

Wine Choice Before The New Year: A Discriminant Analysis Approach

Arif Orçun Sakarya, (Email: sakarya@cankaya.edu.tr), Çankaya University, Turkey,

ABSTRACT

Turkey is a country where grape cultivation is widely made and so wine production potential is strong. Accordingly, especially in recent years, the number and the consumption of both local and imported wine varieties are increasing in the market. As a result, wine consumption patterns are also shifting. In this step, the selection between a local or an imported wine variety is due to some reasons where price and aging has been selected for the study. This study investigates the discriminating effects of the selected variables in a specific time period which also includes the New Year evening.

INTRODUCTION

*A*s a result of favorable climatic and territorial conditions for grape cultivation, Turkey has been a wine producing country since ancient eras; where, wine has been one of the favorite drinks since then. In this framework, existence of high quality grape varieties in some of the regions had a contributing effect on wine production. In Turkey, wine grape cultivation has been made mainly in 9 regions. Some of the grapes cultivated in Turkey are foreign originated grape varieties and some of them are varieties specific to local Turkish regions.

Production and consumption figures can help a better understanding of the wine market in a country. As the viticulture and grape cultivation schemes are one of the main indicators that reflect the production potential in a country, they can be evaluated as signals showing the general situation of the sector. However, to have a clear idea in mind, per capita consumption should also been taken into account as a measure of wine interest. Cultivation, production and per capita consumption have been given in the third part of the study.

In the light of production and demand, wine consumption depends also on the wine consumer behavior especially when consumers have occasions such as parties and New Year celebrations. In fact, in such occasions the social dimension of consuming wine appears.

Two groups discriminant analysis has been conducted in the fourth part of the study. Two variables have been selected under two groups; first group being Turkish red wine brands and the second one is the imported red wine brands (32 separate brands in each of them). Price and aging has been selected as the discriminating variables between both groups to observe those who cause a shift during the selection process.

Accordingly, main purpose of the paper is to give an idea on wine demand patterns by discriminating variables of selection between Turkish and imported wines in a specific period in time that includes before and right after the New Year.

LITERATURE REVIEW

In various studies; wine industry has been analyzed in multiple dimensions. Marketing of wine was one of them. For example, O'Neill *et al* (2002), questioned the relationship between effects and quality wine sales in the service experience framework. Quinton and March (2003) tracked the evolution of internet marketing of wine in the United Kingdom and focused on whether wine producers currently use the Internet as a strategic marketing tool.

In the consumer side; Dimara and Skuras (2005) emphasized on consumer demand for informative labeling of quality food and drink products as a European Union case study. Orth *et al* (2005) considered dimensions of wine region equity and their impact on consumer preferences.

Several researches concerning wine pricing and marketing relationships have also been conducted. The research of Angulo *et al* (2000) was about the measurement of hedonic prices for Spanish quality red wine. Thode and Maskulka (1998) have focused place-based marketing strategies concerning brand equity and vineyard valuation. Additionally, loyalty to price tiers in purchases of bottled wine has been investigated by Romaniuk and Daves (2005). Horowitz and Lockshin (2002) have questioned the relationship between wine quality ratings and variables such as price range, winery rating, vintage and size of winery and region.

WINE PRODUCTION AND CONSUMPTION IN THE COUNTRY

Grape Quantity And Production Potential

As the grape can be treated as the raw material of the wine; grape production quantity can be assumed as one of the main indicators in the wine production. In Turkey, especially raisins play a very important role in agricultural exports. For that reason, some portion of the grape production potential has been used for raisins and grapes and some of them have been afforded to wine grape production. Total grape areas accounts to 737.000 hectares as of 2004 (FAO, 2005). Wine growing areas have also kept their percentages of 1,8-1,9 % within crop area between 1994-2004 (Wittwer and Rothfield, 2006). As a result, the grape production and cultivated areas may be considered as indicators of a stable wine production pattern.

Wine Production, Per Capita Demand And Consumer Behavior

Between 1992-2002; wine production has been varied between 23,3 and 36,3 Million liters (FAO,2005). The production has followed an increasing trend in general. Approximately 84,37% of the wine produced has been supplied to the internal market (Extracted from FAO, 2005).

Per capita consumption of wine has varied between 0,5-0,8 liters between 1994 and 2004 in the country (Wittwer and Rothfield, 2006). Accordingly, it can be claimed that per capita wine consumption is relatively small when compared to some of the other traditional wine producing countries.

When per capita consumption is taken into account, one of the focal points to be considered may be patterns of consumer behavior. Multiple reasons can be assumed concerning patterns of consumption in consumer behavior of wine. Some examples may give us some insights such as:

- Occasions (Gluckman, 1990): According to researcher, wine consumers demographics can be categorized in an occasional framework. These occasions can be special occasions such as celebrations, dinner parties etc and casual occasions such as meals at home. This categorization also reflects that there is also a social side of wine drinking.
- Preferences and culture: People's preferences can also be an important indicator of the wine consumption in relation with the product features (color, taste etc). In the same framework, another point which can be considered in the same dimension is the matter of wine culture and intention of buying (collection/aging or consumption). In some cases tastes and cultural background may also affect each other.
- Signs of quality: Another important point is the notion of traceability for wines where consumers are looking for signs of quality such as AOC (Appellation d'origine controllé) and other geographical indications.
- Labeling: Labeling can also be considered as an indicator of information in purchasing stage.

In the study; in addition to consumer behavior patterns which have been stated above, price may be considered as an additional factor during purchase. As a result, wine purchasing behavior can be related to "non-price and "price" dynamics which will be investigated in details at the next part.

WINE PURCHASE DYNAMICS AND THE PURCHASE MODEL

Wine is a product which carries both tangible (e.g. color) and intangible (e.g. taste) features. In accordance with this; wine purchase dynamics can be classified as price and non price dynamics briefly.

Regarding price dynamics; one point that may have an increasing or decreasing effect on the unit price of the wine is the “macroeconomic” variable, e.g. custom duties (as in the case of Turkey) and taxes for imported and local brands respectively. Another variable that may affect wine pricing is not different than other products’. These are: producer’s (or importer) pricing strategies, distributor decisions, shelving policies, producers’ and retailers’ profit margins and so on. So the price label on the wine may be assumed as a bundle of everything that has been counted above.

According to consumers, price can also be a quality sign itself due to different reasons. However, quality sign can also be investigated under the framework of “non-price” dynamics. When consumers judge wine prices, they may also have a certain approach accompanied by the perceptions of the wine culture, past experiences and brand loyalty purposes. Out of personal intentions, non-price dynamics can be generalized as product specifications such as alcoholic strength, color, vintage, country of origin etc. and distribution and service purposes such as product access and vineyard service quality.

When wines are purchased, in relation with the maximum aging period, they can be either consumed quickly or kept in caves for collection purposes to be consumed in the future. When the wines are preferred to be kept in caves, one of the decisions to be made can be the choice of aging period. So aging period can be assumed as a non-price variable. In fact, essentials cited above establish the mainstream of the study; one of the goals is to select one price and one non-price variable for the analysis.

Assumptions Of Price

As the custom duty level is same for all imported wine types and brands in Turkey for the time period considered, it is assumed that they may have an equally-weighted effect on the price. Moreover, as the data is collected from a unique retailer, it can also be assumed that the main principles of wine pricing do not change. However, there can also “out of retailer price changes” in relation with the producer firm and distributor strategies which are treated as exogenous effects and ignored in the study.

The Model

Wine Varieties In Sample

To reflect the “ambience effect” (explained below), a group of Turkish and imported red wine varieties (32 of each) have been selected. As quality measurement of a wine is difficult because of the subjective views, grape variety of which wines have been produced is assumed as an indicator. In other words, some of the selected wines have been produced of the same grape varieties where we assume that their quality is at least consistent.

Time Frame And Price Assumptions

Prices have been selected between dates 09.12.2005-05.01.2006. Main reason for that is that drinking occasions may take place especially during New Year celebrations. Accordingly, New Year is assumed as a peak season for the wine demand, where it is possible to clearly understand the price and other demand effects. We may call this as “ambience effect”. Another point is the price level of the sample. The price intervals of the similar wine types are almost the same.

The Variables

As mentioned in the introduction part, there are two variables which are assumed as effective during the analysis. The first one is the price variable quoted as PRICE in the tables and the second one is MAXVAL which shows the aging of the wine. Third variable is a dummy one to make the distinction between Turkish and imported wine brands where 1 is used for Turkish wines and 0 for imported wines. Statistical Package for Social Sciences (SPSS) version 12.0 package is used for the analysis.

The Results

Significance Of The Z Function

When we work with two groups of variables, we should find the variables that provide maximum separation between two groups where these variables are called “the discriminator” variables. For that reason, we have to formulate a function that sets the axis which maximizes the values of the discriminator and which is given below as:

$$Z = -0.994 + 0.168 \text{ PRICE} - 0.506 \text{ MAXVAL} \tag{1}$$

This is in fact our linear discriminant function. Hypothesis for the function is:

$$H_0: \begin{pmatrix} \mu^1_{\text{PRICE}} \\ \mu^1_{\text{MAXVAL}} \end{pmatrix} = \begin{pmatrix} \mu^2_{\text{PRICE}} \\ \mu^2_{\text{MAXVAL}} \end{pmatrix}$$

$$H_1: \begin{pmatrix} \mu^1_{\text{PRICE}} \\ \mu^1_{\text{MAXVAL}} \end{pmatrix} \neq \begin{pmatrix} \mu^2_{\text{PRICE}} \\ \mu^2_{\text{MAXVAL}} \end{pmatrix}$$

The test statistic for testing these multivariate hypotheses is a direct generalization of the univariate Wilks’ Λ statistic computed by the statistical package. To test the significance of the function; we have to compare the Wilks’ value with the value obtained by the approximated as a chi-square statistic using the following information (Sharma, 1996):

$$\chi^2 = -[n-1-(p+G)/2] \ln \Lambda \tag{2}$$

Where p = number of selected variables
G = number of groups

This implies that,

$$\chi^2 = -[64-1-(2+2)/2] \ln (0,763) = 16,49$$

This is in fact the same value (with rounding errors) that is provided in the outputs at the table below;

Table 4.1: Wilks’ Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,763	16,482	2	,000

Table 4.1 also provides the significance of the linear discriminant function which is provided by Wilks’ Λ . Computed value for Λ is 0,763 which can be treated as significant. Accordingly, we can reject the null hypothesis at an alpha level of 0,05. This means that when PRICE and MAXVAL are taken altogether their discriminant scores are significantly different. To confirm the difference between variables we can also look at the F values at the Table 4.2 which can be considered as satisfactory.

Significance Of The Variables

To find the best discriminator variable, we have to compare both variables with respect to each other. To reach that, we have to look for discriminant scores that are significantly different between variables. The results are provided in the Table below;

Table 4.2: Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
PRICE	,859	10,186	1	62	,002
MAXVAL	,904	6,565	1	62	,013

When the Wilks’ Λ column is considered in relation to F values; it can be seen that Λ is smaller for PRICE then MAXVAL with a bigger F value. This means that PRICE seems as a better discriminator variable then MAXVAL between Turkish and imported wines.

Standardized Canonical Distribution Functions

Table 4.3: Standardized Canonical Discriminant Function Coefficients

	Function
	1
PRICE	,819
MAXVAL	-,692

The most important feature of the Table 4.3.is that it shows the values for PRICE and MAXVAL which serves as “beta” coefficients as in a multiple regression model. This situation can be commented as follows;

While the consumers are making a wine selection; the price is an important variable. This can be seen in the value of 0,819 which shows that when price increases, it also increases the rotation between Turkish to imported wines and vice-versa. The main reason for this is the price levels of both wine types. The price “band” for imported wines is a little higher compared to Turkish wines in the same quality because of the potential factors that has been stated at the beginning of the 4th part. However to support this idea we also can go back to the sample formation and check the price “bands”.

The basic criterion for deciding that a wine (either Turkish or imported) has the same quality was the raw material that is, grape varieties used for production while ignoring the processing techniques and alcohol ratio in volume (which may also depend of the grape type and harvest location). As a result, they have been treated as table wines of the same quality and this gives us the opportunity to comment on the price more clearly.

All the prices are taken in Turkish currency (YTL) and the critical price is 13 YTL which can be assumed a “threshold price” to separate wines with lower and better quality in general. This has taken us to the following facts:

- Within Turkish wines; there are 16 different types of wines below 13 YTL, while 9 in imported wines in the sample. This may be assumed as there are less number of imported wines below the “threshold price” then Turkish wines;

- Maximum price for Turkish wines is 26,89 YTL and 30,90 YTL for imported wines in the sample;
- Minimum price for Turkish Wines is 6,60 YTL while 9,66 YTL for imported wines.

a, b and c implies that the price band for imported wines is a little wider than Turkish wines as a whole and imported wines are a little bit expensive compared to Turkish ones. The main obstacle for the claims is the compatibility of quality between for the wines with closer prices. As an example, it is not possible to test whether wine brands carrying maximum prices in both groups are exactly in the same quality. To confirm this; even if both wines are produced of exactly the same raw material, a supplemental expert test is needed because of the differences between production, processing, packaging (tangible) and tasting (intangible) variables. Moreover, in addition to variables stated at the beginning of the 4th part, profit margins in wine basis should also be considered at the retailer’s side.

However, the price perceived by each customer can also be subject to differences in their mindset if the social and cultural side of wine purchase behavior is considered. For example, a customer may think of purchasing a Turkish or imported brand as a matter of prestige; while this may not cause any differences for another; he may purchase a brand just because he likes the taste or brand. In such cases, we also may think of a brand loyalty issue, where price label may be ignored by the consumer. As a result, while considering the price, brand loyal customer may ignore the retailer’s shelving policy or profit margins. Another reason for this is the lack of information. A customer, while judging the price by taking every step of the pricing process into account should also have some knowledge about it. This “uninformed” type is in fact the one that we have chosen for our analysis.

B-In table 4.3, the value for MAXVAL is -0,692 which implies that when the maximum aging date decreases it increase the rotation between Turkish to imported wines and vice-versa. Subjectively, it can be assumed that the rotation of “uninformed” type of customer selection from Turkish to imported wines or vice versa is faster when the wine is subject to consumption and not for collection in caves (or just aging). To improve the analysis, we have to introduce the collection variables and customer mindsets of what they expect of a wine’s aging. In a collector’s case; it could also be assumed that in the case of aging increase; the brand loyalty would also increase for certain brands according to the product specifications or selection for collection purposes may simply depend on just maximum aging and so on. As a result, the variables affecting collectors’ mindset should also be investigated in specific studies.

Structure Matrix

Table 4.4: Structure Matrix

	Function
	1
PRICE	,728
MAXVAL	-,584

In the structure matrix, we observe the relationship of every variable with the function, in other words, their “ratio of explanation”. According to table, the values of 0,728 for price and -0,584 can be treated as “consistent” with the results that appear in Table 4.3. However, Table 4.4.also shows that the ratio of explanation especially for the discriminator variable is not that high. This can be seen as a result of potential reasons affecting the pricing process again as stated in the previous part.

CONCLUSION

The basic idea behind the study is not criticizing nor commenting on the pricing policy and the product line of the wholesaler. Rather, the aim of the study is to have short look at the consumption patterns of the consumers in a defined short time period, whose essential point is the distance to the New Year evening. Main point to consider is that the consumption patterns, consumer mindsets and customer tastes are dynamic notions that are subject to changes. Due to such changes the “classification” part of the analysis is also skipped. As a result, it is essential to see this study as a “photograph” taken in a specific moment in time.

During the analysis, price bands are also assumed as an indicator, regardless how they may vary out of the period considered. Moreover, the rationale behind in selecting the time period was to take into account the effects of an increasing potential demand and so clarify the consumption patterns. As a result, it has been observed that in the time period specified; price variable had a greater discriminating effect on a local or imported wine variety, where generally the wines are purchased for consumption purposes rather than aging ones. For future research, experimental analyses concerning consumer behaviors are recommended to be conducted with a larger set of variables.

REFERENCES

1. Angulo, A.M., Gil, J.M., Gracia, A. and Sanchez, M. (2000), Hedonic Prices for Spanish Red Quality Wine, *British Food Journal*, Vol.102 No.7, pp-481-493.
2. Dimara E. and Skuras, D.(2005), Consumer Demand for Informative Labeling of Quality Food and Drink Products. A European Union Case Study, *Journal of Consumer Marketing*, Vol. 22, No.2, pp.90-100.
3. FAO, (2005), *Statistical Databases*, <http://faostat.fao.org/faostat/collections?subset=agriculture>
4. Gluckman, R. (1990), A Consumer Approach to Branded Wines, *European Journal of Marketing*, Vol. 24, No. 4, pp. 27-46,
5. Horowitz, I. and Lockshin, L. (2002), What Price Quality? An Investigation into the Prediction of Wine Quality Ratings, *Journal of Wine Research*, Vol.13 No.1, pp.7-22.
6. METRO Grossmarket Wine Price Catalogue: *Local and Imported Wines* 9 December 2005-05 January 2006.
7. O'Neill, M., Palmer, A., and Charters, S. (2002), Wine Production as a Service Experience-The Effects of Service Quality on Wine Sales, *Journal of Services Marketing*, Vol.16 No.4, pp.342-362.
8. Orth, U.R., Wolf, M.M., and Dodd, T.H. (2005), Dimensions of Wine Region Equity and Their Impact on Consumer Preferences, *Journal of Product and Brand Management*, Vol.14 No.2, pp.88-97.
9. Quinton, S. and March, S.H. (2003), Strategic Interactive Marketing of Wine-A Case of Evolution, *Marketing Intelligence and Planning*, Vol. 21 No. 6, pp. 357-362.
10. Romaniuk, J. and Daves, J. (2005), Loyalty to Price Tiers in Purchase of Bottled Wine, *Journal of Product and Brand Management*, Vol. 14 No.1, pp.57-64.
11. Thode, S.F. and Maskulka, J.M.(1998), Place Based Marketing Strategies, Brand Equity and Vineyard Valuation, *Journal of Product and Brand Management*, Vol.7 No. 5, pp.379-399.
12. Sharma, S. (1996), *Applied Multivariate Techniques* (Eds), John Wiley and Sons Inc., River Street, Hoboken, NJ.
13. Wittwer and Rothfield, (2006) *The Global Wine Statistical Compendium 1961-2004* (Eds), Published by Australian Wine and Brandy Corporation for Centre of Policy Studies, Monash University and the Centre for International Economic Studies, The University of Adelaide, Adelaide.

NOTES