Strategic Implications of the Relationship Between Price and Willingness to Pay: Evidence from a Wine-Tasting Experiment*

Geoffrey Lewis[a] and Tatiana Zalan[b]

Abstract

We empirically examine the relationship between price and willingness to pay (WTP) for wines by conducting a wine-tasting experiment with a manipulation of price similar to that used by Plassman et al. (2008); that is, with the same wines being presented at different prices. We find that for non-expert wine consumers a complex interaction exists between wine appreciation, price and WTP. The key conclusions from the study are that for non-expert wine consumers (1) there is no relationship between intrinsic wine character and enjoyment (individuals rated the same wines quite differently), and (2) price influences both appreciation of wine and WTP, but the latter more strongly. Buying decisions are determined by consumer surplus (the difference between WTP and price), and yet, for non-expert wine drinkers, WTP is itself strongly influenced by price. This complex interaction between the factors that determine buying behavior has strategic implications for competitors in the wine industry. We suggest an understanding of the relationship between WTP and price can be used to shed light on the crisis recently experienced by the Australian wine industry. (JEL Classifications: C91, D03, M30)

Ernest Gallo, the patriarch of the family-owned E&J Gallo Winery in California (the largest winemaker in the world), recalls how, in the early stages of his career, he once sold wine in New York. He offered two glasses of the same red wine to a buyer, who thereupon drank them and asked for the price of the "two" wines. Upon hearing that the first wine cost 5 cents per bottle and the second 10 cents per bottle, the buyer declared that he wanted the 10-cent bottle. The message behind this anecdote is confirmed by many wine auctioneers, who have noticed

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[a] Melbourne Business School, 200 Leicester Street, Carlton, Victoria 3053, Australia; tel.: +61 8 8362 0621; e-mail: g.lewis@mbs.edu.
[b] Torrens University of Australia, Torrens Building, 220 Victoria Square, Adelaide SA 5000, Australia; tel.: +61 8 8113 7825; e-mail: tatiana.zalan@tua.edu.au.

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that in an auction room higher wine prices act as a stimulus rather than as a deterrent, thereby reflecting that, for bidders, part of the pleasure is apparently knowing that a wine is famous and very expensive.

Morss, 2010

"Veblen effects" arise. . . . "budget" brands are priced at marginal cost, while "luxury" brands, though not intrinsically superior, are sold at higher prices to consumers seeking to advertise wealth. Luxury brands earn strictly positive profits under conditions that would, with standard formulations of preferences, yield marginal-cost pricing.

Bagwell and Bernheim, 1996, p. 349

I. Introduction

The initial motivation for our experimental study is to gain a deeper understanding of the causes of the crisis experienced in the Australian wine industry in 2009 (Reuters, 2009). Our interpretation of the industry crisis, which we discuss in the concluding section of the paper, hinges on the proposition that for wine consumers there exists a relationship between price and their willingness to pay (WTP) for wine. Even though the relationship between wine characteristics and WTP has received considerable attention in recent years (e.g., Combris et al., 2006; Gustafson et al., 2011; Oberfeld et al., 2009; Yang et al., 2009), the relationship between price (as the independent variable) and WTP for wine (as the dependent variable) has not been empirically studied. Our study addresses this relationship and thus makes a contribution to the body of literature seeking to more fully explain wine consumers' buying behavior.

We conducted a series of wine-tasting experiments with a manipulation of price similar to that used by Plassman et al. (2008)—that is, unbeknown to the tasters, the same wines were presented at different prices. We find that for non-expert wine consumers a complex interaction exists between price and wine appreciation and WTP. The key conclusions from the study are that for non-expert wine consumers (1) there is no relationship between intrinsic wine character and enjoyment (individuals rated the same wines quite differently), and (2) price influences both appreciation of wine and WTP (a self-reported measure), but the latter more strongly. Buying decisions are determined by consumer surplus (the difference between WTP and price) and yet, for non-expert wine drinkers, WTP is itself strongly influenced by price. We suggest that insights into the relationships between price and WTP can shed light on how managers can, through influencing consumers' WTP via price cues, improve (or damage) their firm's competitive position.

Previous research has made considerable progress in examining the complex relationship between the factors that determine the buying behavior of wine consumers (e.g., Barber et al., 2006; Batt and Dean, 2000; Charters et al., 1999; Horowitz and Lockshin, 2002). Specifically, the researchers examined the relationship between (1) price and wine characteristics (including wine "quality"); (2) enjoyment/subjective appreciation of wine and knowledge of wine; and (3) price and enjoyment.

The findings relevant to our work from this body of research are that price is correlated with objective/extrinsic characteristics (i.e., vintage, packaging, brand) (e.g., Ashenfelter et al., 1995; Byron and Ashenfelter, 1995; Jones and Storchmann, 2001; Schamel and Anderson, 2001), while intrinsic/sensory characteristics have little effect on price (for a review, see Lecocq and Visser, 2006; Unwin, 1999). Following the Bagwell-Riordan (1991) hypothesis—that prices can signal quality, provided that the high-quality product is more costly to produce than the lower-quality product—Schnabel and Storchmann (2010) demonstrate empirically that price signals respond positively to wine quality. In addition, the price premium falls nonlinearly when the proportion of informed buyers increases. The implication is that high-quality producers distinguish themselves from low-quality producers by charging a price above the full information equilibrium.

Another relevant finding from prior research is that non-expert wine drinkers have trouble distinguishing between "good" (expensive) and "bad" (cheap) wines, and even experts (Masters of Wine and wine judges) disagree on wine quality (e.g., Ashton, 2012; Hodgson, 2009; Weil, 2001, 2005). A quotation from Robinson (2013, p. 6) illustrates the point:

> I tasted seven non-vintage champagnes blind with a group of professionals recently. There was horror when they discovered the wine most of them preferred carried a label they regarded as their least favorite. That sort of result is especially common with champagne, arguably the most image-driven—rather than quality-driven—wine of all. But it happens all the time when wine is tasted blind.

Further, individuals who are unaware of the price of the wine that they are tasting do *not* derive more enjoyment from more expensive wines and, in fact, "non-experts" enjoy more expensive wines slightly less (Goldstein et al., 2008). fMRI brain scan studies (Plassman et al., 2008) demonstrate that increasing the price of wine increases subjective reports of flavor pleasantness as well as the neural computations of experienced utility made by the brain. This is consistent with the idea that because perceptions of quality are known to be positively correlated with price (Rao and Monroe, 1989), the individual is likely to expect that a more expensive wine will taste better (Brochet, 2001; also Almenberg and Dreber, 2011).

In our study we focus on the relationship between price and WTP. In Section II, we present the conceptual underpinnings of our research. We then describe the data and method we used in the wine-tasting experiment in Section III. The results are discussed in Section IV. Implications for the Australian wine industry and limitations are presented in Section V.

II. Price, Willingness to Pay, and Buying Behavior

As business strategists, we take as our theoretical point of departure a competitive strategy framework grounded in microeconomics (Brandenburger and Stuart, 1996; Collis and Rukstad, 2008; Ghemawat, 2006; Ghemawat and Rivkin, 2006; Porter,

1985; 1996). This approach focuses on the way in which a firm positions itself in an industry to maximize the unique value that it creates. This value equates to the firm's competitive advantage—defined as the difference between the relative WTP that the firm elicits from its customers and the firm's relative cost (in both cases, "relative" means compared with other firms in the industry).[1]

WTP is the maximum price that a customer is willing to pay for a product before switching to a substitute (or forgoing the purchase) under the given circumstances of time and place (Besanko et al., 2007; Ghemawat and Rivkin, 2006; Postrel, 2010; Smith and Nagle, 2002). WTP is not necessarily what the buyer thinks is a fair price or what the buyer wishes to pay—the buyer always prefers a lower price because this maximizes buyer surplus, but will pay any price up to his or her WTP (Corts and Rivkin, 1999). A customer's WTP is driven by a product's (or service's) value proposition—that is, its bundle of perceived benefits (or utility). Value has both tangible and intangible components. Tangible value tends to be associated with functional, objective benefits, while intangible value is associated with subjective (or symbolic) attributes, such as status, uniqueness, and emotional involvement (for a discussion of the tangible and intangible components of value, see Dixit (2007)). A firm creates a competitive advantage by choosing a strategic position in the industry where it can drive a wedge between relative WTP and relative cost. There exists, in theory, an unlimited number of potential strategic positions that could open up a wedge of value.

Within this framework, price—the focus of much of the wine research described above—is a strategic variable that the firm uses to divide the value created into buyer surplus and producer surplus. The difference between relative WTP and price constitutes "buyer surplus," and the difference between price and cost is "producer surplus" (or profit). After a competitive advantage has been established, a firm may choose to attract more buyers by offering them more surplus by setting price closer to cost, in the process forgoing profits. Competition among firms in a market can thus be thought of as a process in which firms, through their product attributes and prices, submit surplus "bids" to buyers, who will then choose the product that offers them, at that point in time and place, the highest surplus (Besanko et al., 2007, p. 352).

A difficulty with this conceptualization is that, in practice, price is often an element of the value proposition, and so a complex interrelationship is established between price and WTP. In the case of luxury goods (including iconic wines), high price is an inherent element of the value proposition—the intangible components of the value proposition such as status rely on price being high enough to confer

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[1] A full analysis of value added would take account of the firm's cost and its suppliers' opportunity cost; see Brandenburger and Stuart (1996). A thoughtful synthesis of the notion of competitive advantage, defined as differential economic surplus created in a particular transaction, is in Postrel (2010).

exclusivity.[2] So-called Veblen effects[3] (Veblen, 1899/1994)—defined as consumers' willingness to pay a higher price for a functionally equivalent (luxury) good—have been modeled theoretically and are well corroborated empirically (see Bagwell and Bernheim, 1996). In these industries, cost plays a minor role in competitive advantage. Conversely, value propositions such as "we won't be beaten on price" tend to reduce WTP, and competitive advantage depends largely on relative cost. In the ultimate case of pure commodities, WTP is equal to price, which will be set purely by supply and demand (Koller et al., 2010). Thus, the marginal cost curve will dictate a firm's short-run supply decisions (Corts and Rivkin, 2000), cost will be the only basis for competitive advantage, and profitability will be simply a function of where the producer sits on the cost curve.

As mentioned in section I, the relationship between extrinsic and sensory wine characteristics and WTP for wine has been the focus of several recent empirical studies. Some of the hedonic pricing studies referred to earlier make reference to WTP (e.g., Schamel and Anderson, 2001). Strategic analysis of WTP, however, differs from hedonic price studies, which predict an equilibrium market price; where each good is characterized by the set of its characteristics, and regression analysis determines how much of the price can be attributed to each of these characteristics.

In a WTP analysis of sensory characteristics, the objective is to examine the maximum that a consumer would pay for the product in question and how the sensory properties (e.g., astringency, bitterness, aroma, and flavor) of the wine influence this amount (Yang et al., 2009, p. 86). Unlike hedonic price studies, Yang et al.'s (2009) analysis uses the contingent valuation (CV) method, in which consumers are presented with price bids on wines to estimate WTP for sensory characteristics. A (non-expert) consumer-preference model, a consumer-intensity model, a trained-panel model, and an instrumental-measurement model are estimated and compared. The consumer-preference model (containing subjective consumer evaluation variables and demographic variables) was the most accurate in predicting a consumer's WTP. As expected, the closer the wine is to the consumer's ideal, the more he or she would be willing to pay for it.

Oberfeld et al. (2009) investigated the effect of ambient light on taste, aroma, enjoyment (the overall rating of how much the participants liked the wine), and WTP. In this study, the participants were simply asked to state the maximum price that they would be willing to pay, rather than using the more sophisticated CV method to determine WTP. In a series of experiments, the researchers found a

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[2] In the fastest-growing luxury goods market in the world, China, the *Economist* (2011: 72) reports: "They [male Chinese consumers] are often willing to pay a large premium over list price for desired items—many believe, for some reason, the more something costs, the better it is."

[3] Or more generally, interaction effects in which preference for a good increases or decreases with the number of people buying them. The "snob effect" is based on perceived exclusivity where price equates with quality (Leibenstein, 1950).

statistically significant effect for ambient light on the overall enjoyment of a wine. Specifically, consumers reported that they liked the wine better when tasted in red or blue light, rather than in green or white light. These consumers were willing to spend over one euro more for the same bottle of Riesling when they tasted it in red light, compared with when they tasted it in green light. It seems that external factors, in this case, light, affect the enjoyment of wine, which in turn influences WTP.

In a recent study by Gustafson et al. (2011) a novel procedure to measure consumer WTP was developed and applied to an experimental situation in retail stores. The researchers find that when supply-side contamination and individual effects are eliminated from the WTP estimates, the valuation that consumers placed on wine varieties increases significantly and much of the WTP for appellations disappears.

Even though the importance of the relationship between the extrinsic factor price and WTP has been recognized by scholars in the field, it has received little attention from empirical researchers. Goldstein et al. (2008, p. 1) point out that "[w]hen symbolic content is an important part of consumption, the enjoyment of a good might become decoupled from its innate qualities. The symbolic content of a price tag has been emphasized in marketing research . . . when goods with similar characteristics differ in price, a reasonable prior is that the more expensive good will, on average, be of a higher quality."

III. Data and Method

Our data were collected in a series of four wine tastings—which we called the Australian Shiraz Challenge—for MBA students at an Australian business school from December 2010 to February 2013. A total of 107 students participated in the experiment.

The experiment was conducted under the following five conditions of price (as the independent variable):

1. Presented price < True price (presented as lowest-price Wine 1, but actually Wine 4)
2. True price = Presented price (low-priced Wine 2)
3. True price = Presented price (midrange-priced Wine 3)
4. True Price = Presented price (high-priced Wine 4)
5. Presented price > True price (presented as highest-price Wine 5, but actually Wine 2)

The true price was the price paid for the wine at a retail wine merchant. While the retail prices of the Australian Shiraz presented in the three tastings varied slightly for pragmatic reasons (see Table 1), the wine-tasting protocol and the

Table 1
Price Conditions of the Experiment (in A$)

Price Condition	Tasting 1		Tasting 2		Tasting 3		Tasting 4		Tasting Means	
	True (retail) Price	*Presented Price*	*True (retail) Price*	*Presented Price*	*True (retail) Price*	*Presented Price*	*True (retail) Price*	*Presented Price*	*True (retail) Price*	*Presented Price*
1	$34.95	$9.50	$42.95	$9.50	$32.99	$9.99	$34.99	$9.50	$36.47	$9.62
2	$15.99	$15.99	$15.99	$15.99	$16.99	$16.99	$15.99	$15.99	$16.24	$16.24
3	$24.95	$24.95	$24.95	$24.95	$24.95	$24.95	$24.95	$24.95	$24.95	$24.95
4	$34.95	$34.95	$42.95	$42.95	$32.99	$32.99	$34.99	$34.99	$36.47	$36.47
5	$15.99	$43.95	$15.99	$47.95	$16.99	$43.95	$15.99	$43.95	$16.24	$44.95

general experimental approach were strictly observed in each tasting. Given the consistent results across the tastings, we aggregated the data for the purpose of statistical analysis.

The wines were presented in brown paper bags to hide the label, but the retail prices were displayed on the tasting form. The displayed prices varied from A\$9.50 to A\$47.95. The critical manipulation (as in Plassmann et al., 2008) was that the participants were actually tasting only three different wines, and two of the wines, Wine 2 and Wine 4, were presented twice. Wine 2 was presented at its actual retail price of A\$16.24 and at a higher price of A\$44.95. Wine 4 was presented at its actual retail price of A\$36.47 and at a lower price of A\$9.62. Wine 3 was presented only once, at its actual retail price of A\$24.95.

A week prior to the wine tasting, we distributed a wine-tasting guide (based on Rankine, 1990), which gave the students pointers on the sensory evaluation of wine. At the beginning of the tasting, it was stressed that every individual's palate is different, and so each person is likely to respond differently to the wines. The point was made that "there is no right answer at a wine tasting." The participants were told that they would be tasting five different wines of the Australian Shiraz variety, representing a range of retail prices. The prices were shown on the tasting sheet. Heeding the methodological advice of Rao and Monroe (1989, p. 356), we ensured strong price manipulation, because the greater the difference in prices, the more likely we would be to detect the impact of price on the dependent variables. The participants were asked to make tasting notes on the form provided, while attempting to identify the region and vintage of each wine and rating each wine on a scale from 1 ("I don't like it at all") to 6 ("I like it very much"). Prior research used various measures of WTP, including open-ended question format, choice-based conjoint analysis, real purchase data (see Miller et al., 2011) and CV (Yang et al., 2009). In our study, we asked the participants to indicate what they would be willing to pay for each of the wines in a retail liquor store. Given the design of the study, it was not possible to use a formal CV method, but because prices were presented to participants, the WTP question was effectively a "one-step" CV test.

At the end of the tasting, we explained to the students that the tasting was actually an experiment that involved an element of manipulation and that the true purpose was to see whether there was a relationship between price and WTP. The participants were told that the return of their completed forms would indicate informed consent. All 107 students who participated in the tastings returned their completed forms. Table 2 presents summary statistics of the participants' socio-demographic characteristics. The majority of the participants were full-time students, male, and novices in terms of their knowledge of wine (i.e., they were non-experts; about one-third indicated that they were "somewhat knowledgeable" about wine), and six participants (just over 5%) identified themselves as "quite knowledgeable" and "connoisseur"; the rest were novices. Approximately half of them were Caucasian, the other half had Asian background, and one participant was African.

Number of participants	*107*
Median age (years)	32 (std. dev. 4.7)
Ethnicity:	
Caucasian	53 (46.1%)*
Asian	42 (36.5%)
African	1 (0.9%)
Gender:	
Male	66 (57.4%)
Female	32 (27.8%)
Status:	
Full-time students	60 (52.2%)
Part-time students	34 (29.6%)
Knowledge of wine:	
Novice	51 (44.3%)
Somewhat knowledgeable	42 (36.5%)
Quite knowledgeable	5 (4.3%)
Connoisseur	1 (0.9%)

*Note that the percentages may not add up to 100% due to missing data or rounding.

We used repeated measures ANOVA to test differences in (1) ratings (appreciation or enjoyment) of all five wines (measured on a scale of 1 to 6, as in Plassmann et al., 2008); (2) WTP (measured in Australian dollars) and (3) consumer surplus/deficit (calculated in Australian dollars as a difference between WTP and price). We also used Pearson correlation (two-tailed) to establish the relationship between rating (appreciation/enjoyment) of wine and WTP for each of the five wines. The results of the tests are presented and discussed below. All reported results were significant at $p < 0.05$ or higher.

IV. Results and Discussion

A. Descriptive Results

In the first instance, we examined how the participants responded to the presented prices and whether these prices influenced their WTP and appreciation. In 86% of the cases, the low presented price decreased WTP, and in 77% of the cases the high presented price increased WTP. Further, an average decrease of $26.85 in presented price resulted in a $15.25 lower WTP, and an average increase of $28.71 in presented price resulted in $10.15 average increase in WTP. The summary results are displayed graphically in Figure 1 and listed in Table 3.

The relationship among price, appreciation, and WTP for the three wines presented at their true prices (Price Condition 2 A$16.24, Price Condition 3 A$24.95, Price Condition 4 A$36.47) were as expected. The relationships for the two
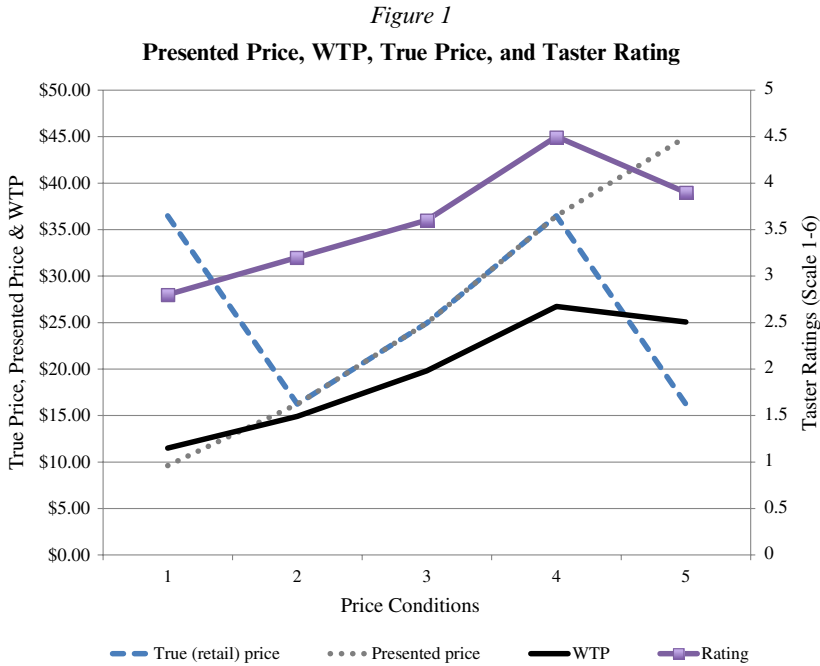
Figure 1

Presented Price, WTP, True Price, and Taster Rating

Table 3

Price Conditions, WTP, Appreciation, and Consumer Surplus (in A$)

Price Condition	Tasting Means		WTP	Appreciation	Consumer Surplus
	True (retail) Price	*Presented Price*	*Mean*	*Mean Rating*	*Mean*
1	$36.47	$9.62	$11.49	2.8	$1.87
2	$16.24	$16.24	$14.91	3.2	− $1.33
3	$24.95	$24.95	$19.80	3.6	− $5.15
4	$36.47	$36.47	$26.74	4.5	− $9.73
5	$16.24	$44.95	$25.06	3.9	− $19.89

wines presented at false prices (Price Condition 1 A$36.47 presented at A$9.62 and Price Condition 5 A$16.24 presented at A$44.95) reveal the influence that the presented price has on appreciation and WTP.

B. Wine Rating (Appreciation) and WTP

The results of the correlation test (Pearson, two-tailed, $p = 0.01$) show that, as expected, the relationship between Appreciation and WTP is strong and statistically significant under all five Price Conditions (0.599, 0.573, 0.619, 0.607, and 0.629, respectively). Table 4 summarizes these results. From these results, we see that wine appreciation and WTP are correlated, as common sense would suggest.

Table 4
Correlation Between Appreciation and WTP Under Five Price Conditions

	Rating 1	*Rating 2*	*Rating 3*	*Rating 4*	*Rating 5*
WTP					
1	.599**				
2		.573**			
3			.619**		
4				.607**	
5					.629**

** Correlation is significant at the 0.01 level (two-tailed).

Table 5
Influence of Presented Price on Appreciation, Repeated Measures ANOVA, Pairwise Comparisons

Price Conditions	*Rating Mean (1–6)*	*Wine*	*Mean Differences in Rating*
1	2.8	2	—.425
		3	− .825*
		4	− 1.670*
		5	− 1.099*
2	3.2	1	.425
		3	− .401
		4	− 1.245*
		5	− .675*
3	3.6	1	.825*
		2	.401
		4	− .844*
		5	− .274
4	4.5	1	1.670*
		2	1.245*
		3	.844*
		5	.571*
5	3.9	1	1.099*
		2	.675*
		3	.274
		4	− .571*

Based on estimated marginal means.
* Significant at the < .05 level.
Adjustment for multiple comparisons: Bonferroni.

C. Presented Pricing and Rating (or Appreciation)

The results of the ANOVA test ($F = 28.21$; $df = 1,105$) (see Table 5) show that the differences in ratings were statistically significant.

In terms of differences in ratings, the most pertinent result was the lower rating given to Price Condition 1 compared with Price Condition 4 (2.8 vs. 4.5), and

the higher rating given to Price Condition 2 when presented as Price Condition 5 (3.9 vs. 3.2), when in fact they were the same wines, just presented at different prices. These results point to a complex interaction between wine appreciation and price and are consistent with the findings of Goldstein et al. (2008) that non-experts struggle to assess wine quality without price signals. The significantly different ratings given to the same wine confirms earlier studies demonstrating that non-experts have trouble distinguishing between wines based on sensory characteristics (Weil, 2001, 2005).

We conducted a number of specific tests to more closely analyze the impact of price on appreciation.

(1) Same wine test

False Low Price—Price Condition 1 ($36.47 presented at $9.62) and Price Condition 4 ($36.47). The statistically significant differences in ratings (2.8 and 4.5 for Price Conditions 1 and 4, respectively) confirm the strong influence of a false low price on Appreciation.

False High Price—Price Condition 2 (A$16.24) and Price Condition 5 (A$16.24 presented at A$44.95). The statistically significant difference in ratings (3.2 and 3.9) confirms the influence of a false high price on appreciation. The false high presented price influences appreciation upward, but not to the same extent as the false low price lowers appreciation. These results suggest that it may be easier to influence appreciation downward with low price than shift appreciation upward with high prices: consumers can be more easily "talked down" on price than "talked up."

Almenberg and Dreber (2012) used an experimental setup to examine the relationship between taste, price, and rating of a good, but without the element of deception used in our study. The results in the Almenberg and Dreber (2012) study suggest, contrary to our findings, that wine consumers can be more easily "talked up" than "talked down." The findings of neither study are conclusive, and this suggests an important area for further research.

(2) Different Wine Test

True Prices—Price Condition 2 (A$16.24) and Price Condition 4 (A$36.47). The significant difference in ratings (3.2 vs. 4.5) confirms the relationship between true price and appreciation. The non-expert tasters in our study appreciated the more expensive wine more, but it is not possible to ascertain whether this is the result of appreciation of intrinsic wine characteristics or the price signal. The findings of Goldstein et al. (2008) that non-expert wine consumers do not appreciate more expensive wine more suggest that our result may be due to the price signal.

False Prices—Price Condition 1 (A$36.47 presented at A$9.62) and Price Condition 5 (A$16.24 presented at A$44.95). The significant difference between the appreciation of Price Conditions 1 and 5 (2.8 vs. 3.9)—the tasters preferred a $16 wine more than a $36 wine!—indicates that the false presented prices overwhelmed differences in

Table 6
Tasters' Comments

Participant ID	Wine 1 ($34.95 presented at $9.50)	Wine 4 ($34.95 presented at $34.95)
ID8	Has "bite"	Distinct flavor, smooth
ID11	Vinegary, didn't like the initial taste, but enjoyed the aftertaste	I like this one, has complexity
ID12	Smell: mainly alcohol; taste: apricot, slightly acidic	Smell: red fruit; taste: balanced, fruity
ID26	Light flavor for Shiraz, but spicy	Lots of spices, good with steak
ID28	Tart	Smooth
ID29	Light, mild aroma	Fuller, smooth after taste
	Wine 2 ($15.99 presented at $15.99)	*Wine 5 ($15.99 presented at $43.95)*
ID2	Astringent, sharp	Balanced, hint of oak, lingering, "plum"
ID5	Vanilla, bit of oak, no "brown" sign of age	Seems to be well balanced
ID8	Too fruity	A bit dry
ID13	Young, apricot, musky	Oaky, nutty, clean, and complex
ID21	A bit bland initially, not much aroma	Smooth, woody
ID23	A little more acidic	Best of the lot, very nice
ID25	Don't like the taste, quite boring	Very fruity, quite "muddy" taste

intrinsic wine quality. These tests present compelling evidence that presented price significantly affects wine appreciation.

The quantitative results were supported by the tasters' comments where opposing evaluations were given to the same wine, for example (from Tasting 1); see Table 6.

D. Presented Price and Willingness to Pay

The repeated measures ANOVA test ($F = 63.35$; $df = 1,100$) was used to analyze whether there were any statistically significant differences in participants' WTP for the wines (see Table 7).

As with the relationship between presented price and appreciation, by looking more closely at the conditions in which presented price was different from true price, we can conduct several tests on the relationship between price and WTP. A visual examination of the results (see Figure 1) suggests that the effect of price on WTP appears to be more pronounced than in the case of appreciation.

(1) Same wine test

False Low Price—Price Condition 1 (A$36.47 presented at A$9.62) and Price Condition 4 (A$36.47). The statistically significant differences in WTP—A$11.49 and A$26.74 for Price Condition 1 and Price Condition 4, respectively—show that the false low price has strongly influenced (reduced) WTP.

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Table 7

Influence of Presented Price on Willingness to Pay, Repeated Measures ANOVA, Pairwise Comparisons (in A$)

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Price Conditions	Mean WTP	Wine	Mean Difference in WTP
1	$11.49	2	− 3.416*
		3	− 8.306*
		4	− 15.243*
		5	− 13.564*
2	$14.91	1	3.416*
		3	− 4.891*
		4	− 11.827*
		5	− 10.149*
3	$19.80	1	8.306*
		2	4.891*
		3	− 6.936*
		5	− 5.258*
4	$26.74	1	15.243*
		2	11.827*
		3	6.936*
		5	1.678
5	$25.06	1	13.564*
		2	10.149*
		3	5.258*
		4	− 1.678

Based on estimated marginal means.

* Significant at the < .05 level.

Adjustment for multiple comparisons: Bonferroni.

False High Price—Price Condition 2 (A$16.24) and Price Condition 5 (A$16.24 presented at A$44.95). Again, the statistically significant differences in WTP (A$14.17 and A$25.96 for Price Condition 2 and Price Condition 5, respectively) suggest that the false high price influences the participants' WTP upward. These results suggest that just as it may be easier to influence appreciation downward with low prices than shift appreciation up with high prices, the same is true for WTP.

(2) Different wine test

True Prices—Price Condition 2 (A$16.24) and Price Condition 4 (A$36.47). The significant differences in WTP (A$14.91 and A$26.74 for Price Condition 2 and Price Condition 4, respectively) confirm the relationship between true price and WTP. These non-expert tasters were willing to pay nearly twice as much for Price Condition 4 than for Price Condition 2, reflecting the relativity of the true price signals.

False Prices—Price Condition 1 (A$36.47 presented at A$9.62) and Price Condition 5 (A$16.24 presented at A$44.95). The significant difference between the WTP of Price Condition 1 (A$11.49) and 5 (A$25.06) indicates that the false presented

prices overwhelmed the higher quality of wine under Price Condition 1 (again, assuming quality is a function of true price). Because of the false presented prices, participants were willing to pay twice as much for a wine whose true price was less than half. These tests show that presented price significantly affects WTP.

E. Consumer Surplus

Based on the results of the previous tests, it is clear that WTP and appreciation respond very strongly to price signals—a higher presented price resulted in a higher WTP. However, the increase was not sufficient to create consumer surplus (the difference between WTP and presented price), as evidenced by the mostly negative numbers that we obtained when computing consumer surplus (Table 3). Only for Price Condition 1 did consumer surplus exist (WTP A$11.49; presented price A$9.62, consumer surplus of A$1.87); the rest of the price conditions result in consumer deficits (means–A$1.33;–A$5.15;–A$9.73;–A$19.89 for Price Conditions 2, 3, 4, and 5, respectively). Based on these results, the tasters in the study would buy only the cheapest wine, most likely indicating that, as consumers, they have a generally low WTP for wine. Further, their consumer surplus decreased as price increased.

This is perhaps not unexpected, given the demographics of the participants in the study and that they are non-expert wine consumers. Their low WTP is indicated by the fact that all three wines presented at their actual retail price did not generate WTP equal to the price. Assuming that the wine merchant has set the price approximately correctly, WTP should be at least equal to price (otherwise, the store would not be selling any wine). It would seem that lowering the price of "good" wine generates sales, but lowers WTP, and that increasing the price of poorer quality wine increases WTP, but not to the extent that it generates sales. The strategic implication, based on the results of our experiments, is that moving down market is much easier than moving up market. This is at the heart of the strategic flaw embedded in the Australian wine industry's Strategy 2025 discussed in Section V.

V. Strategic Implications for the Australian Wine Industry

The findings of our wine-tasting experiment demonstrate the complex, dynamic relationship that exists between the key factors that determine the buying decisions of (non-expert) wine consumers. Consumer choice is determined by buyer surplus and the difference between the WTP and the price, and yet for non-expert wine drinkers WTP is itself strongly influenced by price. This relationship is at the heart of the competitive dynamics that exist in a market with multiple firms vying for market share, and hence has strategic implications for the wine industry. We suggest that an understanding of the relationship between price and WTP

can be used to shed light on the crisis experienced by the Australian wine industry in 2009.

The Australian wine industry crisis (Reuters, 2009) followed the fifth boom in the history of the Australian wine industry (Osmond and Anderson, 1998). Researchers, wine company executives, and industry observers have offered a variety of (often conflicting) explanations of the crisis. Not surprisingly, they have consequently arrived at different conclusions as to what should be done (see Love, 2010; Robinson, 2010; WFA et al., 2009). The fifth boom was directly associated with the much-lauded (Anderson, 2000) industry plan Strategy 2025, which was championed by leading industry bodies. The plan envisioned a three-stage approach to expanding Australia's position in international wine markets:

1. Volume growth (1996–2002), during which rapid vineyard expansion would overcome product shortages, thereby enabling expansion in existing markets and penetration of new markets;
2. Value growth (2002–2015), which would place increased emphasis on building brand strength, market share, and margins; and
3. Pre-eminence (2015–2025), when Australia would have established brand leadership in specific market segments.

The Australian wine industry—both wine producers and grape growers—rushed headlong into stage 1 of the plan, surpassing the 2025 volume target in 2005. Although Australia succeeded in growing both volume and value in absolute terms, by the turn of the century, unit prices (in local currencies) declined dramatically in the key markets (United States and U.K.). In contrast, over the same timeframe, France and Italy, Australia's main competitors in these markets, managed to continually increase their unit prices (Lewis et al., 2013).

We suggest that Strategy 2025 had a fundamental strategic flaw, which stemmed from the inherent relationship between consumer WTP and price, the focus of our experimental study. The dramatic expansion of the industry was achieved by offering "good-quality" wine—wine for which WTP was initially high relative to competitive offerings—at "value-for-money" prices in the major international markets. This strategy gained the support of the large retailers, who sought an ever-larger market share by offering high consumer surplus using low price as their main competitive weapon.

Strategy 2025 implicitly involved a strategy of "buying" market share using price. In time, low price signaled low quality in the mind of consumers, who—as previous research (e.g., Goldstein et al., 2008) and this study show—struggle to make accurate assessments of the intrinsic quality of wine. As a result, WTP progressively decreased. The flaw in Strategy 2025 was that using price as the main competitive weapon to first build volume diminished WTP, and this led to a commoditization trap. The strategic flaw was then compounded when, in order to maintain profitability, the large Australian producers sought ways to lower costs (Smart, 2010), and this had

the result of lowering intrinsic wine quality, reinforcing the perception of consumers, and further lowering WTP. This was a classic commoditization trap (D'Aveni, 2010) with falling WTP, decreasing prices, and shrinking margins. After the market was commoditized, the only basis for competitive advantage was cost. The situation was made worse by the increasing competition from other New World wine producers with lower cost structures, which could offer similar quality wine at lower prices and still remain economically viable. The strengthening of the Australian dollar after 2001—following a half-decade of weakening—further exacerbated the situation (Anderson and Wittwer, 2013). Australian wine producers now face a major problem because, as our study shows, it is easier to increase consumer surplus by lowering price than it is to increase consumer surplus by using price signals to increase WTP. Reducing supply will not automatically increase WTP and rebuilding "Brand Australia" may prove to be hard work in markets where Australian wine has come to be equated with "cheap wine."

Our study has a number of obvious limitations. The sample was one of convenience, rather than representing a cross-section of the population. Further, it was biased toward well-educated, relatively young, male professionals, who were largely non-expert wine consumers. This limits our ability to generalize the results. Even so, the study indicated strong and statistically significant relationships between key factors involved in wine-buying behavior, leading us to believe that replicating this study on a larger, carefully defined sample would be a useful avenue for further inquiry.

A more general limitation is that argued by Postman (2010), who warned that results from experimental settings (e.g., blind tastings) might not translate to everyday settings where people buy and consume wine. In reviewing the results of the Plassman et al. (2008) study, he argues that "blind tasting has little to do with the real life experience of tasting wine" (Postman, 2010, p. 185). In the real world, the relationships among appreciation, price, willingness to pay, and intrinsic wine quality are extremely complex and subject to many hard-to-measure intervening variables—the wine that we so enjoyed with our partner at a beautiful vacation setting may taste different when we taste it at home. Postman suggests that the findings of blind-tasting studies may, to some extent, be artifacts of the process used to obtain them.

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