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The Demand for Wine Tourism in Canyon County, Idaho

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Abstract

Many commercial wineries produce a dual product: commercial wine and wine tourism. Since Idaho wineries charge no entry price, wine tourism demand can only be ascertained with a shadow price for winery visitation. Demand for wine tourism visits for Canyon County in southern Idaho was estimated using the travel cost method. Trip demand was inelastic (-0.4 to -0.6) with respect to own price. The average value of Canyon County wine tourism ranged from $6 to $12 per person per trip, depending upon the assumed opportunity cost of travel time. Elasticities of tastes and preferences, closely related goods, and income were estimated with a view to understanding the market for Idaho's emerging wine tourism industry.

Key words: travel cost model, wine tourism, wine marketing

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Introduction

Visitors have long flocked to the famous grape and wine regions of the world. In the Western United States, the majority of wineries have clustered around the grape growing regions of central and eastern Washington, western Oregon, and the nation's foremost grape and wine region, California's Napa Valley. Those states, plus New York, produce 98% of the $20 billion of table wine produced in the United States (Shriver). The wineries in the grape producing regions sell wine to a national or even international market, and correspondingly attract visitors from around the world. Wine tourism is increasing. New York wineries and festivals drew 3 million visitors in 2001, Missouri 1.8 million, and Ohio 1.5 million (Shriver). In 2002, New York wine tourism went "through the roof" with visits up 25 to 30% over last year (WSJ). In 2001, the Sonoma and Napa wineries attracted over 10 million visitors, who spent $2 billion (WSJ). In response, wineries have been springing up across the nation. With the addition of North Dakota in 2002, all fifty states now have wineries and Washington has been adding a new winery every 20 days (Shriver). Wineries in these prominent grape-growing areas thus produce a dual product: commercial wine and wine tourism. In contrast, the scattered smaller wineries, not located in grape growing regions, generally attract fewer visitors.

With 1,000 acres planted to wine grapes and fifteen wineries scattered throughout the state, the Idaho grape and wine industry is in its infancy. From 1993 to 1999, Idaho's wine grape acreage doubled, making it the fourth largest fruit industry in the state (USDA). Over 87 % of Idaho's wine production (from five wineries) and 75% of the vineyards are clustered within several miles of each other in southern Canyon County. By virtue of their close proximity, the Canyon County wineries are a single tourist site, analogous to California's Napa Valley. Moreover, not only are the wineries in close proximity to each other, they are within 30 miles of Boise and 10 miles of Nampa, Idaho's largest two cities. The Canyon County wineries have neither the national nor the international stature to be a destination attraction. Rather, these wineries are tourism alternatives for day-outings for residents and tourists alike (Woodall et al). From the wineries' perspective tourism not only provides an additional sales outlet, but also builds brand awareness in the faddish and fickle wine market.

Marketing studies for commercial products, including tourist businesses, begin demand studies by examining market prices for the product or admission fees for a commercial tourism business. In contrast, valuing a good that is not traded in a market, such as winery tourism, requires estimation of a shadow price for that good. The travel cost method (TCM) allows demand to be estimated for wine tourism by pricing the number of recreational trips taken to a winery site. The goal of this study is not to pioneer TCM techniques, but rather to expand TCM to a new genre of issues: demand for commercial or agribusiness related tourism. The principle goal of most TCM studies is to measure consumer surplus in order to

estimate the recreational, environmental, or resource value of an unpriced good for benefit-cost analysis of a public investment. In contrast, wine tourism is a private business and this study uses data generated by research funded by the industry. Of course, there is considerable policy interest in the economic success and impacts of this industry. Therefore, the major interest in this study was to examine the shift parameters of the TCM demand function to help understand how Canyon County wineries might better produce and market commercial agribusiness related tourism.

The study has three objectives; the first paved the way for the latter two. The first objective was simply to determine if TCM could be used to estimate the demand for Canyon County wine tourism. Given the proximity of Canyon County wineries to their customer base (the Boise-metropolitan area) we were concerned that the variation in trip distance and corresponding variation in travel cost would be insufficient to estimate a demand function. Similarly, we were uncertain whether Boise metropolitan customers would provide sufficient variation in the number of trips. Given successful estimation of the demand function, we could then calculate price elasticity and trip value (consumer surplus) for Canyon County wine tourism, the second objective. The third objective was to discover which variables influence tourists to spend an afternoon touring Canyon County wineries. These variables are the taste and preference variables of the wine tourist, the substitutes and complements in the demand function, and prices of closely related goods. Among the most intriguing of the variables that might influence wine tourism is what might be termed the "Napa Valley Effect" -- where vineyards and wineries cluster or agglomerate to attract wine tourism in contrast to an isolated individual winery.

Methods

The travel cost method has traditionally been used to value outdoor recreational sites, usually for public investment decisions. In estimating a demand for wine recreation, TCM was applied to a new field, that of a commercial agribusiness industry that doubles as a recreation site. A brief synopsis of travel cost models, as applied to estimating demand for Canyon County wine tourism, is followed by a description of the data. A discussion of demand specification and demand estimation methods conclude this section.

Trip demand for wine tourism is the relationship between quantity (the number of trips taken to a site per year) and price (proxied by travel cost to the site). The TCM calculates an implicit price paid by a visitor to a recreational site and uses this to estimate a demand for visiting the site. The implicit price is the travel cost (and other access costs) to the recreation site, here a cluster of wineries in Canyon County, Idaho. Individuals traveling a range of distances to and from the recreation site (at varying costs of travel) generate variations in price. Generally, travel costs (implicit price) are lower for people living closer to the site and higher

for those further away because travel costs are a function of travel distance. According to the "law of demand," people that start their trip closer to the site will take more trips and those farther away will take fewer, resulting in the negative sloped trip demand function (Parsons). The history and techniques of TCM are detailed in Ward and Beal, Ward and Loomis and Parsons.

The trip demand curve can be used to estimate Canyon County winery visitors' demand and consumer surplus (willingness to pay net of travel costs) (Loomis, Gonzalez-Caban, and Englin). Other trip demand variables are used to examine factors influencing trip demand.

Survey and Data

The Idaho Wine and Grape Growers Commission funded an impact study, which is the source of data for this study (Woodall et. al). A few basic travel cost questions were added to a survey that was intended to ascertain a profile and trip expenditure patterns of Idaho winery visitors. Between August 2001 and October 2001, a self-administered survey was distributed at Canyon County's four largest wineries. Winery staff displayed the surveys in their tasting rooms and invited visitors to participate in the survey. This survey mode introduces potential self-selection bias and hence suggests caution in generalizing the results.

Of the 200 surveys distributed at the wineries, 49% were returned and 89 were useable in the TCM. While this is a modest sample size, it compares favorably with some other studies: it was four to five times that of several wine marketing studies (e.g. Rasmussen and Locksin) and was comparable to the sample size of "at least 100 questionnaires" per winery found in a recent marketing study of the characteristics of winery visitors (Dodd and Bigotte). Moreover, the main issue is whether sample size is adequate to represent the respondent group and to successfully carry out statistical tests. Certainly, a larger sample would have been desirable to enhance the precision and sensitivity of the estimation, but the sample was adequate for this study. For instance, travel distance data is key in determining the reliability of a TCM study. In this case the 95% confidence interval around the trips distance was ± 11%. Reported one-way mileage averaged 23.36, with standard deviation of 12.89 and a range of 1 to 55 miles. Doubling the sample size to make it more comparable to other TCM studies (e.g. McKean et al 2003) would have increased precision, reducing the confidence interval on the mileage variable to ± 8%, a relatively modest gain. Most importantly, the sample size provided an adequate confidence interval considering the short distances traveled to the Canyon County wineries. Further, adequacy of the sample was demonstrated in the following econometric estimates which proved adequate to yield a significant travel cost coefficient.

In the first section of the survey, winery visitors were asked which Canyon County wineries they planned to visit and how often in the past year they visited the wineries (the survey is available from authors). Then, they were asked to explain how they learned of the wineries (word-of-mouth, road signs, etc.), and to describe the nature of the visit. The next section requested the visitor's home zip code and asked the respondent to estimate mileage traveled from where they were staying to the winery, for use as the distance measure in imputing travel costs. Questions about travel expenditures while on this trip followed. Respondents were also asked a question about substitute activities in which they might have participated had they not gone wine tasting. The last sections of the questionnaire asked about the respondent's tastes and preferences and their demographic characteristics.

The survey data provided a profile of the Canyon County wine tourist. The wine visitor is a well-educated individual (34 % with graduate degree), with a moderate to high income, and is between the ages of 36 to 49 (Table 1). The Canyon County wine tourist frequently enjoys modest priced wine, partakes of wine an average of nine times a month and spends just under twelve dollars a bottle (Table 1).

Table 1: Variable Definition and Mean

Definition	Label	Units	Mean
TRAVEL COST DEMAND VARIABLES			
Trips to Canyon County wineries past year (dependent)	Q	trips	2.8
Scenario 1: Per person round trip travel cost	Price	$	2.51
Scenario 2: Per person round trip travel cost	Price	$	7.42
Number of wineries visited during trip	Wineries	number	2.2
Average price per bottle of wine purchases	Connoisseur	$	11.68
Wine consumption (times per month)	Drink	number	9.06
Canyon County lodging expenditures (per person)	Lodging	$	2.02
Household annual income (per person)	Income	$	33,383
How wine tourists learned of wineries	News Ad	0,1	.07
How wine tourists learned of wineries	Brochure	0,1	.22
How wine tourists learned of wineries	Guidebook	0,1	.12
How wine tourists learned of wineries	Road sign	0,1	.24
Alternative to visiting wineries:			
Stayed home	Stayed Home	0,1	.38
Age of respondent	age	years	41
OTHER SURVEY DATA			
Travel distance (one way)	miles	23.36	
Number of people in party	number	2.6	
Describe this visit: Day trip	0,1	.54	
Reason for visit – wine tasting = 1	0,1	.70	
Predominate education – graduate = 1	0,1	.35	
Wine purchases on this trip	$	97	
Visited wineries in other states (yes=1)	0,1	.60	

Source: Woodall et. al.

Idaho wineries are not a destination vacation spot. Sixty percent of winery visitors originated from Idaho, a majority from the Boise area. The visitors are generally on a day outing – specifically for wine tasting. Those wine tourists who do come from outside Idaho are generally visiting family or on a business trip and are on an afternoon outing. The average number of miles traveled to the wineries is approximately 26 miles one way. For visitors from outside Idaho the reported distance from their temporary residence (hotel, or relative's house) to the winery was used in calculate an incremental travel costs. Despite the close proximity of the wineries to the majority of visitors, the typical (modal) wine tourist makes only one trip per year to the wineries, with the mean number of visits being 2.8 per year. Sixty percent of the respondents had previously visited wineries in other states (Table 1).

Demand Specification

The specified TCM trip demand function for empirical estimation is : $Q = f(P, S, Y, \mathbf{Z})$, where the dependent variable Q is the number of trips to Canyon County wineries and the independent variables are; P, the own price (travel cost), S, a vector of prices of closely related goods, Y , income and age, and $\mathbf{Z}$, a vector of preference and marketing variables. The variables are discussed in turn below.

Own Price

The proxy for own price is based on the costs of travel to the site. Formally, the travel trip is a weak complement to the site visit (McConnell). In the case of winery tourism, weak complementarity means that the trip must be taken to enjoy the winery, but the quantity and quality of the visit bears no relationship to the length of the trip, i.e., the cost. Otherwise stated, while the winery visit cannot create utility unless the trip is taken, the utility of the visit is not directly affected by the length of the trip. Therefore, the trip cost is an implicit price for enjoying the winery.

Travel costs are typically calculated as the sum of: travel costs (principally transportation costs) plus the opportunity costs of travel time. The TCM good (a visit to a recreation site) is a complex commodity, necessitating careful specification and calculation of this proxy for own price. The complexity arises because recreation trips are seldom single-purpose and travel itself can bring a complicated blend of pleasures, costs and aggravation to the traveler. Recreational trips use capital and service expenditures for a trip that may combine en route sightseeing with on-site visitation. Furthermore, one must deal with side trip(s) and the economics of time (Walsh et al.).

For this study, Ward's (1984) advice was followed in imputing travel costs as the minimum expenditure required to travel from origin and return. This estimated or "synthetic" travel cost is calculated as the minimum round trip travel expenditures to and from the wineries, including associated incremental costs. Estimated or synthetic travel costs were calculated because a majority of Canyon County winery visitors (55%) were on a one day trip, making reported expenditures a highly variable and even misleading indicator of expenditures. For instance, a day trip to the Canyon County wineries from Boise would not use an entire tank of gas. Thus, reporting no gas purchases would under-estimate costs and the purchase of a full tank would over-estimate costs. With a large enough sample, these irregularities would average out, but with this relatively small sample using reported expenditures could substantially decrease the precision of estimates. Moreover, using the synthetic expenditures helps controls for side-trip costs and for potential memory errors in recalling trip costs. Trip costs were computed using the American Automobile Association's (AAA) average vehicle operation costs for a car, SUV, or RV ($0.12, $0.13 and $0.26, respectively). Only operating costs were included (Ward); ownership costs are not an incremental cost of the trip and were therefore excluded. Trip costs are calculated by multiplying the cost per mile of the vehicle by the reported mileage traveled both ways. Finally, to obtain per-person trip cost, trip costs are divided by the reported number of individuals traveling in the group (mean = 2.6.).

For multi-destination trips only the incremental costs of visiting the wineries were included in own price. Visitors were asked to provide mileage from "home or where you were staying" to ascertain the incremental distance.

The second issue in calculating own price concerns measuring the non-transportation costs of travel. Time spent on the trip is a potentially important component of the total travel cost. Controversy has long surrounded measurement of the cost of travel time (e. g. Freeman, Smith et al., and Shaw.) Depending on the model, the cost of travel time is tied to some or all of three factors: the amount of income forgone, the opportunity cost of time relative to other activities (in household production models), and the disutility or utility of the driving time itself. A common assumption in empirical TCM applications is that the opportunity cost of time is some proportion of monetary income, an assumption that can be traced back to studies of commuters that equate the marginal value of labor with leisure (Cesario, Caulkins et al., Bowker et al., Cameron et al.). Recent approaches attempt to empirically estimate time value directly (McKean, Johnson and Taylor). An alternative perspective is that time value is implicitly captured in the overall value of the trip itself. The trip can be viewed as a part of the recreational outing. Hence, Parsons suggests that any added pleasure of the trip would appear in the demand function, in the form of additional trips, and the trip becomes one of the characteristics of the site visit.

In summary, a comprehensive model of travel time must account for the opportunity cost of time, either as foregone income or as lost utility from other activities; and any entertainment or annoyance value of the trip. Empirical implementation of this comprehensive view of trip time requires direct valuation for each respondent. Even if the issue of the opportunity cost of time were theoretically and empirically resolved, such a method would require data on: travel time, occupation, trip characteristics, distance, and other factors beyond the scope of our present survey. In the absence of a direct valuation of trip time, sensitivity analysis of time costs was used in this study to bracket plausible estimates of the value of time. The demand for Canyon County wine tourism was estimated under two scenarios: the first assigning a zero value to travel time, the second setting the value of travel time at 1/3 of the respondent's income.

The zero travel time assumes zero opportunity cost and also no disutility (or utility) from the drive itself. Most Canyon County winery tourists forego little, if any, income in travel time, nor are these short jaunts an onerous commute. Fifty-four percent of the visitors to the Canyon County wineries made a Saturday or afternoon trip from nearby Boise. Thus, we feel that the most appropriate scenario is to value the non-transportation costs of travel at zero.

A second method of measuring total trip costs imputes an opportunity cost to travel time as a proportion of wages. Following the convention established by Cesario and used by many TCM studies since (e.g. Loomis et. al.), the opportunity cost of travel time was valued at one-third of the respondent's reported income. The hourly rate for travel time was calculated under the assumptions of 2000 hour of work annually and an average travel speed to the wineries of 50 miles per hour. This opportunity cost was added to the vehicle costs to yield the second measure of total trip costs. Again, total trip costs (vehicle plus time costs) were divided by the reported number of individuals traveling in the group (mean 2.6) to obtain per-person trip costs.

Closely Related Goods

Misspecification bias may result when the prices of substitutes and complements prices are omitted from the TCM demand function (McKean, Walsh, and Johnson). Changes in the winery characteristics would not bring any satisfaction to a person who did not visit the winery, but winery characteristics attract visitors, thus affecting the demand for winery visitation. The closely related goods specified in the Canyon County winery demand function were: (1) lodging in Canyon County and, (2) staying at home. Lodging (Lodging) was measured as the reported expenditures on lodging in Canyon County per trip. Lodging was not included as part of the travel cost, because a winery visit was typically a side trip from the main purpose of whatever brought the non-local visitor into the area. Thus the cost of the lodging as a trip expense per se is ascribed to the primary visit. However, if the cost of the primary trip escalates, the non-local visitors will make fewer visits to the

adjoining Boise area and in turn will have less opportunity to visit the wineries. Therefore, lodging expenditures in the Canyon County are a complement to a trip to the wineries for non-local visitors.

Thirty-eight percent of the respondents reported that staying-at-home (Stayed Home, a dummy variable) was the leading alternative activity to visiting the winery. The alternative to staying at home, given on the questionnaire was "another activity". Staying at home or some other activity was thus specified in the demand function as a substitute for a trip to the wineries.

The Napa Valley attracts millions of tourists each year because of the agglomeration of wineries, restaurants, and hotels. Similarly, the availability of multiple wineries in Canyon County should positively influence trip demand. If the presence of more wineries induces more visits, avid wine tourists should visit more wineries, as well as visit the wine area more often. Ideally, this agglomeration effect should be measured with data from a cross section analysis of visits to different locations with different winery densities or from a time series analysis of changes in winery numbers in a particular location. The effect of a cluster of wineries in Canyon County upon the demand function was tested in the demand function by asking respondents the number of wineries visited during a single trip (Wineries mean is 2.2). While not directly testing for agglomeration, a positive coefficient on this variable indicates a demand for visits to multiple wineries and is therefore consistent with an agglomeration effect.

Wine Preferences and Marketing

The experience of a winery visit includes the quality and quantity of wine tasting and the perceptions of that experience may depend upon winery marketing efforts. Winery visitor preferences are assessed by the variables of frequency of wine consumption and the price paid per bottle of wine. The reported frequency of wine consumption over the previous month (Drink) measured the respondents' preference for wine quantity. The wine quality dimension of tastes was measured by the average price the respondent paid for a bottle of wine (Connoisseur). Both quantity and quality measures were hypothesized to increase the number of trips to the wineries.

To gauge advertising success and potential, newspaper (News Ad), guidebooks (Guidebook), brochures (Brochure), and road signs (Road Sign) variables were included in the model. In effect, the advertising mode is a characteristic of the site from the point of view of the visitor. Advertising was measured as a set of dummy variable, based upon the responses to the question; "How did you hear about Canyon County wineries."

Income and Age

The effect of a respondent's budget constraint on visits was specified as the respondent's reported income (Income). This simple income variable was hypothesized to have a positive effect on the number of trips. Recent research has shown that the effect of a leisure or time constraint maybe even more important than the budget constraint (McKean, Johnson and Taylor). Furthermore, when the opportunity cost of travel time is calculated as some function of income (as was the case when the opportunity cost of travel time was calculated at 1/3 reported income), travel time costs and income will be collinear. A more complete model would incorporate a budget and time constraint, as well as travel time costs. Lacking sufficient data for such a model, we used sensitivity analysis to explore this relationship.

Age was also used as a proxy for the constraint on leisure time. An older (especially retired) population has lower time constraints, lower potential for lost income from a visit, and hence could visit the wineries more frequently.

Demand Estimation

Data were obtained from a survey of winery visitors contacted on-site. These data included the dependent variable, the number of visits to Canyon County wineries. Due to the nature of the data and the survey method, estimation of an empirical travel cost demand function must address three issues: (1) a truncated integer dependent variable, (2) overdispersion, and (3) endogenous stratification. Each estimation issue will be discussed, followed by a brief account of the procedure adopted in this study.

The dependent variable (visits per year) is a nonnegative integer, censored at zero. Moreover, an on-site survey excludes those who did not visit the study site, truncating the data at one visit. Conventional regression will bias coefficients toward zero when the dependent variable is truncated from below because it implicitly assumes that some of the distribution lies in the negative quadrant (Maddala). Truncated Poisson regression is often used to remedy this bias (Greene; Creel and Loomis; Hellerstein and Mendelsohn). However, Poisson regression can exhibit overdispersion; the significance of the Poisson regression coefficients can be greatly overstated if the variance of the dependent variable is not equal to its mean, following the restrictions of the Poisson distribution. The negative binomial regression does not suffer this shortcoming; therefore, overdispersion can be tested using the negative binomial regression (Cameron and Trivedi; Greene, 1998).

Overdispersion was rejected[1] , thus allowing the demand function to be estimated with truncated Poisson regression.

Another potential estimation problem is that an on-site survey introduces self-selection bias—only those who visit the site are surveyed. Although the truncation estimation technique excludes zero values, the adjustment for truncation does not account for the possibility that frequent winery visitors are more likely to be in the sample than are less frequent winery visitors. The Poisson regression was adjusted for endogenous stratification by subtracting one from the dependent variable following the procedure developed by Englin and Shonkwiler.

Results

In the results section, the estimated value of wine visitation (consumer surplus) and interpretation of the other wine tourism demand function coefficients and respective elasticities are reported for the two travel time valuation scenarios: (1) Scenario 1, travel time valued at zero (Table 2), and (2) Scenario 2, valuation of travel time at 1/3 of the visitor's income (Table 3).

Consumer surplus is the net value of a winery visit. Annual consumer surplus estimate for demand with continuous variables equals E(r)/(-ß) (Adamowicz et al.), where ß is the estimated price coefficient and E(r) is the mean annual visits from the estimated trip demand function. . Hellerstein and Mendelsohn (1993) show that this consumer surplus calculation also applies to the case where quantity demanded (trips) is a nonnegative integer. The semi-log functional form being equivalent to the Poisson regression used in this study, consumer surplus for a single trip is thus 1/(-ß).

In the first scenario, consumer surplus per trip per person was estimated to be $6 (1/ -0.17, see Table 2). The total annual value of wine tourism for each visitor is $17 (an average visitor makes 2.8 trips per year). In the second scenario, consumer surplus per trip per person was estimated at $12 (1/ -0.08, see Table 3). The total annual value of wine tourism for each visitor is $34 (an average visitor makes 2.8 trips per year). Thus, inclusion of travel time at 1/3 of the income doubled the value of a trip to the Canyon County wineries[2].

Demand for Canyon County wine tourism was price inelastic in scenario 1 (-0.42, Table 2) and became more inelastic under the second scenario of travel time (-0.62,

[1] The overdispersion rate is: Var(Q)/E(Q) = 1+ □E(Q) where Q is the number of trips and ∀ is the overdispersion parameter. The truncated negative binomial regression estimated coefficient on the overdispersion parameter, ∀ was -1.11 with a t-value of 0.77.

[2] A two-tailed t test can be approximated at the 95% level by the level of consumer surplus ± the standard error (Wooldridge). For Scenario 1, the confidence interval around the consumer surplus of $6 was $3.53 to $18.46. For Scenario 2, the 95% confidence interval around the consumer surplus of $12 was $8.07 to $22.79.

Table 2: Scenario 1: Canyon County Winery Travel Cost Demand Model with Travel Time Valued at Zero[a]

Variable	Coefficient	t-ratio	Elasticity
constant	-0.75	0.13	na
Price	-0.17	-2.89	-0.42
Wineries	0.34E-2	0.04	ns
Connoisseur	0.09	0.31	ns
Drink	0.05	4.92	0.45
Lodging	-0.05	-2.40	-0.10
Income	-0.16E-5	-0.39	ns
News Ad	0.84	3.51	0.06
Brochure	0.43	2.09	0.10
Guidebook	1.25	5.27	0.15
Road sign	0.76	3.56	0.18
Age	-0.88E-2	-0.94	ns
Stayed Home	0.46	2.67	0.18

[a] The regression was estimated with truncated Poisson and adjusted for endogenous stratification (adjusted R^2 = 43%). The dependent variable was winery trips per year (mean 2.8). Elasticity was not calculated for variables that were not significant (ns).

Table 3: Scenario 2: Canyon County Winery Travel Cost Demand Model with Travel Time Valued at 1/3 of the Respondents Income [a]

Variable	Coefficient	t-ratio	Elasticity
constant	-0.31	-0.52	na
Price	-0.084	-4.11	-0.62
Wineries	0.02	0.21	ns
Connoisseur	0.03	0.84	ns
Drink	0.05	5.01	0.46
Lodging	-0.05	-2.38	-0.10
Income	-0.50 E-05	-1.19	ns
News Ad	0.88	3.62	0.06
Brochure	0.49	2.33	0.11
Guidebook	1.29	5.50	0.16
Road sign	0.72	3.36	0.17
Age	-.01	-0.88	ns
Stayed Home	0.42	2.35	0.16

[a] The regression was estimated with truncated Poisson and adjusted for endogenous stratification (adjusted R^2 = 45%). The dependent variable was winery trips per year (mean 2.8). Elasticity was not calculated for variables that were not significant (ns).

Table 3). As with any good, substitute prices and portion of income expended explains the price inelasticity of Canyon County wine tourism. A Canyon County wine trip is a very specialized recreational activity, which empirical evidence shows decreases price elasticity (Loomis and Walsh). Canyon County wine tourism is unique in Idaho; substitutes are costly, Oregon and Washington wineries are a five-hour drive. Furthermore, evidence of inelastic demand is shown when respondents reported that the significant alternative to a winery visit was to "stay at home."

Staying at home was the closest substitute activity for a winery trip. The positive sign (0.4) on the "stay at home" dummy variable (Stayed Home) confirms that for the small portion of the regional population that enjoys visiting wineries, there are few substitute recreation activities. Also contributing to price inelasticity is the fact that the costs of winery trips are a minuscule portion of participants' income. Finally, price elasticity for recreational activities is usually greater for weekend trips, than for day visits where costs are lower (Loomis and Walsh).

The lodging variable (Lodging) measures (out of town) visitors spending per trip per person on lodging in Canyon County, which is average revenue, or price per trip per person, for lodging. Winery visits and lodging are complements (coefficient on Lodging equals -0.05 in both scenarios). As the price of lodging drops, more visitors will stay in Canyon County motels and visitation to the wineries will increase.

The agglomeration of wineries in Canyon County or the "Napa Valley Effect" was hypothesized to encourage more trips. Even though Canyon County wineries are within a 10 minute drive of each other, the variable used to represent the agglomeration effect (visits to multiple wineries) was not significant ($t = 0.04$) in the TCM demand in Canyon County. Recall that this was not a direct test of agglomeration because the variable did not measure demand at different levels of winery density. Still, a positive association between visiting more wineries and more winery trips is consistent with the agglomeration hypothesis, that more wineries would induce more visits.

The income variable may be interpreted in the usual fashion as resulting from the is income constraint, but the income variable also is correlated with a higher value for the opportunity cost of time. Winery tourism should be a normal good with a positive response to higher income, but winery visitors earning higher incomes are more likely to lack the discretionary time to visit wineries, in contrast to older retirees with lower incomes and more leisure time. Therefore, income has contradictory effects. In this study, the income variable failed to be significant in both Scenario 1 and Scenario 2. Furthermore, the age variable failed to explain the financial and time constraints that could lead to increased winery visits.

The advertising variables (newspaper ad, brochure, road sign, and guidebook) were all statistically significant and thus positively influenced wineries visits. The

response of tourists to all four types of advertising was highly inelastic, ranging from 0.06 newspaper ads to 0.17 for road signs (Tables 2 and 3).

Wine taste and preferences were specified in the TCM demand function by wine consumption (Drink) and wine quality (Connoisseur). The frequency of wine consumption was statistically significant. A Canyon County winery visitor averages drinks wine an average of nine times per month. Tourists who drink one glass of wine a day are likely to make one additional trip to the winery per year. Canyon County winery visitors prefer moderately priced wine, spending an average of $12 per bottle. The price paid for wine was not significant (t = 0.3) -- the wine "quality" variable did not influence visits to the wineries. To summarize wine preferences, visits to Canyon County wineries increase as the frequency of wine drinking increases, but visits were unaffected by the price paid for wine.

Conclusions and Recommendations

The Travel Cost Method has been used extensively to value non-commercial outdoor recreational sites to make investment decisions regarding public recreation sites. In estimating a demand for winery visitation, TCM was applied to estimating the recreational demand for a commercial agribusiness. TCM estimates trip demand to a recreation site using travel costs as the implicit price paid to visit the site. In contrast, demand studies for a commercial tourism business or agribusiness product examine explicit market prices: the admission fee or product price, respectively.

At the outset, we were skeptical that TCM would be practical in valuing Canyon County wine tourism. Would the variation in trip numbers and travel costs from nearby Boise be sufficient to estimate a TCM demand function? In the end, the price of an "afternoon getaway" to a Canyon County winery proved to be significant and ranged in value from $6 to $12, well within the cost range of recreation alternatives, such as a movie ticket. However, these consumer surplus estimates are extremely sensitive to imputed travel costs; higher travel costs increases consumer surplus. Travel costs included only the round trip vehicle operating costs at 12 cents per mile. Moreover, when the opportunity costs of travel time were valued at the conventional measure of 1/3 the respondent's household income, consumer surplus doubled from $6 to $12. The Canyon County winery visitor profile and the close proximity of the wineries to their customer base suggest that travel time has little value. For many visitors an "afternoon getaway" or "evening jaunt" to the wineries does not require any work/leisure tradeoff and thus no opportunity cost of travel time and for most visitors the leading alternative to a winery visit was to "stay at home."

Having demonstrated that the TCM can accurately estimate the demand for winery tourism, even in an extreme case such as Canyon County, we turned attention to an analysis of that demand to aid wineries decisions. From the winery's perspective,

tourism is a marketing tool. Therefore, the main interest is in price elasticity and the elasticities of tastes and preferences, closely related goods, and income. Knowledge of the visitors' responses as measured by these elasticities helps to understand the market for Idaho's emerging wine tourism industry providing marketing insights for these fledgling wineries.

The "Napa Valley Effect" or agglomeration effect, proxied by the number of wineries visited during a wine trip, was not significant. Even though the proxy is a weak measure of agglomeration, the absence of demonstrated agglomeration effects prompts several marketing questions: Is information about the proximity of the other sites lacking? Do Idaho tourists simply not have the time or inclination to visit multiple wineries? Could activities such as festivals increase visits? Could coordinated advertising to establish a regional identity to promote additional visits to the wineries?

Wine preferences (quantity and quality) were specified in the TCM demand function. Frequency of wine consumption was significant, while wine quality did not affect winery visitation. Canyon County wine tourists enjoy frequently drinking the moderately priced, quality wines, which are Idaho's forte.

The advertising variables (newspaper ad, brochure, road sign, and guidebook) were all statistically significant and positively influence winery's visitation. However, the response was not strong; the response of tourists to all four types of advertising was highly inelastic, ranging from 0.06 newspaper ads to 0.17 for road signs. This result suggests that these small wineries may need to explore other marketing venues.

Should Canyon County wineries charge fees to capture the consumer surplus and recover the costs of tasting rooms and wine tours-- or would a fee deter visitors, thereby reducing the promotional benefits wineries gained from wine tourism as well as the sales made during the visit? Many larger wineries in established wine regions charge wine tasting fees. Large established wineries depend less on local promotion. Smaller wineries often view wine tourism negatively; the expense of providing wine tasting and tours is not offset by wine sales to visitors (Macoinis and Cambourne). An entrance fees separates freeloaders from potential customers. In emerging wine regions, such as Canyon County, wine tourism gives wineries another sales outlet and promotes brand awareness, thereby boosting both wine sales and wine prices in the faddish and fickle wine market.

Because consumer surplus for a wine trip is akin to an uncharged entrance fee, the elasticity of demand provides an insight into the entrance fee question. The price elasticity of Canyon County winery visitation is inelastic (-0.42). Wine tourism is a unique experience for which there are few substitutes. Recall that the most popular alternative to visiting a Canyon County winery was to stay at home. Thus, a 100% increase in the price from the mean of $2.51 to $5.02 (i.e. an entrance fee of $2.51)

would cause winery visitation to drop by 42%. An entrance fee would generate revenue but reduction in visitation may be a poor trade-off for these wineries. As Canyon County wineries seek to establish themselves, the effects of any loss in visitors generated by any entrance fees almost certainly outweighs the small boost in revenues. Free samples and tours may be the most inexpensive and effective marketing tool these wineries have to build brand loyalty and awareness. Moreover, Canyon County winery visitors spend an average of $97 for wine on the trip.

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