to more than 30,000 in 2014. The report also notes that, by 2014, 42% of U.S. consumer wine sales were from grocery stores. Tennessee's wine laws also changed in 2014, allowing wine sales in retail food stores, starting in July 2016 and subject to approval by local voters (Tennessee SB 837) (Tennessee Legislature, 2014).[1] Prior to this legislative change, wines for at-home consumption could only be sold through 592 beer/liquor/wine stores and wineries in Tennessee (US Census Bureau, 2013); the new law expanded the market channels for all wines, including Tennessee-produced wine.

Sales of Tennessee-produced wines have primarily been driven by tourism at wineries. The state's wine-marketing law changed the availability of Tennessee wines and the potential for tourism-based revenues for these wineries. It is therefore important to understand local consumers' willingness to pay (WTP) for a Tennessee-produced and labeled wine and the influence that anticipated food-retailing outlets (such as grocery stores, big box stores, and wholesale clubs) will have on the purchase of Tennessee-labeled wines. This will help Tennessee wineries build consumer preference profiles for Tennessee-labeled wines as well as determine how consumer WTP might vary across retail shopping outlets. These results could also have implications for states that do not currently allow wine sales in food-retailing outlets (Balter, 2017).

The objectives of this study are to

a) provide a measure of in-state wine consumers' WTP for Tennessee-labeled wine (both red and white);
b) provide measures of the influence of demographics, wine preferences, past shopping patterns, and attitudes on consumers' likelihood of choosing a Tennessee wine and their WTP for Tennessee wines;
c) determine the retail outlets at which respondents anticipate purchasing Tennessee wines;
d) provide measures of the influence of demographics, wine preferences, past shopping patterns, and attitudes on retail outlets where consumers anticipate purchasing Tennessee wines (grocery stores, big box stores, warehouse clubs, wineries, and liquor/wine stores); and
e) compare WTP for local wines according to whether a consumer anticipates purchasing Tennessee wines at specified shopping outlets.

[1]Under the law, retail food stores can include grocery stores, big box stores, and wholesale clubs where at least 20% of sales are from the retail sale of food and food ingredients, with at least 1,200 square feet of retail space. Such sales have been approved in all larger cities in Tennessee. As of March 2017, 635 out of 1,351 grocery stores in the state were selling wine (Marcum, 2017).

Prior Research

Studies of Consumer Preferences for Local Wines

Several studies have examined consumer preferences for locally or state-produced wines (Steiner, 2000; Brooks, 2001; Kolyesnikova, Dodd, and Duhan, 2008; Thiene et al., 2013; Thach and Chang, 2015; Woods et al., 2015; Soulek, Dodd, and Velikova, 2016). In a U.S. survey, Thach and Chang (2015) found that only 21% of respondents said state or origin was often a factor in their wine purchase decisions. Furthermore, some evidence suggests that willingness to try and/or purchase locally produced wines may vary by state. For example, Woods et al. (2015) examined local wine preferences in the northern Appalachian states and found that Tennessee consumers were less likely than Ohio consumers to have tried a local wine. Notably, Ohio wines could be purchased in grocery stores, but Tennessee wines were not sold in grocery stores at the time of the study. Thus, Ohio wines likely had more retail-level exposure to consumers than Tennessee wines.

Several studies have examined the influence of demographics and attitudes on preferences for local wines. Woods et al. (2015) found that 39% of survey respondents had tried a state/local wine in the past 12 months and 34% had purchased one. They found that male, ethnically white, non-urban consumers and those with higher wine expenditures were more likely to have tried a state/local wine. Wine expenditures were found to increase at a decreasing rate with higher income and education levels. Consumers stating they often or always purchased local were more likely to try a local wine. Woods et al. (2015) found that males, frequent wine consumers, those with preferences for buying local foods, and those with wine knowledge had higher expenditures on local wines.

Kolyesnikova, Dodd, and Duhan (2008) examined consumer preferences for Texas wines in a 2006 survey of Texans over age 21 who had consumed wine in the past 12 months. They identified four market clusters: *local enthusiasts*, *local detractors*, *local advocates*, and *local non-advocates*, with the largest proportion (over 40%) being local enthusiasts. Examining demographics, consumption patterns, and preferences revealed differences across these clusters. The *local enthusiasts* segment consisted of a higher percentage of wine consumers whose highest level of education was high school diploma and who tended to prefer blush/rose and sweet wines. The *local detractors* segment had the largest proportion of people with graduate degrees, household incomes of over $140,000, and the most frequent wine consumption, preferring red and dry wines. Soulek, Dodd, and Velikova (2016) conducted a follow-up survey of Texans over age 21 who had consumed wine in the past 12 months. Their results showed that preferences for sweet wines had decreased among the Texas respondents compared to the 2006 survey, while preferences for Texas wines increased by over 7%, suggesting a decrease in *local detractors* during the 2006 to 2016 time period (Soulek, Dodd, and Velikova, 2016).

Other studies have shown that quality attributes can be linked to geographic indicators (GI), such as grape variety, which can impact the price premium of wine (Brooks, 2001; Steiner, 2000; Thiene et al., 2013). Thus, a price premium for a bottle of wine with a GI label may be a response to the quality of grapes grown in that region as well as an effort to create value based on the state or region of production.

Location of Shopping Outlets

As noted by Woods et al. (2013), Appalachian wineries tend to rely primarily on tourism visits and on-site sales. While wine tourism behavior has been studied extensively, the transition between winery sales and sales at food-retail outlet stores has not. In a national survey, Thach and Chang (2015) found that the most frequently selected sales outlet was a liquor/wine store followed by grocery stores, discount or warehouse clubs, and winery tasting rooms. 30% of study respondents said they almost always purchase wine in a liquor/wine store, while about 17% said they almost always purchase wine in a grocery store.

Olsen et al. (2015) grouped southern U.S. wine consumers according to wine-variety-seeking behaviors based on a series of Likert-scale questions about preferences for a variety of wines. Questions included agreement with statements that consumers liked to try the most unusual wines, wines with which they were not familiar, exotic wines, wines from different countries, and other statements about variety-seeking attitudes. Among southern U.S. wine consumers, variety-seeking wine drinkers were more likely to be younger, pay more for wine, prefer more varietals, consider themselves to be more knowledgeable, and purchase wine in more locations than moderately variety-seeking or variety-avoiding consumers. The three groups did not differ in their purchasing frequency at grocery stores, but high variety seekers indicated they purchased wine at specialized wine stores and winery tasting rooms more often than moderate- or low-variety-seeking consumers.

Scarpa, Thiene, and Galletto (2009) found evidence of variation in WTP for Prosecco depending on the purchase outlet. The highest wine purchase frequencies and WTP estimates occurred at restaurants, bars, and taverns, and nearly three-fifths of all respondents stated that they never bought wine in supermarkets. Survey findings have also suggested that winery shoppers are middle-aged or older, and many have a college education (Scarpa, Thiene, and Galletto, 2009; Bruwer and Lesschaeve, 2012; Getz and Brown, 2006). Winery shoppers view the winery visit as a total experience (Getz and Brown, 2006; Beames, 2003; Charters and Ali-Knight, 2002; O'Neill and Charters, 2004).

Corsi, Cohen, and Lockshin (2014) studied store images of retail outlets for wine in the minds of Chinese consumers. Their research showed that local retailers had higher perceived levels of service in shopping for wines, while big box retailers were less recognized for such service. However, big box stores were characterized as having a good selection of wines that were easy to find on the shelf, had a good return policy, and were a good value for the money. Based on their results, it might be expected that low-price-seeking, convenience-oriented wine consumers who are less concerned about service might be more likely to shop for wines at big box stores.

Economic Modeling

Willingness to Pay for a Tennessee-Labeled Wine

The application of Random Utility Models allows utility to be associated with each alternative in the consumer's choice set (McFadden, 1974). This study assumes that consumers derive utility from purchasing Tennessee wines such that $U_{TNWine,i} = u(p_{TNWine,i}, X_{np,i})$ and from

purchasing California wines such that $U_{CAWine,i} = u(p_{CAWine}, X_{np,i})$. The prices of the wines are represented by p, while X includes demographic and attitudinal variables for each consumer. Consumer i would select the Tennessee wine if their utility when paying $p_{TNWINE,i}$ were at least as great as when paying $p_{CAWINE,i}$ or

$$U_{TNWine,i}(p_{TNWine,i}, X_{np,i}) \geq U_{CAWine,i}\,(p_{CAWine}, X_{np,i}). \quad (1)$$

While utility cannot be observed, an observed indicator binary variable, $TNWine_i$, is 1 when the difference in utility between choosing the Tennessee wine and the base (California wine) is positive ($U(p_{TNWine,i}, X_{np,i})$ - $U(p_{CAWine}, X_{np,i})$>0) and 0 otherwise (McFadden, 1974).[2] Using a probit model, the probability for choosing the Tennessee wine can be expressed as

$$Pr(TNWINE_i=1) \quad (2)$$

$$= \Pr\,[U_{TNWine,i}\,(Y_i - p_{TNWine,i}, X_{np,i}\,) + \varepsilon_i] \;\geq [\,U_{CAWine,i}\,(Y_i;\; p_{CAWine}, X_{np,i} + \varepsilon_0]$$

$$= \Pr\,(X_{np,i} + \varepsilon_i > p_{TNWine,i})$$

$$= \Pr\,[\frac{\varepsilon_i}{\sigma} > \frac{(\beta'_{pTNWine} p_{TNWine,i} - \beta'_{np} X_{np,i})}{\sigma}$$

$$= 1 - \Phi\left[\frac{(\beta'_{pTNWine} p_{TNWine,i} - \beta'_{np} X_{np,i})}{\sigma}\right],$$

where Y_i is household income, ε_i is the error term (where $\varepsilon_i \sim N(0,\, \sigma^2)$), and Φ is the standard normal distribution (Greene, 2011). The β_{np} are the nonprice parameters to be estimated that are associated with $X_{np,i}$, the consumer socioeconomic, demographic, and attitudinal variables. The β_P is the parameter of the price of Tennessee wine (p_i).

An individual's WTP reflects how much premium s/he would pay for a Tennessee wine relative to a California wine, while utility remains unchanged. Parameter estimates from the probit model are then used to quantify Tennessee consumers' WTP for the Tennessee-labeled wine, which is calculated as

$$\widehat{WTP_i} = \frac{-\beta'_{np} X_{np,i}}{\beta_{pTNWine}}, \quad (3)$$

where $\widehat{WTP}$ is the estimated WTP; $\beta'_{np} X_{np,i}$ represents the sum of the products of the nonprice coefficients and the nonprice variables; and $\beta_{pTNWine}$ represents the estimated coefficient for price (Greene, 2011). The WTP estimates and 95% confidence intervals are calculated using the

[2]According to the Wine Institute, California produces about 85% of U.S. wines (Wine Institute, 2017a). Furthermore, California's shipments within the U.S. in 2016 represented about a 60% share of the U.S. wine market (Wine Institute, 2017b). Since California wines have such a large share of the market, it was believed that offering a California wine as an alternative choice provided a more realistic choice set than wines from an unspecified origin.

Krinsky–Robb (1986) method. The variable names and descriptions for $X_{np,i}$; the price variable, p_i; and the dependent variables, $TNWine_i$, are presented in Table 1.

The marginal effect of the *j*th variable on the probability that the individual selects the Tennessee wine is

$$(4) \qquad \frac{\partial \text{Prob}[TNWine_i=1]}{\partial \text{X}_{\text{ij}}} = \phi(\beta'_{np}X_{np,i} + \beta'_{pTNWine}pTNWine_i) * \beta_j,$$

where ϕ is the density of the standard normal distribution.

The significance of the overall model is evaluated with a log likelihood ratio test (LLR) against an intercept-only model. In addition, the percentage correctly classified provides a measure of the predictive capabilities of the model. An LLR test is also used to examine whether separate probit models should be estimated for the red and white wine choice sets or whether the two groups can be modeled together as combined.[3]

Outlet Choices for Purchasing Tennessee-Labeled Wine

In order to obtain measures of where those choosing a Tennessee wine might expect to purchase it, respondents were asked whether they would "likely purchase a Tennessee-labeled wine" at a variety of food and/or wine retail outlets (grocery store, big box store, warehouse club, winery, and liquor/wine store). Consumers were not asked to pick a single outlet where they believed they would be most likely to purchase Tennessee wines. Respondents could indicate that they would likely purchase Tennessee wine at none, one, more than one, or all of these outlets. Because respondents could indicate multiple outlets where they might be likely to purchase Tennessee wines, a multivariate probit was used to capture the correlations across the error terms between each shopping outlet equation.

Consumer *i* is hypothesized to shop for a Tennessee-labeled wine at shopping outlet *m* (where *m* is 1 = *Grocery*, 2 = *Big Box*, 3=*Warehouse,* 4 = *Winery,* 5 = *Liquor/Wine Store*) if the utility ($S^*_{i,m}$) from doing so exceeds the utility of not shopping at that particular type of outlet for Tennessee-labeled wine ($S^*_{i,n}$). Thus, the outlets where consumers would shop for Tennessee-labeled wine are assumed to contribute to consumer *i*'s utility, as

$$(5) \qquad S^*_{i,m} = f(\psi' Z_{i,m}), m = 1, \dots, M$$

where consumer *i* will choose alternative *m* if

[3] The LLR test is conducted by comparing the LLR from a model with a dummy representing red wine choice sets interacted with all the explanatory variables (LL_u) with that from a model without these interactions (LL_r). The test statistic is calculated as -2*(LL_r-LL_u), where LLR ~ χ^2 with *k* degree of freedom at α=0.05, where *k* is the number of interacted variables. If the calculated value is greater than the critical value, the red and white wine models should be estimated separately.

Table 1. Variable Names, Descriptions, and Means for Probit Model of Willingness to Pay for Tennessee Wines

Variable	Description	Mean (N=458)
Chose TN Wine	1 if chose the Tennessee wine, 0 if chose California wine	0.694
Price of TN Wine	$10, $12, $14, $18	13.376
Age	Age in years	40.124
Female	1 if female, 0 if male	1.729
College	1 if graduated from college, 0 otherwise	0.384
East	1 if resided in East Tennessee, 0 otherwise	0.406
Household Income	Household income in thousands dollars	58.390
Frequency Wine Purchases	1=once a year; 2=every 6 months, 3=monthly, 4=weekly	3.052
Frequency TN Wine Purchases	1=never, 2=once a year; 3=every 6 months, 4=monthly, 5=weekly	3.061
Winery Shopping	1=not in past year, 2=in past year, 3=usually	1.520
Liquor/Wine Store Shopping	1=not in past year, 2=in past year, 3=usually	2.618
Knowledge About CA Wines	1=not at all knowledgeable…5=extremely knowledgeable	1.876
Taste	Importance of wine taste 1=not at all, …, 4=very important	3.884
Local	Importance of wine being local 1=not at all, …, 4=very important	2.279
Sustainability	Importance of wine sustainability 1=not at all, …, 4=very important	2.533
Low Price	Importance of low wine price 1=not at all, …, 4=very important	2.541
Reputation	Importance of wine reputation 1=not at all, …, 4=very important	2.788
Wine Age	Importance of wine age 1=not at all, …, 4=very important	2.456
Bottle Appearance	Importance of wine bottle appearance 1=not at all, …, 4=very important	1.928
TN Taste	Tennessee wine tastes better, 1= strongly agree, …, 5=strongly disagree	3.465
TN Origin	Know more about origin of Tennessee wine, 1= strongly agree, …, 5=strongly disagree	3.642
TN Growers	Buying Tennessee wine supports growers, 1= strongly agree, …, 5=strongly disagree	4.581
TN Price	Tennessee wine prices compare favorably, 1= strongly agree, …, 5=strongly disagree	3.959

(6) $$S^*_{i,m} \geq S^*_{i,n}.$$

The explanatory variables (Z_m) hypothesized to influence shopping location include respondent demographics, past wine shopping patterns, and attitudes about products (see variable descriptions in Table 2).

The probability of anticipating shopping for Tennessee-labeled wine at particular outlets among wine shoppers who would purchase a Tennessee-labeled wine is estimated using a multivariate probit model:

(7) $$S^*_{i,m} = \psi' Z_{i,m} + \epsilon_{i,m}, \; m = 1, ..., M$$

(8) $$S^*_{i,m} = 1 \text{ if } S^*_{i,m} > 0 \text{ and 0 otherwise}$$

where $\epsilon_{i,m}$ are the random error terms distributed as multivariate normal, each with a mean of zero and covariance matrix V, where $V_{mn} = 1$ if m=n or $K_{im}K_{in}\,\rho_{mn}$ otherwise. Note that ρ_{mn} are the correlations between error terms from equations m and n and $K_{ik} = 2S_{ik} - 1$ for each i, k=1,…, M. The method of estimation is simulated maximum likelihood (Cappellari and Jenkins, 2003).

Survey and Data

The survey panel was obtained through the online hosting service, Qualtrics, which recruited panelists who were Tennessee residents, 21 years or older, and wine consumers. A total of 500 survey responses was collected through the online survey platform in September of 2015. A copy of the survey instrument is available from the authors upon request. A map of counties in which respondents were located is shown in Figure 1.

Figure 1. Locations of the Tennessee Wine Survey Respondents

The survey was divided into several sections. In the first section, respondents were asked about their wine purchase and consumption habits, including questions about wine purchasing frequency and use of wine shopping venues (winery/vineyards or liquor/wine stores). The second section asked respondents to rate the importance of wine attributes such as taste/flavor, whether it was locally produced, price, sustainability, and its age.

Table 2. Variable Names, Descriptions, and Means for Potential Shopping Outlets for Tennessee Wines

Variable	Description	Mean (N=305)
Grocery Store	1 if anticipate purchasing a Tennessee labeled wine at a grocery store, 0 otherwise	0.623
Big Box Store	" " at a big box store, 0 otherwise	0.426
Warehouse Club	" " at a warehouse club, 0 otherwise	0.367
Winery	" " at a winery, 0 otherwise	0.744
Liquor/Wine Store	" " at a liquor/wine store, 0 otherwise	0.915
Age	Age in years	40.026
Female	1 if female, 0 if male	1.725
College	1 if college graduate, 0 otherwise	0.361
East	1 if reside in East Tennessee, 0 otherwise	0.452
2015 Pre-Tax Household Income	In thousands of dollars	57.615
Frequency Wine Purchases	1=once a year; 2=every 6 months, 3=monthly, 4=weekly	3.121
Frequency TN Wine Purchases	1=never, 2=once a year; 3=every 6 months, 4=monthly, 5=weekly	3.367
Winery Shopping	1=not in past year, 2=in past year, 3=usually	1.607
Liquor/Wine Store Shopping	1=not in past year, 2=in past year, 3=usually	2.557
Knowledge About CA Wines	1=not at all knowledgeable…5=extremely knowledgeable	1.889
Taste	Importance of wine taste 1=not at all, …, 4=very important	3.889
Sustainability	Importance of wine sustainability 1=not at all, …, 4=very important	2.587
Low Price	Importance of low wine price 1=not at all, …, 4=very important	2.472
Availability	Importance of wine reputation 1=not at all, …, 4=very important	3.164
Advice	Importance of obtaining wine advice 1=not at all, …, 4=very important	2.574
Reputation	Importance of wine reputation 1=not at all, …, 4=very important	2.803
TN Origin	Know more about origin of Tennessee wine, 1= strongly agree, …, 5=strongly disagree	4.003
TN Growers	Buying Tennessee wine supports growers, 1= strongly agree, …, 5=strongly disagree	4.702

.

In the third section, respondents were presented a choice experiment for Tennessee labeled wines (red or white) compared to California wines (red or white) depending on whether they indicated a red or white wine preference. A preference was randomly assigned if none had been indicated. Those who indicated they would purchase a Tennessee-labeled wine were asked about their anticipated shopping outlets for Tennessee wines, including newly available outlets (grocery stores, big box store, and warehouse clubs) and previously existing winery and liquor/wine store outlets. Respondents were asked whether they would likely purchase Tennessee wine at the following types of outlets: warehouse, winery, liquor/wine store, internet, grocery store, or big box store.

The fourth section asked respondents to rate the importance of factors influencing their decision of whether to select a Tennessee wine, including taste, patronage to local growers, and knowing more about the origin of the wine. The final survey section included demographic questions such as household income and respondents' age, gender, and education level.

For the choice experiment, the sample was divided into two groups, depending on whether the consumer expressed a preference for red or white wines. If they expressed no preference, they were randomly assigned to a white or red wine experiment. Respondents were reminded of their budget constraint prior to answering the wine choice set question.[4] The respondent was then presented a hypothetical buying scenario in which they were asked to choose between a "base" wine—represented by a California produced and labeled wine—and a Tennessee-produced and labeled wine. Figure 2 presents an example choice set for the Tennessee-labeled wine compared to the California-labeled wine. While the California wine price was held constant at $12 per bottle, the price of the Tennessee-labeled wine was allowed to vary across respondents, at prices of $10, $12, $14, and $18 per bottle. Note that the sample for the white wine experiment was divided into the four price levels, as was the red wine experiment, so each respondent was presented with one of the four price levels for the Tennessee wine.

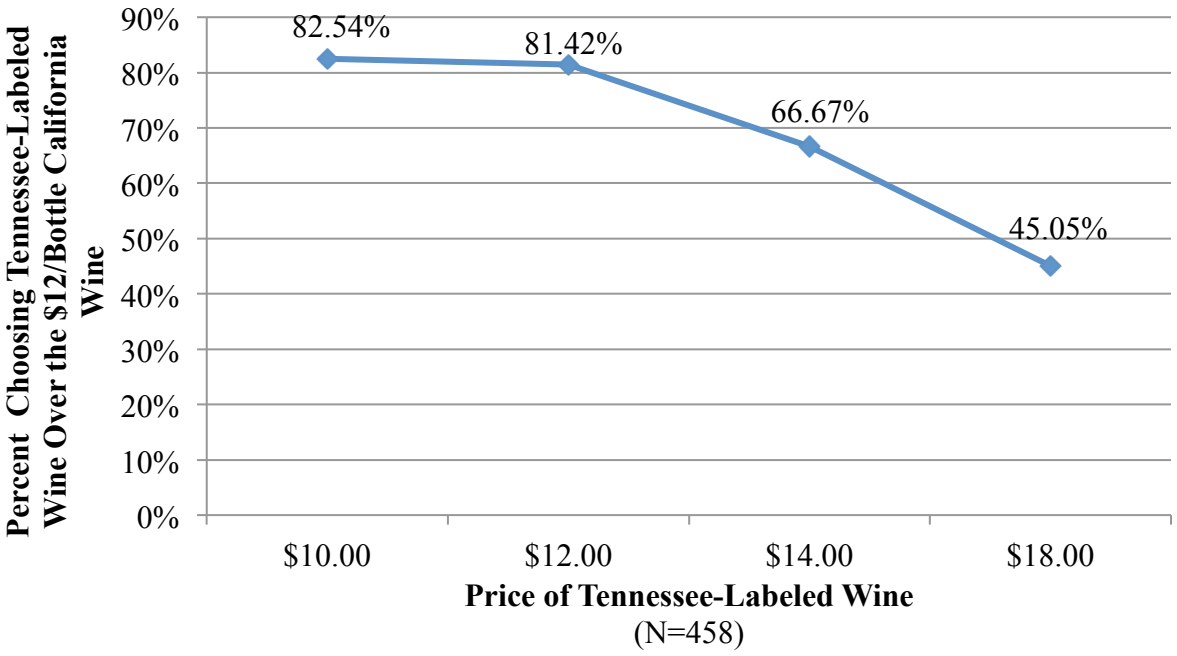
In a 2014 survey of U.S. wine consumers, Thach and Olsen (2015) found that 35% of respondents spent $10–$15 per bottle, while 38% spent less than $10 and 27% spent more than $15. However, the Tennessee-labeled wine prices used in this study were similar to prices from an analysis of Virginia wines in which red and white Virginia wines were determined to be sold to either a super-premium ($10–$13.99 per bottle) or ultra-premium (>$14 per bottle) market segment (Ferreira and Ferreira, 2013). These price tiers were also found to be consistent with wines of comparable reputation in which niche branding and product loyalty were not considered in the pricing (Jarvis and Goodman, 2005). Additionally, a pretest using local participants was conducted to prior to fielding the online survey that, in part, examined pricing.

[4] The reminder read "Before making your decision, consider your household budget. Consider thoroughly how the cost associated with your wine purchase will affect your budget, so that you are certain that you are actually willing to pay the cost associated with the alternative you choose."

Figure 2. Choice Set of Tennessee or California Wine

	Alternative A	**Alternative B**	**Alternative C**
			**NONE**
Price	$14.00/ bottle	$12.00/ bottle	
Label	Tennessee Wine	California Wine	
I prefer	○	○	○

Figure 3. Percent Stating They Would Purchase the Tennessee-Labeled Wine Over the $12/Bottle California Wine.



Results

Willingness to Pay for Tennessee Red or White Wines

A total of 458 respondents replied to the questions necessary for conducting the modeling analysis. Of the choice sets modeled, 52.6% of these were red wine choice sets. The LLR test comparing the model with the red wine choice set dummy interactions revealed that the hypothesis of the interaction coefficients being jointly 0 could not be rejected: $-2(LL_r - LL_u)=28.53 <$ critical value of $\chi^2_{w/23\ df,\alpha=.05}=35.17$l. Hence the red and white dataset were estimated jointly.

The estimated means for the variables included in the WTP model for the Tennessee-labeled wines are shown in Table 1. As shown in Table 1, 69.43% of the respondents indicated they would choose the Tennessee wine over the California wine. The percent of respondents choosing the Tennessee wine at each price level are displayed in Figure 3. Notably, at $10 per bottle, about 82.54% would choose the Tennessee wine. However, at $18 per bottle, this drops to 45.05%.

The estimated probit model for the WTP for the Tennessee-labeled wines is presented in Table 3. As indicated by the LLR test against an intercept-only model, the estimated model is significant at the 95% confidence level. As expected, the sign on price of the Tennessee-labeled wine was significant and negative. The marginal effect shown in the fourth column suggests that, for each dollar increase in a Tennessee-labeled wine, the probability of choosing the Tennessee-labeled wine drops by 3.3%.

Other variables that negatively influence the probability of choosing the Tennessee wine to a significant degree are *Liquor/Wine Store Shopping,* knowledge about California wines (*Knowledge About CA Wines*), importance of sustainability of wines (*Sustainability*), low wine price (*Low Price*), wine reputation (*Reputation*), and wine bottle appearance (*Appear)*. These results suggest that low-price shoppers and reputation shoppers may be less willing to pay a premium for Tennessee-labeled wines. Holding all else constant, a person who usually shops for wine at liquor/wine stores was about 11% less likely to be willing to pay for Tennessee-labeled wine compared to a wine consumer who has not shopped for wine at a liquor/wine store in the past year. A person who is extremely knowledgeable about California wines was 15.9% less likely to choose the Tennessee wine compared to a person who considers themselves not knowledgeable about California wines. Price-concerned wine shoppers were more than 9% less likely to choose the Tennessee-labeled wine. Interestingly, wine consumers who were more concerned about sustainability and wine reputation were also less likely to select the Tennessee-labeled wine. This result could suggest a lack of knowledge about how Tennessee wine grapes are produced relative to California wines as well as beliefs that Tennessee-labeled wines do not have the same reputation as California wines.

Variables with significantly positive influence included being from the eastern region of the state (*East*), household income (*Household Income*), respondent's belief that Tennessee-produced wines taste better (*TN Taste*), the respondent knowing more about the origin of Tennessee wines (*TN Origin*), his or her belief that purchasing Tennessee wines helps local growers (*TN Grower*),

Table 3. Estimated Probit Model for Willingness to Pay for Tennessee-Labeled Wine

Variable	Est. Coeff.	Std. Err.		Marg. Eff.	Std. Err.	
Intercept	0.327	1.278				
Price of TN Wine	-0.151	0.026	***	-0.033	0.005	***
Age	0.009	0.006		0.002	0.001	
Female	-0.077	0.191		-0.017	0.041	
College	-0.208	0.180		-0.045	0.039	
East	0.404	0.164	***	0.087	0.035	***
Household Income	0.004	0.002	*	0.001	0.000	**
Frequency Wine Purchases	-0.001	0.105		0.000	0.023	
Frequency TN Wine Purchases	0.331	0.083	***	0.071	0.017	***
Winery Shopping	-0.046	0.138		-0.010	0.030	
Liquor/Wine Store Shopping	-0.256	0.135	**	-0.055	0.029	**
Knowledge About CA Wines	-0.184	0.120	**	-0.040	0.026	**
Taste	-0.165	0.249		-0.036	0.054	
Local	0.215	0.103	**	0.046	0.022	**
Sustainability	-0.191	0.111	*	-0.041	0.024	*
Low Price	-0.142	0.092	*	-0.031	0.020	*
Reputation	-0.160	0.098	*	-0.034	0.021	*
Wine Age	-0.002	0.109		0.000	0.024	
Bottle Appearance	-0.202	0.098	**	-0.044	0.021	**
Taste	0.360	0.096	***	0.078	0.020	***
TN Origin	0.159	0.074	***	0.034	0.016	***
TN Growers	0.227	0.111	**	0.049	0.024	**
TN Price	0.233	0.081	***	0.050	0.017	***
Percent Correctly Classified	83.84%					
Pseudo R^2	0.3801					
N (458)						
LLR Test (22 df)=214.32***						
Mean WTP for Tennessee Wine=$18.27, LCL=$16.81, UCL=$20.91						

Notes: *** indicates significance at α=0.01, ** at α=0.05, and * at α=0.15.

believing that Tennessee wines were priced favorably (*TN Price*), and knowing that wines were local (*Local*). In addition, more frequent prior purchases of Tennessee-labeled wines (*Frequency TN Wine Purchases*) have a positive influence on the respondent choosing a Tennessee wine.

The marginal effects show that wine consumers in eastern Tennessee are 8.7% more likely to choose Tennessee wine than consumers from other parts of the state. Each additional thousand dollars of household income increases the probability of selecting Tennessee wine by 0.1%. A wine consumer who already purchases a Tennessee-labeled wine weekly is 28.6% more likely to choose the Tennessee-labeled wine in the choice set than someone who has not purchased Tennessee-labeled wines in the past. Among reasons for selecting Tennessee wines, taste (*TN*

Taste) has the largest marginal effect, followed by belief that Tennessee wines are favorably priced (*TN Price*).

The estimated WTP for the Tennessee wine was $18.27 per bottle. The 95% confidence interval lower bound was $16.81 and the upper bound was $20.91 per bottle. The WTP was statistically different from the $12 per bottle base price (California wine).

Shopping Outlet Choices

Among those who indicated they would be willing to purchase the Tennessee-labeled wine or had previously purchased a Tennessee-labeled wine, 62.30% anticipate shopping for wine at a grocery store, 36.72% at a warehouse club, and 42.62% at a big box store—where each of these is among the newly available wine shopping outlets available to Tennessee wine shoppers (Figure 4). Previously available outlets would still be important, with 91.48% stating they would anticipate shopping for Tennessee-labeled wines at liquor/wine stores and 74.43% who would anticipate shopping for Tennessee-labeled wines at wineries. This result can be compared to 87.21% who indicated prior shopping for wine at liquor/wine stores and 44.92% who had previously shopped at wineries.

Figure 4. Percentage Anticipating Shopping for Tennessee Wines at Outlet Type

Overall, the multivariate probit model was significant, as indicated by the likelihood ratio test shown at the bottom of Table 4. In addition, the correlations between the error terms (ρ_{21}, …, ρ_{54}) were jointly significantly different from 0, suggesting that a multivariate probit was appropriate rather than estimating separate probit models for each outlet type. The grocery store model correctly classified 65.16% of observations, while the warehouse club equation classified 60.15%, the big box stores equation classified 61.4%, and the winery equation classified 78.95%.

Table 4. Multivariate Probit Model of Choices of Shopping Outlets for Tennessee Wines (N=305)

	Grocery Stores			Big Box Stores			Warehouse Clubs			Wineries			Liquor/Wine Stores		
Variable	**Est. Coeff.**	**Std. Err.**		**Est. Coeff.**	**Std. Err.**		**Est. Coeff.**	**Std. Err.**		**Est. Coeff.**	**Std. Err.**		**Est. Coeff.**	**Std. Err.**	
Intercept	-1.840	1.217	*	-1.926	1.144	*	-1.035	1.221		-2.492	1.254	**	-2.281	–	
Age	0.000	0.006	**	-0.003	0.006		-0.001	0.006		0.004	0.007		0.027	0.012	**
Female	0.389	0.182	**	0.248	0.179		0.076	0.182		0.140	0.213		0.801	0.341	**
College	-0.038	0.181		-0.145	0.173		-0.118	0.178		-0.070	0.201		-0.058	0.346	
East	-0.013	0.156		-0.075	0.153		-0.065	0.157		-0.026	0.180		-0.520	0.287	*
Household Income	0.000	0.002		-0.004	0.002	*	0.000	0.002		0.001	0.003		0.004	0.005	
Frequency Wine	-0.080	0.123		0.052	0.114		0.134	0.121		-0.205	0.136	*	-0.160	0.212	
Frequency TN Wine Purchases	-0.023	0.092		-0.100	0.087		0.085	0.091		0.006	0.097		0.517	0.184	**
Winery Shopping	-0.088	0.118		-0.078	0.117		-0.374	0.119	***	1.061	0.183	***	-0.115	0.184	
Liquor/Wine Store	-0.014	0.120		0.157	0.117		-0.279	0.120	**	0.194	0.137		1.153	0.207	***
Knowledge about CA Wines	0.163	0.111	*	0.289	0.112	***	0.217	0.110	*	-0.107	0.130		0.105	0.213	
Taste	0.502	0.248	**	0.211	0.247		0.277	0.257		0.187	0.241		-0.587	0.437	
Sustainability	-0.024	0.089		-0.166	0.086	*	0.014	0.089		0.003	0.108		-0.032	0.185	
Low Price	0.115	0.089		0.107	0.085		0.247	0.088	***	-0.185	0.102	*	0.107	0.163	
Availability	-0.063	0.110		0.227	0.101	**	-0.017	0.106		0.030	0.124		0.101	0.198	
Advice	-0.137	0.086	**	-0.134	0.085	*	0.028	0.086		0.135	0.100		-0.273	0.173	*
Reputation	-0.123	0.102		-0.111	0.097		-0.009	0.100		-0.011	0.118		-0.161	0.175	
TN Origin	-0.005	0.077		-0.097	0.076		-0.121	0.077	*	-0.011	0.093		0.229	0.140	*
TN Growers	0.095	0.117		0.155	0.113		-0.088	0.126		0.199	0.126	*	-0.050	0.255	
ρ21	0.761	0.051	**												
ρ31	0.427	0.082	**												
ρ41	0.209	0.103	**												
ρ51	0.388	0.146	**												
ρ32	0.492	0.079	**												
ρ42	0.337	0.097	**												
ρ52	0.602	0.155	**												
ρ43	0.283	0.100	**												
ρ53	0.418	0.171	*												
ρ54	-0.037	0.192													
Percent Correctly Classified	66.23%			63.28%			69.84%			75.08%			95.41%		

Notes: LLR Test (b1=0, …, bk=0) (90 df) = 180.13***. LLR Test (ρ_{gwc} =0, …, ρ_{bw} =0)(10 df) = 144.036 ***. ***=significant at α=.01, **=significant at α=.05, and *=significant at α=.15.

The estimated marginal probability of consumers indicating they would shop for Tennessee-labeled wines at the grocery store was 60.06%, 37.43% at warehouse clubs, 43.07% at big box stores, and 72.67% at wineries. The model predicted that about 16.52% were willing to shop at any of these outlets, and less than 9.38% would shop at none of them.

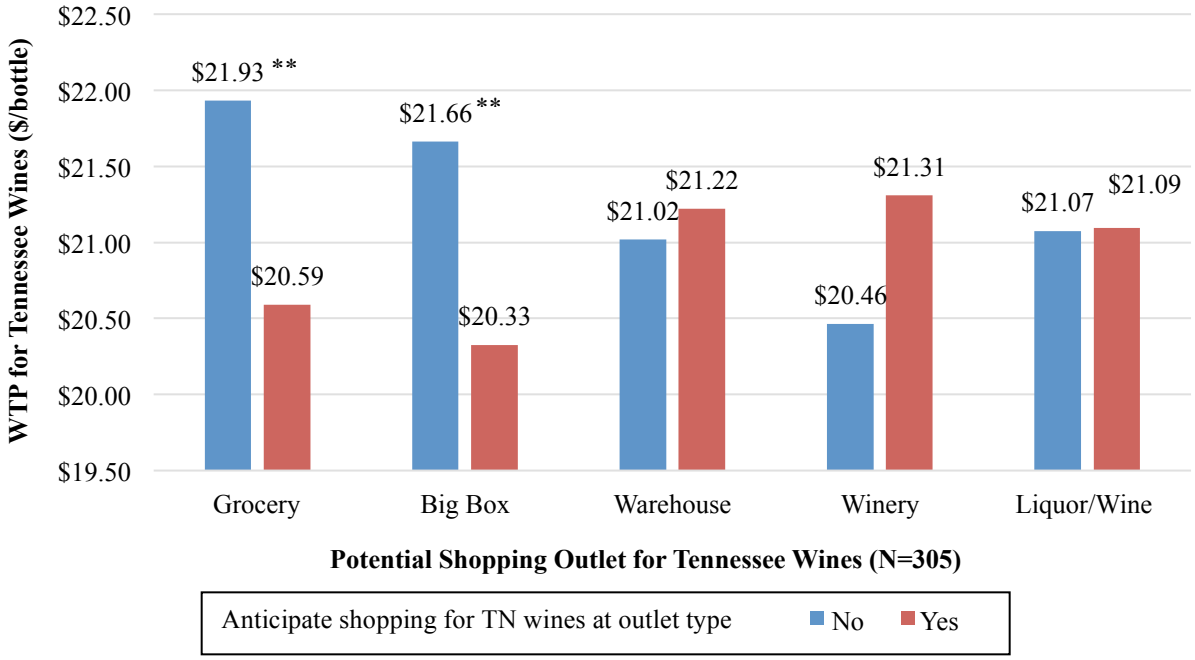
Age (*Age*) and female gender (*Female*) have positive effects on shopping for Tennessee-labeled wines in grocery stores and liquor/wine stores. Consumers located in the eastern part of the state (*East*) indicated that they would be less likely to shop for Tennessee-labeled wines at liquor/wine stores. Those making more frequent wine purchases (*Frequency of Wine Purchases*) indicated that they would be less likely to shop for Tennessee-labeled wines at wineries; however, those who more frequently purchase Tennessee-labeled wines indicated they would be more likely to shop for them at liquor/wine stores. Frequency of shopping for wines at any winery has a positive effect on shopping for Tennessee-labeled wines at wineries but a negative effect on shopping for Tennessee wines at warehouse clubs. A similar pattern holds for shopping frequency for wines at liquor/wine stores.

Those interested in purchasing Tennessee-labeled wines and more knowledgeable about California wines were more likely to shop for Tennessee-labeled wines at grocery stores, big box stores, and warehouse clubs. This result may suggest that these shoppers would be comparing Tennessee-labeled wines with California wines where food products are sold. With respect to wine attributes, importance of taste positively affects shopping for wines at grocery stores, while importance of sustainability negatively influences shopping for Tennessee-labeled wines at big box stores. The results suggest that shoppers driven by low prices are more likely to shop for Tennessee-labeled wines at warehouse clubs but less likely to shop for them at wineries. Wine being readily available positively influences the likelihood that respondents would shop for Tennessee-labeled wines at big box stores, while wanting to obtain wine advice negatively influences the likelihood of shopping for Tennessee-labeled wines at grocery, big box, and liquor/wine stores. Knowing the origin of Tennessee wines positively influences shopping for those wines at liquor/wine stores, as expected. However, the importance of such knowledge negatively influences shopping for Tennessee wines at warehouse clubs. Furthermore, consumers who placed importance on Tennessee wines helping Tennessee grape growers are more likely to shop for Tennessee wines at wineries.

The results suggest that lower income, convenience-oriented shoppers who are less concerned about sustainability and obtaining wine advice are more likely to shop for Tennessee wines at big box stores. Those shopping for Tennessee wines at grocery stores are more likely to be female and interested in wine taste but not concerned about obtaining advice. Warehouse club shoppers looking for Tennessee wines will likely be concerned with low price and be more knowledgeable about California wines but will be less likely to have already shopped for wines at wineries or liquor/wine stores and be less concerned about knowing where Tennessee wines are produced. The results suggest that winery shoppers and liquor/wine store shoppers will continue to shop for Tennessee wines at these locations. Those shopping for Tennessee wines at wineries are less concerned about low prices and more concerned about Tennessee wines benefiting local farmers. Liquor/wine store shoppers were more likely to be older, female, living in middle and west Tennessee, and more frequent Tennessee wine consumers who are concerned about where Tennessee wines come from.

Going beyond who may shop for Tennessee-labeled wines at various outlets and why, individuals' WTP for Tennessee-labeled wines was estimated across these shopping outlets. One might expect, for example, that those who visit wineries expect to pay a premium for the winery experience or that Tennessee wine shoppers at big box stores expect to pay less. Figure 5 compares WTP estimates for Tennessee wines across anticipated shopping outlets. Notably, WTP for Tennessee wines was significantly lower among those who said they would purchase them at grocery stores and big box stores compared to those who would not, suggesting some potential discounting on the part of consumers who anticipate purchasing Tennessee wines at those outlets. Lower WTP for Tennessee wines at grocery stores or big box stores may reflect consumers' belief that the selection of wines in these retail outlets is less likely to include specialized or premium-priced wines. However, we did not find that those who said they anticipated purchasing Tennessee wines at wineries or liquor/wine stores would pay a significant premium compared to those who did not.

Figure 5. Willingness to Pay for Tennessee Wine across Potential Shopping Outlets[a]



[a] **=significant difference in mean WTP values across whether shop at outlet type at α=.05.

Conclusions and Implications

Tennessee made major changes in how wines could be marketed within the state by opening up outlets that sell retail food items to wine sales. The implications of this policy change for the Tennessee wine industry are still emerging; therefore, an understanding of how local consumers perceive Tennessee wines is important to the industry. Since the law expanded potential venues for purchasing Tennessee wines beyond liquor/wine stores and wineries, the industry is positioned to attract a broader range of local consumers.

A choice set experiment revealed that some consumers who stated that they would choose Tennessee-labeled wine still anticipated purchasing Tennessee wines at wineries and liquor/wine stores, while others indicated a willingness to buy them at newly available outlets (grocery stores, big box stores, and warehouse clubs). Consumer demographics and attitudes play significant roles in where Tennessee wine shoppers would expect to purchase local wines. Older females who are taste-conscious shoppers but don't feel a strong need for advice on buying wine and consider themselves more knowledgeable about California wines are more likely to shop for Tennessee wines at the grocery store. Big box store shoppers tend to be lower-income consumers who value the convenience of shopping for Tennessee wines at these venues but don't feel a strong need for information about wine and consider themselves more knowledgeable about California wines. Warehouse shoppers value low prices but, again, consider themselves more knowledgeable about California wines. Interestingly, prior winery and liquor/wine store shopping behavior for Tennessee wines were both negatively related to shopping for those wines at warehouse clubs. One possibility is that warehouse shoppers may have been more likely to cross state lines to purchase wines in bulk from out-of-state warehouse clubs. Past purchase patterns for wines at wineries and liquor/wine stores had strong influences on continued shopping for Tennessee wines at these same outlets. Wineries proved to be the only outlet where the role of Tennessee wines in helping local farmers appeared to influence anticipated shopping, suggesting these consumers still view the winery as strongly tied to wine grape growers.

Even with access to larger grocery retail, big box, and warehouse club chains, it may be difficult to change shopping preference for local wines, since differences in WTP for local wines at these outlets are still unknown. In these locations, consumers could face a variety of wine choices (including California wines, about which many consumers consider themselves to be more knowledgeable). The results from this study suggest that consumers who anticipated purchasing Tennessee wines at grocery stores and big box stores had lower WTP values than those who did not intend to use these outlets. At the time of our survey, only wineries and liquor/wine stores were available to wine shoppers in Tennessee. Therefore, no pricing data were available for Tennessee wines in food-retail facilities at the time of the survey, which would have allowed a price comparison to wines sold at wineries and liquor/wine stores. As Tennessee wines can now be sold in these outlets, future research might examine the extent to which local wines are being sold in food-retailing outlets. Future research might also examine the pricing of wines across food-retailing outlets compared to wineries and liquor/wine stores as well as consumer expectations about pricing and marketing of local wines at food-retailing outlets.

Acknowledgments

Support for the research presented in this article was provided by the Tennessee Farm Winegrowers Alliance, U.S. Department of Agriculture Rural Development-Tennessee Office, and the Tennessee Department of Agriculture.

References

Balter, E. 2017. "Wine Legislation Roundup: A Consumer's Guide to 2017 State Politics." *Wine Spectator,* March 28. Available online: http://www.winespectator.com/webfeature/show/id/Wine-Legislation-Roundup-2017

Beames, G. 2003. "The Rock, the Reef and the Grape: The Challenges of Developing Wine Tourism in Regional Australia." *Journal of Vacation Marketing* 9:205–212.

Brooks, E. 2001. "Counties as Brands: International Trade in Wine." Paper presented at the Conference of the Vineyard Data Quantification Society, St. Helena, CA, May 21–22.

Bruwer, J., and I. Lesschaeve. 2012. "Wine Tourists' Destination Region Brand Image Perception and Antecedents: Conceptualization of a Winescape Framework." J*ournal of Travel and Tourism Marketing* 29:611–628.

Cappellari, L., and S. Jenkins. 2003. "Multivariate Probit Regression Using Simulated Maximum Likelihood," *STATA Journal* 3(3):278–294.

Charters, S., and J. Ali-Knight. 2002. "Who Is The Wine Tourist?" *Tourism Management* 23(3):311–319.

Corsi, A., J. Cohen, and L. Lockshin. 2014. "Store Image Perception of Retail Outlets for Wine in China." Paper presented at the Academy of Wine Business Research 8th International Conference*,* Geisenheim, Germany, June 28–30. Available online http://academyofwinebusiness.com/wp-content/uploads/2014/07/CH01_Corsi_Armando.pdf

Ferreira, J., and G. Ferreira. "Pricing Strategies for Virginia Wineries." *AAEC Extension Update*, Virginia Tech University. Available online: http://news.cals.vt.edu/fbm-update/2013/08/08/pricing-strategies-for-virginia-wineries/

Getz, D., and G. Brown. 2006. "Critical Success Factors for Wine Tourism Regions: A Demand Analysis." *Tourism Management* 27(1):146–158.

Greene, W. 2011. *Econometric Analysis*, 7th ed. Upper Saddle River, NJ: Prentice Hall.

Jarvis, W., and S. Goodman. 2005. "Effective Marketing of Small Brands: Niche Positions, Attribute Loyalty and Small Brands." *Journal of Product and Brand Management* 14(5):292–299.

Krinsky, I., and A. Robb. 1986. "On Approximating the Statistical Properties of Elasticities." *Revue of Economics and Statistics* 68:715–719.

Kolyesnikova, N., T. Dodd, and D. Duhan. 2008. "Consumer Attitudes towards Local Wines in an Emerging Region: A Segmentation Approach." *International Journal of Wine Business Research* 20(4):321–334.

Marcum, E. 2017. "Tennessee Grocery Stores Say Wine Sales a Success." *USA Today Network – Tennessee*, March 17. Available online: https://www.usatoday.com/story/money/business/2017/03/17/tennessee-grocery-stores-say-wine-sales-success/99211156/

McFadden, D. 1974. Conditional Logit Analysis of Qualitative Choice Behavior. In P. Zarembka, ed. *Frontiers in Econometrics*. New York: Academic Press, pp. 105–142.

Nielsen Company. 2015. "Grapes of Worth: How Supermarkets are Becoming Local Wine Shops" *Newswire*, February 19. Available online: http://www.nielsen.com/us/en/insights/news/2015/grapes-of-worth-how-supermarkets-are-becoming-local-wine-shops.html

Olsen, J., T. Atkin. L. Thach, and S. Cuellar. 2015."Variety Seeking by Wine Consumers in the Southern States of the US." *International Journal of Wine Business Research* 27(4): 260–280.

O'Neill, M., and S. Charters. 2000. "Service Quality at the Cellar Door: Implications for Western Australia's Developing Wine Tourism Industry." *Managing Service Quality: An International Journal* 10(2):112–122.

Scarpa R., M. Thiene, and L. Galletto. 2009. "Consumers' WTP for Wine with Certified Origin: Preliminary Results from Latent Classes Based on Attitudinal Response." *Journal of Food Products Marketing* 15(3):231–248.

Soulek, K., T. Dodd, and N. Velikova. 2016. "Consumer Attitudes toward Texas Wine: A Comparative Report 2006–2016." Texas Wine Marketing Research Institute, College of Human Sciences, Texas Tech University, November. Available online: http://www.depts.ttu.edu/hs/texaswine/docs/Consumer-Attitudes-Towards-Texas-Wine.pdf

Steiner, B. 2000. "In Vino Veritas: Does Origin Truly Matter? The Socio-Economics of Origin Labelled Products in Agri-Food Supply Chains: Spatial, Institutional and Coordination Aspects." *Actes et Communications* 17:100–115.

Tennessee Legislature. 2014. Senate Bill 837, An Act to amend Tennessee Code Annotated, Title 2 and Title 57, Relative to Alcoholic Beverages. 108th Tennessee General Assembly. Available online: http://www.capitol.tn.gov/Bills/108/Bill/SB0837.pdf

Thach, L. and K. Chang. 2015. "2015 Survey of American Wine Consumer Preferences." *Wine Business,* November 11. Available online: https://www.winebusiness.com/news/?go=getArticle&dataid=160722

Thach, L., and J. Olsen. 2015. "Profiling the High Frequency Wine Consumer by Price Segmentation in the US Market." *Wine Economics and Policy* 4(1):53–59.

Thiene, M., L. Galletto, R. Scarpa, and V. Boatto. 2013. "Determinants of WTP for Prosecco Wine." *British Food Journal* 115(2):279–299

U.S. Census Bureau. *2013 County Business Patterns*. Washington, DC: U.S. Census Bureau. Available online: https://www.census.gov/data/datasets/2013/econ/cbp/2013-cbp.html

Wine Institute. 2017a. "US/California Wine Production." Available online: https://www.wineinstitute.org/resources/statistics/article83

Wine Institute. 2017b. "2016 California Wine Sales in U.S. Hit New Record: 238 Million Cases with Retail Value of $34.1 Billion." Available online: http://www.wineinstitute.org/resources/pressroom/05012017

Woods, T., X. Deng, L. Nogueira, and S. Yang. 2015. "Local Wine Expenditure Determinants in the Northern Appalachian States." *Journal of Food Distribution Research* 46(2):30–50.

Woods, T., L. Noguiera, and S. Yang. 2013. "Linking Wine Consumers to the Consumption of Local Wines and Winery Visits in the Northern Appalachian States." *International Food and Agribusiness Management Review* 16(4):181–205.