Local Wine Expenditure Determinants in the Northern Appalachian States

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Abstract

Tennessee, Kentucky, Ohio, and Pennsylvania have seen significant increases in the number of wineries in the past decade. Most of the wine distribution has focused on premise sales, although a few of the larger wineries have started to explore other ways for market expansion. This study examines wine expenditure patterns for 1,609 wine consumers in this four state region. Expenditure functions estimated for total wine expenditure confirm expected factors that would positively impact wine purchases, such as wine knowledge and food preparation. But it is also observed that greater wine expenditures are associated with greater inclinations to buy local, suggesting opportunities for local wineries to establish a favorable point of differentiation in this market. Local wine expenditures are positively associated with wine knowledge and education. Our results also suggest those that consume more wine spend more on local wine and have a strong preference for local products in general, suggesting there may be opportunities for additional local food cross merchandising – particularly in places where wine is already being promoted and purchased in general.

Keywords: wine expenditure, local wine, wine knowledge, market segmentation

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Introduction

Wine consumption is increasing globally, and is expected to grow by 6.2% between 2010 and 2015, despite a long-term decline in consumption in western European wine-producing countries (New York Daily News 2012). The rise in consumption is largely driven by the United States, as it ranks number one in wine consumption, accounting for 13% of global consumption (Wine Institute 2014). Americans consume more wine than ever before, with 19 consecutive years of volume growth (Wine Institute 2013). Overall table wine consumption in the United States increased from 213 million cases in 2000 to 323 million cases in 2014 (Wine Institute 2015a).

Consumers in the United States are not only consuming more wine, but also more expensive wine. The United States, as the world's largest retail wine market, spent more than $40 billion on wine in 2010, according to Impact Databank (2010). The International Wine and Spirit Research predicts that the United States will increase its wine consumption by 10% between 2011 and 2015 (New York Daily News 2012).

While wine demand is increasing, so is the wine supply in the United States, mainly for domestic consumption. The U.S. wine industry was almost destroyed by war, Prohibition, and economic depression for about half of the 20th century. In the 1970s, the Californian wine industry started the national wine revival and several other states followed. In 1975, 34 states had wineries compared to 47 states in 1997 and 50 states in 2007 with about 60% of the wineries located outside of California (Canning and Perez 2008). U.S. wine exports have increase dramatically since the 1990s, with a record of 109.9 million gallons at a value of $872 million in 2007, almost a five-fold increase (Canning and Perez 2008).

Wine production and winery numbers in the Northern Appalachian states of Kentucky, Ohio, Tennessee and Pennsylvania have also increased significantly during the past decade, although wine production in the region is still quite small compared to California. The market share for these new wine-producing states is very small. The Wine Institute (2015a) estimates that in 2014 California accounted for 60% of all wines sold on the U.S. market by volume; other recent data suggest imported wines accounted for 31%; and wines from the other 49 states accounted for 8% (Hodgen 2011). According to a wine statistical report in 2009 from the Alcohol and Tobacco Tax and Trade Bureau (2010) California produced 634 million gallons of wine (89% of the U.S. wine production), Kentucky produced almost 2 million gallons of wine (0.28%), Ohio produced 1.1 million gallons of wine (0.16%), Pennsylvania produced 0.8 million gallons of wine (0.12%), and Tennessee produced almost 0.3 million gallons of wine (0.04%). According to Wines & Vines (2013), there were 3,532 wineries in California, 166 wineries in Pennsylvania, 142 wineries in Ohio, 66 wineries in Kentucky (Thornberry 2012) and 40 wineries in Tennessee in 2012.

Wineries local to this region tend to focus on on-premise sales or nearby markets, maintaining a much different market focus compared to larger wineries in large wine-producing regions (Woods et al. 2013). There are several challenges to local wineries in the Northern Appalachian region in addition to their small marketshare. First, local wineries use limited marketing channels, relying heavily on tourism or on premise sales. These tend to be particularly small wineries that do not have access to other distribution channels (Sun et al. 2014). competition is

fierce. Foreign producers are increasingly targeting the U.S. market as drinking habits have shifted. Wine consumption is decreasing in western European wine-producing countries such as France and Italy (Wine Institute 2015b).

While wine consumption in the United States is increasing, to be competitive even in the regional wine market, it is crucial for local wineries to understand consumers and develop effective marketing strategies. We explore the factors driving total wine expenditure and compare them with the factors driving local wine expenditure for consumers in Kentucky, Ohio, Tennessee and Pennsylvania. We also explore the determinants of the probability of trying a local wine. To better understand wine consumers' needs and buying habits, it is necessary to have a comprehensive understanding of wine consumers' characteristics (demographics, lifestyle, wine consumption, knowledge and preferences). With this information, small wineries can use specific marketing instruments, like target marketing, to promote their products. An important concept in target marketing is recognizing whether those who are targeted show a strong affinity or brand loyalty to that particular brand and understanding the values conveyed by that brand. Building brand loyalty is essential for local wine promotion and success in a crowded supplier market. Is there an opportunity for differentiation? Part of that branding strategy is the identification of the wine produced as local to the local market.

Market researchers apply different econometric methods to discern segments within wine consumer markets. These methods include segmentation according to geographic criteria, psychology, demographics, purchasing behavior (propensity to purchase), occasion for purchase or consumption, benefits sought by consumers, etc. There is a vast body of literature on wine market segmentation. Costanigro et al. (2007) argued that different prices mean different products, and segmented the wine market into different price categories. Their results confirmed that implicit prices for attributes differ across prices categories and at least two different wine classes exist: "consumption wines" and "collectible wines." Therefore, these classes identify differentiated products that fulfill different needs and should be considered separately. After examinining over 180 hedonic wine price models, Oczkowski and Doucouliagos (2015) identified a moderate price-quality correlation suggesting the existence of imperfect information regarding wine quality. They identified wine reputation as one of the most important structural vairables for price-quality studies and recommend wine producers to direct resources to improve reputation.

The Wine Market Council (2003) proposed five major behavioral wine segments of the U.S. population by consumption rate: super-core (consume wine daily), core (consume wine at least two or three times per month), marginal (consume wine at least two or three times per quarter), non-adopters (do not drink wine but drink other alcoholic beverages), and non-drinkers (do not drink any alcoholic beverages). Lancaster and Stillman (2009) segmented wine consumers into four categories based on generation: Traditionalists (born between 1900 and 1945), Baby Boomers (born between 1946 and 1964), Generation Xers (born between 1965 and 1977), and Millennials (born between 1977 and 2000). Thach and Olsen (2006) conducted a demographic wine market segmentation targeting millennial wine drinkers. Their results indicated that there is a need for greater wine advertising to this group utilizing fun, social, and relaxed settings; more innovative packaging and labels; a focus on "value" wines; as well as taste enhancements and environmental characteristics.

Johnson, Ringham and Jurd (1991) used conjoint choice analysis to do behavioral segmentation for the Australian wine market. They identified six distinct choice segments: "dry wine enthusiast", "white wine trendies", "Moselle preferrers", "price-sensitive white drinker", "red wine buffs", and "popular red brand preferrers". They found that key profile areas were demographics, values, lifestyle media habits, brand behavior, and brand perceptions. Bruwer and Li (2007) confirmed the existence of five lifestyle-related segments in the South Australia wine market. These segments are: "conservative, knowledgeable wine drinkers" (19.2%), "enjoyment-oriented, social wine drinkers" (16.2%), "basic wine drinkers" (23.5%), "mature, time-rich wine drinkers" (18.2%), and "young professional wine drinkers" (22.9%). They also recognized the evolving nature of this market. Within the U.S. wine market, geographic segmentation demonstrated that most wine consumers live near major cities, such as San Francisco, Los Angeles, Miami, Seattle, and Chicago (ACNielsen 2003).

Arias-Bolzmann et al. (2003) treated country of origin, quality, variety and age as predictors of wine prices, using data from the *Wine Spectator* magazine. Their results confirmed that the North American wine market recognizes differences in country of origin, quality and variety. Zhao (2008) compared the classification systems and structure in the California and French wine industries. The author found that similar categories and wine attributes affect wine price differently under different classification systems. Ali and Nauges (2007) showed that in the short-term pricing depends on reputation to a larger extent than in quality by using data on Bordeaux wines.

This literature documents the heterogeneity of preferences across wine consumers and subsequent opportunities for targeted marketing. However, there are fewer studies on preferences for local wines, particularly across types of wine consumers.

In this study, we explore the answers to three research questions: 1) what are the determinants of total wine expenditure? 2) what are the determinants of local wine expenditure? and 3) what are the determinants of the probability of purchasing a local wine? We use the results from a four state survey of 1,609 wine consumers in Pennsylvania, Ohio, Kentucky and Tennessee. We use a market segmentation model following a Hartman consumer survey on natural foods consumers (The Hartman Group 2000). We classify wine consumers into three categories according to their wine purchases: periphery (at least once per year), mid-level (at least once per month), and core (at least once per week) (Woods et al. 2013). We differentiate between total wine expenditure and local wine expenditure to identify differences among consumers choosing local wine to help local wineries develop effective marketing strategies.

There are several contributions from this study. It contributes to the understanding of Northern Appalachian wine consumer characteristics and expenditure patterns, and subsequently provides a framework for future market strategies for the development of wineries in general and local wineries in specific based on segmentation observations. It is a reasonable expectation that there may be some differences between the factors contributing to local wine purchase (defined here as produced within the state of the wine consumer) as opposed to wine purchases in general.

Data

The data used in this paper were collected using a web-based consumer survey distributed and managed by Zoomerang, an affiliate of Market Tools, Inc. Each participant was double pre-screened, to ensure they were at least 21 years old, and they were wine consumers. A total of 1,609 complete observations were collected in September, 2012. Participants were recruited from Tennessee (403 observations), Kentucky (402 observations), Ohio (401 observations), and Pennsylvania (403 observations).

Survey participants were asked about their wine consumption and purchase habits in the past 12 months, including their expenditures on all types of wine, expenditure on local wine, wine consumption frequency, purchasing habits regarding differently priced wines, past local wine experience, wine knowledge level, local purchase frequency for all products, lifestyle, as well as demographic information.[1] Variables used as dependent and independent variables are defined in Tables 1 and 2 (see Appendix for Table 2).

Table 1. Definitions and Sample Statistics of Dependent Variables ($N = 1,609$)

Variables	Description of Variables	Mean	Std. Dev.	Min.	Max.
Total_expend	Categorical variable from 1 to 6 if respondents indicate their average monthly expenditure on **ALL wine** within the past 12 months either on: 1. Less than $20; 2. $20-$39; 3. $40-$59; 4. $60-$79; 5. $80-$99; and 6. $100 or more.	2.45	1.60	1	6
Local_expend	Categorical variable from 1 to 6 if respondents indicate their average monthly expenditure on **State wine** within the past 12 months either on: 1. Less than $20; 2. $20-$39; 3. $40-$59; 4. $60-$79; 5. $80-$99; and 6. $100 or more.	1.38	1.00	1	6
Local_tried	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

From our sample of 1,609 consumers, 627 respondents (38%) indicated that they tried a state local wine (defined as from a winery within their state) and 34% purchased local wine in the past 12 months, while 45% visited a local winery in the past three years. There are observable differences in the absolute expenditure levels, purchase frequency, and the frequency of wine purchases by quality/cost category. Monthly wine expenditure was self-reported and ranged from $10 to $110, with a mean of $39 for the total sample and $34.62 for the local sample, with only a small fraction (12.92%) reporting zero expenditures on local wine in the last year (no zeroes for the total sample). In terms of wine purchase frequency, 57.60% of consumers purchased wine at least once per month, and 12.11% purchased wine at least once per week in the total sample, while 67.45% of consumers purchased wine at least once per month, and 16.74% purchased wine at least once per week in the local sample. Consumers in both samples buy more wine in the super category ($7-$14 per bottle) on average, 71.4% of total sample and 78.30% of the local sample consumers bought a bottle of wine priced $7-$14 often. Around 50% of the consumers believed their wine knowledge was average to above average in the total sample, compared to 62.67% in the local sample. More information comparing expenditure and consumption characteristics of our total and local consumers is found in Table 3 (see Appendix).

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[1] For more information about the survey and data see Woods, Nogueira and Yang (2013).

Methodology

The methodology used to estimate the determinants of total and local wine expenditure in this study follows the random utility theory, which accounts for an optimization of consumer utility for every choice consumers make on wine expenditure. Therefore, an ordered logit model can be specified as: $y_i^* = x_i'\beta + u_i$. We define: $y_i = j$ if $\gamma_{j-1} < y_i^* < \gamma_j$ in a given *M*-alternative ordered model where $\gamma_0 = -\infty$, and $\gamma_M = \infty$. The error term, u_i, is assumed to be independent and identically distributed, and the ordered logit model has a logistic cumulative distribution function: $F(z) = e^z /(1 + e^z)$. Since wine consumers were asked to choose their total expenditure in six categories, i.e. "less than \$20," "\$20-\$39," "\$40-\$59," "\$60-\$79," "\$80-\$99," and "\$100 or more," the *M*–alternative equals 6 and the ordered logit model can be framed as:

(1) $y_i^* = x_i'\beta + u_i,$

(2) $y_i = 1$ if $y_i^* \leq 0,$

(3) $y_i = 2$ if $0 < y_i^* \leq \gamma_1,$

(4) $y_i = 3$ if $\gamma_1 < y_i^* \leq \gamma_2,$

(5) $y_i = 4$ if $\gamma_2 < y_i^* \leq \gamma_3,$

(6) $y_i = 5$ if $\gamma_3 < y_i^* \leq \gamma_4,$

(7) $y_i = 6$ if $y_i^* > \gamma_4,$

To explain the optimal decision on wine expenditure for each consumer, y_i^* represents wine consumers who would be better off when they spend a certain amount of dollars for wine within a range at each expenditure level. The explanatory variables, x, consist of wine consumption frequency, geographic factors, various lifestyle factors, wine knowledge, past experience with local wine, general support for local food, common wine price points, and demographic factors. The model specification for total or local wine expenditure is:

(8) $Y = \beta_0 + \beta_1 Male + \beta_2 Age + \beta_3 White + \beta_4 Wine\_drinkers + \beta_5 Income + \beta_6 Income^2 + \beta_7 Education +$
$\beta_8 Education^2 + \beta_9 Kids + \beta_{10} Urban + \beta_{11} PA + \beta_{12} KY + \beta_{13} TN + \beta_{14} Residency2 + \beta_{15} Residency3 +$
$\beta_{16} Buy\_local2 + \beta_{17} Buy\_local3 + \beta_{18} Food\_channel + \beta_{19} Prep\_freshfood2 +$
$\beta_{20} Prep\_freshfood3 + \beta_{21} Wine\_knowledge2 + \beta_{22} Wine\_knowledge3 + \beta_{23} Grade\_Popular +$
$\beta_{24} Grade\_Super + \beta_{25} Grade\_Ultra + \beta_{26} Grade\_Luxury + \beta_{27} Local\_Range + \beta_{28} Type\_White +$
$\beta_{29} Type\_Red + \beta_{30} Type\_Fruit + \beta_{31} Type\_Champagne + \varepsilon$

where *Y* represents the category of wine expenditure for total or local wine, β_s are the estimated coefficients, and ε is the error term. Dependent variables are defined in Table 1 and independent variables in Table 2 (see Appendix).

The maximum likelihood method is used to estimate the ordered logit model. The estimated coefficients and odds ratios are provided for interpretation. The odds ratio is calculated by taking the exponent of the estimated coefficient. A positive odds ratio represents the odds of a specific

wine expenditure increase with a higher value of the explanatory variable. However, when the estimated coefficient is negative, the odds ratios would be between 0 and 1, the odds of a specific wine expenditure decreases for the explanatory variable.

One of the assumptions for the ordered logit model is the proportional odds assumption, which means that the estimated coefficients among pairs of outcome groups are the same. Therefore, based on the Chi-Square Score examination in the logistic procedure provided by SAS, a rejected null hypothesis for the proportional odds assumption suggests that the ordered logit model is not valid and one should use a less restrictive model. Each ordered logit model with total or local wine expenditure is examined and the test outcome provided in Tables 4 and 5 (see Appendix).

We assume that consumers optimize their utility when they decide to purchase a local wine. Thus, we also use random utility theory to explain the consumer decision on purchasing local wine. The probability of purchasing a local wine can be explained by wine consumption frequency, geographic factors, various lifestyle factors, wine knowledge, past experience with local wine, general support for local food, common wine price points, and common demographic factors. In the determinants of the probability of purchasing local wine, this study follows the same independent variables as in equation 8. A logistic model is used in determining the probability of purchasing a local wine. The logistic model can be specified as:

$$(9)\quad p = L(x_i'\beta) = \frac{e^{x_i'\beta}}{1+e^{x_i'\beta}}$$

where β is an estimated parameter, x is a vector of regressors, and $L(.)$ is the standard logistic distribution function. To explain the estimated parameters we use the marginal effect since it accounts for the probability regarding the independent variables. The calculation of marginal effects is:

$$(10)\quad \frac{\partial p_i}{\partial x_j} = \frac{\partial \Pr[y_i=1\mid x_i]}{\partial x_{ij}} = \frac{\partial L(x_i'\beta)}{\partial x_{ij}} = \frac{\sum L(x_i'\beta)[1 - \frac{\sum L(x_i'\beta)}{n}]}{n}\beta_j.$$

The examination of the logistic model also provides McFadden's Adjusted R^2, Correctly Predict, and Goodness-of-fit for the model in Table 6 (see Appendix).

Results

The general expenditure function for all wine among consumers in this region suggests several variables are important determinants to explain wine expenditure variation. The ordered logit regression results are summarized in Table 4 (see Appendix). State dummy variables were significant, suggesting some heterogeneity in expenditure across the four states. The propensity to buy more local food and prepare food at home were positive, suggesting these food purchase behaviors are complementary to wine purchase.

Wine knowledge is also positively related to wine purchases. These results were expected. The frequency of wine purchase by cost category also proved to be a good indicator of overall expenditure. These variables are essentially frequency of purchase measures that one would expect to be positively correlated to overall wine expenditure, the frequent purchase of the higher

cost luxury wines providing the largest impact on expenditure. Frequent purchase of white or red wines were also significant coefficients.

It is important to keep in mind that this total wine expenditure regression looks at expenditure patterns for consumers specifically in Tennessee, Kentucky, Ohio, and Pennsylvania. These results do provide, however, a way to characterize wine consumers in the region that could have promotional implications for regional wine marketing in general.

The Brant test suggested a violation of the parallel coefficients assumption that might be employed in a regular logit model.[2] The full multinomial logit model is presented with specific marginal effects reported for each total wine expenditure class.

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_local2 at 0.581 with an odds ratio of 1.787, means the odds of spending more on wine is 1.787 times more likely for those consumers indicating 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.

Similar regressors were applied to expenditures on local wine, summarized in Table 5 (see Appendix). Male wine consumers and those that reported larger numbers of wine consumers in the home were more likely to have higher local wine expenditures. Income also had a positive effect, although at a decreasing rate. Urban wine consumers were less likely to have higher local wine expenditures. Frequent wine purchasing in general, not surprisingly, is a strong determinant of local wine expenditure as is inclination to buy local products. Wine consumers "often" and "always" purchasing local food were 4.1 times more likely to spend more on local wine than those that never purchase what they know to be locally produced foods.

Overall wine knowledge strongly impacted expenditure levels for local wine, suggesting wine connoisseurs are more likely to have given local wines a trial and not dismissing them without experiencing them. Wine consumers that purchased relatively higher priced wines (particularly the luxury category above $25/bottle) were also more likely to have a higher expenditure on local wine. Local wine prices tend to be higher due to their smaller scale of production and not particularly targeted to the value price shopper. It is not surprising to see positive relations to local wine expenditure with frequent purchases of higher priced wine categories here.

Fruit wine consumption turned out to be a strong determining factor for local wine consumption, interestingly not significant for overall wine expenditure. Consumers indicating that they often or always purchased fruit wine were 2.38 times more likely to have a higher expenditure on local wine compared to those that did not. Fruit wines are a popular product among many small and local wineries, supplementing their grape-based wines as a means for product differentiation.

The expenditure functions for all wine versus just local wine suggest several important differences. Several variables were significant explaining local wine expenditures that were not significant for all wine. Gender (male) and income show up as positive factors for local wine

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[2] The results of the Brant test are available upon request.

expenditure and urban shows up as a negative factor– none of these emerging as significant factors for overall wine expenditures. Fresh food preparation, significant for overall wine expenditure, was not a significant determinant for local wines. The heterogeneity observed for overall wine expenditure across states also did not present itself in the local wine results. The specific relation between local wine expenditure and general wine consumption is captured in "core", "mid-level", and "periphery" variables included in the local model. Core and mid-level categories of general wine purchase are positively influencing the local wine expenditure (relative to the periphery category), suggesting more general wine consumption positively affects local wine consumption.

The final model explored the actual likelihood of purchasing local wine using similar determinants, with local trial being a simple response to "tried/not tried a local wine within the past 12 months" (Table 6, see Appendix). This binary logit model would be expected to follow a somewhat similar pattern observed in the expenditure regression, but providing a more general perspective of product awareness and likelihood to consume, recognizing reported trial of a local wine is a less accurate consumption measure than local wine expenditure.

Male, ethnically white, and more frequent wine consumers were more likely to have tried a local wine. Income and education were also positively related, increasing at a decreasing rate (with the negative squared term). Urban consumers were less likely to have tried a local wine. Tennessee consumers were less likely than Ohio (the base) consumers. Propensity to buy local products and knowledge of wine in general, as in the expenditure function, were also a strong determinants. Frequent consumption of the middle priced wine categories were significant. The local trial regression also pointed to both frequent purchase of white wines and fruit wines as significant determinants of trial. The pseudo R^2 for this regression was 0.116 while correctly predicting 68.74% of the responses.

Conclusions

Wine consumption per capita in the United States moved to their highest levels in 2013 at 2.82 gallons and a total national wine consumption twice what it was in 1979 (Wine Institute 2014), as noted earlier. A steadily growing market has created demand for imports, large domestic producers, and small regional wineries. This competition plays out in local areas where local wineries have pursued their niche in the market. Heterogeneity in wine consumer preferences creates the potential for segmenting and targeting wine consumers with particular tastes. The results of overall wine expenditure suggests considerable variation in who purchases wine and to what extent within the Northern Appalachian states of Tennessee, Kentucky, Ohio, and Pennsylvania. Expenditure functions estimated for total wine expenditure confirm expected factors that would positively impact wine purchases, such as wine knowledge and fresh food preparation. A positive connection for local wines with the established wine consumer community should result in a continued growth for local wines as general wine consumption continues to expand. It is also observed that greater wine expenditures are associated with greater inclinations to buy local among general wine consumers, suggesting continued opportunities for local wineries to establish a favorable point of differentiation in this market. These opportunities could be pursued through joining local foods merchandising efforts of existing grocery retailers, restaurants that featured local foods, or local food festivals and events. These results provide

some possible market growth directions to wineries that have traditionally limited themselves to on-premise sales.

Expenditures on local wine are a subset of total wine expenditures, but appear to have somewhat different determinants. They are observed to be driven by gender (more by male consumers), overall frequency of consumption, propensity to buy local, and overall wine knowledge. There appears to be some price sensitivity for local wines. Wine consumers indicating frequent purchases of luxury price category wines had the highest local wine expenditure, but only 15% of the surveyed population indicated purchasing wine in these price ranges "sometimes" or "often".

The relation between local wine expenditure and a number of the independent variables clearly differ across the six expenditure categories, as noted by the marginal effects. These results suggest some heterogeneity of preferences for local wine among Northern Appalachian consumers. Some factors, such as income, number of wine consumers per household, wine knowledge, and frequent purchase of more expensive wines are not surprisingly positively associate with higher local wine expenditure.

As local wine expenditures are positively associated with general wine knowledge and overall education, these results reiterate the opportunities to promote and differentiate local wine in the established wine consumer community. Our results also suggest that local wine may become better accepted as periphery wine consumers expand wine consumption and become more knowledgeable about wine in general. We find that those who consume more wine spend more on local wine and also have a strong preference for local products in general, suggesting there may be opportunities for additional local food cross merchandising – particularly in places where wine is already being promoted and purchased in general

Local wine trial results point more directly to evidence of different consumer segments that could serve as target markets. Local wine has tended to have a better reception – or at least trial – among higher income, higher educated consumers that already have a good knowledge of wine. Wine knowledge and consumption in the region is increasing but local wines are still an underdeveloped market. General education about wine seems to positively impact local trial and expenditure. There is evidence regionally of more heterogeneous wine preferences among those consumers choosing more local wine – especially preferences for fruit wine. White grapes and fruit for wine have been typically easier to grow in the region and subsequently easier to manufacture into better wines.

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Appendix

Table 2. Definitions and Sample Statistics of Independent Variables (*N* = 1,609)

Variables	Description of Variables	Mean	Std. Dev.	Min.	Max.
Male	Binary variable=1 if respondent is male.	0.30	0.46	0	1
Age	Continuous variable; year of age.	52.80	14.26	21	82
Wine_drinkers	Count variable for the number of wine drinkers at respondent's household.	1.77	0.70	1	6
White	Binary variable=1 if respondent's race is white.	0.90	0.29	0	1
Income	Continuous variable; total yearly household income before tax ($1,000).	67.33	41.12	7.5	225
Education	Continuous variable; year of education.	14.56	2.10	9	18
Kids	Binary variable=1 if respondent has kids under 18 at home.	0.26	0.44	0	1
Urban	Binary variable=1 if respondent is from urban (including city and suburb).	0.63	0.48	0	1
OH	Binary variable=1 if respondent is from Ohio.				
PA	Binary variable=1 if respondent is from Pennsylvania.	0.25	0.43	0	1
KY	Binary variable=1 if respondent is from Kentucky.	0.24	0.43	0	1
TN	Binary variable=1 if respondent is from Tennessee.	0.25	0.43	0	1
Residency1	Binary variable=1 if respondent has lived in the state for 1-4 years.	0.05	0.22	0	1
Residency2	Binary variable=1 if respondent has lived in the state for 5-9 years.	0.08	0.28	0	1
Residency3	Binary variable=1 if respondent has lived in the state for 10 or more years.	0.85	0.34	0	1
Core	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
Mid_level	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
Periphery	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
Buy_local1	Binary variable=1 if respondent never purchases what they know to be locally produced foods.	0.06	0.23	0	1
Buy_local2	Binary variable=1 if respondent sometimes purchases what they know to be locally produced foods.	0.52	0.49	0	1

Table 2. *Continued*

Variables	Description of Variables	Mean	Std. Dev.	Min.	Max.
Buy_local3	Binary variable=1 if respondent often and always purchases what they know to be locally produced foods.	0.41	0.49	0	1
Food_channel	Binary variable=1 if respondent watches the food channel or similar programs.	0.75	0.42	0	1
Prep_freshfood1	Binary variable=1 if respondent never prepares fresh food at home.	0.02	0.16	0	1
Prep_freshfood2	Binary variable=1 if respondent prepares fresh food at home for 1-6 times per month.	0.25	0.43	0	1
Prep_freshfood3	Binary variable=1 if respondent prepares fresh food at home for 7 times above per month.	0.72	0.44	0	1
Wine_knowledge1	Binary variable=1 if respondent rates their wine knowledge as a "little" and "novice" level.	0.50	0.50	0	1
Wine_knowledge2	Binary variable=1 if respondent rates their wine knowledge as an "average" level.	0.37	0.48	0	1
Wine_knowledge3	Binary variable=1 if respondent rates their wine knowledge as an "above average" and "expert" level.	0.12	0.32	0	1
Grade_popular	Binary variable=1 if respondent purchases popular wine ($4-$7/bottle) at the frequency of sometimes and often.	0.50	0.50	0	1
Grade_super	Binary variable=1 if respondent purchases super wine ($7-$14/bottle) at the frequency of sometimes and often.	0.71	0.45	0	1
Grade_ultra	Binary variable=1 if respondent purchases ultra wine ($14-$25/bottle) at the frequency of sometimes and often.	0.43	0.49	0	1
Grade_luxury	Binary variable=1 if respondent purchases luxury wine (above $25/bottle) at the frequency of sometimes and often.	0.15	0.36	0	1
Local_range	Continuous variable; respondent defines local winery in terms of mile range from their home.	60.68	64.82	0	1001
Type_white	Binary variable=1 if respondent indicates the white wine purchasing frequency as "often" and "usually/always."	0.43	0.49	0	1
Type_red	Binary variable=1 if respondent indicates the red wine purchasing frequency as "often" and "usually/always."	0.52	0.49	0	1
Type_fruit	Binary variable=1 if respondent indicates the fruit wine purchasing frequency as "often" and "usually/always."	0.33	0.47	0	1
Type_champagne	Binary variable=1 if respondent indicates the champagne/sparkling purchasing frequency as "often" and "usually/always."	0.24	0.43	0	1

Table 3. Consumption Characteristics' Comparison in Total versus Local Samples.

Consumption Characteristics	Total Wine Expenditure (1,609)	Local Wine Expenditure (627)
Expenditure		
<$20	38.66%	52.31%
$20-$39	22.93%	25.52%
$40-$59	17.72%	9.57%
$60-$79	9.14%	4.31%
$80-$99	4.29%	1.28%
$100 or more	9.26%	7.02%
Core	12.11%	16.74%
Mid_level	45.49%	50.71%
Periphery	42.38%	32.53%
Buy_local1	6.09%	3.34%
Buy_local2	52.14%	43.54%
Buy_local3	41.77%	53.12%
Food_channel	75.69%	78.78%
Prep_freshfood1	2.73%	1.75%
Prep_freshfood2	25.06%	20.26%
Prep_freshfood3	72.21%	77.99%
Wine_knowledge1	50.66%	37.33%
Wine_knowledge2	37.29%	43.54%
Wine_knowledge3	12.05%	19.13%
Grade_popular	50.21%	50.87%
Grade_super	71.40%	78.30%
Grade_ultra	43.74%	52.95%
Grade_luxury	15.96%	21.37%
Local_range	60.68	63.13
Type_white	43.25%	51.03%
Type_red	52.75%	59.16%
Type_fruit	33.37%	40.50%
Type_champagne	14.84%	17.53%

Note. Expenditure level <$20 includes no zeroes for the total sample and 12.92% zeroes for the local sample.
All consumers in the local sample have tried a local wine. Local_range is defined in miles.

Table 4. Total Wine Expenditure

Dependent Variable	Total Wine Expenditure		Marginal Effects					
	Coefficient	O.R [a]	Less than $20	$20-$39	$40-$59	$60-$79	$80-$99	$100 or more
Male	0.154	1.166	-0.035	-9.4e-05	0.012	0.009	0.004	0.008
	(0.106)		(0.023)	(0.001)	(0.008)	(0.006)	(0.003)	(0.005)
Age	-0.002	0.997	0.0005	-8.2e-06	-0.0002	-0.0001	-6.8e-05	-0.0001
	(0.003)		(0.000)	(0.000)	(0.000)	(0.0003)	(0.0002)	(0.0001)	(0.0002)
Wine_drinkers	-0.102	0.902	0.023	-0.0003	-0.008	-0.006	-0.002	-0.005
	(0.069)		(0.015)	(0.000)	(0.005)	(0.004)	(0.001)	(0.003)
White	-0.019	0.980	0.004	-4.4e-05	-0.001	-0.001	-0.0005	-0.001
	(0.164)		(0.037)	(0.000)	(0.013)	(0.010)	(0.004)	(0.008)
Income	0.002	1.002	-0.0005	8.6e-06	0.0002	0.0001	7.1e-05	0.0001
	(0.003)		(0.000)	(0.000)	(0.0003)	(0.000)	(0.0001)	(0.0001)
Income^2	0.00001	1.000	-4.5e-06	6.6e-08	1.6e-06	1.2e-06	5.4e-07	1.0e-06
	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education	-0.344	0.708	0.079	-0.001	-0.029	-0.021	-0.009	-0.018
	(0.378)		(0.086)	(0.002)	(0.032)	(0.023)	(0.010)	(0.019)
Education^2	0.009	1.009	-0.002	0.00003	0.0008	0.0005	0.0002	0.0005
	(0.012)		(0.002)	(0.000)	(0.001)	(0.000)	(0.000)	(0.0006)
Kids	-0.010	0.989	0.002	-0.00003	-0.0009	-0.0006	-0.0002	-0.0005
	(0.119)		(0.027)	(0.000)	(0.010)	(0.007)	(0.003)	(0.006)
Urban	0.088	1.092	-0.020	0.0004	0.007	0.005	0.002	0.004
	(0.101)		(0.023)	(0.000)	(0.008)	(0.006)	(0.002)	(0.005)
PA	0.027	1.027	-0.006	0.00006	0.002	0.001	0.0007	0.001
	(0.138)		(0.031)	(0.000)	(0.011)	(0.008)	(0.003)	(0.007)
KY	0.549***	1.732***	-0.120***	-0.008	0.043***	0.035***	0.016***	0.032***
	(0.141)		(0.029)	(0.005)	(0.010)	(0.009)	(0.005)	(0.009)
TN	0.539***	1.715***	-0.118***	-0.007	0.043***	0.034***	0.016***	0.032***
	(0.140)		(0.029)	(0.005)	(0.010)	(0.009)	(0.005)	(0.009)
Residency2	-0.306	0.735	0.072	-0.006	-0.026	-0.017	-0.007	-0.014
	(0.257)		(0.062)	(0.009)	(0.022)	(0.013)	(0.005)	(0.010)
Residency3	-0.073	0.928	0.016	0.00001	-0.006	-0.004	-0.002	-0.003
	(0.214)		(0.048)	(0.000)	(0.017)	(0.013)	(0.006)	(0.011)
Buy_local2	0.581**	1.787**	-0.133**	0.002	0.048**	0.035**	0.015**	0.030**
	(0.234)		(0.053)	(0.004)	(0.019)	(0.014)	(0.006)	(0.012)
Buy_local3	0.749***	2.114***	-0.167***	-0.003	0.060***	0.046***	0.021***	0.042***
	(0.240)		(0.052)	(0.005)	(0.018)	(0.015)	(0.007)	(0.014)
Food_channel	0.131	1.140	-0.030	0.001	0.011	0.007	0.003	0.006
	(0.117)		(0.027)	(0.001)	(0.010)	(0.006)	(0.003)	(0.005)
Prep_freshfood2	0.819**	2.269**	-0.174**	-0.018	0.061**	0.053**	0.025*	0.052*
	(0.393)		(0.076)	(0.018)	(0.024)	(0.026)	(0.014)	(0.030)
Prep_freshfood3	0.716*	2.047*	-0.169*	0.016	0.061*	0.040**	0.017**	0.033**
	(0.386)		(0.093)	(0.017)	(0.032)	(0.020)	(0.008)	(0.016)
Wine_knowledge2	0.743***	2.102***	-0.164***	-0.006	0.059***	0.046***	0.021***	0.043***
	(0.107)		(0.022)	(0.005)	(0.008)	(0.007)	(0.004)	(0.007)
Wine_knowledge3	1.094***	2.987***	-0.213***	-0.050***	0.066***	0.073***	0.039***	0.084***
	(0.165)		(0.026)	(0.015)	(0.007)	(0.012)	(0.008)	(0.018)

Table 4. *Continued*

Dependent Variable	Total Wine Expenditure		Marginal Effects					
	Coefficient	O.R [a]	Less than $20	$20-$39	$40-$59	$60-$79	$80-$99	$100 or more
Grade_popular	0.104	1.110	-0.024	0.0003	0.008	0.006	0.002	0.005
	(0.101)		(0.023)	(0.000)	(0.008)	(0.006)	(0.002)	(0.005)
Grade_super	0.274**	1.315**	-0.064**	0.003	0.023**	0.016**	0.007**	0.013**
	(0.112)		(0.026)	(0.002)	(0.009)	(0.006)	(0.002)	(0.005)
Grade_ultra	0.532***	1.702***	-0.120***	-0.0005	0.044***	0.032***	0.015***	0.029***
	(0.113)		(0.025)	(0.003)	(0.009)	(0.007)	(0.003)	(0.006)
Grade_luxury	0.882***	2.415***	-0.181***	-0.030***	0.061***	0.058***	0.029***	0.061***
	(0.141)		(0.025)	(0.010)	(0.008)	(0.010)	(0.006)	(0.013)
Local_range	0.0003	1.000	-8.8e-05	1.2e-06	0.00003	0.0002	1.0e-05	2.0e-05
	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Type_white	0.427***	1.532***	-0.097***	-0.0002	0.035***	0.026***	0.012***	0.023***
	(0.099)		(0.022)	(0.002)	(0.008)	(0.006)	(0.003)	(0.005)
Type_red	0.593***	1.809***	-0.136***	0.003	0.049***	0.035***	0.016***	0.031***
	(0.101)		(0.023)	(0.003)	(0.008)	(0.006)	(0.003)	(0.005)
Type_fruit	0.164	1.179	-0.037	-5.4e-05	0.013	0.010	0.004	0.008
	(0.153)		(0.034)	(0.001)	(0.012)	(0.009)	(0.004)	(0.008)
Type_champagne	-0.106	0.898	0.024	-7.4e-04	-0.009	-0.006	-0.002	-0.005
	(0.164)		(0.038)	(0.001)	(0.014)	(0.009)	(0.004)	(0.008)
Intercept 1	-0.219							
	(2.840)							
Intercept 2	0.991							
	(2.840)							
Intercept 3	1.942							
	(2.841)							
Intercept 4	2.700							
	(2.841)							
Intercept 5	3.192							
	(2.842)							
N. of observations	1609							
LR χ^2	538.010***							
Proportional odds test	148.920* [b]							

Note. Asterisks indicate levels of significance: * = 0.10, ** = 0.05, and *** = 0.01.

Wald Test was also performed in SAS for inference of each coefficient, β_k: $z* = b_k / s\{b_k\}$.

[a] O.R. represents odds ratio.

[b] The result of the proportional odds test suggests to use a less restrictive model, like the multinomial logit model. However, we only present the outcomes of the ordered logit model for ease of interpretation, since the outcomes of the multinomial logit model are very similar. The outcomes of the multinomial logit model are available upon request.

Table 5. Local Wine Expenditure

Dependent Variable	Local Wine Expenditure		Marginal Effects					
	Coefficient	O.R [a]	Less than $20	$20-$39	$40-$59	$60-$79	$80-$99	$100 or more
Male	0.318**	1.375**	-0.038**	0.022**	0.017*	0.003*	0.0009	0.004*
	(0.153)		(0.019)	(0.011)	(0.003)	(0.001)	(0.0005)	(0.002)
Age	-0.006	0.993	0.0007	-0.0004	-0.0001	-6.2e-05	-1.7e-05	-0.00009
	(0.005)		(0.000)	(0.000)	(0.000)	(0.000)	(0.0005)	(0.000)
Wine_drinkers	0.178*	1.194*	-0.020*	0.011*	0.004*	0.001*	0.0004	0.002*
	(0.096)		(0.011)	(0.006)	(0.002)	(0.0009)	(0.000)	(0.001)
White	0.176	1.192	-0.019	0.011	0.003	0.001	0.0004	0.002
	(0.248)		(0.025)	(0.015)	(0.005)	(0.002)	(0.0003)	(0.003)
Income	0.012**	1.012**	-0.001**	0.0008**	0.0002**	0.0001**	3.3e-05*	0.0001**
	(0.005)		(0.000)	(0.000)	(0.000)	(0.000)	(0.0006)	(0.000)
Income^2	-6.5e-05**	0.999**	7.5e-06**	-4.3e-06**	-1.4e-06**	-6.1e-07**	-1.7e-07*	-8.9e-07**
	(0.00002)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education	0.596	1.816	-0.068	0.039	0.013	0.005	0.001	0.008
	(0.573)		(0.066)	(0.038)	(0.013)	(0.005)	(0.000)	(0.007)
Education^2	-0.024	0.976	0.002	-0.001	-0.0005	-0.0002	-6.6e-05	-0.0003
	(0.019)		(0.002)	(0.001)	(0.000)	(0.0001)	(0.001)	(0.0002)
Kids	-0.104	0.901	0.011	-0.006	-0.002	-0.0009	-0.0002	-0.001
	(0.168)		(0.018)	(0.010)	(0.003)	(0.001)	(0.000)	(0.002)
Urban	-0.279*	0.756*	0.033*	-0.019*	-0.006*	-0.002*	-0.0007	-0.003*
	(0.149)		(0.018)	(0.010)	(0.003)	(0.001)	(0.0004)	(0.002)
PA	0.191	1.211	-0.022	0.013	0.004	0.001	0.0005	0.002
	(0.210)		(0.025)	(0.014)	(0.005)	(0.002)	(0.0005)	(0.003)
KY	0.072	1.074	-0.008	0.004	0.001	0.0006	0.0002	0.001
	(0.210)		(0.024)	(0.014)	(0.004)	(0.002)	(0.0006)	(0.003)
TN	-0.019	0.980	0.002	-0.001	-0.0004	-0.0001	-5.3e-05.	-0.0002
	(0.210)		(0.024)	(0.013)	(0.004)	(0.001)	(0.0005)	(0.002)
Residency2	-0.173	0.841	0.018	-0.011	-0.003	-0.001	-0.0004	-0.002
	(0.388)		(0.040)	(0.023)	(0.007)	(0.003)	(0.0009)	(0.004)
Residency3	0.267	1.307	-0.028	0.016	0.005	0.002	0.0006	0.003
	(0.318)		(0.031)	(0.018)	(0.006)	(0.002)	(0.0007)	(0.003)
Buy_local2	1.159***	3.188***	-0.180***	0.095***	0.038***	0.016***	0.004**	0.025***
	(0.248)		(0.048)	(0.023)	(0.011)	(0.005)	(0.002)	(0.008)
Buy_local3	0.719***	2.053***	-0.085***	0.048***	0.016***	0.007***	0.002**	0.010***
	(0.186)		(0.022)	(0.013)	(0.004)	(0.002)	(0.0009)	(0.003)
Food_channel	0.793	2.211	-0.091	0.052	0.017	0.007	0.002	0.010
	(0.539)		(0.061)	(0.035)	(0.012)	(0.005)	(0.001)	(0.007)
Prep_freshfood2	1.417***	4.124***	-0.181**	0.100**	0.036**	0.015**	0.004*	0.023**
	(0.540)		(0.075)	(0.039)	(0.016)	(0.007)	(0.002)	(0.011)
Prep_freshfood3	-0.200	0.818	0.023	-0.013	-0.004	-0.001	-0.0005	-0.002
	(0.181)		(0.022)	(0.012)	(0.004)	(0.001)	(0.0005)	(0.002)
Wine_knowledge2	1.047	2.849	-0.146	0.080	0.029	0.012	0.003	0.019
	(1.043)		(0.170)	(0.087)	(0.036)	(0.016)	(0.005)	(0.025)
Wine_knowledge3	1.186	3.274	-0.114	0.067	0.022	0.009	0.002	0.013
	(1.036)		(0.083)	(0.049)	(0.016)	(0.006)	(0.002)	(0.009)

Table 5. *Continued*

Dependent Variable	Total Wine Expenditure		Marginal Effects					
	Coefficient	O.R [a]	Less than $20	$20-$39	$40-$59	$60-$79	$80-$99	$100 or more
Grade_popular	-0.082	0.921	0.009	-0.005	(0.010)	-0.0007	(0.002)	(0.007)
	(0.149)		(0.017)	(0.009)	-0.001	(0.001)	-0.0002	-0.001
Grade_super	0.169	1.184	-0.019	0.011	(0.003)	0.001	(0.0004)	(0.002)
	(0.176)		(0.019)	(0.011)	0.003	(0.001)	0.0004	0.002
Grade_ultra	0.256	1.291	-0.029	0.017	(0.003)	0.002	(0.0004)	(0.002)
	(0.170)		(0.020)	(0.011)	0.005	(0.001)	0.0007	0.003
Grade_luxury	0.499***	1.647***	-0.065**	0.036**	(0.004)	0.005**	(0.0005)	(0.002)
	(0.189)		(0.027)	(0.015)	0.013**	(0.002)	0.001*	0.008**
Local_range	3.1e-05	1.000	-3.6e-06	2.0e-06	(0.005)	2.9e-07	(0.0009)	(0.003)
	(0.001)		(0.000)	(0.000)	7.1e-07	(0.000)	8.5e-08	4.3e-07
Type_white	0.264*	1.303*	-0.030*	0.017*	(0.000)	0.002*	(0.000)	(0.000)
	(0.145)		(0.017)	(0.009)	0.006*	(0.001)	0.0007	0.003*
Type_red	0.117	1.124	-0.013	0.007	(0.003)	0.001	(0.0004)	(0.002)
	(0.153)		(0.017)	(0.010)	0.002	(0.001)	0.0003	0.001
Type_fruit	0.867***	2.380***	-0.111***	0.062***	(0.003)	0.009***	(0.0004)	(0.002)
	(0.217)		(0.030)	(0.017)	0.022***	(0.003)	0.002**	0.014***
Type_champagne	-0.219	0.803	0.024	-0.014	(0.006)	-0.001	(0.001)	(0.004)
	(0.226)	0.921	(0.024)	(0.014)	-0.004	(0.001)	-0.0005	-0.002
Intercept 1	9.495							
	(4.386)							
Intercept 2	10.541							
	(4.388)							
Intercept 3	11.220							
	(4.389)							
Intercept 4	11.694							
	(4.390)							
Intercept 5	11.880							
	(4.391)							
N. of observations	1609							
LR χ^2	285.910***							
Proportional odds test	134.830							

Note: Asterisks indicate levels of significance: * = 0.10, ** = 0.05, and *** = 0.01.
  Wald Test was also performed in SAS for inference of each coefficient.
  [a]O.R. represents odds ratio.

Table 6. Probability of Local Trial

Dependent Variable	Local_tried	
	Coefficient	**Marginal Effect**
Male	0.230*	0.047*
	(0.126)	(0.025)
Age	-0.005	-0.001
	(0.004)	(0.0009)
Wine_drinkers	-0.006	-0.001
	(0.079)	(0.016)
White	0.462**	0.090**
	(0.200)	(0.037)
Income	0.007*	0.001*
	(0.004)	(0.0008)
Income^2	-4.7e-05**	-9.6e-06**
	(0.000)	(4.3e-06)
Education	1.061**	0.215**
	(0.484)	(0.097)
Education^2	-0.035**	-0.007**
	(0.016)	(0.003)
Kids	-0.184	-0.037
	(0.140)	(0.027)
Urban	-0.318***	-0.047***
	(0.121)	(0.024)
PA	-0.234	-0.036
	(0.157)	(0.031)
KY	-0.182	-0.138
	(0.164)	(0.032)
TN	-0.709***	-0.031***
	(0.171)	(0.031)
Residency2	-0.155	-0.050
	(0.320)	(0.063)
Residency3	0.255	0.091
	(0.262)	(0.051)
Core	0.436**	0.040**
	(0.203)	(0.043)
Mid_level	0.200	0.032
	(0.133)	(0.027)
Buy_local2	0.370	0.073
	(0.287)	(0.054)
Buy_local3	0.872***	0.182***
	(0.294)	(0.060)
Food_channel	-0.080	-0.016
	(0.140)	(0.028)
Prep_freshfood2	-0.141	-0.028
	(0.401)	(0.080)
Prep_freshfood3	0.168	0.034
	(0.393)	(0.079)
Wine_knowledge2	0.556**	0.112***
	(0.130)	(0.025)

Table 6. *Continued*

Dependent Variable	Local_tried	
	Coefficient	**Marginal Effect**
Wine_knowledge3	0.979***	0.209***
	(0.198)	(0.042)
Grade_popular	-0.004	-0.0009
	(0.121)	(0.024)
Grade_super	0.339**	0.068**
	(0.137)	(0.027)
Grade_ultra	0.220	0.045
	(0.136)	(0.028)
Grade_luxury	0.234	0.048
	(0.177)	(0.037)
Local_range	-9.4e-05	-1.9e-05
	(0.0008)	(0.0001)
Type_white	0.398***	0.082***
	(0.117)	(0.024)
Type_red	0.178	0.036
	(0.121)	(0.024)
Type_fruit	0.720***	0.149***
	(0.177)	(0.036)
Type_champagne	-0.150	-0.030
	(0.186)	(0.036)
Constant	-10.273***	
	(3.655)	
Log Likelihood	-950.920	
Wald χ^2	207.250***	
Pseudo R^2	0.116	
McFadden's Adjusted R^2	0.084	
N. of observations	1,609	
Correctly predict	68.74%	
Goodness-of-fit (χ^2)	1,625.110	

Note. Asterisks indicate levels of significance: * = 0.10, ** = 0.05, and *** = 0.01.