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The distributors' view on US wine consumer preferences. A discrete choice experiment

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Abstract. This study explored the view that distributors have towards the most valued wine attributes by consumers in the US market, applying the discrete choice experiments technique. Furthermore, to explore the extent to which the distributors' perspective may reflect consumers' preferences, the results are analyzed considering previous evidence with consumers in the same market. The results from a scaled multinomial logit, mixed logit and generalized logit models reveal similarities with consumer studies' findings, especially for the influence of medals/awards, the origin of the wine, grape variety, and price, and it also identifies possible trends in the market. This evidence suggests that data collected using the knowledge and experience of wine distributors generates valuable information through a smaller sample at a lower cost than through applying consumer surveys, which is relevant in large markets with a higher number of consumers.

Keywords: consumer choice, stated choice method, distributors' perspective, wine choice.

JEL codes: C25, D12, D20.

1. INTRODUCTION

Consumer behavior has evolved over the years, and understanding the motivations, thought processes, and experiences of individuals as they make a choice is essential to improve marketing strategies and consumer welfare (Malter et al., 2020). This statement becomes particularly relevant in wine as it is considered a complex "experience good" (Ali & Nauges, 2007; Mueller et al., 2010) described by several intrinsic (e.g., wine-related, variety, alcohol content, flavor, or style) and/or extrinsic (e.g., price-related, packaging, awards, ratings, and brand) attributes.

On the demand side, wine consumption trends are undergoing significant changes (Castellini & Samoggia, 2018) related to consumer spending habits, purchase power, new choice criteria or expectations (such as health-oriented, environmental-oriented, or based on cultural issues, identity/authenticity), and to the existence of substitute products, like beer and

spirits. This became more relevant in the pandemic crisis (due to Covid-19) where consumer patterns will focus more on sustainability issues, which demands the strength of the greening process of the CAP (Vergamini et al., 2021). Accordingly, the wineries behavior, in terms of management decisions regarding technology, products, marketing, and other factors, is framed in a global market characterized by a monopolistic competition structure, where there exists a large number of firms with different characteristics and sizes; restricted control over price-output; with product heterogeneity; asymmetric information; and freedom to enter or exit the market (Parenti et al., 2017). Despite competition in domestic market, in this industry, firms' competitiveness is increasingly dependent on the ability to trade at an international level (Macedo et al., 2019).

Both changes in market supply and demand have been appealing for a vertical and horizontal wine differentiation based on unique factors such as grape varieties, terroir, quality, and brand or, at the marketing level and distribution channels. Understanding the drivers of wine consumers' purchasing decisions has been the object of a lively debate. As a highly differentiated product, wine preferences are distinctive and country-specific. In this sense, companies need to know consumer's preferences for the attributes of wine to establish marketing strategies, which requires data collection and analysis. Typically, companies use consumer panels through the application of surveys, which can be expensive (Windle & Rolfe, 2011), and whose validity depends on the sample size and randomness (Mitchell & Jolley, 2010).

Over the last few years, there have been a large number of consumer-oriented studies, including in wine research, particularly those using the technique of discrete choice experiments (DCE), a stated preference method, to estimate which attributes are crucial to decision-making by decomposing the good into its attributes or characteristics in light of Lancaster's theory (Lancaster, 1966). The use of the DCE technique has attracted researchers' interest as an alternative to more conventional techniques, as it improves the feasibility of valuation studies, and is relevant for research and policy. This method facilitates obtaining information about the most valued wine attributes in the decision-making process, providing information about how consumers value wine based on their intrinsic and extrinsic characteristics, and assessing a price premium or willingness to pay (WTP) for each wine characteristic. Empirical evidence provides the WTP measures for different wine cues, such as labeling (e.g., Combris et al., 2009; Mueller et al., 2010), wine origin (e.g., D'Alessandro & Pecotich, 2013; Kallas et al. 2013), grape variety (e.g., Corsi et al. 2012; Kallas et al.

2013), awards or medals (e.g., Combris et al. 2009; Corsi et al. 2012), brand and price (e.g., Xu et al. 2014).

For marketing purposes, the results of these studies allow wineries to adjust the definition of their wines to the consumer's profile, gathering the needs of each market and segment. However, to obtain robust consumer knowledge representative samples are required and consider sample selection issues to avoid biased and inconsistent estimators (Heckman, 1979). Solving these issues requires surveying a large number of consumers with high costs. Alternatively, similar information may be collected easily and reliably, by inquiring intermediaries who continuously contact with wine consumers and have knowledge about their preferences and habits.

The distributors make an appropriate linkage between the producer and the final consumer based on consumer insights, playing a pivotal role in choosing the product to sell in each specific market. The distributors decide which products to carry, the market segments to reach, and the prices to charge consumers for each product. Moreover, as Sashi & Stern (1995) attested, in some industries (such as producer goods industries), the intermediaries in the distribution channel are agents of product differentiation. After analyzing the sales of Australian wines on the British retail market, Steiner (2004) found that consumers associate a distribution channel with a specific product quality. In the same sense, Pu, Sun, and Han (2019) state that an increasing number of manufacturers are considering selling differentiated products through different channels as their distribution strategy through quality differentiation.

Regardless of the question of the distribution channel and its relationship with product differentiation, which has been gaining attention [reviewed by Pu et al. (2019)], wine distributors are agents with a deep knowledge of consumer's preferences and behaviors when purchasing wine. Thus, they may act as key players in collecting information for wineries to meet consumer needs, an increasingly complex and challenging demand. This alternative source of information has the advantage of obtaining data through smaller samples of the target markets. Therefore, supported by the DCE theoretical background, the goal of this paper is to test whether the distributors' data may be an alternative source of information to convey consumers' preferences and trends in the target market. Specifically, this article explores wine distributors' perceptions about the most valued wine attributes by consumers using the DCE technique. This information is obtained by administering a survey on wine distributors in the American market (USA), positioned as the world's largest consumer in 2018 (OIV, 2019), but whose background and related

studies about wine consumers' preferences are few. As far as we know, this approach has not been conducted before, constituting an innovative research topic capable of promoting helpful knowledge to wineries and wine distributors.

The paper is organized as follows. Section 2 presents the methods comprising the study design, sample, and the methodology employed. Section 3 includes the results and discusses previous evidence on consumer preferences/choices in the US market. The conclusions of this study are presented in Section 4.

2. METHODS

2.1. Data

An online survey comprised of four sections (general characterization of the distributor; ranking of wine characteristics importance; wine valuation scenarios (10 choice sets); business characterization of the distributor) was distributed by a specialized external firm, the Nielsen Consulting company, through distributors that operate in the US market to collect information about the attributes and values in the consumers choice. From the 1109 distributors for US market (bestwineimporters.com in October 2019), a total of 92 valid questionnaires multiplied by the 10 choice sets provides a DCE sample size of 920 observations.

As to the characterization of the data sample (Table 1), the distributors have been on the wine market for 18 years, on average. Red wine is the most important category in terms of market share of wine sales (on average, 53%). For 50% of the distributors, white wine represents up to 25% of wine sales, rosé represents up to 6%, and sparkling wine represents up to 5%. The specialist retailer is the most relevant distribution channel in terms of share of wine sales, followed by the on-trade channel, hypermarkets/supermarkets, and small grocers. Moreover, 62% sell to hypermarkets/supermarkets, and 59.8% to small grocery stores. The wine sales represent the most crucial portion of the distributors' total sales (84%, on average). On average, online sales represent near 7% of the total distributors' business. Nevertheless, for 66% of the distributors, the average share of online sales is zero.

When asking distributors to identify the three most important attributes in the market they serve, the price attribute leads the ranking, followed by other relevant attributes, such as the expert ratings, grape variety, and country of origin (Figure 1).

Table 1. Distributor's business characterization.

	Mean	Median
Years in the market	18	15
Market share		
White	0.25	0.25
Red	0.53	0.50
Rosé	0.93	0.65
Sparkling	0.73	0.50
Others	0.30	0.00
Presence in market channels		
Hyper and supermarkets	0.62	
Small grocers	0.60	
Specialist retailers	0.92	
On-trade	0.94	
Online	0.34	
Share of sales in each channel		
Hyper and supermarkets	0.30	
Small grocers	0.17	
Specialist retailers	0.44	
On-trade	0.39	
Online	0.07	
Share of wine sales in the total sales	0.84	0.98
Less than 50%	0.14	
50 - 75%	0.123	
76% or more, less than 100%	0.25	
100%	0.49	

2.2. Choice experiment

The choice experiment used in this research includes six attributes (see Table 2), representing highly influential cues for wine choice.

Medals/awards: consumers perceive this attribute as an important sign of quality when choosing a wine (Corsi et al., 2012; Lockshin, Jarvis, D'Hauteville, & Perrouy, 2006). A gold medal with a "gold medal winner" description written in the middle was included.

Alcohol level: the growing concern about the effects of overconsumption of alcohol explains the inclusion of this attribute, characterized by three different levels: low (12% vol), medium (13.5% vol), and high (15% vol) alcohol wines.

Origin: wine origin is well documented as one of the most important cues for wine choice (e.g., Kallas et al., 2013). Six levels describe this attribute at the country level: countries with a long history and tradition in wine production – Italy (54.8 mhl), France (48.6 mhl), and Portugal (6.1 mhl) – being in the top 5 in European production (OIV, 2019) and wines from the new producing countries – USA (23.9 mhl), Australia (12.9 mhl), and

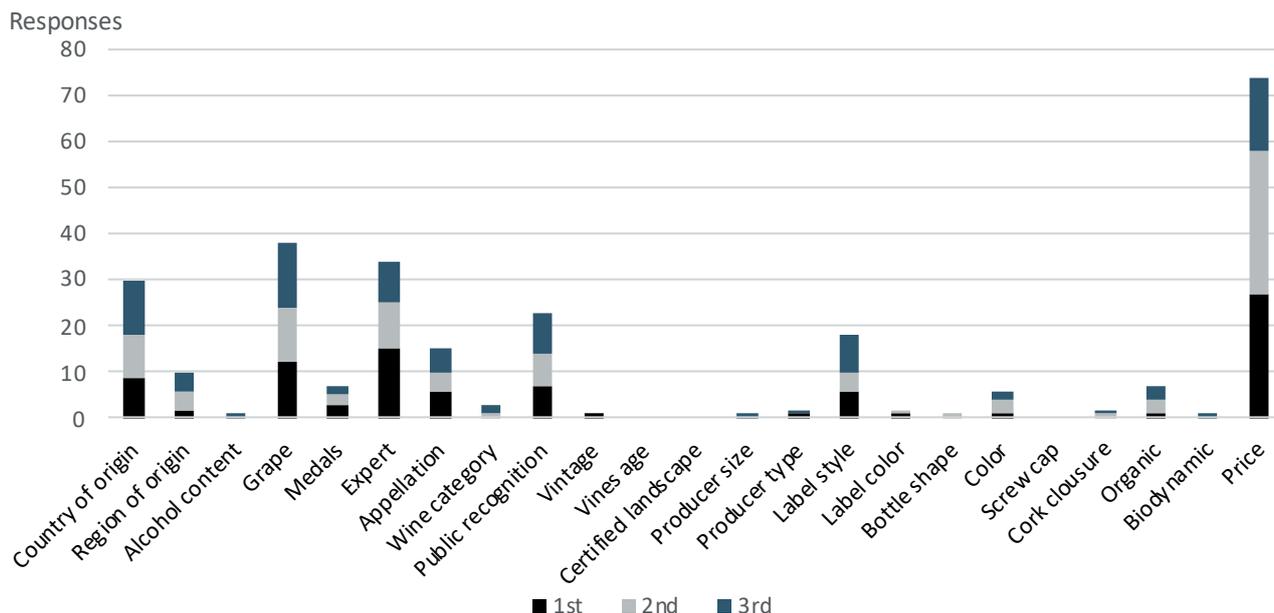


Figure 1. Three most attractive wine attributes in the market in which the distributor operates.

Table 2. Attributes and levels used in the choice experiment.

Attributes	Medals/ Awards	Alcohol level	Origin	Grape variety	Closure	Price
Levels	Yes No ⁺	12% vol. 13.5% vol. 15% vol.	France Italy Portugal USA Australia ⁺ Chile	Cabernet Sauvignon Syrah Red blend No information ⁺	Cork Screw Cap ⁺	\$8.99 \$12.99 \$17.99 \$24.99

⁺ reference level on dummy coding.

Chile (12.9 mhl) – also being in the top 5 in the New World production (OIV, 2019) accounting for the changes in the international wine market.

Grape variety: this factor is a choice driver, especially for the New World wines (Corsi et al., 2012; Kallas et al., 2013). Regarding consumers’ preferences for wine varieties, in 2018, the best-selling wine varieties in the US market based on volume included Chardonnay, Cabernet Sauvignon, and Red Blends (Nielsen, 2019). Therefore, two well-known red varieties were selected (Cabernet Sauvignon and Syrah) and a Red Blend.

Closure: this packaging trait may function as a signal of expected quality (Bekkerman & Brester, 2019). Two bottle closure types, screw cap, and cork closure are the most common closures in the wine market. The screw cap closure and the cork closure covered with a capsule were realistically presented in the survey.

Price: it is one of the primary drivers of choice and is commonly used as an indicator of quality (e.g., Lockshin et al., 2006; Corsi et al., 2012). Four price levels were included between the range of \$8.99 and \$24.99. The choice of price levels was based on the actual price range of red wine in the off-channel in the US market.

A D-efficient design with no priors was obtained using the Ngene software. The attributes’ levels were combined into alternative wines and arranged in 10 sequential choice sets¹. Each choice set was formed by three alternative wines plus a none-option, as displayed in Figure 2. Distributors were asked to select their preferred option or bottle of wine that fits better the market they serve in terms of the consumers’ preferences,

¹ The number of choice sets S was selected based on the equation: $S \geq K / (J - 1)$, where K= #parameters including constant; J=#alternatives (Ngene v1.2.1 software, ChoiceMetrics, 2018).



Figure 2. Example of a choice set.

according to the question: “Imagine you have three different types of wine. Which of the following wines do you find as the most successful in serving wine consumers in your market?”

2.3. Discrete choice model

The method of discrete choice experiments has its roots in the Lancaster (1966) model of consumer behavior, which defines a good in terms of its characteristics, and on the random utility theory (McFadden, 1974), where an individual is a rational decision-maker aiming to maximize her or his utility. Respondent n ($n=1, \dots, N$) chooses among different J alternatives in T choice situations. A random utility expression represents each alternative j , according to the following equation:

$$U_{njt} = \beta'x_{njt} + \varepsilon_{njt} \tag{1}$$

x_{njt} is the vector of explanatory variables and includes product attributes and respondents' characteristics, ε_{njt} is the random component. The alternative that gives the highest utility is chosen, such that $P_{nj} = \text{prob}(\beta'x_{nj} + \varepsilon_{nj} > \beta'x_{nk} + \varepsilon_{nk}) \quad \forall j \neq k \in C$, where C is the choice set of J alternatives, $j=1, \dots, J$.

In the present application, the utility associated with a particular set of alternatives J can be derived as follows:

$$U_{jn} = \beta_{medals} * Medals_j + \beta_{alcohol} * Alcohol_j + \beta_{France} * France_j + \beta_{Italy} * Italy_j + \beta_{Portugal} * Portugal_j + \beta_{USA} * USA_j + \beta_{Chile} * Chile_j + \beta_{cabernet} * Cabernet_j$$

$$+ \beta_{syrah} * Syrah_j + \beta_{blend} * Blend_j + \beta_{closure} * Closure_j + \beta_{price} * Price_j + \varepsilon_n \tag{2}$$

In the mixed logit (MIXL) model (Train, 2009), also known as the random parameters logit model, the parameters are assumed to vary from one individual to another, such that:

$$\beta_n = \beta + \Delta z_n + \Gamma u_n \tag{3}$$

in which β, Δ, Γ are parameters to be estimated, Γ is the lower triangular Cholesky matrix, z_n a set of characteristics of individual n , u_n is a vector of random components, capturing non-observable effects, and $\beta + \Delta z_n$ stands for heterogeneity in the mean of the distribution of the random parameters. The choice probabilities from the model are:

$$\text{Prob}(\text{choice}_n = j | x_{njt}, u_n) = \frac{\exp(\beta'_n x_{njt})}{\sum_{j=1}^J \exp(\beta'_n x_{njt})} \tag{4}$$

Omitting the observed heterogeneity captured in Δz_n , by convenience, the generalized mixed logit model (GMXL) includes scale heterogeneity across respondents through random alternative-specific constants (Fiebig, Keane, Louviere, & Wasi, 2010; Greene & Hensher, 2010). Consequently:

$$\beta_n = \sigma_n \beta + [\gamma + \sigma_n (1-\gamma)] \Gamma u_n \tag{5}$$

where $\sigma_n = \exp(\bar{\sigma} + \tau w_n)$ is the individual specific standard deviation of the idiosyncratic error term, τ captures the unobserved scale heterogeneity, and w_n captures unobserved heterogeneity. The mean parameter in the variance, $\bar{\sigma}$, is not identified independently from τ , such that σ_n is normalized to 1 by setting $\bar{\sigma} = -\tau^2/2$. γ is a weighting parameter, bounded between 0 and 1, controlling how the variance in residual preference heterogeneity varies with scale. If $\gamma = 0$, the GMXL model reverts to the scaled mixed logit model (Greene & Hensher, 2010), $\beta_n = \sigma_n[\beta + \Gamma u_n]$; when $\sigma_n (\tau = 0)$, the GMXL reverts to MIXL; and when $\text{var}(u_n) = 0$ it reverts to the scaled multinomial logit model (SMNL).

3. RESULTS AND DISCUSSION

Table 3 presents the SMNL, MIXL and GMXL model results, using maximum simulated likelihood methods with 500 Halton draws in NLOGIT 6. Following Greene, Hensher, and Rose (2006) and Kragt (2013), a constrained triangular distribution was used for the random

Table 3. Results from SMNL, MIXL and GMXL models.

Attributes	SMNL	MIXL		GMXL	
	Mean	Mean	SD	Mean	SD
Medals	0.906*** (0.196)	0.997***	0.691***	1.200***	0.462
Alcohol	-0.014 (0.039)	-0.014	0.147***	0.031	0.151***
Country of origin					
France	1.497*** (0.409)	1.310***	0.633***	2.069***	0.391*
Italy	1.232*** (0.412)	0.672**	0.742***	1.192**	0.763**
Portugal	-0.940*** (0.334)	0.784***	0.794***	1.165**	1.347***
USA	0.958** (0.389)	0.699**	0.069	1.315**	0.408
Chile	0.982** (0.434)	0.499	0.753**	1.350**	0.225
Grape variety					
Cabernet Sauvignon	0.284* (0.162)	0.137	0.987***	0.482*	1.137***
Syrah	-0.062 (0.211)	0.013	0.785***	0.263	1.182***
Red blend	0.598* (0.313)	0.592**	0.010	1.012**	0.947**
Closure	0.176 (0.114)	0.420***	0.801***	0.580***	0.879***
Price	-0.057*** (0.013)	-0.079***	0.079***	-0.095***	0.029**
ASC ¹	-0.434 (0.509)	-1.186**		-0.136	
Variance parameter in scale (τ)	0.821***			0.730***	
Weighting parameter (γ)				0.064	
Sigma:					
Sample mean	0.985			0.933	
Sample standard deviation	0.895			0.670	
Log-likelihood	-1110.9	-1008.2		-997.0	
AIC	2249.9	2064.3		2048.0	
BIC	2317.1	2179.6		2173.0	
McFadden pseudo-R ²	0.11	0.20		0.20	
Observations	920	920		920	

Standard errors in parenthesis; SD = standard deviation; ***, **, * significance at 1%, 5%, 10% level, respectively.

¹ Alternative specific constant – Included for the none-option and it represents the respondent n 's preference towards the opt-out choice compared to the three alternatives included in our experiment.

price parameter, and a normal distribution was defined for the other attributes (Kragt, 2013).

The scale heterogeneity parameter (τ) was equal to 0.821 and highly significant, indicating the presence of substantial scale heterogeneity, such that respondents varied in terms of certainty/consistency in their choices. Results show that accounting for taste heterogeneity by introducing random parameters provides a better fit than SMNL, with GMXL achieving best performance indicators. The majority of standard deviations for the random parameters are significant, showing taste differences across wine consumers in the perspective of wine distributors, which suggests individual preference heterogeneity. However, while the results from MIXL show preference homogeneity for a red blend wine and American origin, GMXL reveals that preferences are homogeneous for US, Chilean, and awarded wines and contradicts MIXL revealing heterogeneity in preferences for red

blend wines. The coefficients on Cabernet Sauvignon and Chilean origin become insignificant when introducing random coefficients in the MIXL. Nevertheless, GMXL suggests that these attributes affect wine choice. Both MIXL and GMXL suggest the relevance of cork closure.

The results show the importance of medals/awards, wine origin, grape variety, closure, and price. In particular, the present study shows that French origin and blended wines are significant and positive drivers for distributors' choice, while Australian origin has the opposite effect. These findings support a DCE's outcomes on wine consumers' preferences (Gonçalves et al., 2020) which also found a positive impact of an awarded wine and the negative influence of price and Australian wines on consumers' choice. Moreover, the coefficient on closure is statistically significant, suggesting that this attribute (cork closure compared to screw cap) positively affects the utility of choosing a wine when introducing

Table 4. Willingness to pay estimates¹, in US\$.

	SMNL	MIXL	GMXL
Medals	15.76***	17.33***	15.92***
Alcohol	-0.25	-0.33	0.18
Country of origin			
France	26.04***	22.32***	20.82***
Italy	21.42***	11.94**	12.84***
Portugal	16.34***	13.38***	11.85***
USA	16.66**	12.69**	10.89***
Chile	17.07**	8.34	8.093**
Grape variety			
Cabernet Sauvignon	4.93*	1.41	3.51***
Syrah	-1.07	-0.08	-0.11
Red blend	10.39**	10.78**	8.25***
Closure	3.06	7.57***	6.10***

***, **, * significance at 1%, 5%, 10% level, respectively.

¹ WTP values for SMNL were estimated as $WTP = -(\beta_k / \beta_{price})$, while for the MIXL the WTP were calculated based on unconditional estimates. In the case of GMXL, the model was re-parameterized in "WTP space" to directly produce the WTP estimates.

random coefficients. This finding is in line with Kelley et al. (2015) results, which found that consumers are more willing to increase purchases if bottles have cork closures using the conjoint analysis technique. Additionally, wine distributors perceive red blend varieties as a relevant attribute for consumers' choice.

Regarding willingness to pay measures, presented in Table 4, the results from distributors' perspective suggest the highest price premium for French origin (from \$20.82 to \$26.04 among models), followed by medals (from \$15.76 to \$17.33). There is also a positive price premium for the other origins compared to the Australian one. The results also reveal the importance of red blend variety, with a premium ranging between \$8.25 and \$10.78, and cork closure compared to screw cap (from \$6.10 to \$7.57 among models).

Summing up, despite being a data source from distributors, the results are in line with those obtained from consumers in the same market, using either the same/similar methodology (Gonçalves et al., 2020; Kelley et al., 2015) or with different methodologies (Chrysochou et al., 2012; Lockshin et al., 2015; Pomarici et al., 2017; Thach et al., 2020). Among these, Chrysochou et al. (2012) show the importance of grape variety using the Best-Worst Scaling (BWS) approach. This result was later confirmed by Lockshin et al. (2015) and Pomarici et al. (2017) using the same method. These scholars also reveal the importance of the origin of the wine (Lockshin et al., 2015; Pomarici et al., 2017), price (Pomarici et al., 2017), and medals/awards (Lockshin et al., 2015). Additionally,

in line with the present study, Thach et al. (2020) also reported the relevance of blended wines, which might reflect a recent trend among American wine drinkers towards red blends instead of monovarietal.

4. CONCLUSION

This study employs a DCE in the US market, to assess the perspective of wine distributors regarding consumers' preferences. It explores whether the perception of a market distributor, who knows the market well, may reflect the evidence suggested by consumers' preferences studies for wine. This study supports the importance of attributes such as price, medals, country of origin, and grape variety. As first highlighted in the previous questions of scoring an extensive list of attributes and identifying the three most attractive attributes, the alcohol content is not a significant attribute in choosing one bottle of wine over another. When faced with trade-offs between only six attributes, the closure attribute is relevant, suggesting a market trend favoring cork stoppers over screwcaps. We believe that bottle closures may influence the consumers' perception of the quality of a wine and consequently how much they are willing to pay for the product. A recent study (Bekkerman and Brester, 2019) found that, on average, US consumers are willing to pay more for wines with cork closures rather than screw caps. The same study also found that this premium increases for lower-priced wines and decreases for more expensive wines, suggesting that the bottle's closure has an enormous impact on the perceived quality of the wine.

Results from this study reinforce that both price and medals are well-known wine cues for choice in the analyzed market (both in consumer and distributors' views). The red blend is a positive and significant choice driver for wine in the view of distributors, which suggests red blends as an opportunity in the US wine market.

There are important implications based on this study. First, it reflects the view of distributors, who are important players in the wine value chain, about the most valued attributes in the US market, which is relevant for wineries to adapt their supply. Second, this study suggests that distributors know consumer's preferences in the respective market, potentially foreseeing emerging trends. Hence, the distributors can provide robust information on wine consumers' preferences and behaviors, representing a potential alternative to directly obtaining this information from the consumers.

As usual, this research is not free of drawbacks. First, to reach this specific target of respondents, an

external consulting company was contacted to distribute the survey. This action has costs, and it was possible because this research was funded. Second, as it is common in similar studies, there is no certainty that all relevant attributes are included in the survey, so the results may not fully capture the market preferences. Additionally, the comparison with results from other consumer studies only indicates preference matching since the survey design, technique, and analysis period are not synchronized. Thus, future research should compare data from these different sources (distributors and consumers) using the same technique and period to obtain more solid conclusions. Additionally, inquiring about this specific target (distributors) with market knowledge and experience may also benefit from a more qualitative study to investigate, for example, barriers and drivers of wine placement.

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