Tennessee Consumers' Willingness to Pay for Tennessee Wine

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BACKGROUND

- The United States (US) is the largest wine consuming country by volume in the world (Wine Institute 2014).
- Wine consumption in the US grew from 449 million gallons in 1993 to 893 million gallons and $37.5 billion in sales in 2014 (Wine Institute 2015).
- With such a large and growing market, grape production and wineries are emerging in areas of the US that have not previously been recognized as wine producing (Loureiro 2003).
- Tennessee (TN) has a history of limited wine grape production (Lockwood 2001) but has recently seen an increase in both grape and wine production.
- Per capita wine consumption in TN is relatively low.
- However, recently a law was passed permitting the sale of wines in grocery stores and other retail outlets selling at least 20% grocery food products.
- This change could open up additional markets for TN wines and introduces the products to consumers not previously reached through winery and liquor store sales.
- Currently, much of the local wine sales occur at the wineries across the state.
- Consequently, little is known about premiums consumers might be willing to pay for TN wines in side-by-side comparisons such as might occur in grocery stores or other food shopping outlets.
- In addition, no research on TN consumers' willingness to pay (WTP) for TN wines exists.

Per Capita Wine Consumption

TN WINERIES
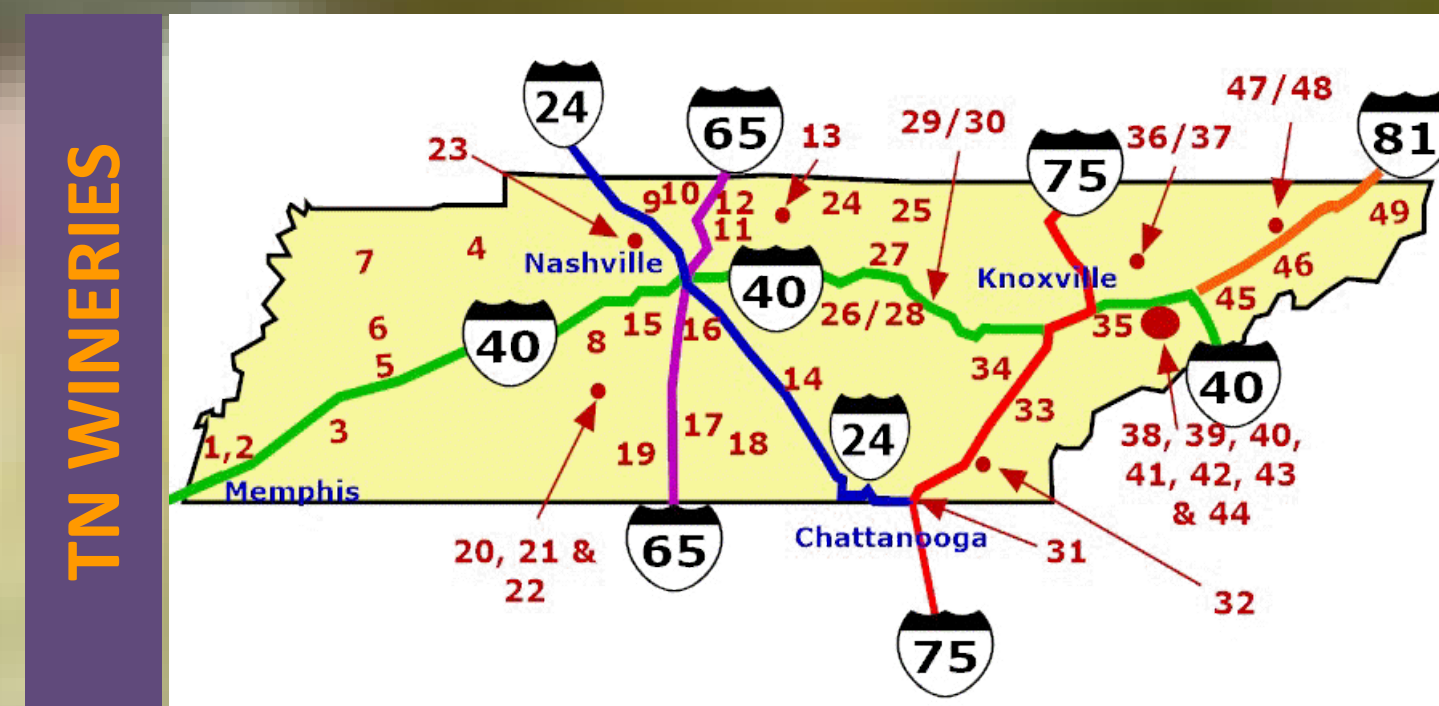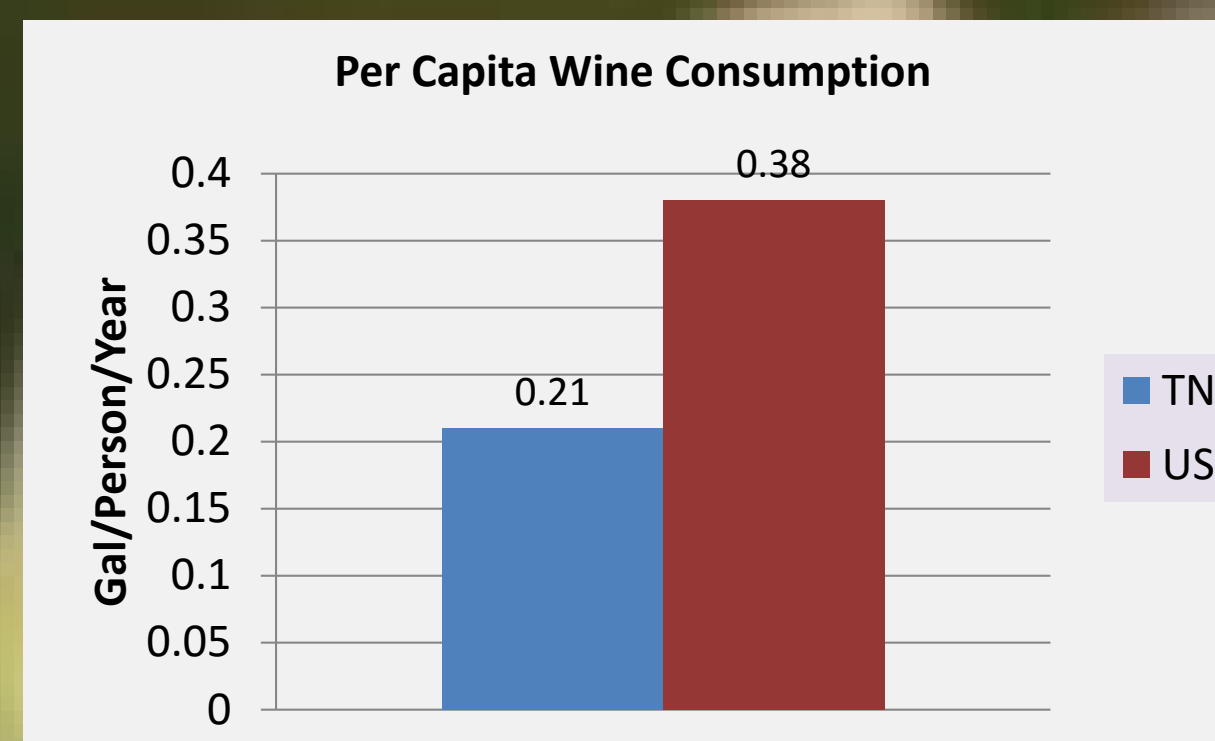
OBJECTIVES

- 1) Provide measures of TN consumers' WTP for TN labeled and produced wines (red, white and Muscadine).
- 2) Ascertain demographic characteristics and attitudes of TN consumers influencing WTP for TN wines.

DATA

- Data was obtained through Qualtrics online survey hosting service during Sept. 2015.
- Survey panel-TN residents, 21 years and older, current wine consumers.
- A total of 500 survey responses were collected.
- Following a cheap talk script, respondents were presented with choice sets.
- Assignment to red/white choice sets was based on preferences for red or white wine (or randomly if no preference).
- Respondents were also asked to complete a Muscadine choice set.
- Respondents were asked to assume that all wine attributes were identical except price and origin.
- For red and white wine choice sets, base (CA) wine price was $12/bottle, TN wine prices were either $10, $12, $14, or $18/bottle.
- For the Muscadine choice sets, base (NC) wine price was $10/bottle, TN wine prices were either $8, $10, $12, or $14/bottle.

	Alternative A	Alternative B
Price	$10.00/bottle	$12.00/bottle
Label	Tennessee Wine	California Wine
I prefer		

	Alternative A	Alternative B
Price	$10.00/bottle	$10.00/bottle
Label	Tennessee Wine	North Carolina Wine
I prefer		

Example Choice Experiments- White/Muscadine Wines.

METHODS

Random Utility Models (RUMs) are used (McFadden 1974). If the utility derived from selecting the TN wine is greater than that from selecting the alternative, then the outcome will be selection of the TN wine. The probability of the ith respondent choosing the TN wine is then

$$(1)\ \Pr(TNWINE_i = 1) = \Phi(\beta_p p_i, \beta_k' x_{ki}),$$

where $TNWINE_i$=1 if TN labeled wine, 0 otherwise (CA for red and white and NC for the Muscadine), p_i=TN wine price, x_{ki}=matrix of k demographics and attitudes, β are parameters to be estimated, and Φ is the std. normal distribution. See Table 1 for variable names and descriptions.
The marginal effects (ME) of each of the continuous variables upon choosing the TN wine can be expressed as:

$$(2)\ ME_{ij} = \phi(\beta_p p_i, \beta_k' x_{ki}) * \beta_j.$$

where β_j is the parameter on the jth variable of interest and ϕ is the std. normal density. The mean of these individual ME's for each variable are calculated. For dummy variables, the differences in the probabilities (using equation 1) with the dummy variable set at 0 and 1 are calculated to obtain the marginal effects. The WTP can be expressed as

$$(3)\ WTP_i = -\beta_k' x_{ki} / \beta_p.$$

Estimates from each probit model are used to quantify TN consumers' WTP for TN labeled wines (red, white, and Muscadine) and the various factors influencing those decisions.

RESULTS

Table 1. Descriptions and Summary Statistics of Dependent and Independent Variables for TN Labeled Wines

		Muscadine (N=437)	White (N=214)	Red (N=242)
Variable	**Description**			
Dependent Variables				
TNWHITE	= 1 if choose TN labeled white wine	---	0.719	---
TNRED	= 1 if choose TN labeled red wine	---	---	0.669
TNMUSC	= 1 if choose TN labeled Muscadine wine	0.819	---	---
Independent Variable				
PRICEMUSC	Price of TN white wine: $8, $10, $12, $14	10.984	---	---
PRICEWHITE	Price of TN white wine: $10, $12, $14, $18	---	13.00	---
PRICERED	Price of TN red wine: $10, $12, $14, $18	---	---	13.727
AGE	Age of respondent (years)	39.80	40.00	40.24
FEMALE	= 1 if the respondent was female	0.744	0.821	0.649
INCOME	= 1 if the respondent had an annual household income of $50,000 or higher	0.438	0.413	0.471
COLLEGE	= 1 if the respondent had a bachelor's degree or higher	0.387	0.379	.388
WHITEWINE	= 1 if the respondent prefers white wine	0.413	0.780	----
REDWINE	= 1 if the respondent prefers red wine	0.370	----	.802
CAKNOW	Knowledge level of CA wines 1=not at all, 2=somewhat, 3=knowledgeable, 4=extremely	---	1.715	2.017
TNKNOW	Knowledge level of TN wines 1=not at all, 2=somewhat, 3=knowledgeable, 4=extremely	---	1.710	1.992
LOWPRICE	Importance of low price 1=not, …, 5=very	3.085	3.112	3.025
TASTE	Importance of taste 1=not, …, 5=very	4.881	4.902	4.860
APPEAR	Importance of appearance 1=not, …, 5=very	2.281	2.220	2.314
AVAIL	Importance of availability 1=not, …, 5=very	---	3.986	3.979
REPUTE	Importance of reputation 1=not, …, 5=very	---	3.299	3.380
LOCAL	Importance of locally produced 1=not, …, 5=very	2.769	2.799	2.678
VISIT	Importance of visiting winery/vineyard 1=not, …, 5=very	3.130	3.061	3.140
LIKEMUSC	=1 if consumer likes Muscadine wine, 2= does not like , 3= never tried	0.627	---	---
WINEVIN	Usually purchases wine from winery/vineyard	0.405	---	---
LIQUOR	Usually purchases wine wine/liquor store	0.883	---	---
CLUSTER	= 1 if the respondent was located in a county with three or more wineries	0.078	0.079	0.087
METRO	= 1 if the respondent was located in a zip code that is classified as metro by the USDA ERS	0.757	0.748	0.769

Table 2. Estimated Marginal Effects, Goodness of Fit, and WTP Estimates from the Probit Models[a,b]

	Marginal Effect		
Variable	TNMUSC (N=437)	TNWHITE (N=214)	TNRED (N=242)
PRICE	-0.047 ***	-0.030 ***	-0.054 ***
AGE	0.002 *	0.152	0.036 ***
FEMALE	0.027	-0.021	-0.084
INCOME	0.189	0.057 *	0.040
COLLEGE	0.015	-0.195 ***	-0.060
WHITEWINE	-0.064	0.091	-
REDWINE	-0.088 *	-	-0.112 *
CAKNOW	-	-0.164 ***	-0.061 *
TNKNOW	-	0.233 ***	0.084 **
LOWPRICE	-0.009	-0.016	-0.048 **
TASTE	0.073 *	-0.090	0.090
APPEAR	-0.20	-0.001	-0.056 **
AVAIL	0.021	-0.026	0.036
REPUTE	-	-0.005	-0.120 *
LOCAL	0.021	0.064 **	0.078 ***
VISIT	0.033 **	0.000	0.021
LIKEMUSC	0.023	-	-
WINEVIN	0.006	-	-
LIQUOR	0.080	-	-
CLUSTER	-0.044	0.024	0.066
METRO	-0.018	-0.043	0.019
LLR Test of Model Fit	88.82 ***	68.56 **	88.89 ***
Percent Correctly Classified	82.2	81.3	78.9
Estimated WTP	$16.03	$19.48	$16.62
Premium Above Base Price[b]	$6.03 ***	$7.48 ***	$4.62 ***

****=significant at α=.01, **=significant at α=.05, *=significant at α=.10.
[b] Test of the hypothesis H₀: Premium = 0.

CONCLUSIONS

- Results from the three separate probit models suggest TN consumers place premium values on wines produced within the state.
- The WTP estimate for the TN labeled white wine was 62.3% above the base (CA) wine, the TN labeled red wine was 38.5% above the base (CA) wine and the TN labeled Muscadine wine was 50.3% above the base (NC) wine.
- Consumer profiles for each type of TN wine are
  - Muscadine-older, less preference for red wine, greater importance of wine taste, value the ability to visit the vineyard/winery.
  - White-higher income level, not a college graduate, less knowledgeable about CA wines but more knowledgeable about TN wines, and prefer locally produced.
  - Red-older, less knowledgeable about CA wines but more knowledgeable about TN wines place less importance on low price, bottle appearance, and reputation, but prefer locally produced.
- Positive influence of visits to a vineyard/winery on WTP for TN Muscadine suggests a consumers value the experience of visiting the winery as part of their wine purchase.
- With the change in wine retailing law, future research should examine where consumers would anticipate shopping for TN wines.

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