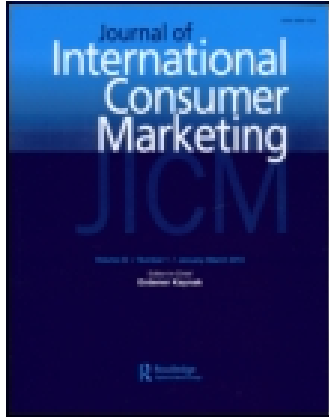


This article was downloaded by: [California State University of Fresno]

On: 29 September 2014, At: 16:33

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal of International Consumer Marketing

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/wicm20>

Factors that Affect Willingness to Pay for Red Wines in China

Pei Xu^a & Y. C. Zeng^b

^a Department of Agricultural Business at California State University-Fresno, Fresno, California, USA

^b School of Agricultural Economics and Rural Development at Renmin University of China, Beijing, China

Published online: 25 Sep 2014.

To cite this article: Pei Xu & Y. C. Zeng (2014) Factors that Affect Willingness to Pay for Red Wines in China, Journal of International Consumer Marketing, 26:5, 426-439, DOI: [10.1080/08961530.2014.928606](https://doi.org/10.1080/08961530.2014.928606)

To link to this article: <http://dx.doi.org/10.1080/08961530.2014.928606>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Factors that Affect Willingness to Pay for Red Wines in China

Pei Xu
Y. C. Zeng

ABSTRACT. This study analyzes the impact of education on Chinese consumers' willingness to pay for domestically produced and imported red wines. It uses a conjoint choice experiment and survey data gathered from China's major red wine market in Beijing. A conditional logit and a mixed logit model suggest that (1) Chinese consumers are sensitive to price change and they seek reasonably priced, aged, and branded wines; (2) high-end French wines are the most preferred wines; (3) if education is not considered, consumers are willing to pay a premium to switch from a Chinese wine to a California wine; (4) if education is considered, consumers prefer Chinese wines better than California wines; and (5) a group of job-preparing school graduates is willing to pay a premium for California wines. Our new data show that a new consumer segment with a weaker educational background is an emerging red wine consumption group.

KEYWORDS. Red wine consumption, education impact, willingness to pay, red wine in China, conjoint analysis, California red wines

INTRODUCTION

China's consumption of imported red wines has been dramatically increased due to expanded per capita income, an emerging new consumption trend representing Western lifestyles, and consumers' curiosity about imported food (Balestrini and Gamble 2006; *China Daily* 2009; T. S. Wang and Mao 2009; Zhan and He 2012). China's wine consumption has tripled from 1995 to 2012 (OIV 2013; OIV Statistical Report 2013) and it is now the world's largest

consumer of luxury Hennessy Cognac (*China Daily* 2009). China's predicted overall luxury wine consumption will show the strongest growth in the upcoming decade (Balestrini and Gamble 2006; B. P. Zhang and Kim 2013). In contrast, luxury wine demand from the United States, European countries, and Japan have revealed a relatively slow, and even negative, growth (*People's Daily Online* 2011). Indeed, China has attracted the attention of domestic Chinese and international wine marketers to respond to its rapid rise in demand. Wine

Pei Xu is affiliated with the Department of Agricultural Business at California State University–Fresno, Fresno, California, USA. Y. C. Zeng is affiliated with the School of Agricultural Economics and Rural Development at Renmin University of China, Beijing, China.

Address correspondence to Pei Xu, California State University–Fresno, Department of Agricultural Business, 5245 N. Backer Avenue, M/S PB101, Fresno, CA 93740-8001, USA. E-mail: pxu@csufresno.edu

marketers from France (42.74% of China's all import value), Australia, Italy, and the United States are but some of the international sellers seeking an opportunity to expand their market share in China (*China Newsnet* 2012; *China Daily* 2013). The United States' red wine export to China was \$74 million dollars in 2012, an 18% increase over its 2011 export. Ninety percent of American red wines are from California. Though the Chinese market has become California's fifth-largest red wine export destination, red wine shareholders in California have little knowledge about the red wine preference in China (Lockshin 2014; Wine Institute 2013). International wine makers and marketers, wine policy planners, and other shareholders have sought an improved understanding about China's red wine consumption trend. With the new knowledge they seek to better serve the needs of Chinese consumers and to accomplish higher profit margins.

This study focuses on Chinese consumers' price willingness to pay (WTP) for domestic and imported wines. Being able to understand price acceptability can help wine businesses plan an appropriate marketing strategy. This study also addresses the impact of education on wine choices. In the Chinese context, consumers' educational background was found to greatly affect their food choices (F. Wang et al. 2009; Xu et al. 2012; Xu, Wang, and Song Forthcoming; Zeng and Wang 2007; H. Y. Zhang and Wang, 2009). For instance, Chinese consumers with a higher educational background tend to choose government-certified-safe pork than those with a lower education (Xu, Wang, and Song Forthcoming). The impact of education on red wine choices can be profound, given red wine's sophisticated product attributes. Our sample was collected from Beijing, China's largest wine market, which still grows 25%–30% annually (*China Daily* 2012). About 31% of this city's residences hold an undergraduate degree, and the food choices of this highly educated group were found to deviate from China's other consumer segments (National Bureau of Statistics of China, published statistics in 2011; Xu and Wang Forthcoming). This study emphasizes red wines purchased for personal consumption rather for

gift purchases. It aims to contribute to the international wine marketing literature by focusing on the impact of education, as well as price, country of origin (COO), wine age, and wine brand on Chinese red wine choices.

LITERATURE REVIEW

Research about China's red wine consumption is particularly scant, despite the fact that China is the world's fifth-largest importer of major wines (OIV 2013). A paucity of published research has looked into the impact of price, COO, and brand on Chinese wine choices. For instance, Yu and colleagues (2009) used survey data to show that a bottle priced at \$4–\$10 is preferred for a family occasion, and a bottle at \$39 is favorable for a gift occasion. Balestrini and Gamble (2006) noted that China's wine market has a potential to grow and that Chinese consumers lack knowledge about red wines. They showed that many Chinese evaluate wine quality from where the wine is produced (COO), and the impact of COO on wine choice becomes even more significant if the wine is bought for business uses. Furthermore, red wine retailers often display red wines according to the country in which the wine was produced, making it easier for consumers to use COO as a choice criterion (Chaney 2002). Chinese were also found to value branded wines and to relate branded wines with success, prosperity, and enhanced social status. A sample gathered from Shanghai and Guangzhou, China's two wealthiest cities, shows that red wine lovers believe branded red wines represent the Western lifestyle, good social image, and elegant behavior (Liu and Murphy 2007). Camillo (2011) identified brand and price as two primary factors that affected wine consumption choices. However, none of these published studies has quantified the impact of price change on wine choices.

The one study that looked into the impact of education on Chinese wine choices used a simple Pearson correlation to show that consumers with a higher education degree are more likely to purchase an expensive wine (Camillo 2011). In the Western literature, consumers' education

TABLE 1. Reviewed Studies to Support Attribute Selection

	Authors and year of publication	Product and findings
COO on wine selection	Keown and Mura 1995	COO was the most important factor affected wine selection in Northern Ireland.
	Skuras and Vakrou 2002	COO contributes to WTP in Greece.
	Balestrini and Gamble 2006	Chinese consumers use COO to evaluate wine quality.
	Li, Hu, and Zhuo 2006	35% of respondents in Shanghai and Hangzhou China rely on COO to make wine choice.
	Yu et al. 2009	For private occasions, Chinese wines tend to be the first choice. For gift or business dinner, French wines are the first choice for Chinese.
	Camillo 2011	COO was the second-most-important factor, and price was the fifth factor that affected Chinese consumers' wine selection.
Price on wine selection	Assael 1995	Price is an important cue to quality in wine choice.
	Lockshin and Horowitz 2002	Quality-conscious consumers use price to judge wine quality.
	Liu and Murphy 2007	Examined Shanghai and Guangzhou consumers' wine behavior and found that the higher the wine price signals the higher social status.
	Yu et al. 2009	Beijing consumers tend to purchase cheap wine for daily consumption and expensive wine for a business dinner or gift.
	Camillo 2011	Price is positively correlated with one's education and salary.
	Mann, Ferjani, and Reissig 2012	Price is more important than COO in affecting organic wine choice.
Brand on wine selection	Atkinson 1999	Brand is perceived to be more important than price and COO to determine wine quality.
	Orth and Krsha 2002	Wine brand acts as a quality signal.
	Lockshin et al. 2006	Australian consumers are willing to pay less for national big brand but more for small brand wines.
	Gergaud and Livat 2007	Knowledgeable consumers tend not to use brand but use price to evaluate wine quality.
	Camillo 2011	Chinese consumers use brand as the most important factor to evaluate wine quality.
Wine age on wine selection	Mtimet and Albisu 2006	Spanish consumers value wine age on wine choice.

background was found to positively affect Canadians' white wine consumption (Bruwer, Leschaeve, and Campbell 2012). Famularo, Bruwer, and Li (2010) used a sample *t*-test to show that those with a higher education tend to consume more white wines. St. James and Christodoulidou (2011) interviewed California wine consumers and used a correlation matrix to show that university graduates esteem wine because wine tastes good, it is sociable and fun, and it is good for health. These published studies have commonly applied simple statistical methods, and none of them has applied an econometric framework to calculate the impact of education on wine choices. Table 1 summarizes the previous findings about how COO, price, wine age, and wine brand could affect wine choices. The literature suggests that we include these four

attributes in our analysis. We also pretested our questionnaire with 10 randomly selected red wine consumers in Beijing, and these consumers confirmed that they consider these four attributes when purchasing red wines.

DATA

This study applies a choice-based conjoint (CBC) analysis to estimate price WTP. Batsell and Lodish (1981) initiated a CBC framework to estimate the probability that an individual consumer will choose one product out of several alternatives. The CBC framework can be used to evaluate trade-offs between selected product attributes (Lusk and Hudson 2004). The major drawback of the CBC method is its estimation

bias resulting from overstating WTP in a hypothetical situation (Cummings, Harrison, and Rutstrom 1995). To evaluate the negative impact of potential estimation bias, Lusk and Schroeder (2004) compared consumer responses to hypothetical versus nonhypothetical questions, and they discovered that WTP estimates were not different at a statistically significance level across the two settings. The second drawback of the CBC experiment is related to the reliability of gathered information when respondents were given repeated questions. When respondents are asked to complete a large set of repeated questions, they may lose focus. To minimize this problem, we asked each respondent to complete three repeat questions only. According to Lusk and Norwood (2005), large experimental designs with more repeated questions do not necessarily perform better than small experiments with fewer repeated questions. We first selected attributes and attribute levels through a preliminary interview with Beijing consumers. Table 2 shows the selected attributes and their levels. We then used a random method to generate 36 cards from a full factorial design, using SAS programming. The random method ensures zero correlation among the selected attributes, and it is also flexible in estimating interactions of attributes (Lusk and Norwood 2005). We asked each respondent to complete three repeated questions (three cards) by picking their most preferred option out of four available options. These four options include an opt-out option if the respondent is not interested in purchasing any available product (figure 1). Using information gathered from

TABLE 2. Selected Attributes and Attribute Levels

Attributes	Levels
Country of origin	China U.S. France
Price	80 Yuan/bottle 150 Yuan/bottle 280 Yuan/bottle
Years	Two Five Ten
Brand	Branded Not branded

the card questions, this study applies a conditional logit econometric model to estimate the effect of each selected attribute on wine choices. It then uses a mixed logit model to estimate an interaction term of education and COO on the demand of domestic Chinese and imported red wines from California and France.

The questionnaire includes 54 questions in five sections: (1) red wine consumption frequency, quantity, and expenses; (2) retail venues used and factors affecting purchase; (3) effect of brand, wine age, and consumption occasions on wine purchases; (4) consumption frequency, quantity, expenses for imported wines; and (5) demographics. The questionnaire information was gathered in Beijing's four districts of Chaoyang (23%), Xicheng (32%), Haidian (16%), and Dongcheng (29%) in spring 2012. Graduate students from a Chinese university visited supermarkets and food stores in the selected districts to administrate

FIGURE 1. A Sample Card

Assume you are buying a bottle of red wine for your family; please pick your MOST preferred product from the four listed.				
	Country of origin	Price	Year	Brand
1	China	80 Yuan	Two	Branded
2	U.S. California	150 Yuan	Five	Not branded
3	France	280 Yuan	Five	Not branded
4	I prefer none of the listed product			

TABLE 3. Demographics

	Frequency	%
Age		
20–25	32	14%
25–35	90	39%
36–45	59	25%
46–55	29	13%
Above 55	22	9%
Total	232	100%
Gender		
Male	97	41%
Female	137	59%
Total	234	100%
Marital status		
Married	179	78%
Not married	47	21%
Other	3	1%
Total	229	100%
Education		
Middle school or below	11	4%
High school or technical school	54	23%
Job training college	37	16%
Bachelors	89	38%
Masters or PhD	45	19%
Total	236	100%
Before tax household monthly income Chinese Yuan		
Less than 3000	13	6%
3,000–5,000	29	12%
5,001–7,000	39	17%
7,001–9,000	29	12%
9,001–11,000	23	10%
11,001–13,000	22	9%
13,001–17,000	23	10%
17,001–23,000	29	12%
Above 23,001	29	12%
Total	236	100%
Job		
State owned	64	38%
Large private owned	62	37%
Foreign owned	45	27%
Other	30	18%
Small private owned	18	11%
Chinese foreign joint owned	14	8%
Total	169	100%

the survey. Interviews took place in Beijing's two largest supermarkets of Carrefour (36%) and Wal-Mart (30%) and other mid- and small-sized food stores (34%). Carrefour and Wal-Mart carry large assortments of imported red wines, which provided us an opportunity to interview shoppers of domestic and imported red wines. Data collection was conducted around the 2012 Chinese New Year when consumers shopped for holiday gifts. Graduate students first approached the respondents and

asked if they were willing to participate in the survey. If they were, the survey would start by students reading the confidentiality agreement to the respondent and having the respondent fill in the questionnaire. Each interview took about 15 minutes. A total of 236 observations are used in this analysis.

Respondents' demographic profiles are presented in table 3. More respondents were between 25–45 years old (64%); fewer respondents were younger than 25 (14%) or older than 55 (9%). Respondents under 18 years old were not included in the interview because the legal drinking age in China is 18. The sample includes more females (59%) than males (41%) and more married consumers (78%) than not married (21%). Many respondents have a high school degree or a vocational college certificate (39%), and a majority hold a bachelors' or higher degree (57%). The sample's education level is higher than the population education statistics in Beijing. According to China's National Bureau of Statistics (2011), 31.5% of Beijing residences hold a bachelor's degree, and in our sample 38% of the respondents held a bachelor's degree. Our sample also has 19% of the respondents holding a master's or a PhD degree. It might be that the two largest supermarkets are where highly educated consumers tend to shop. Income seems evenly distributed across groups: 35% of our respondents made an income of 7,000 Yuan or less (\$1,111/month, US\$1 = 6.3 Chinese Yuan), 31% between 7,001 and 13,000 Yuan (\$1,111–\$2,063), 22% between 13,001 and 23,000 Yuan (\$2,064–\$3,650), and only 12% are in the wealthiest group who earns more than 23,001 Yuan per month (\$3,651). Over two-thirds of the respondents work for large state-owned companies (38%), or large private-owned companies (37%). Respondents' high educational background also explains why many of them work for a foreign-owned company (27%), which often requires a strong educational background. Only a few work for small private-owned companies (11%) or a Chinese-foreign jointly owned company (8%). Of those who selected "other jobs," some are retired, laid off, or reported that they are students.

Table 4 presents California red wine consumption behavior. Among the 236

TABLE 4. California Red Wine Consumption Behavior

<i>n</i> = 236	Count	%
	Have bought California red wines.	
Yes	66	28%
No	165	70%
Not sure	5	2%
Total	236	100%
	Do you like California red wines?	
Yes	114	52%
No	105	48%
Total	219	100%
	Why do you like California red wines? (multiple choice)	
Like its taste	71	62%
Brand is good	52	46%
Good quality	34	30%
Price is reasonable	30	26%
Color is good	22	19%
Friend recommendation	16	14%
Alcohol level is right	16	14%
Package looks good	10	9%
Label provides sufficient information	6	5%
I have been drinking it for a long time	3	3%
Other reasons	2	2%
Products are often on sale	1	1%
	Why do you not like California red wines? (multiple choice)	
Never had it before	49	47%
Do not like its taste	21	20%
Price is too high	12	11%
Like red wines from other countries	6	6%
Other reasons	6	6%
Like Chinese red wines	5	5%
Brand is bad	3	3%
Do not trust its quality	3	3%
Price is too low	2	2%
Friends criticized it	2	2%
Label does not provides enough information	2	2%
Color is not right	1	1%
Appearance is not good	1	1%
Alcohol level is too high	1	1%
Alcohol level is too low	1	1%
	Do you believe California red wines are better than Chinese red wines?	
Yes	34	30%
No	69	60%
Not sure	10	9%
No answer	1	1%
Total	113	100%
	For your family use, are you willing to buy California red wines?	
Yes	131	56%
No	102	44%
Total	233	100%
	For pleasing your guests, are you willing to buy California red wines?	
Yes	169	72%
No	67	28%
Total	236	100%
	For gift purposes, are you willing to buy California red wines?	
Yes	177	75%
No	59	25%
Total	236	100%

(Continued on next page)

TABLE 4. California Red Wine Consumption Behavior (*Continued*)

<i>n</i> = 236	Count	%
Compared to Chinese red wines, are you willing to pay more for California red wines?		
Yes	124	43%
No	110	57%
Total	234	100%
How much more are you willing to pay for California red wines?		
1–10%	24	20%
11–20%	51	42%
21–30%	23	19%
31–40%	8	7%
41–50%	6	5%
more than 50%	9	7%
Total	121	100%
If you choose to purchase California red wines, are you going to buy more/less than what you do now?		
More	14	6% (8%)
Do not change	162	70%
Less	54	24% (29%)
Total	230	100%

respondents who have heard about California wines, 66 had bought the wines (28%). Some respondents did not buy the wines but have heard about the wines from different sources. A total of 114 respondents (52%) like California wines. Respondents were asked to choose from a given list of reasons of why they liked the wines. For this multiple-choice question, the top four most popularly selected reasons are: (1) like its taste (61%); (2) brand is good (46%); (3) good quality (30%); and (4) price is reasonable (26%). A total of 105 respondents do not like California red wines, and the top three reasons are: (1) never had it before (47%); (2) do not like its taste (20%); and (3) price is too high (11%). Of the 114 respondents who like California red wines, 34 (30%) believe that California red wines are better than Chinese wines; 69 believed California red wines are not better than Chinese wines, and 10 (9%) are not sure about which country's wines were better; one respondent left this question unanswered. Even though only about one-third of the respondents believe California wines are better than the Chinese alternative, they are willing to try California wines for family occasions (56%), to please their guests (72%), or for gift purposes (75%). Many respondents are willing to pay more for California wines than for Chinese wines: 42% of the 124 respondents are willing to pay 11%–20% more, and 38%

are willing to pay 21% or more for a bottle of California wine than a Chinese wine. Six percent of the respondents plan to purchase 8% more wine than they do now after they switch to California wines, but 24% of them plan to purchase 29% less, while most of them would not change the purchase quantity after the switch. Interestingly, preliminary statistics seem to reveal that even though many respondents do not believe that California wines are better than domestic Chinese wines, they are willing to try California wines and are willing to pay a good price for them. Perhaps California wines are considered as suitable to please their guests or to use as an appropriate gift. For both occasions, they seek a foreign-made rather than a domestic wine.

Reported purchase venues for California wines are shown in table 5. Large supermarkets are most popularly visited for the purchase of California wines (64%), followed by liquor stores (14%), and mid- or small-sized supermarkets (9%). Respondents are less likely to visit duty-free shops (4%), online stores (3%), and alcohol wholesalers (2%). About one-third of them believe that a higher wine price signals better quality, but more of them (48%) are not sure if such reasoning exists, and 20% of them believe price does not indicate quality at all. Even though many respondents have often purchased

TABLE 5. Purchase Venues of California Red Wines

Where do you most often shop for red wines?		
Large supermarkets	117	64%
Liquor stores	25	14%
Mid- or small supermarkets	17	9%
Other	8	4%
Duty shop	7	4%
Online	6	3%
Alcohol wholesalers	3	2%
Total	183	100%
Do you agree that "high red wine prices indicate high quality"?		
Yes	74	32%
No	45	20%
Not sure	109	48%
Total	228	100%
Do you often purchase food online?		
Yes	85	37%
No	146	63%
Total	231	100%
Are the foods bought online good in quality?		
Yes	90	39%
No	140	61%
Total	230	100%
Do you agree that "it is popular to buy red wines online"?		
Yes	73	32%
No	158	68%
Total	231	100%

foods online (37%), and many agree the foods they bought online are good in quality (39%), very few of them have purchased red wines online (3%). However, about one-third of them perceive that purchasing red wines online is popular (32%) in China.

MODEL

We assume respondent profiles are the same across the sample, and thus it is appropriate to use a conditional logit model to estimate the impact of each selected attribute on derived consumption utility (McFadden 1974). The probability P_{ij} that an individual i will choose alternative j from choice set C is the probability that the utility associated with choice j is greater than the utility associated with all other k choices in the same choice set:

$$P_{ij} = P(\beta x_{ij} + \varepsilon_{ij} > \beta x_{ik} + \varepsilon_{ik})$$

$$P_{ij} = P(\varepsilon_{ij} - \varepsilon_{ik} > \beta x_{ij} - \beta x_{ik}), j \neq k$$

Assuming the error terms ε are independent and identically distributed with a Weibull-Gnedenko, extreme value distribution, P_{ij} is:

$$P_{ij} = \frac{\exp(\beta x_{ij})}{\sum_{k=1}^j \exp(\beta x_{ik})}$$

The conditional logit model is used to estimate this main effect model:

$$utility = \beta_1(China) + \beta_2(CA) + \beta_3(France) + \beta_4(price) + \beta_5(5year) + \beta_6(10year) + \beta_7(brand)$$

The first three coefficients estimate the COO impact on derived utility, and they are estimated relative to the opt-out option. We estimate the "five-year" and "10-year" coefficients relative to the "two-year" coefficient, and the "two-year" variable is omitted. The "branded" coefficient is estimated relevant to the "no-brand" coefficient, and the "no-brand" variable is omitted as well. In the conditional logit model, x represents product attributes only.

In order to control heterogeneity of respondents' individual specific characteristics, we apply a mixed logit model to estimate the interaction between individual specific characteristics and selected product attributes (Colombo, Calatrave-Requena, and Hanley 2007; Train 2003). The mixed logit model is used to estimate this education interaction model:

$$utility = \beta_1(China) + \beta_2(CA) + \beta_3(France) + \beta_4(price) + \beta_5(5year) + \beta_6(10year) + \beta_7(brand) + \beta_8(CA * education2) + \beta_9(CA * education3) + \beta_{10}(China * education2) + \beta_{11}(China * education3) + \beta_{12}(France * education2) + \beta_{13}(France * education3)$$

The "education" variable is defined as: Education 1—high school or below; Education 2—

vocational schools; Education 3—bachelor's degree or above.

The vocational schools in China include a lower level of job-preparing high schools and technician training schools, both accepting middle school graduates. Graduates from these lower-level job-preparing schools receive a high school equivalent certificate. The higher level of vocational schools include technician colleges and specialized job-preparing colleges. Students spend two to three years learning specific job-related skills to prepare themselves for a preassigned job. The aims of the vocational schools are to: (1) provide skilled workers for China's manufacture, service, and its agriculture industries; and (2) train migrant workers to help them locate jobs in the urban areas (Wikipedia 2010). Statistics show that since 2009, China's lower-level job-preparing schools alone have graduated about 6 million qualified workers annually (Beijing Language and Culture University 2013), showing that job-preparing school graduates have formed a big share in China's labor force.

To estimate the education interaction impact, we apply a mixed logit model such that for individual i , the random parameters β can be specified as:

$$\beta \sim H(\theta, \nu)$$

where H is a probability distribution function with mean θ and variance ν of the underlying distribution function. The probability of an individual i choosing alternative j is given by:

$$P_{ij} = \int \frac{\exp(x_{ij}\beta)}{\sum_{k=1}^j \exp(x_{ik}\beta)} \delta(\beta) d\beta$$

where $\delta(\beta)$ is the joint density function for the random parameter β (Hu, Woods, and Bastin 2009). In both conditional logit model and mixed logit model, WTP estimates the amount of money an individual consumer is willing to give up in exchange for utility associated with possessing a desirable attribute of a product. We follow Lusk and

Norwood (2005), and Mayen, Marshall, and Lusk (2007) to estimate WTP:

$$WTP_j = \frac{\beta_{j=1} - \beta_{j=0}}{-\beta_{price}}$$

The variance of WTP is estimated using Greene (2002):

$$\text{var}[WTP] \approx \left(\frac{\partial WTP}{\partial \beta} \right)' (\text{var}[\hat{\beta}]) \left(\frac{\partial WTP}{\partial \beta} \right)$$

RESULTS

The conditional logit model and the mixed logit model estimate the main effect and the interaction effect of the selected variables using STATA12 econometric software. The results are shown in table 6. The log likelihood test, the likelihood ratio chi test, and the Prob > chi² test show that the selected explanatory variables can effectively explain the variance in the dependent choice variable. Thus, we can reject the null hypothesis that none of the selected variables can explain the utility change associated with the red wine choice. In the conditional logit model, coefficients for the three COO variables are all positive and statistically significant, meaning that red wines from these three countries are significantly preferred to the no-purchase option. The France variable has the largest coefficient, followed by the California variable and the China variable. Thus, red wines are most desirable if from France and are least desirable if from China, due to the COO effect.

In the mixed logit model, new variables are created by multiplying the education variable with the COO variables (the interaction terms). With the interaction effect, the coefficient estimates for the three COO variables remain positive and significant, which suggests that respondents prefer wines from these three countries to the no-purchase option. However, the magnitude of the California coefficient becomes smaller (dropped from 1.455 to 1.055), which suggests a smaller COO impact of this variable on the derived utility. This

TABLE 6. Estimated Coefficients

Conditional logit results			Mixed logit results		
Variables	Coefficient	$P > z $	Variables	Coefficient	$P > z $
China***	1.254	< .001	China***	1.316	< .001
CA***	1.455	< .001	CA***	1.055	.002
France***	1.611	< .001	France***	1.664	< .001
Price***	-0.004	< .001	Price***	-0.004	< .001
5 years	0.159	.265	5 years	0.166	.247
10 years**	0.282	.046	10 years*	0.285	.043
Brand***	0.513	< .001	Brand***	0.509	< .001
—	—	—	CA x Education 2*	0.656	.052
—	—	—	CA x Education 3	0.413	.162
—	—	—	China x Education 2	-0.010	.976
—	—	—	China x Education 3	-0.097	.73
—	—	—	France x Education 2	-0.187	.543
—	—	—	France x Education 3	-0.017	.946
Log likelihood	-1004	Log likelihood	-1,001		
LR chi27	140	LR chi27	145		
Prob>chi2	< .001	Prob > chi2	< .001		

*** means statistically significant at 1% level; ** at 5% level; * at 10% level.

result combined with the significant interaction term of *California* and *education 2* variable ($\alpha = 0.1$) indicates that vocational school graduates are less likely than other respondents to choose California wines due to the COO impact. They are more likely to purchase California wines due to the education effect. First, the positive coefficient of the *education 2* and *California* interaction suggests that job-preparing school graduates value California wines more than the base level, which represents graduates of a high school or of a lower degree (*education 1* and *California*). Thus, compared to a high school graduate, graduates from a vocational school tend to choose California wines. Second, the *CA*education 3* interaction term has a coefficient that is not significantly different than the base level. Thus, those with a bachelor's or a more advanced degree are the same as those high school graduates who tend not to choose California wines.

The price coefficient in both models is negative and statistically significant, depicting a downward sloping demand curve. Chinese consumers are sensitive to price change when purchasing red wines, and a higher price is associated with a lower quantity demanded. The two wine age variables are both positive, but only the 10-year variable is statistically

significant. This suggests that respondents value the 10-year wines significantly more than they value the base level of two-year wines. However, they perceive the five-year wines as the same as the two-year alternative. As the literature has discovered, branded wines are greatly favored more than the no-brand option (table 6).

These results have important implications. First, there is a strong linkage between COO and wine choices. Chinese consumers purchase French wines mainly for the consideration of the country. Perhaps France-produced wines have left Chinese with a good impression, either about the quality, the taste, or other desirable features, such that wines imported from this country are associated with these good features. It may also be because Chinese consumers care for their social image, or in Chinese, *mianzi*. Liu and Murphy (2007) already noted that Chinese consumers believe that the luxury French wines symbolize a greater social image. To a lesser extent, COO was found to affect the purchase of domestic Chinese and imported California wines as well. Thus, wine marketers may plan their marketing strategy accordingly to take into account the COO impact.

Second, the purchase of California wines is strongly affected by consumers' educational background. Consumers with a vocational school

TABLE 7. Relative Importance of Selected Attributes

	Conditional logit	Mixed logit
Price	0.47	0.42
COO	0.19	0.29
Brand	0.27	0.24
Wine age	0.07	0.06

degree are more likely to choose California wines. Given that this education effect is not significant for the purchase of French and Chinese wines, it can help California wine shareholders identify the right consumers. Even though anecdotal evidence seems to suggest that Chinese with an advanced degree are more likely to choose French wines, our sample suggests such a link does not exist. Those with an advanced degree indeed appreciate the less-prestigious domestic Chinese wines the same as the French wines. Our sample shows that 62% of those choosing Chinese wines hold a bachelor's or a more-advanced degree. Income may matter. Our sample reveals that those with a weaker education background of a high school degree tend to report a high monthly income of \$1,100–\$1,400 on average, a similar income as the highly educated group. Given that income might correlate with education background, the mixed logit model only includes the education variable.

The relative importance (RI) of each selected attribute denotes how important the attribute is in proportion to the total computed importance. Following Mayen and colleagues (2007), the relative importance of the price attribute is computed:

$$R.I. = \frac{\beta_4(80) - \beta_4(280)}{(0 - \beta_1) + [\beta_4(80) - \beta_4(280)] + (0 - \beta_6) + (0 - \beta_7)}$$

Results of the RI estimate are shown in table 7. In both models, price is the highest in total importance. Without the education impact, brand is the second most-influential attribute, followed by COO and wine age. With the education impact, COO weighs more than brand. Given that none of the selected attributes has a greater than 0.5 weight and none is less than 0.05, all four attributes share the same importance and should be included in the estimation.

Table 8 presents the WTP estimates. The conditional logit shows that respondents are expected to receive an average of 45.19 Yuan (\$7.13, US\$1 = 6.3 Chinese Yuan) to move from a California produced red wine to a Chinese alternative. They are willing to pay 35.13 Yuan (\$5.57) to move from a California wine to a French wine. Thus, respondents value French wines the most, followed by California wines, and the Chinese wines the least. This finding is consistent with the conditional logit

TABLE 8. Willingness to Pay

Attributes	Conditional logit			
	Mean WTP	Standard deviation	95% Confidence Interval	
			Lower bound	Upper bound
CA to China	-45.19	31.39	-106.22	15.84
CA to France	35.13	30.45	-24.56	94.83
Year 2 to year 5	35.77	31.56	-26.10	97.64
Year 2 to year10	63.28	29.98	4.51	122.05
Branded to No-brand	-115.36	32.58	-179.86	-50.85
		Mixed logit		
CA to China	61.89	81.78	-98.41	222.18
CA to France	144.40	75.20	-2.99	291.80
2 years to 5 years	39.36	34.92	-29.08	107.80
2 years to 10 years	67.58	35.57	-2.14	137.29
Branded to No-brand	-120.69	35.17	-190.33	-51.05

results reported in table 6. However, the WTP's 95% confidence interval includes a zero, which means the WTP is not significantly different from zero.

The mixed logit estimation shows that respondents are willing to pay an average of 61.89 Yuan (\$9.82) to move from a California wine to a Chinese wine and 144.4 Yuan (\$22.88) to move from a California wine to a French wine. Compared to the conditional logit results, WTP for Chinese wines has changed from a negative 45 Yuan (\$7.14) to a positive 61 Yuan (\$9.68). Thus, due to the COO impact, consumers value a Chinese wine more than a California wine. The education effect in table 6 does show that respondents who graduated from a vocational school tend to choose California wines. However, a dominating effect shows that respondents holding other degrees favored French and Chinese wines, and they are willing to pay a premium to switch from California wines to wines produced in these two countries. Again, the estimated WTPs were not significantly different from zero. Chinese carefully consider wine age and brand. WTP estimates show that wines with a longer life-time are more desirable than younger wines. Branded wines are more desirable than the no-name alternatives: Respondents seek to receive 120.69 Yuan (\$19.16) to switch from a branded wine to a no-brand option.

CONCLUSIONS AND IMPLICATIONS

China's proliferating red wine market has newly become a primary target for domestic and international wine marketers. Their ability to understand Chinese consumers' wine preference and price willingness to pay will enable them to successfully enter the Chinese market and to remain profitable in the increasingly competitive marketplace. This study aims to help red wine marketers better understand Chinese consumers' purchase choices and recognize their willingness to pay for wines of different features. The sample we obtained in China's major wine market of Beijing provides important marketing implications. First, price is the dominant factor to affect Chinese red

wine purchases. On the one hand, consumers want reasonably priced wines, possibly to use for family occasions. The lower-end domestic and imported California wines perhaps are appropriate to satisfy this need. On the other hand, consumers are willing to pay a high premium for the prestigious and imported French wines, perhaps to please guests or to use as a gift. In both cases, they seem to look for wines that have the right price to be used for their planned occasion. In that sense, their sensitivity to price change does not mean that they are looking for the cheapest wines. They seem to look for a cheaper wine in the acceptable price range for their intended occasion.

Second, wines' country of origin matters to Chinese consumers. This does not mean that Chinese appreciate imported wines more than the domestic Chinese wines. Indeed, many consumers perceive imported California wines as not better than the domestic. However, they are willing to buy California wines, especially when they look for a wine to entertain a guest or to use as a gift, perhaps to present to their guests, to show the gift receivers how much they are Westernized and thus to show an enhanced social image. However, consumers' COO preference is diversified greatly such that wines from France, California, or locally made each can find their suitable consumers. There is no one product that suits the needs of a differentiated Chinese market.

Third, branded wines are so much more desirable than the no-brand alternative. Red wine brand effect is so significant that consumers would rather pay a high premium for a branded wine than for an imported item. This shows that Chinese consumers have become familiar with red wines and that they are able to identify a branded wine. Twenty years ago when red wines were mainly to please top government officials and the minority wealthy class, an average Chinese consumer was not able to characterize a branded wine. The new popularity of red wines in family and business get-togethers has enhanced consumers' contact with red wines, and thus have helped them better learn red wine brands. With improved knowledge, Chinese consumers are more likely to

differentiate wine brands when make wine purchases.

Fourth, consumers' education background can affect their red wine choice. Though many respondents indicate in the interview that they like California red wines, those graduated from vocational schools are more likely to choose California wines. Consumers in this segment are about 38 years old with have a household monthly income of \$800 to \$1,100 on average. They are price sensitive and are inclined to explore wines imported from California. For unexplored reasons, these consumers are less interested in wines imported from France or wines made in China. The vocational school graduates can be the primary targets for California wine marketers.

REFERENCES

- Assael, H. 1995. *Consumer behavior and marketing action*. 4th ed. Boston, MA: PWS-Kent.
- Atkinson, J. 1999. Meaningless brands from meaningful differentiation. *Journal of Wine Research* 10 (3): 229–233.
- Balestrini, P., and P. Gamble. 2006. Country-of-origin effects on Chinese wine consumers. *British Food Journal* 108 (5): 396–412.
- Batsell, R. R., and L. M. Lodish. 1981. A model and measurement methodology for predicting individual consumer choice. *Journal of Marketing Research* 18:1–12.
- Beijing Language and Culture University. 2013. Lower level job-preparing school graduates become the primary workforce in China, 2013. http://blog.sina.com.cn/s/blog_55c294dc0101back.html (accessed August 15, 2013).
- Bruwer, J., I. Lesschaeve, and B. L. Campbell. 2012. Consumption dynamics and demographics of Canadian wine consumers: Retailing insights from the tasting room channel. *Journal of Retailing and Consumer Services* 19:45–58.
- Camillo, A. A. 2011. A strategic investigation of the determinants of wine consumption in China. *International Journal of Wine Business Research* 24 (1): 68–92.
- Chaney, I. M. 2002. Promoting wine by country. *International Journal of Wine Marketing* 14 (1): 34–40.
- China Daily*. 2009. China's luxury market still a tough nut to crack. June 13. http://www.chinadaily.com.cn/bizchina/2009-06/13/content_8281164.htm (accessed May 29, 2013).
- China Daily*. 2012. China's wine consumption grows at 25–30% annually, expecting to excel England. <http://sp.chinadaily.com.cn/wine/20120619/28954.html> (accessed on August 13, 2013).
- China Daily*. 2013. China will set pace for wine industry growth. March 10. http://www.chinadaily.com.cn/sunday/2013-03/10/content_16294916.htm (accessed May 20, 2013).
- China's National Bureau of Statistics. 2011. Education level of Beijing residences. http://www.stats.gov.cn/tjgb/rkpcgb/dfrkpcgb/t20120228_402804317.htm (accessed May 20, 2013).
- China Newsnet*. 2012. China has become the world fifth largest wine consumer market. <http://finance.chinanews.com/cj/2012/02-16/3675449.shtml> (accessed May 20, 2013).
- Colombo, S. J., J. Calatrave-Requena, and N. Hanley. 2007. Testing choice experiment for benefit transfer with preference heterogeneity. *American Journal of Agricultural Economics* 89:135–151.
- Cummings, R. G., G. W. Harrison, and E. E. Rutstrom. 1995. Homegrown values and hypothetical surveys: Is the dichotomous choice approach incentive-compatible? *American Economic Review* 85:260–266.
- Famularo, B., J. Bruwer, and E. Li. 2010. Region of origin as choice factor: Wine knowledge and wine tourism involvement influence. *International Journal of Wine Business Research* 22 (4): 362–385.
- Greene, W. H. 2002. *Econometric analysis*. 5th ed. Upper Saddle River, NJ: Prentice Hall.
- Gergaud, O., and F. Livat. 2007. How do consumers use signals to assess quality?" American Association of Wine Economists Working Paper No. 3. http://www.wine-economics.org/aawe/wp-content/uploads/2012/09/AAWE_WP03.pdf (accessed April 20, 2013).
- Hu, W., T. Woods, and S. Bastin. 2009. Consumer acceptance and willingness to pay for blueberry products with nonconventional attributes. *Journal of Agricultural and Applied Economics* 41 (1): 47–60.
- Keown, C., and C. Mura. 1995. Purchasing behavior in the Northern Ireland wine market. *British Food Journal* 97 (1): 17–20.
- Li, L., X. Hu, and J. Zhuo. 2006. Do Chinese consumers prefer to buy imported wine? The effect of country-of-origin. *Proceedings of the International Conference of the WTO, China, and the Asian Economies, IV: Economic Integration and Economic Development*, June 24–25, University of International Business and Economics, Beijing, China. <http://faculty.washington.edu/karyiu/confer/beijing06/papers/zhuo-li-hu.pdf> (accessed August 8, 2013).
- Liu, F., and J. Murphy. 2007. A qualitative study of Chinese wine consumption and purchasing: Implications for Australian wines. *International Journal of Wine Business Research* 19 (2): 98–113.

- Lockshin, L. 2014. China and wine: Its impact on the global wine trade. Editorial for *Wine Economics and Policy*. http://ac.els-cdn.com/S2212977414000076/1-s2.0-S2212977414000076-main.pdf?_tid=0fd16858dc6a-11e3-99a3-00000aab0f27&acdnat=1400183564_ae4cac301027cfdb5610c146fe491b64 (accessed May 12, 2014).
- Lockshin, L., and I. Horowitz. 2002. What price quality? An investigation into the prediction of wine-quality ratings. *Journal of Wine Research* 13 (1): 7–22.
- Lockshin, L., W. Jarvis, F. D'Hauteville, and J. Perrouy. 2006. Using simulations from discrete choice experiments to measure consumer sensitivity to brand, region, price, and awards in wine choice. *Food Quality and Preference* 17:166–178.
- Lusk, J. L., and D. Hudson. 2004. Willingness-to-pay estimates and their relevance to agribusiness decision making. *Review of Agricultural Economics* 26 (2): 152–169.
- Lusk, J. L., and F. B. Norwood. 2005. Effect of experimental design on choice-based conjoint valuation estimates. *American Journal of Agricultural Economics* 87 (3): 771–785.
- Lusk, J. L., and T. C. Schroeder. 2004. Are choice experiments incentive compatible? A test with quality differentiated beef steaks. *American Journal of Agricultural Economics* 86 (2): 467–482.
- Mann, S., A. Ferjani, and L. Reissig. 2012. What matters to consumers of organic wine? *British Food Journal* 114 (2): 272–284.
- Mayen, C., M. I. Marshall, and J. L. Lusk. 2007. Fresh-cut melon—The money is in the juice. *Journal of Agricultural and Applied Economics* 39 (3): 597–609.
- McFadden, D. 1974. Conditional logit analysis of qualitative choice behavior. In *Frontiers of econometrics*, ed. P. Zarembka, 105–142. New York: Academic Press.
- Mtimet, N., and L. M. Albisu. 2006. Spanish wine consumer behavior: A choice experiment approach. *Agribusiness* 22 (3): 343–362.
- OIV. 2013. StatOIV Extracts. <http://www.oiv.int/oiv/info/enstatoivextracts2> (accessed August 8, 2013).
- OIV. 2013. Statistical report on world vitiviniculture. http://www.oiv.int/oiv/files/2013_Report.pdf (accessed on August 8, 2013).
- Orth, U. R., and P. Krška. 2002. Quality signals in wine marketing: The role of exhibition award. *International Food and Agribusiness Management Review* 4:385–397.
- People's Daily Online. 2011. China to become world's largest luxury goods market. <http://english.people.com.cn/90001/90776/90882/7361917.html> (accessed August 12, 2013).
- Skuras, D., and A. Vakrou. 2002. Consumers' willingness to pay for origin labeled wine: A Greek case study. *British Food Journal* 104 (11): 898–912.
- St. James, M., and N. Christodoulidou. 2011. Factors influencing wine consumption in Southern California consumers. *International Journal of Wine Business Research* 23 (1): 36–38.
- Train, K. 2003. *Discrete choice methods with simulation*. Cambridge, England: Cambridge University Press.
- Wang, F., J. Zhang, W. S. Wu, Z. T. Fu, and X. S. Zhang. 2009. Consumers' perception toward quality and safety of fishery products, Beijing, China. *Food Control* 20:918–922.
- Wang, T. S., and R. H. Mao. 2009. Shanghai consumers' wine consumption behavior. *Economics and Law* 12 (207): 151–152. <http://www.docin.com/p-149857983.html> (accessed May 20, 2013).
- Wikipedia. 2010. Education in China. http://en.wikipedia.org/wiki/Education_in_the_People%27s_Republic_of_China#Primary_education (accessed August 15, 2013).
- Wine Institute. 2013. 2012 U.S. wine exports, 90 percent from California, reach record high of \$1.4 billion. February 21. <http://www.wineinstitute.org/resources/pressroom/02212013> (assessed August 19, 2013).
- Xu, P., and Z. G. Wang. Forthcoming. Country of origin and willingness to pay for pistachio: A Chinese case. *Journal of International Food and Agribusiness Marketing*.
- Xu, P., Z. G. Wang, and S. F. Song. Forthcoming. Opinion leadership and Chinese consumers' attitudes towards pork with a quality and safety label. *The Chinese Economy*.
- Xu, P., Y. C. Zeng, Q. C. Fong, T. Lone, and Y. Y. Liu. 2012. Chinese consumers' willingness to pay for green- and eco-labeled seafood. *Food Control* 28:74–82.
- Yu, Y., H. Sun, S. Goodman, S. Chen, and H. Ma. 2009. Chinese choices: A survey of wine consumers in Beijing. *International Journal of Wine Business Research* 21 (2): 155–168.
- Zeng, Y. C., and H. W. Wang. 2007. Cognition of green food and its determinant: A study on consumers working in medical and sanitation organizations in Hebei Province. *Ecological Economy* 1:142–145.
- Zhan, L. J., and Y. Q. He. 2012. Understanding luxury consumption in China: Consumer perceptions of best-known brands. *Journal of Business Research* 65:1452–1460.
- Zhang, B. P., and J. H. Kim. 2013. Luxury fashion consumption in China: Factors affecting attitude and purchase intent. *Journal of Retailing and Consumer Services* 20 (1): 68–79.
- Zhang, H. Y., and H. J. Wang. 2009. Consumers' willingness to pay for green agricultural products in Guangzhou City. *Journal of Agro-Technical Economics* 6: 62–69.