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## **Linking Wine Consumers to the Consumption of Local Wines and Winery Visits in the Northern Appalachian States**

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### **Abstract**

Wineries in the Northern Appalachian states have expanded significantly over the past 10 years, however, marketing still presents challenges in this globally competitive industry. We explore the linkages between general wine consumption and winery tourism. A market segmentation model is applied to local wine purchases and winery visit behavior. In this four state study of 1,609 wine consumers in Pennsylvania, Ohio, Kentucky, and Tennessee we provide insights into local wine purchasing differences among core, mid-level, and periphery wine consumers. We analyze the determinants of trying local wine and visiting local wineries. Finally, we examine differences in post-winery visit behavior. Our results suggest that the frequency of wine consumption and increase in wine knowledge positively influence the decision to try a local wine and visit a local winery.

**Keywords:** wine consumption, winery tourism, market segmentation, local winery promotion and post-winery visit behavior.

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## Introduction

Wineries in the Northern Appalachian states have expanded significantly over the past 10 years, however, marketing still presents challenges in this globally competitive industry. Most wineries in this region depend heavily on tourism and on-site sales while differentiating themselves through experience-based value propositions. Transaction costs (search costs) for wine are high for both the winery and consumers because of asymmetric information and product proliferation (Maumbe and Brown 2013), challenging the success of new wines, new wineries and new wine-producing regions. Local origin labeling is one way to help new wine-producing regions market and establish a reputation for their products (Loureiro 2003); however, the product needs to be of high quality. Experience dimensions of products encountered at a winery can add further value and sustained differentiation as visitors bring past experiences with local products to purchases in later retail venues. Winery visits and appropriate marketing strategies can help local wineries in the Northern Appalachian states of Pennsylvania, Ohio, Kentucky, and Tennessee create increased awareness, differentiation, and value in a crowded wine market. These states share common geographic proximity and recent growth in the number of wineries, increasing from 76 in 2003 to 342 in 2011 (Woods and Ernst 2011a, 2011b), but have differences in wine marketing and distribution that could contribute to some differences in where and how consumers shop for local wine. Local wineries need to understand the linkages between general wine consumption, winery tourism, and the consumers' behavioral response following local winery visits in different retail settings as they create future marketing strategies.

We explore the linkages between general wine consumption and winery tourism in this paper. A market segmentation model is used following a Hartman consumer study on natural foods consumers (The Hartman Group 2000) and applied to local wine purchases and winery visit behavior. In this four state study of 1,609 wine consumers in Pennsylvania, Ohio, Kentucky, and Tennessee, we provide insights into channel participation differences among periphery (purchased wine at least once per year), mid-level (at least once per month), and core (at least once per week) wine consumers. We analyze the determinants of trying local wine and visiting local wineries. Finally, we examine differences in post-winery visit behavior across these groups. These results have important implications for local winery promotion in this region.

The objectives for this paper are: 1) to analyze the linkages between general wine consumption and local winery tourism; and 2) to determine differences in the behavioral response to local winery visits between core, mid-level, and periphery wine consumers. Successful marketing strategies are becoming increasingly important as wineries continue to expand in the Northern Appalachian states of Pennsylvania, Ohio, Kentucky and Tennessee. Winery visits are a major driver in local wine seeking and promoting by wine consumers at all levels, suggesting the experiential value dimension is carried forward into future purchases. Wineries need to understand the behavior and consumption patterns of their potential consumers to develop successful marketing strategies. Our analysis provides important results for local wineries with implications for strategic market development.

There are several general studies related to wine tourism in new regions. Dodd (1995) examines the characteristics of winery visitors in Texas. His results show that people with an existing knowledge and interest in wine are the main visitors to Texas wineries. These consumers have

high levels of wine consumption, high income and education levels. He suggests that new wineries should initially target this consumer group rather than introduce the product to new consumers. More recently, Rasch and Gretzel (2008) investigate how effectively Texas wineries market tourism. Their results indicate that wineries in Texas are missing strategic opportunities to market wine tourism to other areas. Current online marketing efforts are not sufficient to promote Texas wine regions in the state. Collaborative marketing efforts through websites can be an important tool to develop wine tourism in Texas. Wargenau and Che (2006) investigate wine tourism development in southwest Michigan. They find that alliances along the Southwest Michigan Wine Trail have advanced the development and marketing of wine tourism.

Regarding countries outside the United States, Tefler (2001) conducted interviews at 25 local wineries in the Niagara Wine Route to document the importance of strategic alliances to develop wine tourism. His results suggest that wineries that have taken an aggressive approach to tourism have benefited through increased sales. Charters and Ali-Knight (2002) examine the behavior and characteristics of the wine tourist by looking at the purpose of visit, general tourist motivation and relationship to other tourist activities in Australia. Bruwer (2003) conducted 125 face-to-face interviews with wine route estate enterprises in South Africa to study the wine tourism “product” offered. He finds that South Africa has an active wine tourism market with well-developed facilities and infrastructure. Most wine tourists are classified as “wine lovers”, who are also the most likely group to purchase wine during the visit. Martin and Williams (2003) describe the policies that influence the development of wine tourism in British Columbia, Canada. Jaffe and Pasternak (2004) determine the potential for wine tourism in Israel. Murphy, Ho and Chan (2005) examine the importance of website features and replies to consumer emails for Australian wineries. Their results suggest that the wineries studied are approaching the first stage in website evolution providing basic information. The wineries, however, are weak in providing societal and virtual information. They identify several opportunities for gaining competitive online advantages in wine tourism. Getz and Brown (2006) examine the consumer characteristics for long-distance wine tourism. A sample of 161 wine consumers in Calgary, Canada, revealed that highly motivated, long-distance wine tourist prefer destinations offering a wide range of cultural and outdoor activities.

Some studies focus on identifying the determinants of wine consumption. For example, Hussain, Cholette and Castaldi (2007) identify econometrically the determinants of wine consumption in the United States. They use 122 survey responses from Northern California consumers. The authors identify knowledge as the most important determinant of wine consumption, with knowledgeable consumers consuming larger volumes of wine, across all price points. Bruwer, Saliba and Miller (2011) conduct exploratory research in Australia to determine differences in behavior dynamics and sensory preferences of different consumer groups. They surveyed 150 visitors to ten wineries in the Yarra Valley wine region in Australia. The authors find specific differences by gender and generation. Preszler and Schmit (2009) conduct a survey of upscale restaurants and wine stores in New York City to identify the attributes influencing wine purchasing decisions. The authors find that larger, more expensive restaurants usually include fewer New York wines. Restaurants that serve more domestic wines, and Riesling and Cabernet Franc wines usually include more New York wines. Price, variety across several dimensions and wine’s collective reputation (region and grape variety) were the most important attributes influencing wine purchasing decisions. Wolf, Carpenter and Qenani-Petrela (2005) show that the

California wine market is segmented by age. Wine consumption behavior of Generation X consumers is different from Generation Y and Baby Boomers. The authors find differences in demographics, purchasing attitudes and behaviors among the different generations.

Most market segmentation studies focus on generational differences, in particular, identifying the preferences of Millennial (Generation Y) consumers (Thach and Olsen 2006; Fountain and Charters 2010) and how wineries are incorporating new components in their marketing strategy (Thach 2009). Thach and Olsen (2006) interviewed 108 Millennials. The authors describe the Millennials perceptions and attitudes regarding wine and what the wine industry can do to better market to them. Their results indicate that wineries need to advertise specifically to this group utilizing fun, social, and relaxed settings; innovative packaging and labels; and a focus on value wines. Millennials are also interested in learning about wine, taste enhancements and the environmental emphasis of the winery. Fountain and Charters (2010) use a modified mystery shopping approach to explore the expectations and experience of Generation Y as wine tourists, as compared to Generation X and Baby Boomers. The authors find that Generation Y participants placed an emphasis on enjoying the entire experience of the winery, not just wine tasting. Specifically, Generation Y participants want: relaxing and informal settings; a personalized experience; interaction with the staff; and different experiences depending on the type of winery. Thach (2009) investigates to what extent 208 US wineries are incorporating Wine 2.0 components in their marketing strategy. The author defines Wine 2.0 components as social networking, blogs, vlogs (online videos), and interactive e-commerce. Results suggest US wineries have not adopted Wine 2.0 components to a great extent as of the time of the study.

Few studies focus on more specifically on consumer attitudes towards new wine areas or areas that are new to wine tourism. Loureiro (2003) studies consumer response towards wine grown in Colorado. The author calculates the mean willingness to pay for Colorado environmentally friendly and Colorado regular wines. Her results suggest that wineries need to achieve a reputation for high quality to obtain a higher premium in differentiated markets. Kolyesnikova, Dodd and Duhan (2008) conduct a telephone survey to study consumer attitudes toward local wines in an emerging region, Texas. They find that the Texas wine market was segmented into four clusters: local enthusiasts, local detractors, local advocates and local non-advocates. The authors develop socio-demographic and wine consumption profiles for each cluster to help local wineries and marketers to establish new products. Marzo-Navarro and Pedraia-Iglesias (2012) study a region in Spain with a long wine-making tradition, but new to wine tourism, Aragon. The authors research the attitude of Aragon wineries towards wine tourism, and the wineries' ideas about how to further develop their marketing strategy to increase wine tourism in the region. They identify some of the characteristics necessary to develop wine tourism: good wine, good food, appropriate lodging, and complementary touristic activities. Most of the wineries in Aragon, however, are located in rural areas with little infrastructure. For Aragon to become an important wine tourism destination the tourism industry, the wine industry and the government would have to invest in infrastructure to provide the appropriate global experience for consumers.

Our results are consistent with general studies related to new wine regions, suggesting that the frequency of wine consumption and increase in wine knowledge positively influence the decision to try a local wine and visit a local winery. However, there are only a few studies using

econometric analysis of the characteristics and determinants of consumer behavior in terms of wine consumption and even fewer studies analyzing winery visits and post-winery visit behavior, as we describe in the following paragraphs. Our study also differs from previous studies by using a total of 1,609 useable survey data from wine consumers in the region. We obtained information on wine purchases, expenditure, preferences, knowledge, winery visits, post-winery visit behavior, preferences for local foods, and demographics.

Reputation is extremely important in wine consumption (Schamel 2009), also in the context of wine choices by patrons in restaurants (Preszler and Schmidt 2009), establishing legitimacy and regional identity for new wineries and wine regions (Sprouse, Ross, Chaddad and Gomez 2013), and agro-tourism (Sharpley and Vass 2006), creating a potential market penetration problem for new wine areas. Furthermore, all wineries need to understand what consumers need and want, which can only be done through a thorough understanding of consumer characteristics and how those characteristics affect consumer behavior. Our study contributes to the literature by analyzing wine consumption, winery visits, and post-winery visit behavior for the Northern Appalachian states of Pennsylvania, Ohio, Kentucky, and Tennessee. We identify differences in wine consumption, winery visits and post-winery visit behavior based on several characteristics: consumption level, demographic characteristics, preferences for local foods, among others. Our analysis provides important results for local wineries with implications for strategic market development.

## **Data**

The data used for this study were collected through a web-based consumer survey using an existing consumer panel maintained by Zoomerang.com, an affiliate of MarketTools, Inc. The survey was administered during mid-September 2012 to a diversified array of consumers who are at least age above 21 from these four states: Pennsylvania (25.05%), Ohio (24.92%), Kentucky (24.98%), and Tennessee (25.05%). A total of 1,609 useable survey data were collected.

Following a Hartman consumer study on natural foods consumers (The Hartman Group 2000), the first section was designed to understand respondents' wine consumption and frequency on specific types of wine. The second part contains the respondents' wine knowledge and experiences with local wine and local winery visits. The third part attempts to understand respondents' post-winery visit behavior. And the fourth part comprises the demographic questions and some related questions, like purchasing behavior for the local food, preparing fresh food at home, and watching food channel programs.

This study focuses on the linkage between general wine consumption and winery tourism, thus, our survey attempts to extract the information associated with wine purchases, expenditure, preferences, knowledge, winery visits, post-winery visit behavior, preferences for local foods, and demographics. About 57% of respondents reveal that they have purchased wine for any occasion at least once per month during the past 12 months. In general, respondents buy more super wine (\$7-\$14/bottle) compared to popular wine (\$4-\$7/bottle), ultra wine (\$14-\$25/bottle),

and luxury wine (above \$25/bottle). Almost 50% of respondents classified their wine knowledge level in “average” and “above average” categories.

In terms of experiences on local wine and local winery visits, 38% of respondents have tried local wine within the past 12 months, and 45% of respondents have visited local wineries at least once during the past three years. The top three post-winery visit behaviors in terms of frequency are: actual purchase of a wine in the store, recommendation of the winery to a friend, and recognizing a wine in a store. We also include information on resident period in the state, the local concept in terms of mile range, local food purchases, food channel, and frequency of fresh food preparation at home. The definitions and descriptive statistics of these variables are presented in Tables 1 and 2 (see Appendix). The expected signs, actual signs and references for the independent variables are presented in Table 3 (see Appendix).

Several interesting results can be observed in the data relating wine consumers to local wine consumption and propensity to visit a local winery. The frequency of wine consumption in general, as one might expect, relates positively to the likelihood that the consumer had tried local wine within the past 12 months. Similarly, more frequent wine consumers are more likely to have visited a local winery at least once during the past three years (Table 4). These would appear to be favorable results from the perspective of local wineries wondering about the potential demand situation as wine consumption likely continues to increase in the region. Wine consumption per capita in the U.S. has been growing steadily for decades, although, at 9.4 l/capita, still well behind European countries like the UK (21.6) and Germany (24.5) and South American countries like Chile (18.8) (The Wine Institute 2013).

## Methodology

We use a market segmentation model following Wells and Haglock (2005) who used the Hartman consumer study on natural foods consumer lifestyle segments and applied this model to local wine purchases and winery visit behavior (The Hartman Group 2000). The concept of differentiation through experience goods is discussed by Besanko et al. (2010) based on the seminal work exploring search and experience goods by Nelson (1970) and explored specifically in the context of marketing wine through wineries. In the four-state study of 1,609 wine consumers in Pennsylvania, Ohio, Kentucky, and Tennessee we provide insights into channel participation differences among core, mid-level, and periphery wine consumers. We analyze the determinants of trying local wine and visiting local wineries. Approximately 45% of wine consumers reported visiting a local winery at least once during the past three years. We examine differences in post-winery visit behavior across these groups.

The linkage between general wine consumption and winery tourism can be studied from consumers' past experiences. We use a logit model to analyze the characteristics of consumers that: 1) have tried a state local wine within the past 12 months, and 2) have visited a state local winery during the past three years. The time range is a little arbitrary, but tries to balance the expected low frequency of visits and the ability of a respondent to recall details associated with the visit. The logistic regression model specifies

$$(1) \quad p = L(x_i'\beta) = \frac{e^{x_i'\beta}}{1 + e^{x_i'\beta}}$$

where  $L(\cdot)$  is the standard logistic distribution function,  $x$  is a regressor vector, and  $\beta$  is a  $K \times 1$  parameter vector. The estimated parameters in a logit model are not easy to interpret directly, thus, we calculate the marginal effects to interpret the parameters:

$$(2) \quad \frac{\partial p_i}{\partial x_j} = \frac{\partial \Pr[y_i = 1 | x_i]}{\partial x_j} = \frac{\partial L(x_i'\beta)}{\partial x_j} = \frac{\sum L(x_i'\beta)[1 - \sum L(x_i'\beta)]}{n} \beta_j$$

Following random utility theory, consumers are assumed to optimize their utility for their choices to try state local wine and visit state local winery. As a result, their decision of trying local wine and visiting a local winery can be explained by demographic factors, food consumer behavior factors, and wine consumer attributes. The demographic factors are gender, age, race, income, education, family with kids, urban versus rural, state differences, and length of residency in the state. The food consumer behavior factors are whether consumers purchased locally produced foods, how far from their home is considered local, whether consumers watch food channels, and whether they prepare fresh food at home. The wine consumer attributes are wine knowledge, frequency of wine purchasing, and purchasing frequency by price category.

The definitions and summary statistics of dependent and independent variables are exhibited in Tables 1 and 2. Approximately 38% of consumers have tried local wine and 45% have visited state local wineries. The model specification is: for those consumers who have tried a state local wine is:

$$(3) \quad Y = \beta_0 + \beta_1 \text{Male} + \beta_2 \text{Age} + \beta_3 \text{White} + \beta_4 \text{Income} + \beta_5 \text{Income}^2 + \beta_6 \text{Education} + \beta_7 \text{Kids} + \beta_8 \text{Urban} + \beta_9 \text{PA} + \beta_{10} \text{KY} + \beta_{11} \text{TN} + \beta_{12} \text{Residency2} + \beta_{13} \text{Residency3} + \beta_{14} \text{Buy\_local2} + \beta_{15} \text{Buy\_local3} + \beta_{16} \text{Local\_range} + \beta_{17} \text{Food\_channel} + \beta_{18} \text{Prep\_freshfood2} + \beta_{19} \text{Prep\_freshfood3} + \beta_{20} \text{Wine\_knowledge2} + \beta_{21} \text{Wine\_knowledge3} + \beta_{22} \text{Mid\_level} + \beta_{23} \text{Core} + \beta_{24} \text{Popular\_wine} + \beta_{25} \text{Super\_wine} + \beta_{26} \text{Ultra\_wine} + \beta_{27} \text{Luxury\_wine} + \varepsilon$$

here  $Y$  represents *Local\_tried* or *Winery\_visit*, depending on the model,  $\beta_s$  are the coefficient estimates, the variables are defined in Table 2 (see Appendix), and  $\varepsilon$  is a standard logistic distributed error term. Table 3 (see Appendix) includes the expected and actual signs for the coefficients estimates and the previous studies that have used the same or similar explanatory variables.

Consumers were asked to indicate the frequency of post-winery visit behaviors, a series of future actions either at another retail store or during a subsequent visit to the winery. Only 713 out of 1,609 respondents indicated they had visited a winery within the past three years. For each post-winery visit behavior, consumers were asked to choose an ordered frequency response: “1: hasn’t happened,” “2: once,” “3: 2-3 times,” and “4: more than 3 times.” Respondents could mark one category as an indication of the frequency regarding their post-winery visit behavior. Hence, an



ordered logit model is individually applied to these seven post-winery visit behaviors, which are explained by the same set of independent variables in equation (3).

We divide the post-winery visit behaviors in two groups: four in-store behaviors and three additional winery visit behaviors. The in-store behaviors are: recognizing a wine in a store; asking about the availability of a wine in a store; actual purchase of a wine in the store; and purchase of another state local wine in the store. The additional winery visit behaviors are: recommendation of the winery to a friend; follow-up visit to the same winery; and visit of another winery in local state.

The ordered logit model is based on one latent variable ( $y_i^*$ ) but with a different match to the observed independent category ( $y_i = 1, 2, \dots, M$ ). It can be specified as:

$$(4) \quad y_i^* = x_i' \beta + u_i.$$

For an  $M$ -alternative ordered model we define:

$$(5) \quad y_i = j \text{ if } \gamma_{j-1} < y_i^* \leq \gamma_j,$$

where  $\gamma_0 = -\infty$  and  $\gamma_M = \infty$ . Then, the probability of chosen alternative  $j$  is the probability of latent variable ( $y_i^*$ ) between two unknown boundaries  $\gamma_{j-1}$  and  $\gamma_j$ . Assuming that  $u_i$  is i.i.d. the ordered logit model has a logistic cdf:  $F(z) = e^z / (1 + e^z)$ . In this case  $M$  equals 4 and is also a cumulative outcome. We can frame our ordered logit model as:

$$(6) \quad y_i^* = x_i' \beta + u_i.$$

$$(7) \quad y_i = 1 \text{ if } y_i^* \leq 0,$$

$$(8) \quad y_i = 2 \text{ if } 0 < y_i^* \leq \gamma_1,$$

$$(9) \quad y_i = 3 \text{ if } \gamma_1 < y_i^* \leq \gamma_2,$$

$$(10) \quad y_i = 4 \text{ if } y_i^* > \gamma_2,$$

where the  $y_i^*$  can loosely be interpreted as “how likely wine consumers would reveal their post-winery visit behavior.” The ordered logit model in this study was estimated using the logistic procedure with the descending option in SAS. This option allows us to interpret the positive coefficient, which also corresponds to an increase in the value of the dependent variable.

We use maximum likelihood to estimate the ordered logit model. The estimated coefficients cannot be directly interpreted, thus, we calculate the odds ratios by taking the exponent of the estimated coefficients. A positive odds ratio means that the odds of a specific post-winery visit behavior increase with a higher value of the explanatory variable. A negative coefficient has an odds ratio between 0 and 1, which decreases the odds of a specific post-winery visit behavior for the explanatory variable.

The ordered logit model assumes that the estimated parameters between each pair of outcome groups are the same. This is called the proportional odds assumption. The logistic procedure in SAS provides a Chi-Square Score Test for the examination of the proportional odds assumption. A rejected null hypothesis for the proportional odds test suggests that the one-equation model is not valid and we should fit a less restrictive model, like a multinomial logit model.

## Results

### *Local Wine Purchasing and Frequency of Wine Consumption*

Following the frequency of consumption in the Hartman consumer study, wine consumers were segmented into three groups: periphery (purchased wine at least once per year), mid-level (at least once per month), and core (at least once per week). Table 4 shows the percentage of consumers in each group based on local wine purchases, local winery visits and post-winery visit behavior. Over half of the wine consumers in the core group have tried local wine and visited local wineries; however, only less than half of wine consumers have tried local wine and visited local wineries in the periphery and mid-level groups. In terms of post-winery visit behavior, core wine consumers are more likely to purchase a wine from the winery in a subsequent visit to another retail store and are more likely to recommend the winery to a friend. These observations reveal that wine consumers in each group behave differently. Therefore, it is necessary to explore the characteristics of each group of consumers.

**Table 4.** Local Wine Behavior by Frequency of Wine Consumption<sup>a</sup>

<b>Behavior</b>	<b>Periphery (N=682)</b>	<b>Mid-level (N=732)</b>	<b>Core (N=195)</b>	<b>Total<sup>b</sup> (N=1,609)</b>
<i>Local_tried</i>	30%	43%	54%	38%
<i>Winery_visit</i>	38%	49%	61%	45%
<b>Post-Winery Visit Behavior</b>				
<b>Behavior</b>	<b>Periphery (N=246)</b>	<b>Mid-level (N=348)</b>	<b>Core (N=119)</b>	<b>Total<sup>c</sup> (N=713)</b>
<b>In Store:</b>				
<i>Recognize brand</i>	54%	76%	76%	68%
<i>Ask about availability</i>	43%	64%	78%	59%
<i>Purchase same local</i>	75%	82%	82%	80%
<i>Purchase other local</i>	46%	60%	67%	57%
<b>Winery Visit:</b>				
<i>Recommend same</i>	66%	80%	79%	75%
<i>Visit same</i>	54%	68%	75%	65%
<i>Visit other</i>	48%	62%	66%	58%

a –the initial survey question allowed for an extent of frequency of each behavior; “hasn’t happened”, “once”, “2-3 times”, and “more than 3 times”. These percentages represent “hasn’t happened” or “happened”.

b –frequency of local wine trial and winery visit by wine consumption is measured here across all wine consumers responding.

c –frequency of post-winery behaviors is reported by frequency only for the sub-set of consumers indicating they had visited a local winery within the past 3 years.

This study places a special emphasis on the relation between winery visits and post-winery visit behaviors that potentially have some reflection on the quality of the winery experience and/or bearing on future local wine purchasing. Within the full sample of wine consumers is a subset of those that actually visited a winery – 713 of the 1,609 (44.3%). Selected behaviors following a visit to a local winery are evaluated in more detail later, but initially we explore the relation between in-store and future winery behaviors across frequency of wine consumption in general. There appears to be a medium to strong positive relation between frequency of wine consumption and the range of in-store behaviors (Table 4). More frequent wine consumers are more likely to recognize and ask about a wine coming from a winery they have visited, as well as purchase other local wines. The frequencies of each of these in-store behaviors are relatively high given that many wineries in the region are fairly small, typically with limited distribution outside of the winery.

Post-winery visit behaviors involving recommending the same winery, actually visiting the same winery again, and subsequently visiting other local wineries also appear to be positively related to the frequency of wine consumption. In sum, initial winery visits have clear positive impacts both in subsequent retail purchase settings and future winery visits – an important component to building the local wine awareness and experience.

#### *Determinants of Trying Local Wine and Visiting Local Wineries*

The logit models examining the likelihood of trying a local wine within the past 12 months and visiting a local winery within the past three years provided more detail with respect to other variables explaining variation. These models were estimated using the full sample of 1,609 regional wine consumers and are summarized in Table 5 (see Appendix). More senior wine consumers and those indicating an urban residence were less likely to indicate they had tried a local wine. Tennessee consumers also were less likely to have tried a local wine relative to the omitted Ohio consumer group. Income had a positive effect but at a decreasing rate (given the negative squared coefficient). White ethnicity, makes significant local food purchases in general, wine knowledge, and wine frequency (both mid-level and core compared to the omitted periphery group) were all positively associated with the likelihood to consume local wine. Frequent consumption of mid-priced wines (both Super and Ultra categories – typical of the price range of many local wines) also was positive.

The likelihood of visiting a local winery within the past three years was negatively influenced by age, urban residency, and the miles defined as local – suggesting the more narrow the individual's geographic concept of local the more likely they were to have indicated having visited a local winery. Kentucky wine consumers were less likely to have indicated visiting a local winery compared to Ohio consumers. Male consumers, those indicating making more frequent local food purchases, those more frequently preparing fresh food at home, watching food channels, consumers indicating greater wine knowledge, and more frequent consumption (Core) were each positively associated with the likelihood of having visited a local winery. Income, similar to trying local wine, was positive but at a decreasing rate.

*Determinants of In-Store Purchase Behavior Post-Winery Visit*

Possible determinants of four selected in-store behaviors are examined among those respondents that indicated they actually visited a local winery (Table 6, see Appendix). The frequency of each behavior is summarized in Table 1 (see Appendix). Of course it is difficult to determine if the retail experience caused the winery visit or the other way. Further, there is a likely cognitive limit to behavior recall across the behaviors explored. It is reasonable, for example, to expect a respondent to have a better recollection of purchase frequencies than recognition frequencies associated with a local wine, especially since we allow for visits as far back as three years to be included. At the very least, we want to explore here joint recognition of the brand and to get some sense of awareness and promotion complementarity between the winery and other retail settings. The frequency of each in-store behavior was framed in an ordered logit model for each behavior based on the recalled extent of frequency of each behavior; “hasn’t happened”, “once”, “2-3 times”, and “more than 3 times”.

Consumers were asked first if they recognized a wine in a store following their visit, exploring brand recognition carrying into another setting. The ordered logit regression suggested that age and urban residency adversely affected recognition of the local winery brand. Tennessee and Pennsylvania consumers were also less likely to recognize the brand relative to Ohio consumers. Male, local food orientation, wine knowledge, and wine consumption frequency (particularly Mid-level) positively impacted recognition. More frequent consumption of popular, super, and luxury wines also contributed positively to recognition. The odds ratio allows us to interpret the coefficients in terms of relative likelihood of a higher value for the independent variable. A positive coefficient estimate, such as BUY\_LOCAL3 at 1.432 with an odds ratio of 4.187, means the odds of recognizing a local wine in the store following a winery visit is 4.187 times more likely for those consumers indicating positively that they “often” or “always” purchase what they know to be locally produced foods. The odds ratio, then, allows us to not only determine the positive or negative effects, but the magnitude of the effect.

The second in-store behavior inquired whether the consumer had asked about the availability of a wine in a store following a winery visit. The regression suggested age and income as the only negative variables – older and wealthier consumers are less likely to inquire. Longer in-state residency, greater wine knowledge, and more frequent consumption were all positive. Consumers that frequently purchased higher end wines (ultra and luxury) were also more likely to inquire. Kentucky consumers were more likely to inquire when compared to those in Ohio. Length of residency had the strongest influence on this behavior; consumers that were residents for more than 10 years were 2.625 times more likely to inquire about availability than those that had lived in the state for 1-4 years.

The third and fourth in-store behaviors explored whether consumers indicated they actually purchased a wine from the winery at the store or, related, whether they purchased a wine from another local winery. Purchasing wine from the visited winery was negatively affected by age and urban residence – younger and non-urban consumers were more likely to make this purchase. Male, length of in-state residency, strong tendency to buy local, and high wine knowledge were positive factors influencing both the likelihood and frequency of purchasing wine specifically from the winery visited and purchase wine from another local winery.

Consumers that frequently watched the Food Channel were more likely to purchase wine from another local winery, as were Kentuckians relative to wine consumers in Ohio.

These in-store behaviors are different, each with different implications for local wine marketing. Different factors contributed to helping explain the variation observed in these behaviors, but four common factors were observed in all four regressions. Males are more likely to report positive inquiry and purchase in the store following a winery visit compared to females. Younger wine consumers, similarly, are more likely to be more active seekers in a store, as are those with greater wine knowledge. These results alone would seem to offer implications for local wine promotion programs where local wineries are expanding beyond simply winery premise sales.

#### *Determinants of Additional Winery Visit Behaviors Post-Initial Winery Visit*

Three behaviors relating specifically to additional winery visits were examined – recommending the same winery, actually visiting the same winery again, and visiting another local winery (Table 7, see Appendix). The frequency of each behavior is, again, summarized in Table 1 (see Appendix). We examine if there appears to be a relation between a recent winery visit and these three behaviors. Word of mouth promotion and repeat sales are extremely important to smaller wineries that depend on experience goods, many with limited promotion budgets and unable to take advantage of the scale economies associated with brand development (Schamel 2009; Sprouse, Ross, Chaddad and Gomez 2013).

The frequency of recommending the same winery was positively influenced by tendency to buy local food, hold a higher range defining local in terms of miles, and wine knowledge. Higher frequency of purchasing super and ultra-priced wines were also positively related to recommending the same winery. Younger wine consumers and those outside of an urban area were more likely to recommend the same winery.

The frequency of actually visiting the same winery was positively influenced by being male and having higher knowledge of wine. More frequent purchasing of super and ultra-priced wines was also positively related to visiting the same winery. Age, education, and urban residency were each negative factors influencing repeat visits to the winery.

Finally, males, consumers tending to buy local food, and those with higher wine knowledge were apt to more frequently visit other local wineries, given they had visited at least one local winery within the past three years. Frequent purchases of popular, super, and luxury-priced wines were also positively related to visiting other local wineries.

The ordered logit model was selected given the ordered nature of the dependent variable (“none”, “once”, “two-three times”, and “more than three times”). Ordered logit models are appealing in that they can address not only whether a behavior occurred, but can also take into account the frequency of the behavior. A limitation of these regressions, however, is generalizing from the coefficients in the event significant differences are observed moving through degrees of frequency of behavior – the so-called parallel influence assumption. The proportional odds test suggested a more restrictive general multinomial logit model be employed in 5 of the 7 behaviors

modeled. Observation of the expanded regressions in each of the multinomial representations, however, did not suggest significant differences from the ordered logit results presented here.

It is somewhat difficult to draw absolute causal relations between the winery visits and the subsequent observed behaviors. But it is difficult to conceive of a controlled experiment where cause and effect between these events and behaviors could be measured. These regressions, at the very least, examine the importance of the relation of a host of variables between an initial local winery visit and subsequent behavior that can provide some direction for local wine and winery awareness and consumption.

One may be concerned about the goodness of fit of our models (Pseudo  $R^2 = 0.097$  and  $0.072$ , McFadden's Adjusted  $R^2 = 0.071$  and  $0.047$ ). However, having low  $R^2$  is characteristic of consumer behavior studies, especially related to a behavior recall. Abello, Palma, Anderson and Waller (2012) obtain an Adjusted  $R^2 = 0.138$ , while Govindasamy and Nayga (1997) obtain a McFadden's  $R^2 = 0.14$ . That said, the larger sample size studying a population like this, and resulting signs and levels of statistical significance suggest that our results are encouraging. These results document some important relations between variables often mentioned but rarely integrated into local food behavior studies.

## Conclusions

Wineries have expanded significantly in the Northern Appalachian states, particularly within the past 10 years. Most of these wineries started small and emphasized on-premise sales to complement the tourism aspect of these businesses. These wineries have expanded in scale and number, however, making marketing and sales through other retail channels more important regionally. There are differences in off-premise wine sales approaches allowed in each of the states studied, but wineries in the region still depend significantly, if not exclusively, on sales locally – on premise.

This study draws several conclusions from its survey of regional wine consumers. The frequency of wine consumption plays favorably to local wine trial and winery visitation. Increases in wine knowledge generally also have a positive effect on the consumer connections to the local wine industry. The young local wine industry in the region should benefit from growth in wine awareness and consumption generally as the U.S. wine consumer continues to drink more wine. The analysis stops short of relating post-winery visit behaviors, but there is likely a relationship between the overall quality of the experience at the winery with the subsequent search, purchase, and informal referral of products marketed from the winery. These factors increase in importance as off-premise sales increase.

Getting the wine consumer to the local winery provides an important opportunity to influence future purchasing behaviors off-premise, but also for future visits to local wineries. Several striking results noted across the various measures of wine trial and purchase behavior is that younger wine consumers and those residing outside of the urban area are regularly showing stronger connections to the local wines and wineries. Measures that show strong consumer connection to place, such as years of residence and enthusiasm toward local food in general, also

are important drivers. This study suggests several potentially interesting launching points for further study of consumer behavior toward local wine consumption and engaging the winery experience. For example, it would be useful for the industry to understand the relation between on-premise and off-premise purchases, the effects of in-store merchandise on winery visits, the effects of agro-tourism programs and state-specific local programs (like Kentucky Proud) on local wine consumption and local winery visits, and in general what motivates consumers to try a local wine and visit a local winery.

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## Appendix

**Table 1.** Definitions and Summary Statistics of Dependent Variables

Variable	Description	Mean	Std. Dev.	Min.	Max.
<i>Local_tried</i> <sup>a</sup>	Binary variable=1 if respondents have tried what they know to be a state local wine within the past 12 months.	0.38	0.48	0	1
<i>Winery_visit</i> <sup>a</sup>	Binary variable=1 if respondents have visited a winery in the state during the past 3 years.	0.45	0.49	0	1
<i>Recognize brand</i> <sup>b</sup>	Discrete variable for “recognizing a wine in a store”; respondents may respond one of these categories: 1: hasn’t happened (32%); 2: once (27%); 3: 2-3 times (28%); and 4: more than 3 times (13%).	2.22	1.03	1	4
<i>Ask about availability</i> <sup>b</sup>	Discrete variable for “asking about the availability of a wine in a store”; respondents may respond one of these categories: 1: hasn’t happened (41%); 2: once (31%); 3: 2-3 times (20%); and 4: more than 3 times (8%).	1.94	0.96	1	4
<i>Purchase same local</i> <sup>b</sup>	Discrete variable for “actual purchase of a wine in the store”; respondents may respond one of these categories: 1: hasn’t happened (20%); 2: once (31%); 3: 2-3 times (32%); and 4: more than 3 times (17%).	2.45	0.99	1	4
<i>Purchase other local</i> <sup>b</sup>	Discrete variable for “purchase of another state wine in the store”; respondents may respond one of these categories: 1: hasn’t happened (43%); 2: once (26%); 3: 2-3 times (22%); and 4: more than 3 times (9%).	1.95	0.99	1	4
<i>Recommend same</i> <sup>b</sup>	Discrete variable for “recommendation of the winery to a friend”; respondents may respond one of these categories: 1: hasn’t happened (25%); 2: once (30%); 3: 2-3 times (30%); and 4: more than 3 times (15%).	2.35	1.01	1	4
<i>Visit same</i> <sup>b</sup>	Discrete variable for “follow-up visit to the same winery”; respondents may respond one of these categories: 1: hasn’t happened (36%); 2: once (30%); 3: 2-3 times (21%); and 4: more than 3 times (13%).	2.12	1.03	1	4
<i>Visit other</i> <sup>b</sup>	Discrete variable for “visit of another winery in the state”; respondents may respond one of these categories: 1: hasn’t happened (42%); 2: once (30%); 3: 2-3 times (19%); and 4: more than 3 times (9%).	1.94	0.97	1	4

**Table 2.** Definitions and Summary Statistics of Independent Variables

Variable	Description	Mean	Std. Dev.	Min.	Max.
<i>Male</i>	Binary variable=1 if respondent is male.	0.30	0.46	0	1
<i>Age</i>	Continuous variable; year of age.	52.80	14.26	21	82
<i>White</i>	Binary variable=1 if respondent's race is white.	0.90	0.29	0	1
<i>Income</i>	Continuous variable; total yearly household income before tax (\$1,000).	67.33	41.12	7.5	225
<i>Education</i>	Continuous variable; year of education.	14.56	2.10	9	18
<i>Kids</i>	Binary variable=1 if respondent has kids under 18 at home.	0.26	0.44	0	1
<i>Urban</i>	Binary variable=1 if respondent is from urban (including city and suburb).	0.63	0.48	0	1
<i>PA</i>	Binary variable=1 if respondent is from Pennsylvania.	0.25	0.43	0	1
<i>KY</i>	Binary variable=1 if respondent is from Kentucky.	0.24	0.43	0	1
<i>TN</i>	Binary variable=1 if respondent is from Tennessee.	0.25	0.43	0	1
<i>OH</i>	Binary variable=1 if respondent is from Ohio.	0.24	0.43	0	1
<i>Residency1</i>	Binary variable=1 if respondent has lived in the state for 1-4 years.	0.05	0.22	0	1
<i>Residency2</i>	Binary variable=1 if respondent has lived in the state for 5-9 years.	0.08	0.28	0	1
<i>Residency3</i>	Binary variable=1 if respondent has lived in the state for 10 or more years.	0.85	0.34	0	1
<i>Buy_local1</i>	Binary variable=1 if respondent never purchases what they know to be locally produced foods.	0.06	0.23	0	1
<i>Buy_local2</i>	Binary variable=1 if respondent sometimes purchases what they know to be locally produced foods.	0.52	0.49	0	1
<i>Buy_local3</i>	Binary variable=1 if respondent often or always purchases what they know to be locally produced foods.	0.41	0.49	0	1
<i>Local_range</i>	Continuous variable; respondent defines "local" winery in terms of mile range from their home.	60.68	64.82	0	1001
<i>Food_channel</i>	Binary variable=1 if respondent watches the food channel or similar programs.	0.75	0.42	0	1
<i>Prep_freshfood1</i>	Binary variable=1 if respondent never prepares fresh food at home.	0.02	0.16	0	1
<i>Prep_freshfood2</i>	Binary variable=1 if respondent prepares fresh food at home for 1-6 times per month.	0.25	0.43	0	1
<i>Prep_freshfood3</i>	Binary variable=1 if respondent prepares fresh food at home for 7 times above per month.	0.72	0.44	0	1
<i>Wine_knowledge1</i>	Binary variable=1 if respondent rates their wine knowledge as "little" or "novice" level.	0.50	0.50	0	1
<i>Wine_knowledge2</i>	Binary variable=1 if respondent rates their wine knowledge as an "average" level.	0.37	0.48	0	1
<i>Wine_knowledge3</i>	Binary variable=1 if respondent rates their wine knowledge as an "above average" and "expert" level.	0.12	0.32	0	1
<i>Periphery</i>	Binary variable=1 if respondent has purchased wine for any occasion within the past 12 months at least once per year.	0.42	0.49	0	1
<i>Mid_level</i>	Binary variable=1 if respondent has purchased wine for any occasion within the past 12 months at least once per month.	0.45	0.49	0	1
<i>Core</i>	Binary variable=1 if respondent has purchased wine for any occasion within the past 12 months at least once per week.	0.12	0.32	0	1
<i>Popular_wine</i>	Binary variable=1 if respondent purchases popular wine (\$4-\$7/bottle) at the frequency of sometimes or often.	0.50	0.50	0	1
<i>Super_wine</i>	Binary variable=1 if respondent purchases super wine (\$7-\$14/bottle) at the frequency of sometimes or often.	0.71	0.45	0	1
<i>Ultra_wine</i>	Binary variable=1 if respondent purchases ultra wine (\$14-\$25/bottle) at the frequency of sometimes or often.	0.43	0.49	0	1
<i>Luxury_wine</i>	Binary variable=1 if respondent purchases luxury wine (above \$25/bottle) at the frequency of sometimes or often.	0.15	0.36	0	1

**Note.** Full sample N = 1,609.

**Table 3.** Expected and Actual Signs for Independent Variables (Local Wine Trials and Local Winery Visit)

Independent Variables	Expected Sign	Actual Sign	References
<i>Demographic factors</i>			
Gender (Male)	+	+	Hussain, Cholette and Castaldi (2007); Bruwer, Saliba and Miller (2011); Wolf, Carpenter and Qenani-Petrela (2005); Thach and Olsen (2006); Fountain and Charters (2010); Loureiro (2003); Kolyesnikova, Dodd and Duhan (2008); Marzo-Navarro and Pedraia-Iglesias (2012)
Age	-	-	Hussain, Cholette and Castaldi (2007); Bruwer, Saliba and Miller (2011); Thach and Olsen (2006); Fountain and Charters (2010); Loureiro (2003); Kolyesnikova, Dodd and Duhan (2008); Marzo-Navarro and Pedraia-Iglesias (2012)
Race (White)	+	+	Hussain, Cholette and Castaldi (2007); Bruwer, Saliba and Miller (2011); Kolyesnikova, Dodd and Duhan (2008)
Income	+	+	Hussain, Cholette and Castaldi (2007); Bruwer, Saliba and Miller (2011); Wolf, Carpenter and Qenani-Petrela (2005); Loureiro (2003); Kolyesnikova, Dodd and Duhan (2008); Marzo-Navarro and Pedraia-Iglesias (2012)
Education	+	0	Bruwer, Saliba and Miller (2011); Wolf, Carpenter and Qenani-Petrela (2005); Loureiro (2003); Kolyesnikova, Dodd and Duhan (2008); Marzo-Navarro and Pedraia-Iglesias (2012)
Family with kids	+	0	Bruwer, Saliba and Miller (2011); Wolf, Carpenter and Qenani-Petrela (2005)
Urban vs. rural	+	-	
Length of residency in the state	+	0	Loureiro (2003)
<i>Food Consumer Behavior Factors</i>			
Purchase locally produced foods	+	+	Loureiro (2003); Kolyesnikova, Dodd and Duhan (2008)
How far is local	-	-	Sireix, Grolleau and Schaefer (2008); Hu, Batte, Woods and Ernst (2013)
Watch food channels	+	+	
Prepare fresh food	+	+	
<i>Wine Consumer Attributes</i>			
Wine knowledge	+	+	Hussain, Cholette and Castaldi (2007); Fountain and Charters (2010); Kolyesnikova, Dodd and Duhan (2008); Marzo-Navarro and Pedraia-Iglesias (2012)
Frequency of wine purchasing	+	+	Bruwer, Saliba and Miller (2011); Thach and Olsen (2006); Fountain and Charters (2010); Loureiro (2003); Kolyesnikova, Dodd and Duhan (2008)
Purchasing frequency by price category	+	+	Bruwer, Saliba and Miller (2011); Wolf, Carpenter and Qenani-Petrela (2005); Loureiro (2003)

**Table 5.** Results of Logit Model for Local Wine Trial and Local Winery Visit

Dependent Variable	<i>Local_Tried</i>		<i>Winery_Visit</i>	
	Coefficient	Marginal Effect	Coefficient	Marginal Effect
<i>Male</i>	0.182 (0.123)	0.038 (0.025)	0.205* (0.119)	0.046* (0.026)
<i>Age</i>	-0.009** (0.004)	-0.001* (0.001)	-0.012*** (0.004)	-0.002*** (0.001)
<i>White</i>	0.380* (0.195)	0.076** (0.037)	0.311** (0.180)	0.068* (0.039)
<i>Income</i>	0.008** (0.004)	0.001** (0.0008)	0.008** (0.004)	0.001** (0.0008)
<i>Income</i> <sup>2</sup>	-4.9e-04** (0.00002)	-1.0e-04** (4.2e-06)	-4.2e-04** (0.00001)	-9.6e-06** (4.4e-06)
<i>Education</i>	-0.005 (0.023)	-0.001 (0.005)	0.013 (0.027)	0.003 (0.006)
<i>Kids</i>	-0.169 (0.137)	-0.034 (0.027)	0.035 (0.132)	0.008 (0.029)
<i>Urban</i>	-0.326*** (0.119)	-0.068*** (0.025)	-0.238** (0.114)	-0.053** (0.025)
<i>PA</i>	-0.233 (0.154)	-0.048 (0.031)	-0.027 (0.151)	-0.006 (0.033)
<i>KY</i>	-0.168 (0.161)	-0.034 (0.032)	-0.387** (0.157)	-0.085** (0.034)
<i>TN</i>	-0.673*** (0.169)	-0.134*** (0.031)	-0.154 (0.158)	-0.034 (0.035)
<i>Residency2</i>	-0.163 (0.318)	-0.033 (0.064)	-0.203 (0.286)	-0.045 (0.063)
<i>Residency3</i>	0.225 (0.258)	0.046 (0.052)	-0.118 (0.226)	-0.026 (0.051)
<i>Buy_local2</i>	0.380 (0.287)	0.076 (0.055)	0.085 (0.251)	0.019 (0.055)
<i>Buy_local3</i>	0.956*** (0.294)	0.204*** (0.061)	0.596** (0.257)	0.136** (0.058)
<i>Local_range</i>	-0.0003 (0.0008)	-6.4e-04 (0.0001)	-0.001** (0.0009)	-0.0004** (0.0002)
<i>Food_channel</i>	-0.063 (0.137)	-0.013 (0.028)	0.291** (0.130)	0.065** (0.029)
<i>Prep_freshfood2</i>	-0.054 (0.393)	-0.011 (0.081)	0.906** (0.441)	0.195** (0.086)
<i>Prep_freshfood3</i>	0.223 (0.385)	0.046 (0.079)	0.851** (0.432)	0.182** (0.084)
<i>Wine_knowledge2</i>	0.524*** (0.127)	0.109*** (0.026)	0.368*** (0.122)	0.082*** (0.027)
<i>Wine_knowledge3</i>	0.986*** (0.194)	0.216*** (0.042)	0.781*** (0.191)	0.177*** (0.042)
<i>Mid_level</i>	0.256** (0.129)	0.053** (0.027)	0.120 (0.123)	0.027 (0.027)
<i>Core</i>	0.493** (0.198)	0.106** (0.043)	0.427** (0.197)	0.097** (0.045)

**Table 5. Continued**

Dependent Variable	<i>Local_Tried</i>		<i>Winery_Visit</i>	
	Coefficient	Marginal Effect	Coefficient	Marginal Effect
<i>Popular_wine</i>	0.060 (0.118)	0.012 (0.024)	-0.098 (0.112)	-0.022 (0.025)
<i>Super_wine</i>	0.380*** (0.133)	0.078*** (0.027)	0.142 (0.124)	0.032 (0.028)
<i>Ultra_wine</i>	0.246* (0.133)	0.051* (0.028)	0.198 (0.127)	0.045 (0.029)
<i>Luxury_wine</i>	0.273 (0.172)	0.058 (0.037)	0.187 (0.169)	0.042 (0.038)
<i>constant</i>	-1.863*** (0.711)		-1.689** (0.711)	
Log Likelihood	-971.266		-1,029.677	
Wald $\chi^2$	178.980***		140.320***	
Pseudo R <sup>2</sup>	0.097		0.072	
McFadden's Adjusted R <sup>2</sup>	0.071		0.047	
N. of observations	1,609		1,609	
Correctly predict	67.25%		63.77%	
Goodness-of-fit ( $\chi^2$ )	1,628.500		1613.390	

**Note.** Asterisks indicate levels of significance: \* = 0.10, \*\* = 0.05, and \*\*\* = 0.01. Standard errors in parenthesis.

**Table 6. Ordered Logit Regressions for Post-Winery Visit In-Store Behavior**

Dependent Variable	<i>Recognize Brand</i>		<i>Ask About Availability</i>		<i>Purchase Same Local</i>		<i>Purchase Other Local</i>	
	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>
<i>Male</i>	0.283* (0.158)	1.327	0.451* (0.162)	1.571	0.356** (0.156)	1.428	0.419*** (0.160)	1.521
<i>Age</i>	-0.015*** (0.005)	0.985	-0.022*** (0.005)	0.977	-0.009* (0.005)	0.990	-0.011** (0.005)	0.988
<i>White</i>	-0.026 (0.026)	0.974	-0.228 (0.264)	0.796	0.140 (0.259)	1.151	-0.396 (0.262)	0.672
<i>Income</i>	-0.0009 (0.005)	0.999	-0.010* (0.005)	0.990	-0.004 (0.005)	0.995	-0.006 (0.005)	0.993
<i>Income</i> <sup>2</sup>	0.00001 (0.00002)	1.000	0.00004 (0.00002)	1.000	0.00001 (0.00002)	1.000	0.00002 (0.00002)	1.000
<i>Education</i>	-0.023 (0.037)	0.977	0.031 (0.038)	1.032	-0.056 (0.036)	0.945	-0.009 (0.038)	0.990
<i>Kids</i>	-0.127 (0.168)	0.880	-0.038 (0.172)	0.962	0.116 (0.167)	1.123	0.218 (0.170)	1.244
<i>Urban</i>	-0.330** (0.151)	0.719	-0.236 (0.155)	0.790	-0.415*** (0.148)	0.660	-0.029 (0.153)	0.971
<i>PA</i>	-0.857*** (0.205)	0.424	-0.105 (0.212)	0.900	0.090 (0.199)	1.094	-0.083 (0.209)	0.920
<i>KY</i>	-0.298 (0.212)	0.742	0.501** (0.219)	1.651	0.131 (0.211)	1.141	0.482** (0.217)	1.620

Table 6. Continued

Dependent Variable	Recognize Brand		Ask About Availability		Purchase Same Local		Purchase Other Local	
	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>
<i>TN</i>	-0.935*** (0.213)	0.392	0.050 (0.217)	1.052	0.022 (0.207)	1.023	0.163 (0.215)	1.178
<i>Residency2</i>	0.176 (0.379)	1.193	0.335 (0.390)	1.399	-0.123 (0.369)	0.884	0.097 (0.382)	1.103
<i>Residency3</i>	0.426 (0.316)	1.532	0.965*** (0.328)	2.625	0.237 (0.309)	1.268	0.560* (0.319)	1.751
<i>Buy_local2</i>	0.719* (0.420)	2.053	0.142 (0.412)	1.153	0.587 (0.384)	1.800	0.363 (0.420)	1.439
<i>Buy_local3</i>	1.432*** (0.427)	4.187	0.686 (0.419)	1.986	1.332*** (0.393)	3.792	0.961** (0.426)	2.616
<i>Local_range</i>	-0.0008 (0.001)	0.999	-0.001 (0.001)	0.999	-0.0004 (0.001)	1.000	-0.00006 (0.001)	1.000
<i>Food_channel</i>	-0.087 (0.190)	0.916	0.627 (0.204)	1.872	0.104 (0.186)	1.110	0.494** (0.201)	1.640
<i>Prep_freshfood2</i>	1.371 (1.070)	3.939	0.022 (0.860)	1.023	0.741 (0.780)	2.099	0.252 (0.874)	1.288
<i>Prep_freshfood3</i>	1.311 (1.067)	3.712	-0.305 (0.858)	0.737	0.580 (0.777)	1.786	0.042 (0.872)	1.044
<i>Wine_knowledge2</i>	0.556*** (0.171)	1.745	0.545*** (0.176)	1.726	0.417** (0.168)	1.518	0.676*** (0.174)	1.966
<i>Wine_knowledge3</i>	0.596** (0.238)	1.816	0.789*** (0.242)	2.201	0.388* (0.236)	1.475	0.565** (0.240)	1.760
<i>Mid_level</i>	0.437** (0.175)	1.549	0.277 (0.182)	1.320	0.016 (0.172)	1.017	0.002 (0.179)	1.002
<i>Core</i>	0.199 (0.252)	1.221	0.643** (0.257)	1.903	0.037 (0.248)	1.038	-0.085 (0.255)	1.089
<i>Popular_wine</i>	0.267* (0.152)	1.307	0.090 (0.157)	1.095	0.103 (0.149)	1.109	0.190 (0.155)	1.210
<i>Super_wine</i>	0.748*** (0.177)	2.113	0.236 (0.181)	1.267	0.772*** (0.172)	2.166	0.210 (0.179)	1.234
<i>Ultra_wine</i>	0.062 (0.170)	1.065	0.333* (0.176)	1.396	0.433** (0.168)	1.542	0.088 (0.174)	1.093
<i>Luxury_wine</i>	0.718*** (0.204)	2.050	0.545*** (0.205)	1.725	0.250 (0.202)	1.285	0.411** (0.204)	1.509
<i>Intercept 4</i>	-4.491*** (1.313)		-4.184*** (1.154)		-3.320*** (1.072)		-3.981*** (1.159)	
<i>Intercept 3</i>	-2.706** (1.310)		-2.468** (1.147)		-1.617 (1.069)		-2.257* (1.153)	
<i>Intercept 2</i>	-1.339 (1.307)		-0.840 (1.143)		0.005 (1.066)		-0.994 (1.151)	
N. of observations	713		713		713		713	
LR $\chi^2$	180.705***		201.478***		126.459***		131.230***	
Proport.1 odds test	83.107*** <sup>b</sup>		63.290		73.934** <sup>b</sup>		63.264	

**Note.** Asterisks indicate levels of significance: \* = 0.10, \*\* = 0.05, and \*\*\* = 0.01. Standard errors in parenthesis. Wald Test was performed in SAS for inference of each coefficient,  $\beta_k$ :  $z^* = b_k / s\{b_k\}$ . <sup>a</sup> O.R. represents odds ratio. <sup>b</sup> The result of proportional odds test suggests that we use a less restrictive model, like a multinomial logit model. Results using a multinomial logit model are very similar and available upon request.

**Table 7.** Ordered Logit Regressions for Post-Winery Visit Additional Winery Visit Behavior

Dependent Variable	Recommend Same		Visit Same		Visit Other	
	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>
<i>Male</i>	-0.117 (0.155)	0.890	0.370** (0.156)	1.448	0.307* (0.159)	1.360
<i>Age</i>	-0.011** (0.005)	0.988	-0.012** (0.005)	0.987	-0.003 (0.005)	0.997
<i>White</i>	0.320 (0.259)	1.377	-0.110 (0.259)	0.895	0.099 (0.265)	1.105
<i>Income</i>	-0.005 (0.005)	0.994	-0.0001 (0.005)	1.000	0.003 (0.005)	1.003
<i>Income</i> <sup>2</sup>	0.00002 (0.00002)	1.000	9.7e-06 (0.00002)	1.000	-1.3e-07 (0.00002)	1.000
<i>Education</i>	-0.029 (0.036)	0.971	-0.120*** (0.037)	0.886	-0.044 (0.037)	0.957
<i>Kids</i>	0.225 (0.166)	1.253	-0.030 (0.168)	0.970	0.233 (0.170)	1.263
<i>Urban</i>	-0.339** (0.148)	0.712	-0.437*** (0.150)	0.646	-0.037 (0.152)	0.963
<i>PA</i>	-0.253 (0.199)	0.776	0.084 (0.202)	1.088	-0.044 (0.207)	0.957
<i>KY</i>	0.152 (0.210)	1.165	-0.132 (0.213)	0.876	0.042 (0.217)	1.044
<i>TN</i>	-0.084 (0.206)	0.919	-0.074 (0.209)	0.928	0.193 (0.213)	1.214
<i>Residency2</i>	-0.195 (0.368)	0.822	-0.151 (0.369)	0.859	0.332 (0.381)	1.394
<i>Residency3</i>	-0.052 (0.308)	0.949	-0.167 (0.308)	0.846	0.291 (0.320)	1.338
<i>Buy_local2</i>	0.567 (0.389)	1.765	0.054 (0.388)	1.056	0.418 (0.417)	1.519
<i>Buy_local3</i>	1.023*** (0.396)	2.782	0.487 (0.395)	1.628	0.798* (0.424)	2.221
<i>Local_range</i>	0.001* (0.001)	1.002	-0.002 (0.001)	0.998	-0.0009 (0.001)	0.999
<i>Food_channel</i>	-0.137 (0.185)	0.871	0.180 (0.190)	1.198	-0.051 (0.193)	0.950
<i>Prep_freshfood2</i>	1.418 (0.882)	4.132	0.477 (0.793)	1.612	0.800 (0.903)	2.227
<i>Prep_freshfood3</i>	1.262 (0.879)	3.532	0.298 (0.790)	1.347	0.504 (0.900)	1.656
<i>Wine_knowledge2</i>	0.476*** (0.167)	1.610	0.725*** (0.170)	2.067	0.843*** (0.175)	2.325
<i>Wine_knowledge3</i>	0.781*** (0.236)	2.184	0.917*** (0.237)	2.502	1.182*** (0.241)	3.264
<i>Mid_level</i>	0.105 (0.171)	1.112	0.007 (0.174)	1.008	-0.125 (0.178)	0.882



**Table 7. Continued**

Dependent Variable	<i>Recommend Same</i>		<i>Visit Same</i>		<i>Visit Other</i>	
	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>	Coefficient	O.R. <sup>a</sup>
<i>Core</i>	0.173 (0.247)	1.189	0.048 (0.249)	1.049	-0.159 (0.254)	0.853
<i>Popular_wine</i>	-0.010 (0.149)	0.989	0.205 (0.151)	1.228	0.368** (0.154)	1.445
<i>Super_wine</i>	0.371** (0.171)	1.449	0.463*** (0.175)	1.590	0.334* (0.179)	1.397
<i>Ultra_wine</i>	0.380** (0.167)	1.464	0.336** (0.169)	1.400	0.038 (0.173)	1.039
<i>Luxury_wine</i>	0.115 (0.201)	1.122	0.102 (0.201)	1.108	0.558*** (0.204)	1.748
<i>Intercept 4</i>	-3.590*** (1.149)		-1.013 (1.081)		-4.675*** (1.181)	
<i>Intercept 3</i>	-1.912* (1.146)		0.369 (1.080)		-3.119*** (1.174)	
<i>Intercept 2</i>	-0.453 (1.144)		1.751 (1.082)		-1.686 (1.171)	
N. of observations	713		713		713	
LR $\chi^2$	108.929***		111.914***		115.712***	
Proportional odds test	75.902** <sup>b</sup>		93.029*** <sup>b</sup>		88.370** <sup>b</sup>	

**Note.** Asterisks indicate levels of significance: \* = 0.10, \*\* = 0.05, and \*\*\* = 0.01. Standard errors in parenthesis.

Wald Test was performed in SAS for inference of each coefficient,  $\beta_k : z^* = b_k / s\{b_k\}$ .<sup>a</sup> O.R. represents odds ratio. <sup>b</sup> The result of proportional odds test suggests that we use a less restrictive model, like a multinomial logit model. Results using a multinomial logit model are very similar and available upon request.