

Consumer Willingness to Pay a Premium for Organic Wine: Discriminant analysis

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Abstract

Consumer interest in organic wine is growing but the production process and the benefits in such products create a challenge. Producers require premiums for their products due to the difficult production environment and the perceived benefits in their products. However predicting consumers' willingness to pay (WTP) for the benefits of organics is hard. This study explores the characteristics of consumers that are willing to pay premium for organic product and those unwilling. This research is significant; it will assist producers/marketers to provide products to consumers in a sustainable manner. The survey was carried online with wine consumers on a database. The Stata 12 software was used to analyse the variable statistics, factor analysis and discriminant analysis. The results indicated that consumers' knowledge of organic wine, their attitude, perceived risk and risk reduction strategy affect WTP a premium for organic wine. The discriminant analysis shows the consumers willing and those unwilling to pay premium were significantly different. From a managerial perspective, it will be cost-effective to target these consumers groups differently in terms of communication and offering. As a limitation, one of the screening criteria may have discriminated against the new wine converts and thus reduced the total variability of the population.

Keywords: Wine; Consumer; Attitude; Perceived risk; Willingness to pay, Discriminant analysis.

Introduction

Consumer food consumption pattern in the modern world is changing, and factors such as health, environment, demographics and lifestyle have been attributed as some of the reasons for the change. Consumers now buy products that are either organic or conventional or a mix of both. In countries such as Germany, France, Britain, Spain, Italy, the United States, Australia and New Zealand, organic production is growing and there is a commonality in the reasons for the growth. Consumers are increasingly aware of the health and the environment implications associated with the products they consume. This has a profound effect on their behaviour towards organic products and the expansion of the market globally (Bhaskaran, Polonsky, Cary, & Fernandez, 2006; Childs, 2006; Geier, 2006). The growth of organic food and beverage sales represented approximately 4.0% of all food and beverage sales in 2010 with the United States' sales of organic food and beverages grown from \$1 billion in 1990 to \$26.7 billion in 2010, and sales in 2010 increased by 7.7% over 2009 (Organic Trade Association, 2010).

The reasons why consumers chose organic products appears consistent across products, cultures and time (Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007). The major platform upon which organic products are promoted to consumers relates to the health and environmental benefits (Organic Research Centre, 2008). However the support for these benefits claim is not equal and at times doubtful. Some studies have reported the perceived health claim as superior and this attracts more consumers to organic products than the environmental benefit (Aertsens, Mondelaers, Verbeke, Buysse, & Huylenbroeck, 2011; Mondelaers, Verbeke, & Van Huylenbroeck, 2009).

The growth in the organic industry in Australia has been strongly influenced by rapidly growing overseas demand (Willer & Kilcher 2012). However the domestic market is also expanding (BFA 2012), it is not at the same rate as the conventional product (BFA 2012; Remaud & Sirieix 2010). Most wine consumers purchase organic wine for the perceived health and environmental benefits (Mann, Ferjani, & Reissig, 2012). There are some consumers whose primary reason for purchase/consumption is not for the health or environmental benefit. They purchased the product for prestige and social image (Mann, Ferjani, & Reissig, 2012; Ogbeide, 2013).

Organic wines are generally more expensive than the conventional ones for a number of reasons. Under an organic system, a vineyard for example is slower to yield, and the grape yield is lower. Over time, growers can pick significantly fewer tonnes of grape than their conventional competitors (de Ponti, Rijk, & van Ittersum, 2012; Jonis, Soltz, Schmid, Hofmann, & Trioli, 2008; Seufert, Ramankutty, & Foley, 2012; Wright & Grant, 2011). Labour for the production of organic crops in a mono crop system such as viticulture is relatively high compared with conventional production practices. The benefit of low labour usage for the chemical weeding is lost. Though economies of scale are increasing, organic production is still small scale. Post-harvest handling, marketing, distribution and certification costs of relatively small volumes of organic products from small farm units usually translate into higher average costs for the producers (Jonis et al. 2008). The benefits of organic product, the small economy of scale, low yield and high labour cost have created higher price differential compared to the conventional one.

Consumers from an organic purchase and consumption perspective fall into two main groupings – organic and non-organic consumer. Organic consumers have been classified into three sub groups - periphery organic consumers, mid-level organic consumers and core organic consumers (Hartman Group 2009). The periphery organic consumers include those changing attitudinally but not making significant behavioural changes to engage in organic product acquisition. There are the mid-level organic consumers; this group show changes in their attitude and behaviour towards organic product while the core organic consumers are most intensely involved both attitudinally and behaviourally. There are the organic sceptics or the non-organic consumers group whose attitude and behaviour remain anti-organic and make every effort to discredit positive organic claims (Hartman Group 2009).

The objective of this study is to explore the characteristics that distinguish Australian consumers willing to pay premium for organic product and the unwilling ones. This study is significant as it will assist producers and marketers to provide their products to consumers in a sustainable manner. Willingness to pay (WTP) can be used to form organic wine market segments. This can provide the marketers an opportunity to extend to the various consumer segments the appropriate communication strategy, targeting and positioning the viable segments differently. By determining the factors that influence WTP, the industry obtains insight into the behaviour and attitude of organic wine consumers and tailor appropriate marketing strategies and programs to reach them.

Literature review

Consumer knowledge of organic products benefits

Consumers' product knowledge is acquired from many sources – product label, expert store personnel, free trial, research information and previous users. Scientific information available to consumers is of divergent views. Several studies have presented findings about the health claims of organic products. Benbrook, Zhao, Yáñez, Davies, and Andrews (2008) matched

236 valid pairs of organic and conventional products across 11 different nutrients. They found that 61.0% of organic products matched had more nutrients than the conventional products. Also, they noted that the organic samples had higher concentrations of polyphenols and antioxidants in about 75% of 59 matched pairs. They concluded that increasing the consumption of these nutrients through the consumption of organic product that are rich in them is vital to improving human and animal health.

Kaffka, Bryant, and Denison (2005) reported that the concentration of two types of flavonoids - quercetin and kaempferol, were respectively 79% and 97% higher in organic tomatoes than conventional ones; their presence almost doubled as a result of the application of organic manure based nitrogen to the plants. These flavonoids are antioxidants which have been proven to fight aging and prevent some chronic diseases.

As there are studies supporting organic products benefits so are others on the contrary. Smith-Spangler et al. (2012), used 200 peer-reviewed studies to examine differences between organic and conventional food and concluded that organic foods may reduce exposure to pesticide residues and antibiotic-resistant bacteria, but there is a lack of concrete evidence that organic foods are significantly more nutritious than conventional foods. This is an important factor that has the capacity to negatively moderate consumer attitude and behaviours towards organic product, and influence consumer WTP a premium for any perceived benefit of organic products.

The diversity of research outcomes about organic products has impact on consumer knowledge. According to Hollingsworth (2001), consumers are slow to embrace organic food and wine as a result of conflicting benefit claims, many of which have little visible or quantifiable effect. Saher, Lindeman, and Hursti (2006) noted that some consumers that have the knowledge of the environmental benefits of organic products believe in the scientific proofs surrounding the product and, also rely on personal experience, conviction and beliefs in the products providing the benefits to make purchase. In Australia, despite gradual acceptance of the claims, there is a segment of the market that lacks the knowledge and does not believe organic wine has any environmental usefulness (Mueller & Umberger, 2010).

Furthermore, Bazoche, Deola, and Soler (2008) reported that French wine consumers believe that wines with perceived environmental benefit and conventional wines are valued the same and are not disposed to pay more for organic wine. DAFF (2004) reported that consumers with favourable knowledge about organic product are disposed to the environmental and health benefits and willing to pay as much for the benefit as the price premiums often attached to the product. The reverse is the case when the product knowledge is lacking or there is scepticism about the product and its benefits (Hartman Group 2009).

Attitudes of consumers towards organic product

According to Fishbein and Ajzen (1980), a person's attitude towards an object is positively linked with actions taken towards the object, but can be affected by different factors that cause learning to take place prior to attitude formation. Research has focused on examining the effects of motives, beliefs and values on attitudes towards organic products and WTP reporting varied outcomes. Magnusson, Avrola, K, Aberg, and Sjoden (2003) compared health and environment motive as predictors of attitude towards the purchase of organic product and found health motive as a stronger predictor. This finding was not supported by Honkanen, Verplanken, and Olsen (2006) who claimed environmental motive is stronger than health in predicting attitude towards organic product purchase.

Consumers of organic products build their attitudes based on their own beliefs and evaluation of any environmental and health benefits perceived (Tsakiridou, Mattas, & Tzimitra-Kalogianni, 2006). Consequently, consumers make their purchasing decisions taking note of other personal and social elements that impact their decision (Fishbein & Ajzen 1980). Hence the state of the consumer's attitude toward any perceived beneficial attributes of an organic product will determine their WTP a premium for them (Barber, Taylor, & Strick, 2009; Shepherd, Magnusson, & Sjoden, 2005; Thøgersen, 2007).

Consumer perception of risk

Organic product like wine is a product for pleasure and social connection; when it is purchased or consumed there are usually some considerations of perceived risk to consumers. Mitchell and Grottel (1989) stated that the major perceived risks in wine are those of taste, social approval and whether the wine will complement a meal. These risk perception factors have a psychological undertone regarding social image of consumers (McCarthy, Perreault JR, Quester, Wilkinson, & Lee, 1994). Mitchell and Grottel (1989) reported that price of wine is not considered to be particularly important as a risk compared with other risks; however, Grewal, Gotlieb, and Marmorstein (1994) suggest that perceived financial risk is a key determinant of consumers' willingness to pay for new or innovative products.

Mann et al. (2012) and Tsourgiannis, Karasavoglou, and Nikolaidis (2013) reported two important perceived risk attributes that determine whether a consumer will choose organic wine: (1) the perceived health effects of organic wine, and (2) perceived status image attached to organic wine consumption. The social value of organic wine as a high-status drink in Europe represents the reason for this latter preference.

The taste attribute of organic wine received some criticism and has been a source of perceived risk. Trioli and Hofmann (2009) argue that the negative perception of the taste of organic wine stems from the early stages of organic wine production, when production know-how was inadequate. The perception is not true anymore but its poor image remains, particularly in non-European countries. Thøgersen (2007) reported Danish consumers' attitudes toward organic product consumption was consequent on the beliefs that organic products are better for the environment, taste better and are healthier. Remaud and Sirieix (2010) using a sample of 151 respondents, found that consumers' perception of conventional, organic and biodynamic wine is the same regarding the environmental and health claims. These conflicting outcomes constitute perceived risk for consumers and impact on WTP (Grewal, Gotlieb & Marmorstein 1994).

Consumer risk reduction strategy

Mitchell and Grottel (1989) suggested that buyers of products which evoke a certain kind of risk have a variety of ways open to them for relieving their risk tensions. Wine consumers have been studied to use risk relievers such as: (1) opportunity to taste (Johnson & Bruwer, 2004; Mitchell & Grottel, 1989), (2) personal recommendations (Nisbet & Kotcher, 2009), (3) free samples (Schiffman & Kanuk, 2006), (4) store reputation/image (Lockshin & Kahrmanis, 1998; Semeijn, Van Riel, & Ambrosini, 2004; Slovic, 2000), (5) product knowledge and information search (Arbuthnot, Slama, & Sissler, 1993; Cox, 1967b; Ward, 1996), (6) product/brand loyalty (Kerstetter & Cho, 2004; Lockshin & Spawton, 2001), (7) the bring your own bottle (BYO) of wine phenomenon (Benjamin & Podolny, 1999; Bruwer & Nam, 2010; Oczkowski, 1994) and (8) product price (Benjamin & Podolny, 1999; Oczkowski, 1994; Ogbeide et al. 2014).

The knowledge of a product's quality make-up is important; this enables price to act as a surrogate such that perceived product quality may equal a high price which is acceptable to consumers. The corollary is that the more consistent the quality of a product, the lower the perception of financial risk (McCarthy & Henson, 2005); hence it is arguable that higher prices serve as a financial risk reliever.

Willingness to pay

The willingness to pay is assessed as the amount of money that a consumer is willing to part with to gain an equivalent utility derived from a product (Lusk and Hudson 2004). The value of the perceived health, environment and social benefits of organic wine is difficult to estimate. One of the methods that have been used to determine the value of such benefits is the estimation of consumers' willingness-to-pay (Goldberg & Roosen, 2005). Studies such as Barber, Taylor and Strick (2009), Falguera, Aliguer and Falguera 2012; Hamzaoui-Essoussi and Zahaf (2012), Kang et al. (2012) and Ogbeide (2013) have used WTP method to estimate the premium consumers are likely to pay for organic product benefits.

Jolly, (1991) found that the amount consumers are willing to pay for organic products depended on the type of product, the relative cost of a comparable conventional one and the absolute price of the product. However, previous studies on willingness to pay have been carried out using any of the three methods: (1) revealed preference, (2) stated preference and (3) offers of products. All of them have their strength and weaknesses. Revealed preference method is based on actual purchases observed under realistic marketing mix conditions; it has been assumed to have a high degree of external validity (Ben-Akiva et al., 1994; Chang, Lusk, & Norwood, 2009; Hofacker, Gleim, & Lawson, 2009).

According to Ben-Akiva et al. (1994), stated preference is a behaviour-based intentions or responses to hypothetical choice situations. Stated preference uses conjoint analysis or contingent valuation method. The contingent valuation method (CVM) involved assigning monetary value to environmental and public goods. It has been extended to the determination of WTP for private goods or services that do not yet exist or are not well defined. Maynard and Franklin (2003) measured WTP for a non-market good by creating a hypothetical market for such a good. Owusu and Anifori (2013) used it to determine WTP for organic fruit and vegetable in Ghana.

The use of CVM to measure WTP has involved modifications to minimise the main issues of hypothetical bias and lack of incentive to buy (NOAA, 1993). Modification includes the use of open-ended or close-ended questions, and/or single-bounded or double-bounded dichotomous choice questions (Lusk & Hudson, 2004). Sattler and Volckner (2002) evaluating the best approach to measure WTP, concluded that in practice stated preference data could be preferred as it is a more cost-effective way to recruit respondents, as an obligation to buy is likely to reduce the possibility to win respondents and minimise the effect of severe liquidity constraints which can bias WTP downward in the context of a revealed preference procedure.

Methodology

Organic wine was chosen as the product for this research to enable the investigation of the budding organic wine market and to gain an understanding of the general wine consumers' behaviour towards organic wine. The data used in this study was gathered online from a random sample of wine consumers on a marketing database in a manner that reflected the population distribution of the Australian States and Territories.

A total of 2099 consumer respondent was analysed. The marketing database used for the survey consisted of different products consumers; it was first screened for wine consumers based on pre-determined criteria provided to the list manager. Respondents that qualified for the study were all 18 years and over according to Australian states and territories laws on the legal age of alcohol use. Furthermore, respondents selected had over the last six months prior to the survey (on average) consumed or purchased a bottle of wine every month. This enabled the study to meet the requirement of a basic wine consumer (Bruwer & Li, 2007). First time purchasers or consumers of wine were excluded from the survey as their repeat purchase or consumption could not be assured.

The survey was carried out online and the latent behavioural variables used were each designed as a series of statements that required responses on a rating scale. Some of the scale items were adapted from the works of Ogbeide (2013), Ogbeide and Bruwer (2013) and Bearden, Netemeyer, and Haws (2011)'s handbook of marketing scales while the others were developed based on the acquired knowledge from the literature reviewed. Social demographic details of the respondents were also collected. The method of the data analysis included descriptive statistics, factor analysis and discriminant analysis. All the analyses were conducted using Stata 12 software.

Result and discussion

Willingness to pay premium for organic wine

This study elicited consumers' WTP a premium for organic wine.

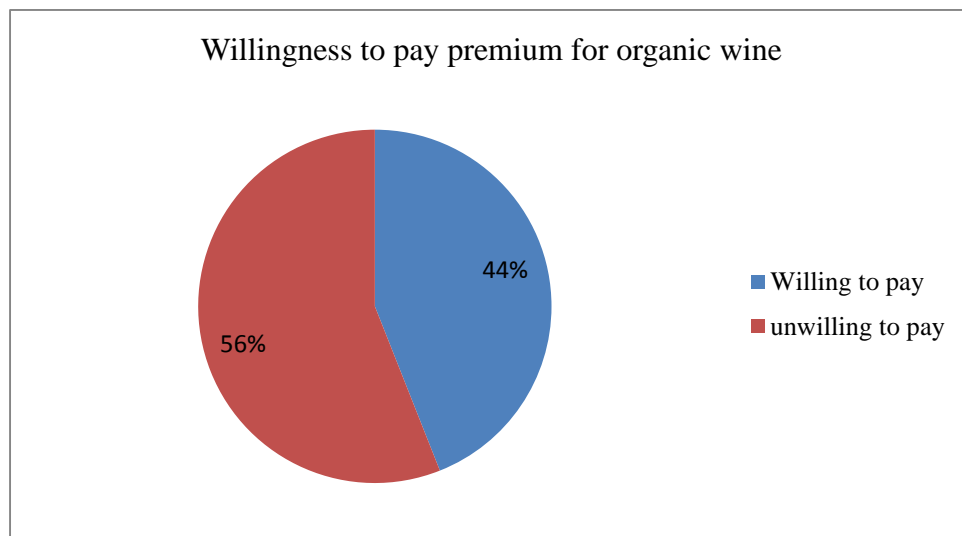


Figure 1 Consumers willing to pay premium for organic wine

Consumers were asked to indicate their WTP a premium for organic wine. The consumers that provided a "yes" response showed willingness to pay a premium while those that provided "no" response were not willing to pay a premium for the product. The descriptive statistics of the outcome is presented in Figure 1. Approximately 56% of the respondents expressed WTP premium for organic wine and about 44% of the sample responded otherwise. This is an indication of more consumers willing to pay a premium for organic wine that have some attributes that the conventional wine don't have and have recognised those attributes as worth premium payment. Now that the wine consumers' willing to pay a

premium for organic wine has been determined; the next set of results measured the influence of attitudinal and behavioural variables of their WTP a premium.

Descriptive analysis of Consumer knowledge of organic wine

Consumers’ knowledge of organic wine was measured using five observed variables – see Table 1.

Table 1 Descriptive Statistics for consumer knowledge of organic wine

Question	Strongly disagree (%)	Disagree (%)	Somewhat disagree (%)	Undecided (%)	Somewhat agree (%)	Agree (%)	Strongly agree (%)	# of observation	Mean	Std Dev
Organic wine has specific health benefits that reduce the risk of developing heart disease.	1.9	4.4	5.5	41.4	25.8	15.6	5.4	2099	4.5	1.2
The organic wine market is growing.	1.0	1.8	6.0	32.0	29.9	22.9	6.4	2099	4.8	1.1
When you buy organic wine, you help the environment.	2.1	3.4	6.4	31.6	28.5	21.0	6.9	2099	4.7	1.3
Organic wines do not contain artificial additives.	1.2	1.8	5.4	33.5	24.0	25.9	8.5	2099	4.9	1.2
Organic wine costs more than the conventional type.	0.9	0.6	2.8	20.5	25.5	33.3	16.5	2099	5.4	1.2
Variable Summary	1.2	2.4	5.2	31.8	26.7	23.3	8.7		4.9	

From the descriptive statistics; considering all the variables used to determine consumer knowledge about organic wine - the mean for each of the variables was more than average. This is an indication that slightly more than half of the sample varyingly agreed with the variables used to test their knowledge. The percentage of the consumers that disagreed or lacked opinion about the variables shows that a sizeable proportion of the consumers lacked common knowledge associated with organic products. The inference is that as more consumers become aware or have product knowledge in sufficient amount, there is the likelihood that consumer attitude can be positive towards organic wine. Also considering that on average, 31.8% of the consumers were undecided about the statements that were used to define consumer knowledge is a worry from a marketing sense. This percentage reflects a large consumer group that will be of interest to marketers in terms of targeting and offering of products.

Consumers’ attitude towards organic wine

Table 2 Respondents’ attitude towards organic wine

Question	Strongly disagree (%)	Disagree (%)	Somewhat disagree (%)	Undecided (%)	Somewhat agree (%)	Agree (%)	Strongly agree (%)	# of observation	Mean	Std Dev
Humans need to adapt to the natural environment.	0.6	1.2	3.3	15.8	32.0	31.5	15.5	2099	5.3	1.2
I am concerned about the health and environment issues of the use of chemicals.	0.8	2.0	4.3	15.3	29.8	29.8	18.0	2099	5.3	1.2
The health and environmental value of organic wine is worth the premium to be paid.	5.4	7.4	12.5	36.9	20.7	13.2	3.9	2099	5.3	1.4
Health and environment claims should be verified.	0.6	0.5	1.2	11.7	21.2	34.1	30.7	2099	4.2	1.1
When you buy organic wine, you make a financial sacrifice for the environment.	2.7	4.4	7.2	34.7	25.5	19.7	5.9	2099	5.8	1.3
Variable Summary	2.0	3.1	5.7	22.9	25.8	25.7	14.8		5.2	

Consumers’ attitude towards organic wine was measured using five observed variables. On average, the mean level of agreement for all the variables was 5.3; which suggests that consumers have a “stronger” support for the variables used to measure their attitude. The response obtained from attitude measurement was positively stronger than the outcome from the measurement of their knowledge of organic wine. This is an indicator that other factors other than knowledge influence their attitude toward organic wine and the WTP a premium.

Consumers’ perceived risk towards organic wine

Table 3 Descriptive Statistics for respondents’ perception of risk

Question	Very unlikely (%)	Unlikely (%)	Somewhat unlikely (%)	Undecided (%)	Somewhat likely (%)	Likely (%)	Very likely (%)	# of observation	Mean	Std Dev
The wine may not taste good.	2.1	6.0	12.3	35.6	26.7	12.1	5.2	2099	4.4	1.3
The benefit may not be commensurate with the premium paid.	1.2	2.8	4.8	29.9	30.3	19.2	12.0	2099	4.9	1.3
The wine may not meet friends’ or family’s expectations.	2.0	5.0	10.3	35.5	27.3	15.0	5.0	2099	4.5	1.3
It may not create any environmental benefits.	1.901	3.5	9.6	35.2	27.8	15.1	7.0	2099	4.6	1.3
The health benefits claim may not be true.	1.6	3.1	7.6	33.4	30.3	15.9	8.1	2099	4.7	1.3
Variable Summary	1.8	4.1	8.9	33.9	28.5	15.5	7.5		4.6	

The result of the perception of risk by consumers indicates an outcome above the mean for all the variables used to test their perception of risk. This is an indication that despite consumers’ positive attitude towards organic wine, there was perception that the product may not meet or provide the expected benefits. This could have been compounded by the level of product knowledge (Hershey & Walsh, 2001).

Consumers’ risk reduction strategy

Table 4. Descriptive Statistics for respondents’ risk reduction strategy

Question	Very unlikely (%)	Unlikely (%)	Somewhat unlikely (%)	Undecided (%)	Somewhat likely (%)	Likely (%)	Very likely (%)	# of observation	Mean	Std Dev
Choosing organic wine with expert endorsement.	4.0	4.5	9.0	27.9	29.9	19.4	5.4	2099	4.6	1.4
Buying organic wine based on the information on the label.	2.6	5.1	8.5	26.3	36.1	17.3	4.1	2099	4.6	1.3
Choosing organic wine by the reputation of brand.	2.6	4.1	7.2	24.9	34.9	21.1	5.2	2099	4.7	1.3
Purchasing familiar brand of organic wine.	2.4	3.5	5.1	27.3	33.2	22.3	6.3	2099	4.8	1.3
Purchasing wine with less carbon foot print.	4.7	5.6	9.6	34.7	26.3	13.9	5.1	2099	4.3	1.4
Variable Summary	3.3	4.6	7.9	28.2	32.1	18.8	5.2		4.6	

Table 4 contains outcome on consumers applying the risk reduction strategy in a wine occasion. The mean score of all the variables 4.6 indicates that most of consumers in the survey have the practical information either by training or experience about these risk relievers for organic wine and that they rely on them when making acquisition. The large

percentage (28.2) of undecided consumers shows a consumer group with no opinion on these variables. This group needs to be carefully and professionally provided with the relevant risk relievers in a convincing manner. This is consistent with Ogbeide et al. (2014) that experts should be used to provide services to wine consumers as a way of allaying perceived risk.

Result of factor analysis and reliability test

It was important that the observed variables used strongly represent the latent variables and the ones that do not meet the condition were deleted. Before the discriminant analysis was carried out, a factor analysis was conducted to ensure the variables that best represent each of the latent factors were used. Table 5 presents the result of factor analysis and reliability test. The table shows the factor loading from the factor analysis of the five-variables of consumer attitude and behaviours: knowledge of organic wine, consumers' attitude, perceived risk and risk reduction strategy.

Table 5 Factor analysis and reliability test

	<i>variance</i>
Knowledge of organic wine - Cronbach Alpha: 0.84	
Organic wine has specific health benefits that reduce the risk of developing heart disease.	0.80
The organic wine market is growing <i>Ogbeide et al., (2014)</i> .	0.82
When you buy organic wine, you help the environment.	0.85
Organic wines do not contain artificial additives.	0.79
Consumers' attitude - Cronbach Alpha: 0.78	
Humans need to adapt to the natural environment.	0.80
I am concerned about the health and environment issues of the use of chemicals <i>Ogbeide et al., (2013)</i> .	0.79
Health and environment claims should be verified <i>Ogbeide et al., (2013)</i> .	0.79
When you buy organic wine, you make a financial sacrifice for the environment.	0.74
Perceived risk - Cronbach Alpha: 0.88	
The wine may not taste good; adapted from <i>Bearden et al., (2011)</i> .	0.81
The benefit may not be commensurate to the premium paid; adapted from <i>Bearden et al., (2011)</i> .	0.81
The wine may not meet friends' or family's expectations; adapted from <i>Bearden et al., (2011)</i> .	0.80
It may not create any environmental benefits; adapted from <i>Bearden et al., (2011)</i> .	0.84
The health benefits claim may not be true.	0.85
Risk reduction strategy - Cronbach Alpha: 0.90	
Choosing organic wine with expert endorsement <i>Ogbeide et al., (2013)</i> .	0.84
Buying organic wine based on the information on the label.	0.85
Choosing organic wine by the reputation of brand <i>Ogbeide et al., (2013)</i> .	0.88
Purchasing familiar brand of organic wine.	0.81

The factor loading for each of the observed variables reported was above 0.5. All observed variables that had multicollinearity were deleted from analysis as recommended (Hair, Black, Babin, & Anderson, 2010; Tabachnick & Fidell, 2007). The values of Kaiser-Meyer-Olkin measure of sampling adequacy (KMO-MSA) were within the accepted threshold (equal to and above 0.5). Cronbach's alpha values for knowledge of organic wine, consumers' attitude, perceived risk and risk reduction strategy were equal to or above 0.7, indicating the variables met the recommended threshold (Hair et al. 2010).

Discriminant analysis

The distinguishing characteristics of consumers willing and those not willing to pay a premium for organic wine were explored by discriminant analysis. Discriminant analysis was used, for its unique capacity to differentiate between groups based on discriminant score. The study tested for significance that there is difference between consumers willing to pay and those unwilling to pay premium for organic wine using canonical correlations. In Stata 12, by default all the canonical dimensions are tested together, hence this study presents four

multivariate test statistics (Wilks' lambda, Pillai's trace, Lawley-Hotelling trace, and Roy's largest root) and their significance levels.

Table 6 Tests of significance of all canonical correlations for WTP premium for organic wine

Multivariate test	Statistic	D/f 1	D/f 2	F	Prob>F
Wilks' lambda	0.84	4	2094	99.57	0.001
Pillai's trace	0.16	4	2094	99.57	0.001
Lawley-Hotelling trace	0.19	4	2094	99.57	0.001
Roy's largest root	0.19	4	2094	99.57	0.001

(D/f 1 = degree of freedom for the variables and D/f 2 = degree of freedom for the respondents) for determining the F statistics.

The null hypothesis was that the respondents willing to pay a premium for organic wine and those not willing were not linearly related. The hypothesis was evaluated based on the p-values associated with the F statistics of the multivariate tests. The null hypothesis was rejected as the p-values were all less than 0.05. The overall relationships between the predictors and WTP were significant, at $p < 0.001$ indicating that there is difference between respondents willing to pay and those unwilling to pay premium for organic wine. The strength of the overall relationship between the outcome and predictor variables was provided by the canonical correlation (see Table 7).

Characteristics of consumers' willingness and unwillingness to pay a premium for the environmental benefit of organic wine

Four attitudinal and behavioural variables – consumers' knowledge of organic wine, consumers' attitude, perceived risk and risk reduction strategy were used to analyse the difference between consumers willing and unwilling to pay a premium for organic wine. Table 7 shows the result.

The study determined the relative importance of each predictor variable in discriminating between consumers that were willing and those unwilling to pay a premium for the study product using the canonical structure coefficients (loading). The standardized coefficient (R^2) was not considered for interpretation because of its instability and possible variable correlation (Perreault, Behrman & Armstrong 1979). Canonical structure matrix shows the order of importance of the discriminating variables by total correlation.

Table 7 Factors that differentiate consumers willing and those unwilling to pay for organic wine

	Perceived risk	Consumers' attitude	Risk reduction strategy	Knowledge of organic wine
WTP	0.30	-0.88	-0.68	-0.65
Canonical structure matrix (r) 0.3 or more is accepted			P < 0.001	

Table 7 reports the structure matrix that shows the correlations of each predictor with the discriminant function. Canonical structure matrix (r) 0.30 or more (Significant at $p < .001$) was used to interpret the function. Applying this rule, WTP was discriminated by perceived risk ($r = 0.30$), consumers' attitude ($r = -0.88$), risk reduction strategy ($r = -0.68$) and knowledge of organic wine ($r = -0.69$). This result indicated that attitude towards organic wine was the main discriminate of consumers' WTP as the canonical loading was highest for this attribute.

Using discriminant analysis to explore the difference that exists in a *priori* defined wine consumer groups about their WTP premium for organic wine, perceived risk, consumers' attitude, risk reduction strategy and knowledge of organic wine were the determinate factors. Attitude towards organic wine mainly defined the consumers. Consumers with negative attitude towards organic wine were not willing to pay premium for the wine and were also noted to have low product knowledge, risk reliever and high risk perception. Attitude consumer shows towards organic wine was noted to be a function of many factors. Knowledge and risk relievers are important in changing attitude (Naspetti & Zanoli 2009; Nisbet & Kotcher 2009). The differentiation of consumers by their WTP presents marketers with segments to be pursued differently.

Conclusion and implication

In this era of global food systems, effective communication of product and its attributes to final consumers is a managerial task that goes far beyond meeting public and private standards imposed by governments and retailers. It involves deliberate and careful understanding of the consumers themselves and those triggers that release or constrain them to make a purchase. The results obtained from this study indicate growth in organic wine market and also provide valuable information about the consumers and what influence their behaviour in the organic wine market.

The consumers' knowledge of organic product, attitude, perceived risk and risk reduction strategy affect their WTP a premium for organic wine in particular, and any other organic products being evaluated. Apart from these variables determining WTP, they influence decisions on how much premium the consumers are willing to pay for organic wine.

Consumers' under-awareness and lack of knowledge obscures their need to be assisted through the creation of knowledge stimulating environments. This implies that sensitisation and enlightenment programs that are geared toward perceiving this need must be embarked upon cautiously due to the contested nature of the scientific evidence, to effectively help consumers move toward more organic product consumption.

From a managerial perspective, this study provided two distinct consumer groups – the willing and the unwilling. It will be cost-effective to target the consumers in these groups differently in terms of offering. The organic wine characteristics such as health and environmental benefits should be reinforced into the mind of health and environment conscious wine consumers when marketing to them. To influence non-organic wine consumers' attitude, organic wines should be extended to them as a package of product that have health and environmental benefits, better taste, create enjoyment and positive experience. Apart from the health and environmental benefits, marketing effort should be tailored towards promoting the taste value of organic wine. This will end the perceived low quality image held by consumers sooner and appeal to them to try the product. Therefore, regular organic wine tasting events should be conducted with the wine makers and the major sales outlets taking the lead. This study opine that marketing organic wine by its taste attribute will refine or remodel it into people's subconsciousness as taste can be instantly assessed by the consumers through simple sensory evaluation by mouth. Environmental and health benefits can require scientific analyses to determine; this is above the scope of most consumers thus creating difficulty in convincing individuals about these benefits. Therefore, taste must be promoted just as vigorously as environmental and health benefits in the organic equation in order to attract a premium.

The distinguishing characteristics between consumer group willing and unwilling to pay premium for organic wine can be useful in designing marketing communication strategy that reduces risk perception. Marketers when communicating to consumers should be conscious of the types and design of strategy to adopt and their application. Marketers should be cognisant that attitude will impact on consumers' reception and response to communication. Different application methods should be used depending on consumer attitude meter. Overall, this study has contributed to further understanding of wine consumers, particularly in Australia, in relation to their awareness and knowledge of organic wine and especially concerning WTP a premium for its attributes.

Further study should be carried out to determine the best methods to influence consumer behaviour towards organic wine particularly the periphery organic, the sceptic and the anti-organic consumers.

Limitations of the study

Inevitably, there are limitations in any research. The fact that the study is not a longitudinal survey is a limitation, as attitudinal variables cannot be fully understood in a snapshot. Also, that the research is exploratory presents a shortcoming in itself as similar research is required to confirm the results of the study. The sample size of over 2,000 respondents is large, but in terms of generalisation on a population of about 15 million drinking adults, it may not be enough to reveal the variability in the population. One of the screening criteria of "must have consumed/purchased at least a bottle of wine every month in the last six months" may have discriminated against the new wine converts and thus reduced the total variability.

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