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Modeling Perceptions of Locally Produced Wine among Restaurateurs in New York City[*]

by

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Abstract

Poor perceived product quality, an inadequate sales force, and intense competition from wines produced elsewhere are common reasons cited for why New York wines have not achieved broad acceptance in the New York City (NYC) market. NYC restaurant owners, sommeliers, and chefs were surveyed regarding their perceptions and purchasing decisions of wines grown and bottled in New York State. Factor analysis was applied to examine the structure of interrelationships among key indicators of product perception, and an ordinal logistic regression model was used to identify the characteristics of restaurants that show a strong propensity to adopt local wines. The results indicate that a NYC restaurant's type of cuisine does not affect its propensity to adopt local wine, nor does a restaurant's desire to offer a large, geographically diverse wine list. The perceived collective reputation for a wine region's excellence in one particular grape varietal was found to be the most significant factor in the probability of adoption of local wines in NYC. An important implication of these results is that being local is not enough, and New York winery stakeholders could establish a more prominent presence in NYC by emphasizing their collective reputation for particular grape varietals.

Keywords: product perception, restaurant, wine, sommeliers, local, collective reputation, New York, New York City

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I. Introduction

A strong tradition of regional support has enabled most wineries in the world to sell their products in nearby urban centers. For example, California wines dominate the majority of wine lists at restaurants in San Francisco. Wines produced in New York (NY), however, have traditionally been shut out of the upscale New York City (NYC) market. Nearly 75 percent of gross revenue at small independent NY wineries is earned directly from consumers in the winery tasting room (NY Agricultural Statistics Service 1998). Wine industry leaders in NY, who have led a surge in attention towards quality the past 10 years, are questioning why their products are not broadly accepted in their closest urban market.

Market impediments for premium NY wines could be underscored by the long-standing association of NY with high-volume jug wines made using native and French-hybrid grapes. Less than five percent of NY vineyard acreage is devoted to the noble *Vitis vinifera* plantings, even though these ultra premium wines are the fastest growing segment of the state's agricultural economy (NY Agricultural Statistics Service 1998). Price is another factor, with lingering doubts by consumers that local wines can justify the same prices as imports. Some industry leaders believe there are ways to overcome past reputation, both individually and cooperatively, including better supply and distribution, stronger regional identity, and greater emphasis on quality production methods.

The metropolitan NYC area is the second biggest wine market in the U.S. after Los Angeles and is number one in imported wines, consuming 30 percent of America's total (Wine Market Council 2000). This is both a blessing and a curse for small independent NY wineries, whose brands are legitimized when served in taste-making upscale NYC restaurants. Yet competition for the same group of top accounts in NYC is fierce, particularly at the ultra premium price points where the wine industry is replete with product differentiation. Consider that in 2001 there were 900 wineries in the state of California alone producing a combined 5,300 distinct wine labels, including over 1,000 Cabernet Sauvignons, 800 Chardonnays, and 600 Merlots (Moran 2001). Wines from lesser known locales that offer value and innovation are being sought out (Walker 2002), but attentiveness to meeting the needs of restaurants is critical for continued success (Lockshin 1999).

Some grape growing appellations have become synonymous with excellence in particular varietals. For example, Oregon has a niche with Pinot Noir that its two neighbors, Washington and California, cannot claim. New Zealand has distinguished itself with Sauvignon Blanc, and Chile has increasingly become associated with high quality Malbec. These connections between place and grape are common, and are generally believed to confer some degree of regional identity. However, the extent to which regional grape associations enable greater success in the restaurant market has not been systematically tested.

General end-use consumers make wine purchase decisions based on layered cognitive brand associations which act as extrinsic cues for what is inside the bottle, for example region of origin, grape, label design, and price (Quester and Smart 1998). Since consumers have varying levels of product involvement, they have been observed placing higher importance on extrinsic collective quality indicators – the abstraction of a wine's subjective or perceived quality – rather than on personal or quantifiable appraisals of specific product attributes (Atkinson 1999; Combris, Lecocq and Visser 1997; Dodds and Monroe 1985; Holbrook and Corfman 1985; Lockshin and Rhodus 1993; Monroe and Krishnan 1985; Wade 1999; Zeithaml 1988).

In certain constrained shopping situations where the consumer has not tasted a wine and has no information on the history of the winery label, the reputation of a well-established growing region becomes an important part of the decision and can reduce point-of-purchase anxiety, even if it means paying more money than a similar bottle from a newly emerging wine region (Brook-Carter 2001; Greatorex and Mitchell 1988; Landon and Smith 1997; Schamel and Anderson 2001; Tustin and Lockshin 2001). However, purchase decisions by restaurateurs are not as readily understood, nor is it safe to assume behavioral similarities with end-use consumers. Sommeliers experience wine differently, using intrinsic cues such as flavor, aroma, and color to guide buying decisions, and are driven by different economic motivations.

This study employs quantitative modeling techniques to assess the relative influence of various product attributes on the purchasing decisions of sommeliers in upscale NYC restaurants. The goals are to understand the likelihood for NYC restaurateurs to adopt locally grown wines, and to provide management recommendations to NY wine industry stakeholders. We continue now with a description of data collected and survey methodology. The conceptual modeling framework follows, along with the empirical results. We close with some summary conclusions, implications, and directions for future research.

II. Data

Exploratory interviews were first conducted with NY winery stakeholders in May of 2001 to gather opinions about the NYC marketplace and frame this study within a practical management context. Once study parameters were identified, a survey was developed using the Tailored Design Method for maximum effectiveness (Aaker, Kumar and Day 2001; Dillman 2000).

A. *Survey Development*

The survey targeted upscale restaurant decision makers regarding their restaurant wine list selections. The survey consisted of questions related to respondent demographics, perception of the NY wine industry, and scaled preferences for various wine styles, regions of origin, grapes, prices, and other product attributes. Subjects were asked to indicate their level of agreement with a range of attitudinal statements about NY. Constructs such as satisfaction, reputation, and prestige were measured from several different perspectives by asking multiple closely related questions.

A five-point Likert Scale was used for most questions to present stricter opinion boundaries, give a more accurate determination of means across a wide range of individuals, and allow sets of attributes to be combined into composite scores (Aaker, Kumar and Day 2001). Sommeliers were also asked to submit a copy of their restaurant's wine list along with the completed questionnaire. The order and wording of questions was pilot tested with winery stakeholders, faculty and graduate students at Cornell University, and NYC sommeliers who were not survey participants. Participation was voluntary, and anonymity and confidentiality were maintained throughout the process.[1]

B. *Survey Response*

The respondent pool was limited to CEOs, owners, chefs, sommeliers, wine directors, and general managers of fine dining restaurants in the five boroughs of NYC. A judgment sample of nearly 300 NYC restaurants was compiled using recommendations from the NY Wine & Grape Foundation, NY Restaurant Association, International Wine Center, *Time Out New York*, the *Zagat* guide, *Bon Appetit*, *Food & Wine*, *Saveur*, *Wine Advocate*, *Wine Enthusiast*, and *Wine Spectator*.

Shortly before the surveys were mailed out, the September 11th, 2001 terrorist attacks in lower Manhattan destroyed several restaurants in the sample and shut down dozens more. The survey went ahead a month later with a remaining sample list of 215 restaurants, 93 of which, it

[1] A copy of the full survey instrument is available from the corresponding author upon request.

was later discovered, did not receive the questionnaire because it was held up in a post-9/11 anthrax free postal sorting facility. In the end 122 restaurants received a questionnaire and 56 sent it back with complete information.

The 56 NYC restaurants had gross annual sales between $500,000 and $20,000,000, with a median of $7,500,000. On average, nearly 19 percent of gross sales could be attributable to wine sales. Wine sales were highest in December, followed by November and October. Types and styles of cuisine ranged widely among respondents, although 39 percent identified themselves as either American or Contemporary. French restaurants made up approximately 20 percent of the sample, followed by 11 percent Italian, 7 percent seafood, and the remainder (23 percent) divided up among Steakhouses, Mediterranean, Indian, eclectic, and health-conscious eateries.

Dinner entrée prices ranged from $6.95 to $150.00, with the average low entrée price at $23.21 and an average high entrée price of $39.46. The restaurant professionals who filled out the surveys included 48 percent wine or beverage managers, 24 percent owners/CEOs/managing partners, 22 percent general managers, and about 6 percent chefs.

The wine lists of responding restaurants featured a cumulative total of 6,719 wines from around the world, or approximately 120 wines per restaurant. The average price across all wines was $86.62 per 750mL bottle; the average dessert wine was $140.71, sparkling $111.46, red $95.79, white $57.88, and rosé $28.85. At the time these wine lists were collected in 2001, restaurants had not yet adjusted their offerings to reflect changes in post-9/11 consumer spending for high-end wines (Walker 2002). Sixty percent of wine list selections were imported, and of those imported wines nearly 58 percent were French, 28 percent Italian, and the remaining 14 percent divided among Spain, Australia, and the rest of the world. Figures 1 and 2 illustrate that in this sample both red and white NY wines are significantly less expensive than both foreign and west coast domestic wines served in the same restaurants.

III. Empirical Modeling

Two analytical approaches were used in evaluation of the survey results. For all types of respondents, Factor Anaylsis (FA) was used to better understand and interpret responses on the importance of various attributes in wine purchasing decisions. In addition, for the sommelier data, an ordered logit model was estimated to more fully understand the factors attributing to the number of NY wines on their respective wine lists.

A. *Factor Analysis*

As part of the survey, respondents were asked to assess 23 separate attributes related to their wine purchasing decisions (detailed below). FA was used to examine the broad underlying patterns within those 23 variables, analyze the level of interrelationships among them, and statistically derive a more parsimonious set of factors that still maximizes the information contained in the original data. In this way, the relatively large number of observed variables (23) can be reduced into a smaller set of unobserved (latent) uncorrelated variables called factors, to facilitate a better interpretation of the data.

Consider a set of k observed variables that we would like to reduce into a more parsimonious set of underlying factors m. The k observed variables (y_i) can be expressed as a weighted composite of a set of latent factors (F_m) such that:

$$y_i = \lambda_{i1}F_1 + \lambda_{i2}F_2 + ... + \lambda_{im}F_m + e_i \;, \; i = 1, 2, \ldots, k, \tag{1}$$

where λ_{im} is the m^{th} factor score, or factor loading, on variable i. Given the assumption that the residuals are uncorrelated across observed variables, the correlations among the observed variables are accounted for by the factors; i.e., any correlation between a pair of observed variables can be explained in terms of their relationships with the latent factors (Pett et al. 2003). Each original variable is standardized to have a mean zero and unit variance to eliminate the influence of scale effects. The residual term, e_i, is therefore assumed with zero mean, and variance k, uncorrelated across i and factors F_m.

The key to interpreting what the factors measure is related to the factor loadings; i.e., for each factor F_m, one evaluates which variables load (correlate) the highest on that factor and low on the other factors. In evaluating the high loading variables, one determines what these variables have in common.

B. *Logistical Regression*

Sommelier response data were analyzed to understand the factors that lead to increased listings of NY wines on respondent wine lists. For our purposes, we categorize the number of wines (*NYWINE*) on respondent wine lists into three categories: (1) non-users with zero NY wines on their wine list; (2) light users with between one and four NY wines; and (3) medium/heavy users with five or more NY wines. The three categories of the *NYWINE* variable were based on absolute number of NY wines on a list, not the proportion of the total. For example, a restaurant with 16 NY wines would be considered a Medium/Heavy User whether the total list had 20 wines or 200. We analyze the factors affecting wine list placements using a cumulative logit regression model (Allison 1999), where the probability effects of each independent variable on the categorical placement can be determined.

Assume that the decision maker (n) is a restaurant sommelier in NYC, and he or she determines the set of available alternatives for the restaurant's wine list. The sommelier also evaluates the attractiveness (utility) of each alternative wine (i) and chooses the wine or combination of wines which maximize the restaurant's profit and patrons' enjoyment. The attractiveness of wine *i* is denoted as V_{in} , which is assumed to depend on a set of attributes of the wine (X_i) and the characteristics of the decision maker or firm (Z_n). V_{in} is expressed as:

$$V_{in} = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_K X_{Ki} + \delta_{i1} Z_{1n} + \delta_{i2} Z_{2n} + \ldots + \delta_{iM} Z_{Mn} \tag{2}$$

Now, let (p_{ij}) equal the probability that restaurateur *i* fits into ordered category *j* of the dependent variable, $j=1, \ldots, J,$ where J=3 in our data. The cumulative probabilities (F_{ij}) predict the probability that restaurateur *i* is in the j^{th} category or higher, or:

$$F_{ij} = \sum_{m=j}^{J} p_{im} \tag{3}$$

This model can then be specified as a set of (J-1) equations:

$$\log\left\{\frac{F_{ij}}{1-F_{ij}}\right\} = \alpha_j + \beta x_i \quad j = 1, \ldots, J-1 \tag{4}$$

The model is estimated using Proc Logistic in SAS (Allison 1999). It was hypothesized that variation in the level of NY wine use among NYC restaurants would be a function of the attributes described in Table 1, which were summarized from the questionnaire responses and wine lists. In the case of missing data, values were imputed by computing sample averages across all restaurants for which the data existed (Kovar and Whitridge 1995). The list of potential model variables can be classified under two major headings: (1) attributes of the restaurant; and (2) attributes of the wine list selection.

Explanatory variables that exhibited high degrees of correlation with others were eliminated prior to estimation. For the Cuisine variable (each restaurant was classified into only one cuisine style), American (*AMER*), contemporary (*CONTEMP*), and eclectic (*ECLEC*) restaurants were subjectively defined in *Zagat* and not reliably distinct enough for inclusion. There were not enough Steakhouse restaurants (*STEAK*) for its own category, and French restaurants (*FRENCH*) typically carry predominantly French wines and are not likely to be local wine adopters. Italian (*ITALIAN*) and Seafood (*SEA*) restaurants were the cuisine styles kept in the model because both types of restaurants have specifically characterized wine selections to match their distinctive foods, thus capturing much of the information about wine-and-food pairing constructs. All other cuisine styles were subsumed within the other category (*OTHER*) as the base category for comparison.

Prices for dinner entrées could be a proxy for the sophistication of restaurant clientele, yet the two variables for low (*LOWENTREE*) and high (*HIGHENTREE*) priced entrées were highly correlated and not included in the model specification. Instead, a new variable representing the median entrée price (*MIDENTREE*) was used. Total gross sales volume (*SALES*) and wine's contribution to total gross sales (*WINE_PERC*) were also included as important restaurant characteristics.

The proportion of wines from Oregon and Washington (*PORWA*) was eliminated because similar information was captured more completely by the proportion of domestic wines variable (*PDOMESTIC*). The proportions of wines from France (*PFRANCE*) and Italy (*PITALY*) were eliminated for the same reason that California was not included on the initial list of variables – wines from these regions are so ubiquitous in the NYC market that the low variability in wine list presence would be insufficient to elicit any significant statistical response. The proportions of wines from Spain (*PSPAIN*) and Germany (*PGRMNY*) were kept in the model because they have a small market presence, similar to NY wine, and there was considerable variability in the presence of wines from these regions among the restaurants in the sample. The proportion of wines from Australia (*PAUSTRL*) also had little variation in the data and was eliminated for statistical purposes.

The proportion of red wine (*PRED*), Riesling (*PRIESLING*), and Cabernet Franc (*PCBFRANC*) were hypothesized to be significant factors for local wines based on the amount of acreage planted to these varietals in NY. The average white wine price (*AVGWHITEP*) was eliminated as it was highly correlated with the average red wine price (*AVGREDP*), so only one of the price variables was necessary.

IV. Results

As mentioned above, respondents were asked to rate the importance of 23 attributes to their overall wine purchasing decisions on a five point Likert Scale. The attributes are listed in Table 2 and ranked by their mean response scores. FA was used to reduce these 23 attributes to more general, evaluative constructs.[2] Three subjective statistical criteria were used to help select the appropriate number of factors. First, the minimum proportion of variance explained by factors was set at 0.60. Second, given that the original variables are standardized and thus have unit variances, a useful factor must have an eigenvalue greater than one. Third, the number of factors selected should demonstrate diminishing marginal returns with respect to their eigenvalues as the number of factors increases. Finally, interpretability of the factors extracted must be conceptually meaningful to facilitate broader interpretation.

A. *Factor Analysis Results*

The initial FA solution is displayed in Table 3. As the results show, initial eigenvalues are greater than one for up to eight factors, with diminishing marginal returns thereafter. In reviewing the change in eigenvalues as the number of factors increased, the most obvious change in marginal returns occurs at five factors, but those five factors explain less than 53 percent of total variation. Eight factors satisfy most of the criteria, however this did not result in a

[2] Factor Analysis was conducted using the data reduction/factor analysis function in SPSS.

conceptually meaningful collection of factors, and the eighth eigenvalue is only slightly above one. Given this, the final factor number selected was seven, and satisfies all the criteria.

To understand which variables under consideration are correlated with each other, and hence comprise the factors, a component (factor) score correlation matrix was constructed. Each of the 23 variables under consideration was assigned a correlation coefficient, or factor loading, with each of the seven defined factors. The factor coefficient matrix was clarified by constructing a rotated correlation matrix to group together attributes that have the highest correlation with each other across the sample (*r-value* closest to -1 or +1). Each variable-to-factor interaction cell with the highest degree of correlation for that particular variable is highlighted in Table 4, and arranged in descending order.[3]

To test for confidence in our final results the same FA procedure described above was repeated six separate times for varying numbers of factors, and all tests were duplicated a second time using a randomly selected split of the data. Each of the 12 times FA was conducted, similar groupings of correlated attributes arose, lending statistical validity to the results.

FA does not rank the factors in Table 4 based on their importance. Rather, factors are arranged in descending order of magnitude in how much they explain the total observed variance within the data set. Using data from the original survey, the variable means that comprise each factor were combined to yield an overall factor mean, or a mean response rating. The underlying factors identified are valid and meaningful and the calculated factor means are used for rank-ordering based on the factors' overall importance to survey respondents.

The most important factor influencing wine purchase decisions from this sample of upscale NYC restaurants was the wine's "Quality for Price Point." This factor (factor mean =

[3] The SPSS principal component analysis function was used with varimax (orthogonal) rotation and Kaiser normalization.

4.07) represented attributes associated with a wine's value or profit margin potential (*VALU*) and price category (*PRIC*). Following this, "Product Diversity" was ranked next (3.65) and included attributes associated with variety in tastes (*VART*), prices (*VARP*), and regions (*VARR*), and dissatisfaction with the current wine selection (*DISS*). A wine's "Collective Reputation" closely followed (3.37) and represented the reputation or prestige of a wine's region (*REPR*) or grape varietal (*REPG*). Ranked fourth (3.31) was the factor of "Tasting is Believing" and reflected a wine's word-of-mouth familiarity (*WOMT*), tasting/personal appraisal (*TAST*), contact with a winery representative (*CONT*), and the newness or innovativeness of the wine (*INNO*).

Factors of relatively less importance included "Personal Relationships" (3.08) that related to personal relationships with wholesalers/distributors (*PRSD*) or the winery/winemaker (*PRSW*), as well as wholesaler/distributor wine recommendations (*RECM*). The amount of "Consumer Exposure" was also ranked lower (2.84), reflecting attributes associated with a winery's (*MEDW*) or region's (MEDR) media exposure or competition medals, *Wine Spectator* rankings (*SPEC*), a winery's brand reputation or prestige (REPB), and restaurant customer comments or requests (*CUST*). Finally, "Promotions" were found to be the least important factor (2.47) affecting purchase decisions, and represents wholesaler/distributor sales or discounts (*SALE*), the existence of standing orders with a wholesaler/distributor (*ORDR*), or the availability of other promotions or displays from the distributor.

B. *Logit Results*

The cumulative logit model was estimated using maximum likelihood; to avoid singularity, the non-use NY wine category was excluded.[4] Most explanatory variables are of the expected sign and are significant at the 10% significance level. To understand which combination of variables would be the best fit for this data, we adopt general-to-specific

[4] The model was estimated using the PROC LOGISTIC function in SAS, ver. 9.0.

modeling philosophy by sequentially reducing the number of originally included, but insignificant, variables (Tomek and Kaiser 1999). For ease of exposition, we include only the final selected model in Table 5. Given differences in the number of explanatory variables, the validity of the restricted model forms were tested using the Akaike Information Criterion (AIC) and Schwartz Criterion (SC) tests.[5] The final model parameter estimates are all significant at the 10% significance level or less.

While it is difficult to interpret the magnitudes of the coefficients across variables that are measured in different units, evaluating the signs of these coefficients is useful. Larger restaurants, restaurants for which wine sales represent a high proportion of total sales, restaurants with relatively expensive entrée prices, and restaurants that include a high proportion of Spanish wines are all associated with lower adoption of local NY wines. Similarly, the presence of NY wines at NYC restaurants is positively correlated with certain features of a restaurant's wine list: higher red wine prices; a high proportion of domestic wine; a high proportion of German wine; and high proportion of Riesling and Cabernet Franc.

C. *Adjusted Odds Ratio Results*

Further insight from the model comes when interpreting the adjusted odds ratio for each variable (Table 6). Each odds ratio point estimate can be interpreted as the impact of a one-unit increase in that variable on a restaurant's odds of moving into a higher *NYWINE* category. The odds ratio estimates are different from the maximum likelihood estimates in Table 5 in that an

[5] The Akaike Information Criterion (AIC) is expressed as AIC = $-2 \text{ Log L} + 2(k + s)$, where k is the number of ordered values for the response, s is the number of explanatory variables, and LogL is the log likelihood model estimate. Similarly, the Schwartz Criterion (SC) is expressed as SC = $-2 \text{ Log L} + (k + s)\log(\text{N})$, where N is the total number of observations.

odds ratio value above one represents a positive impact on the chances of the restaurant being in a higher category of the dependent variable, *NYWINE*. An odds ratio value between zero and one indicates that variable has a negative impact on a restaurant's chances of moving into a higher *NYWINE* category. Arithmetically, the odds ratio point estimate for a variable is obtained by taking the exponent of the corresponding coefficient estimate.

The adjusted odds ratio for the percentage of wines made from Cabernet Franc is 5.09, meaning that a one percent increase in the number of Cabernet Franc wines on a restaurant's wine list increases the odds of a restaurant being in a higher category of *NYWINE* adoption by over five times. However, the range in the 95% confidence interval is large and includes one, implying, statistically, the percentage increase in not significantly different from zero. However, an increase in the percent of Riesling wines on a restaurants wine list raises the odds of a restaurant being in a higher category of *NYWINE* adoption by over three-and-three-quarter times, a value that is statistically different from zero. It is clear that the proportion of Cabernet Franc and Riesling – varietal strengths of NY – on a NYC wine list has the largest effect on the odds of that restaurant being, categorically, a *NYWINE* heavy user.

For *PGRMNY*, the adjusted odds ratio of 2.11 implies that a one-unit increase in the proportion of German wines in the restaurant's imported wine selection more than doubles the odds of the restaurant being in a higher *NYWINE* category. Germany's wine regions have many well-documented similarities to the climatic and soil conditions found in NY's Finger Lakes, an area also known for Riesling. The parameter estimates represent independent contributions, i.e. net of all other variables including *PRIESLING* and its relatively high p-value is likely due to the correlation with *PRIESLING*.

An increase in the average price of red wines on a wine list by one dollar raises the odds of being in a higher *NYWINE* category by nearly 20 percent (1.18). In context, local wines in NYC can be chosen as wine list-broadening or token selections restaurateurs may use to expand the range of price points they offer. If there is a higher price generally for all the red wines on the list, perhaps the lower priced red NY wines are used to balance the list. Similarly, an increase in the proportion of domestic wines by one percentage point leads to an increase in the odds of being in a higher *NYWINE* category by 17 percent (1.17).

The adjusted odds ratio for *WINE_PERC* is 0.73, meaning an increase in the proportion of gross sales that is attributed to wine (versus food) by one percent decreases the odds of falling into a higher *NYWINE* category by nearly 30 percent. This may mean that wine bars and bistros, which rely more heavily on wine sales as related to gross income, are less likely to adopt NY wines than restaurants that may have the same amount of wine selections on their list but rely more heavily on food sales. In addition, a one dollar increase in the *MIDENTREE* price lowers the odds of being in a higher category of *NYWINE* adoption by almost 40 percent (0.64). That is, restaurants with more expensive entrées carry fewer local wines.

An increase in the proportion of Spanish wines on a restaurant's wine list (*PSPAIN*) lowers the odds of being in a higher *NYWINE* category by almost two-thirds (0.34). Spanish wines in this study were about 75 percent red, and often comprised of varietals not grown in NY, but it is unclear why Spanish wines would have a negative effect on *NYWINE* and, for example, Italian wines do not. Finally, restaurants with a higher gross sales volume have substantially lower odds of being in a higher *NYWINE* category (0.33). The implication is that larger-scale, top-grossing restaurants generally carry fewer local wines.

V. Conclusions

Several conclusions can be drawn from this research that carry important management implications for NY wine industry stakeholders. In the FA approach, regional reputation was combined with grape varietal reputation in the same construct, and when those attributes were separated for the ordinal logit modeling their importance to local wine adoption was still strong. In the descriptive statistics, respondents rated regional reputation more highly than individual winery brand name, but they only valued reputation indicators to the extent that they were reliable predictors of quality. The absence of strong NY wine sales in NYC is not necessarily due to a predominantly negative image of the product quality, nor to high prices. Instead, low sales in NYC can likely be attributed to the lack of any specific image at all. The regional brand identity of NY wine is not strongly defined because it is not explicitly communicated, and therefore is not universally understood by those who set trends in the culinary industry. A coalescence of marketing goals and principles among NY winery stakeholders could make a difference in this regard.

Among surveyed upscale restaurants in NYC, there is an indication that the type of cuisine and food-pairing preferences do not influence propensity of restaurants to adopt locally grown NY wines. Likewise, a restaurant's desire to offer a large wine selection or a broad range of wine styles does not affect its propensity to adopt local wines. The second-most important construct isolated in the Factor Analysis, called "Product Diversity," when analyzed using the ordinal logit model, was deemed largely insignificant in its overall contribution to the odds of greater local wine adoption. All the remaining attributes of the restaurant which fit under the broad "Price Point/Size" heading decrease the odds of local wine adoption in NYC. That is, restaurants with higher gross sales volume, higher entrée prices, and a larger proportional dependence on wine for their income are less likely to sell local wines. A higher proportion of

Riesling, Cabernet Franc, and domestic wines on a wine list indicate better odds for that restaurant to adopt local wines. The most important factor in determining the willingness of NYC restaurants to adopt NY wine is the perceived collective reputation of the region and its comparative advantage in producing world-class wines in a small group of grape varietals, for example Riesling and Cabernet Franc.

The communication of a regionally focused local wine program in the urban marketplace may increase sales of NY wine outside the winery tasting rooms. Restaurateurs' sensitivity to the local agricultural movement can be powerful, but is limited by the extent to which a reputation of local wines exists, either positive or negative. Perceptions of NY wines shift downward more easily than upward, and the industry is battling years of historical association with non-premium wines. The challenges of competing in a marketplace as globally diverse and fiercely competitive as NYC are great for the small, independently owned farm wineries in NY. The wine regions of NY need to understand the specific nature of NYC restaurateurs' propensity to adopt local wines, which does not appear to be influenced by food pairing choices or offering a wide range of tastes for customers. However, these challenges can be overcome by emphasizing strong regional identities in the state's winegrowing regions, and showcasing the competitive strengths local wines have to offer for particular grape varietals, such as Riesling. To put it succinctly, it is simply not enough to base a marketing platform on being local unless it is accompanied by strong associations with excellence and focused production priorities.

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Table 1

Description of attributes affecting variation in the *NYWINE* variable

Restaurant Characteristics

Variable	Description
SALES	Annual gross sales volume for that location ($)
WINE_PERC	Proportion of total gross sales attributed to wine (%)
CUISINE	Variable describing the type of cuisine at the restaurant: AMER = 1 if CUISINE = "American"; else = 0 CONTEMP = 1if CUISINE = "Contemporary"; else = 0 ECLEC = 1 if CUISINE = "Eclectic"; else = 0 FRENCH = 1 if CUISINE = "French"; else = 0 ITALIAN = 1 if CUISINE = "Italian"; else = 0 SEA = 1 if CUISINE = "Seafood"; else = 0 STEAK = 1 if CUISINE = "Steakhouse"; else = 0 OTHER = 1 if CUISINE = "Other"; else = 0
LOWENTREE	Price of the lowest priced dinner entrée on the menu ($)
HIGHENTREE	Price of the highest priced dinner entrée on the menu ($)

Wine list characteristics

Variable	Description
NUMWINE	Total number of all wines on the wine list
PDOMESTIC	Proportion of total wines which are made in the USA (%)
PORWA	Proportion of domestic wines from Oregon & Washington (%)
PFRANCE	Proportion of imported wines that are from France (%)
PITALY	Proportion of imported wines that are from Italy (%)
PAUSTRL	Proportion of imported wines that are from Australia (%)
PSPAIN	Proportion of imported wines that are from Spain (%)
PGRMNY	Proportion of imported wines that are from Germany (%)
PRED	Proportion of total wine list that is red wine (%)
PRIESLING	Proportion of all styles of wine made from white grape varietals which were made from Riesling (%)
PCBFRANC	Proportion of all styles of wine made from red grape varietals which were made from Cabernet Franc (%)
AVGREDP	Average price of all red wines ($)
AVGWHITEP	Average price of all white wines ($)

Table 2

Variables influencing wine purchase decisions of NYC restaurateurs

Variable	Attribute Description	Mean	95% Conf. Interval
TAST	Tastings/Personal appraisal	4.66	± 0.15
VALU	Value/profit margin potential	4.14	± 0.24
VARR	Desire to offer wines from a variety of different regions	4.13	± 0.25
PRIC	Price category	3.99	± 0.21
VARP	Desire to offer a broader range of prices	3.90	± 0.28
VART	Desire to offer a greater variety of wine qualities and tastes	3.89	± 0.26
CUST	Customer comments/demand/requests	3.70	± 0.27
PRSD	Personal relationship with wholesaler/distributor	3.47	± 0.31
PRSW	Personal relationship with winery/winemaker	3.40	± 0.28
REPR	Wine region's reputation/prestige	3.40	± 0.25
REPG	Grape "varietal" reputation/prestige	3.33	± 0.27
REPB	Winery or name brand reputation/prestige	3.44	± 0.29
INNO	Product is "new" or innovative	3.06	± 0.29
WOMT	Word-of-mouth	3.00	± 0.27
SALE	Discounts, sales or coupons offered by wholesaler/distributor	2.91	± 0.29
DISS	Generally dissatisfied with current wine list and want a change	2.68	± 0.35
PROM	Wine tastings, P-O-P materials or promotions by distributor	2.46	± 0.33
CONT	Contact from winery sales/marketing representative	2.52	± 0.27
SPEC	Wine Spectator rankings/scores	2.42	± 0.27
ORDR	Standing order with wholesaler/distributor	2.04	± 0.32
MEDW	Media articles or competition medals for a particular winery	2.41	± 0.24
RECM	Wholesaler/distributor recommendations	2.37	± 0.26
MEDR	Media articles or competition medals for a wine region	2.25	± 0.23

Table 3

Initial Factor Analysis solution, computed eigenvalues, and total variance explained

Factor	Original Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumul-ative %	Total	% of Variance	Cumul-ative %	Total	% of Variance	Cumul-ative %
1	4.67	20.30	20.30	4.67	20.30	20.30	3.27	14.21	14.21
2	2.82	12.26	32.57	2.82	12.26	32.57	2.59	11.25	25.46
3	2.51	10.90	43.47	2.51	10.90	43.47	2.32	10.09	35.55
4	2.14	9.32	52.79	2.14	9.32	52.79	1.97	8.56	44.10
5	1.35	5.87	58.66	1.35	5.87	58.66	1.95	8.47	52.58
6	1.19	5.19	63.85	1.19	5.19	63.85	1.91	8.31	60.89
7	1.14	4.955	68.79	1.14	4.95	68.79	1.82	7.91	68.79
8	1.02	4.46	73.25						
9	0.86	3.73	76.98						
10	0.73	3.19	80.18						
11	0.73	3.16	83.34						
12	0.65	2.86	86.19						
13	0.55	2.40	88.59						
14	0.45	1.96	90.55						
15	0.42	1.82	92.37						
16	0.38	1.65	94.02						
17	0.28	1.23	95.25						
18	0.28	1.19	96.45						
19	0.22	0.96	97.41						
20	0.19	0.83	98.24						
21	0.18	0.79	99.03						
22	0.12	0.50	99.53						
23	0.11	0.47	100.00						

Table 4
Rotated component matrix with variable-factor correlations

	Factor						
Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**
MEDW	0.88	< |±0.10|	< |±0.10|	0.20	< |±0.10|	< |±0.10|	< |±0.10|
MEDR	0.83	< |±0.10|	< |±0.10|	< |±0.10|	0.22	< |±0.10|	< |±0.10|
SPEC	0.80	< |±0.10|	0.20	0.12	< |±0.10|	0.12	< |±0.10|
REPB	0.58	< |±0.10|	-0.28	0.23	-0.31	0.44	< |±0.10|
CUST	0.52	0.30	< |±0.10|	-0.11	0.18	0.34	-0.11
VART	< |±0.10|	0.77	0.13	< |±0.10|	< |±0.10|	-0.15	< |±0.10|
VARP	< |±0.10|	0.76	-0.20	< |±0.10|	-0.11	0.18	0.15
VARR	-0.35	0.46	0.45	< |±0.10|	-0.19	0.16	0.15
DISS	0.23	0.38	< |±0.10|	0.35	0.16	-0.34	0.36
WOMT	0.19	-0.21	0.74	0.14	0.16	.017	< |±0.10|
TAST	< |±0.10|	< |±0.10|	0.72	-0.36	-0.16	< |±0.10|	< |±0.10|
CONT	< |±0.10|	0.34	0.61	0.18	0.15	0.32	< |±0.10|
INNO	0.14	0.46	0.50	-0.14	-0.25	0.13	< |±0.10|
SALE	< |±0.10|	< |±0.10|	0.13	0.80	< |±0.10|	0.20	< |±0.10|
ORDR	0.13	< |±0.10|	-0.18	0.73	0.18	< |±0.10|	0.13
PROM	0.31	0.51	< |±0.10|	0.51	< |±0.10|	< |±0.10|	-0.14
PRSD	< |±0.10|	-0.12	< |±0.10|	0.14	0.83	0.22	0.22
RECM	0.21	-0.16	< |±0.10|	0.17	0.66	-0.24	0.29
PRSW	< |±0.10|	0.34	0.18	-0.13	0.54	0.19	-0.28
REPR	0.31	0.13	0.18	< |±0.10|	< |±0.10|	0.76	0.11
REPG	0.23	-0.20	0.33	< |±0.10|	0.18	0.65	.21
VALU	< |±0.10|	< |±0.10|	< |±0.10|	< |±0.10|	0.26	0.16	0.82
PRIC	< |±0.10|	0.32	< |±0.10|	< |±0.10|	< |±0.10|	< |±0.10|	0.79

Table 5

Cumulative logit maximum likelihood model results for *NYWINE* dependent variable

	Full Model			Final Model		
Variable	Estimate	Std Error	P-value	Estimate	Std Error	P-value
Intercept 3	-25.81	14.75	0.08	-12.07	4.80	0.01
Intercept 2	-3.34	8.33	0.69	1.55	2.45	0.53
ITALIAN	-5.81	5.90	0.32			
SEA	2.69	3.89	0.49			
SALES	-2.20	1.17	0.06	-1.10	0.57	0.05
NUMWINE	< -0.01	< 0.01	0.64			
WINE_PERC	-0.63	0.36	0.08	-0.31	0.16	0.05
MIDENTREE	-0.87	0.47	0.07	-0.44	0.19	0.02
AVGREDP	0.33	0.18	0.06	0.17	0.08	0.03
PSPAIN	-2.58	1.53	0.09	-1.08	0.55	0.05
PGRMNY	1.31	0.76	0.08	0.75	0.46	0.10
PDOMESTIC	0.18	0.11	0.11	0.16	0.07	0.02
PRED	0.22	0.17	0.19			
PRIESLING	2.57	1.32	0.05	1.33	0.57	0.02
PCBFRANC	3.67	2.32	0.11	1.62	0.93	0.08
AIC	46.96			42.22		
SC	72.29			60.80		
-2 log l	16.96			20.22		

Table 6

Adjusted odds ratio estimates for *NYWINE* dependent variable

Effect	Point Estimate	95% Wald Confidence Limits	
SALES	0.334	0.110	1.012
WINE_PERC	0.732	0.537	0.998
MIDENTREE	0.639	0.439	0.929
AVGREDP	1.183	1.021	1.372
PSPAIN	0.339	0.115	0.995
PGRMNY	2.110	0.859	5.186
PDOMESTIC	1.168	1.025	1.330
PRIESLING	3.769	1.243	11.430
PCBFRANC	5.090	0.825	31.387

Figure 1

Average red and white prices (per 750 mL bottle) for NY wine versus other domestic states

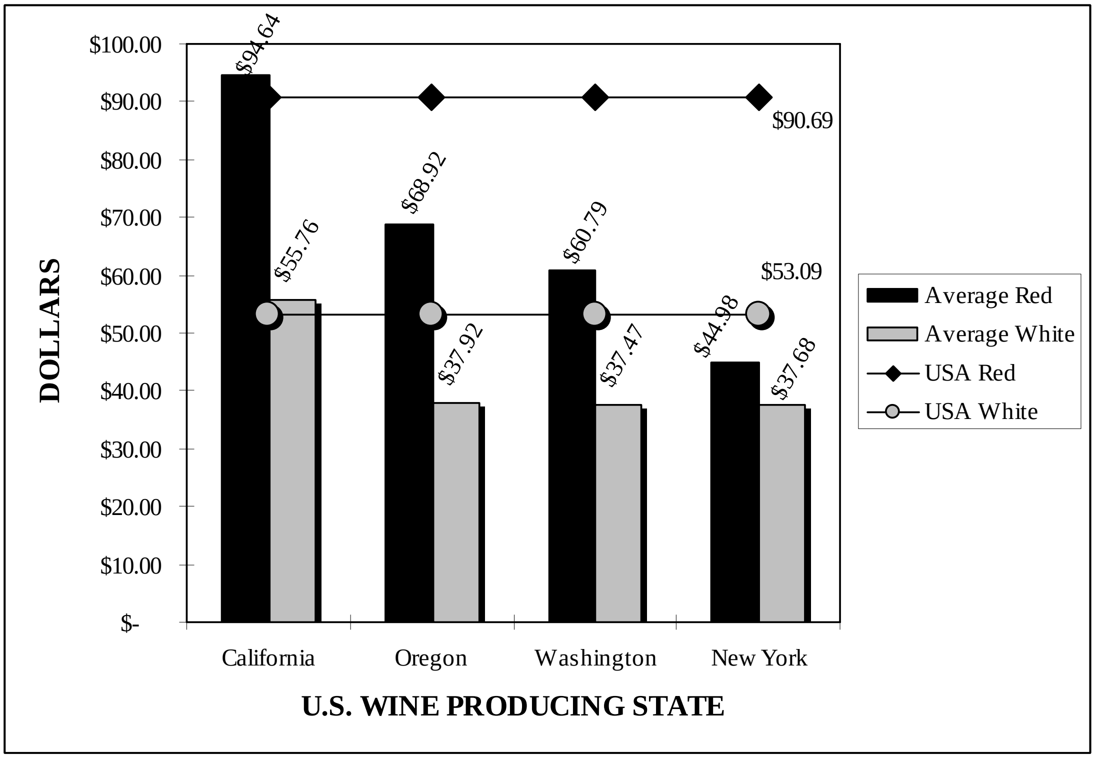

Figure 2

Average red and white prices (per 750 mL bottle) for NY wine versus imports