

## WINE CONSUMPTION IN CHINA: PROFILING THE 21ST CENTURY CHINESE WINE CONSUMER

### CONSUMO DE VINHO NA CHINA: PERFIL MÉDIO DO CONSUMIDOR CHINÊS DE VINHO DO SÉCULO XXI

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#### SUMMARY

This article determines the factors that influence Chinese wine consumption and, thus, contribute to define an average Chinese wine consumer profile for the years 2000 to 2014. The article proposes a model that explains the variations in the consumption of wine in China, because of traditional factors of the theory of demand (price of wine, income, and price of a substitute good), and sociodemographic factors (age, gender, marital status, level of education, geographical area, and tourism activities). The article reveals that an increased income, a married marital status, living in an urban area, and tourism activities, significantly and positively contributed to the increase of wine consumption in China. In addition, the article demonstrates that wine is not a substitute of beer in China, and that it is hard to associate an increase of wine consumption with the gender and the educational level of the average Chinese. In contrast, age negatively and significantly influenced the wine consumption in China, meaning that wine consumers are becoming younger.

#### RESUMO

Este artigo analisa os fatores que influenciam o consumo de vinho na China e, assim, contribui para definir um perfil médio de consumidor para os anos de 2000 a 2014. O artigo propõe um modelo que explica as variações no consumo de vinho na China, com base nos fatores clássicos da teoria da procura (preço do vinho, rendimento e preço de um bem substituto) e fatores sociodemográficos (idade, sexo, estado civil, grau de instrução, área geográfica e atividades turísticas). O artigo revela que um aumento do rendimento, o estado civil casado, viver numa área urbana e a presença de atividades turísticas contribuíram de forma significativa e positiva para o aumento do consumo de vinho. Além disso, o artigo demonstra que na China o vinho não é um substituto da cerveja, e que é difícil associar um aumento do consumo de vinho ao género e ao nível educacional do chinês médio. Em contraste, a idade influenciou, de modo negativo e significativo, o consumo de vinho na China, o que significa que os consumidores de vinho estão a tornar-se mais jovens.

**Key words:** wine, China, demographics, consumption.

**Palavras-chave:** vinho, China, demografia, consumo.

#### INTRODUCTION

In the Western World, wine is a symbol of culture, history, and even religion. Wine and wine culture have been a crucial part of Europe for thousands of years and have been exported to all over the world. While this brilliant and long lasting European wine

culture is acknowledged, it may not be ignored the wine culture and history of China. China has a 6,000-year history of grape growing and a 2,000-year history of wine making (Zhang *et al.*, 2013). Since the Han Dynasty (206 B.C.–220 A.D.), when the *Vitis vinifera* was introduced to China from Central Asia (Wang and Huang, 2009), it has not been hard to find

historical and cultural references of wine in China (Jenster and Cheng, 2008; Li and Bardají, 2017). The beginning of the modern Chinese wine industry was initiated by the establishment of the Changyu Company in 1892 by Zhang Bishi (1841-1916) in the coastal city of Yantai, Shandong (Mitry *et al.*, 2009).

After a rapid economic growth of more than thirty years since the Reform and Opening Up Policy in 1978, China has become the world's second largest economy with a vast market size of 1.36 billion people. This dramatic development of the Chinese society stimulates both the production and the consumption of alcoholic beverage in China. Due to this economy's expansion, the improved living standard and the growing middle class, there was a rising trend in both the total alcohol consumption and the per capita wine consumption in China. Since the entry of China into the World Trade Organization (WTO) in 2001, which helped decline wine import tariffs, foreign wines began to enter the Chinese market at a fast pace (Chen and Lombaerde, 2013; Liu *et al.*, 2013; Li and Bardají, 2017). It was hard to imagine that one day China would be one leading wine consumer. However, the fact is that in 2013, China had surpassed France as the world's largest red wine consumer with more than 1.8 billion bottles of red wines sold in its territory, and in 2015 China had been ranked the world's fifth largest market for all kinds of wines with a total consumption of 16 million hL (OIV, 2018).

Even though traditional alcohol beverages such as *Baijiu* (Chinese liquor of cereals) and beer occupy the traditional alcohol market and it is not normal to drink wines with traditional Chinese food, Chinese people started to learn more about grape wines in the past decade (Dewald, 2003; Lin and Tavoletti, 2013). Chinese consumers are influenced by a history, culture and values that are very different from those of a Western consumer (Taylor, 2014). But in recent years, as noted in Capitello *et al.* (2015) and Gómez *et al.* (2015), the Chinese wine consumption has undergone major changes underlying a modern Chinese consumer, who adopts the Western lifestyle, and prefers foreign products (Zhao and Belk, 2007; Li *et al.*, 2011; Bi *et al.*, 2012). Wine is a drink reflecting the expectations of this new consumer, generally a young consumer.

According to the OIV (2018), in 2017 world wine consumption increased with respect to the previous year due to the fact of increased consumption in the United States, China and Australia. With a total consumption of 32.6 million hL of wine in 2017, the United States established itself for the sixth consecutive year as the world's largest consumer of

wine, followed by France (27 million hL), Italy (22.6 million hL), Germany (20.2 million hL), and China (17.9 million hL). The United States and China are the two main world economies, and they both drive the upsurge of consumption of wine in the world. However, it will be China that will become the main consumer before the year 2030 (ahead of the United States and France), and will boost world growth in the next 15 years (Baque *et al.*, 2016) - Figure 1 and Table I.

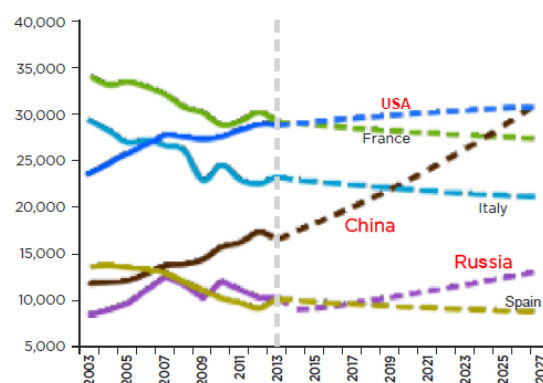


Figure 1. Changes in the consumption of wine, 2013 and expected for 2027, in thousands of hectoliters. Source: OIV (2018).

Mudanças no consumo de vinho, 2013 e esperado para 2027, em milhares de hectolitros. Fonte: OIV (2018).

Table I

Ranking of consumption of wine, 2013 and expected for 2027, volume per country

Ranking do consumo de vinho, 2013 e esperado para 2027, volume por país

	Ranking 2013	Ranking 2027
USA	1	2 (-1)
France	2	3 (-1)
Italy	3	4 (-1)
Germany	4	5 (-1)
China	5	1 (+4)
UK	6	7 (-1)
Russia	7	6 (+1)
Argentina	8	8
Spain	9	9
Australia	10	10

Source: OIV (2018).

Wine consumption begins to be generalized in modern Chinese culture from the mentioned process of economic opening initiated in the 1980s, despite a long tradition in the cultivation of grapes and winemaking. As Campo (2018) points out, the success of wine in China is a reality. In addition to its huge and varied cuisine, its technology and the reputation of its citizens' workers, China has been positioning itself for some years also in the wine business. Its level of growth has experienced an annual increase of 10% in the last years, and its consumers have surpassed Japan, becoming the Asian country with the highest consumption of wine. The economic growth of the country and the interest for western wine and its tastes have led to this advance.

Drinking wine is a symbol of wealth, sophistication, and social status. It suggests a desirable social image, elegance, and worldliness (Liu and Murphy, 2007; Hu *et al.*, 2008; Banks and Overton, 2010; Li *et al.*, 2011). Chinese do drink wines for the celebration of important occasions such as the Chinese New Year and the Mid-autumn Festival when the Chinese lucky color red and the health benefit of wines are appreciated (Liu and Murphy, 2007; Muhammad *et al.*, 2013). Health benefits and beauty purpose seem to be the first motivation of Chinese wine customers especially for the young female consumers (INS, 2017). In addition, wine can play an important role in the social connections as gift or banquet drink and luxury and expensive wines can show the generosity and richness of the host which caters to the Chinese traditional value "*Mian Zi*" (Liu and Murphy, 2007; Yu *et al.*, 2009; Somogyi *et al.*, 2011). If, in addition, the wine comes from a foreign country it is perceived as a luxury good of higher quality (Agnoli *et al.*, 2014). Origin, brand, label (name, design, color, and image) are important when consumers purchase wines and French wines are considered in China as good wines with high quality (Wilson and Huang, 2003; Yu *et al.*, 2009; Liu and Murphy, 2014; Xu *et al.*, 2014; Tang *et al.*, 2015). It is presented on important occasions or is used as a gift for parents or elderly relatives (Knight *et al.*, 2008; Li *et al.*, 2011).

Education also affects Chinese customers' wine purchase (Xu and Zeng, 2014). Since Chinese consumers are becoming more experienced, intrinsic cues such as taste, quality, and value-for-money are more valued for regular consumption (Liu *et al.*, 2014). Besides wines from Bordeaux, Chinese consumers are more inclined to go for excellent wines from other wine regions of the world and getting more information from wine courses and websites (Masset *et al.*, 2016). Enhanced customers' knowledge, product familiarity and emotional attachments to a specific wine region could contribute

to the ethnocentrism of wine (Yang and Paladino, 2015).

As a response to the interest of wine and the desire of leisure, wine tourism has also developed in China (Zhang *et al.*, 2013). The wine tourism includes visiting in wineries where the visitors may engage in several activities such as wine and food tasting, grape picking, and learning about wine culture. Many local Chinese governments intend to develop the wine tourism to support the local wine industries and to encourage the wine consumption of Chinese consumers.

This process of expansion of the Chinese wine industry, both from the perspective of production and consumption, makes the Chinese wine market very attractive for both local wineries and foreign producers. It is considered one of the markets with the greatest growth potential. China has become a player in world wine trade and is an important destination market for the main exporting countries (Mityr *et al.*, 2009). In this sense, it is essential to know the demographic characteristics of the average Chinese consumer since it is the key to the success of any type of business.

Like what Villanueva *et al.* (2015) studied for the American wine consumer for the period 1995-2014, and what also Villanueva *et al.* (2017) did for the European wine consumer for a similar period, this article presents an empirical and econometric description of Chinese wine consumer's demographic and socioeconomic characteristics for the years 2000 to 2014. This article also follows a similar methodology as the articles mentioned before and uses for its analysis official Chinese Census variables (gender, age, education level, and household income), and Chinese wine industry variables (production, and wine consumption in volume and per capita). Wine has been dealt with as a homogeneous product, considering the total wine consumed in China during a year. Although there are many wine categories, unfortunately the Euromonitor (2018b) data sets presents "wine consumption volume" and "wine production volume" without differentiating any of these categories.

This article emphasizes wine consumer demographics as an area of research that provides a description of wine consumer profiles, mainly using psychographic variables and quantitative analysis. Some other research has been done referred to the description of wine consumer profiles and is mentioned as follows: the work done about China by Camillo (2012), Germany by Szolnoki and Hoffmann (2014) and Wiedmann *et al.* (2014), the United Kingdom by Ritchie (2007) and Phillips and Wilson (2016),

France by Summerfield (2013), Spain by Gil and Sánchez (1997) and De-Magistris *et al.* (2014), Italy by Casini *et al.* (2009), Europe by Villanueva *et al.* (2017), Australia and New Zealand by Bruwer *et al.* (2002), Johnson and Bruwer (2003), Thomas and Pickering (2003) and Bruwer and Li (2007), South Africa by Ndanga *et al.* (2009), Argentina by Yvon (2007), Chile by Palma *et al.* (2014), and the U.S.A. by Hussain *et al.* (2006) and Villanueva *et al.* (2015).

The purpose of this article is to determine the factors that influence the Chinese wine consumer and, thus, contribute to define an average Chinese wine consumer profile for the years 2000 to 2014. Following, the methodology is explained, then the data is presented, and an econometric model is specified and estimated to identify this profile, the results are shown, analyzed, and discussed, and finally, some conclusions are defined.

## MATERIAL AND METHODS

In recent years there has been a change in the wine market in China linked to a better understanding of the industry, the increase in the purchasing power of the population, the process of urbanization, the entry into the W.T.O., and the growing interest in adopting Western habits of life (Liu *et al.*, 2013; Labanda and Ruenes, 2016). In this section, the article proposes a model that explains the variations in the consumption of wine in China, because of traditional factors of the theory of demand (price of wine, income, and price of a substitute good), and sociodemographic factors (age, gender, marital status, level of education, geographical area, and tourism activities).

Thus, we can affirm that the main hypothesis (MH) analyzed in this work and collected in the model affirms that:

MH: Wine consumption in China is a function of:

MH1: the traditional factors of demand, and

MH2: sociodemographic factors.

### Traditional factors of demand

The traditional factors of demand are price, income, and price of a substitute good (beer). Next, the literature is reviewed on how wine consumption relates to each factor.

As Bi *et al.* (2012) points out, **price** is a fundamental influence in the choice of products. The price of wine in China is a critical factor when it comes to explaining demand. The results of the investigations of Liu and Murphy (2007) and Yu *et al.* (2009) show that consumers prefer to pay low prices for daily

consumption, but higher prices for wine bought for gift purposes or special occasions, since it serves as a symbol of social status (Hu *et al.*, 2008; Zhang *et al.*, 2008; Somogyi *et al.*, 2011).

**Income** is another variable to consider. In China, the increase in wine consumption is associated with the increase of incomes. In fact, higher income is one of the reasons for the expansion of the consumption of wine in China (Huang and Rozelle, 1998; Sun, 2009; Camillo, 2012 International Wine and Spirit Research, 2013; Liu *et al.*, 2013; Muhammad *et al.*, 2013).

The **price of a substitute good** is another traditional factor considered in the theory of demand. Among the alcoholic beverages, the major competitors of wine are beer and spirits (ICEX, 2012; Wang, 2013), due to cultural and historical traditions. Although, as Mitry *et al.* (2009) point out, wine is a convincing substitute for beer and spirits in China. The price of beer is used.

### Sociodemographic factors

The sociodemographic factors considered are age, gender, marital status, level of education, geographical area, and tourism activities.

Regarding **age**, Camillo (2012) found that the Chinese average wine consumer was between 19 and 35 years of age. In the same line, Li *et al.* (2011) and International Wine and Spirit Research (2013) point out that the main objective for wine sellers should be the members of the younger generation. In contrast, in other studies such as Liu *et al.* (2013) the results are inconclusive.

Regarding **gender**, a study by Liu *et al.* (2013) concludes that men are more likely to be wine buyers than women. However, Mitry *et al.* (2009) and Chen (2012) point to an increase in the consumption of wine by women, since gender equality continues to increase in China. In Liu *et al.* (2014) it is stated that women having more knowledge about wine will show a greater interest in wine consumption in the future than men (Li *et al.*, 2011). Yet, in the study by Liu and Murphy (2007) it was deduced that the purchase of wine was considered a masculine role and that wine was perceived as more masculine than feminine (Bretherton and Carswell, 2001).

**Marital status** is another influencing factor in wine consumption (Camillo, 2012). Wine is considered a good disinhibitor and has a place in the intimacy of the couple (Nielsen Report, 2009). In addition, findings published in Journals of Gerontology indicate that couples who drink have a greater likelihood of a long-term happy marriage (Mercer, 2016). Other authors, on the other hand, point out that

married men and women have lower rates of wine consumption compared to their unmarried counterparts (Temple *et al.*, 1991; Chilcoat and Breslau, 1996; Bachman *et al.*, 1997; Curran *et al.*, 1998). In other studies, such as Liu *et al.* (2013), the results are inconclusive.

Chinese wine consumers are generally well **educated** (Gong *et al.*, 2004; Balestrini and Gamble, 2006; Liu *et al.*, 2014). In the last decade, educated young professionals have led to an expansion of wine consumption (Sun, 2009). The average consumer of wine in China tends to have university studies (China Economic Information Network, 2012).

The **geographical area** is another of the variables introduced in the model, distinguishing between rural and urban areas. Wine consumers are more likely to live in large urban areas such as Shanghai, Beijing, Guangzhou, Chengdu, and Shenzhen (Li *et al.*, 2011; International Wine and Spirit Research, 2013). As noted in Lin and Wang (2010), Agnoli *et al.* (2014), and Capitello *et al.* (2015), there are important differences between people living in urban areas and in rural areas; the former is related to modernity, which in China leads to the consumption of foreign products, and the latter is linked to traditional consumption patterns. In addition, as Ripari (2005) points out, the difference in income between the urban and rural sectors is important. The changing landscape of the Chinese population from rural to urban households with better access to consumer goods, together with higher disposable income and the rise of the middle class, provides the basis for continued growth in the Chinese wine market (Huang and Rozelle, 1998).

The last factor considered in the model is tourism activities (Hall, 2000; Charters and Ali-Knight, 2002; Getz and Brown, 2006; Mitchell *et al.*, 2012). Wine tourism is a form of tourism of special interest, and an important component of both the wine and tourism industries (Hall *et al.*, 2000). Many wine regions and tourist destinations have realized that the benefits of wine tourism extend far beyond the winery door to practically all areas of the regional economy and into urban areas (Carlsen, 2004).

### Data and Empirical Model

The database used includes the time series of wine consumption and its influencing factors (price of wine, income, price of beer, age, gender, marital status, level of education, geographical area and tourism activities) for the period 2000-2014 (15

years). For the development of the study, a model with two groupings of variables was specified. The first one uses the classical variables of a demand function, price of the good, income, and price of the substitute good. The second adds sociodemographic variables to identify the profile of the average consumer. Thus, to evaluate the effect of independent variables on wine consumption in China and to test the hypothesis, the following econometric model (Equation 1) has been proposed.

$$WC_t = f(WPx_t, Income_t, BPx_t, Age_t, Gender_t, MaritalStatus_t, Education_t, GeoArea_t, Tourism_t, u_t)$$

Eq. 1

where  $u_t$  is the random disturbance that  $u_t \sim N(0, \sigma_u^2)$

For the detection of the functional form of the model, the Box-Cox technique was used. As Arrufat (1997) states, this technique makes it possible to contrast hypotheses referring to the appropriate functional form. According to demand theory, an inverse relationship between the quantity demanded and the price of wine is expected, and a positive relationship with income, and a positive relationship with the price of beer are also expected. Regarding the sociodemographic variables, and as concluded from the review of the literature, the expectations may be non-conclusive. However, in general terms the Chinese consumer is identified as male, young, married, educated, resident in an urban area, and driven by tourism.

The variables specified for this study are shown in the Table II, and their descriptive statistics in Table III.

Once the variables are described, we turn to the estimation and validation of the model (Equation 2).

$$WC_t = f(WPx_t, Income_t, BPx_t, Age_t, Gender_t, MaritalStatus_t, Education_t, GeoArea_t, Tourism_t, u_t)$$

Eq. 2

First and to determine if it is necessary to apply some transformation on the dependent variable and/or the continuous independent variables, the Box-Cox procedure is applied. The models with a p-value higher than 0.05 are chosen. These models are associated with the LR test for the theta and lambda powers with values -1, 0, 1, and for the theta and lambda values lower than 0.05, respectively (Tables IV and V).

**Table II**  
Variables of the Empirical Model  
*Variáveis do Modelo Empírico*

Variable	Tipology	Description
<i>Dependent</i>		
<i>Wine Consumption</i> (WC)	Continuous	Wine Consumption in China (in Liters). Source: China Sugar & Liquor Yearbook (2003-2014); China Food Industry Yearbook (2014-2015); UN Comtrade (2016)
Wine Price (WPx)	Continuous	Wine Unit Price per Liter (USD constant, inflation-adjusted, based on 2014, CPI 1978=100) Source: UN Comtrade (2016), National Bureau of Statistics of China (2016)
Income	Continuous	China GDP Growth Rate (% constant inflation-adjusted, based on 2014, CPI 1978=100) Source: National Bureau of Statistics of China (2016)
Beer Price (BPx)	Continuous	China Beer Unit Price (USD dollar per Liter, constant inflation-adjusted, based on 2014, CPI 1978=100) Source: UN Comtrade (2016), National Bureau of Statistics of China (2016)
Age	Discrete	1: if the highest rate of variation of the population is between 15-29 years 2: if the highest rate of variation of the population is between 30-39 years 3: if the highest rate of variation of the population is between 40-49 years 4: if the highest rate of variation of the population is between 50-59 years 5: if the highest rate of variation of the population is within more than 60 years Source: National Bureau of Statistics of China (2016)
Gender	Discrete	1: if the highest rate of variation of the population is masculine 0: if the highest rate of variation of the population is feminine Source: National Bureau of Statistics of China (2016)
Marital Status	Continuous	Chinese Married Couples Source: National Bureau of Statistics of China (2016)
Education	Continuous	Number of students who return to China after graduation abroad Source: National Bureau of Statistics of China (2016)
Geographical Area (GeoArea)	Discrete	1: if most of the population resides in rural areas 2: if most of the population resides in urban areas Source: National Bureau of Statistics of China (2016)
Tourism Activities (Tourism)	Continuous	Number of Chinese Outbound Visitors (person-times) Source: National Bureau of Statistics of China (2016)

**Table III**  
Descriptive statistics  
*Estatísticas descritivas*

<b>Continuous variables</b>						
	Minimum	Maximum	Mean	SD	Obs	
Wine Consumption	2.23e+010	4.98e+010	3.68e+010	1.03e+010	15	
Wine Price	0.822	4.22	2.24	1.36	15	
Income	7.30	14.2	9.71	1.91	15	
Beer Price	0.563	0.980	0.722	0.133	15	
Marital Status	7.8600e+006	1.3469e+007	1.0473e+007	2.2109e+006	15	
Education	9.12e+003	3.65e+005	1.13e+005	1.24e+005	15	
Tourism Activities	1.05e+007	1.07e+008	4.70e+007	3.07e+007	15	
<b>Discrete variables</b>						
	Frequency					
	F:0	F:1	F:2	F:3	F:4	F:5
Age		1	0	3	6	5
Gender	11	4				
Geographical Area		11	4			

**Table IV**  
LR statistic  
*Estadística LR*

	LR statistic $H_0$	Restricted log likelihood	LR statistic chi2	P-value Prob > chi2
model(lhsonly) left-hand-side Box-Cox model;	theta = -1	-294.66808	19.18	0.000
	theta = 0	-286.76333	3.37	0.066
	theta = 1	-286.28394	2.41	0.121
model(rhsonly) right-hand-side Box-Cox model	lambda = -1	-297.26404	22.04	0.000
	lambda = 0	-293.35734	14.22	0.000
	lambda = 1	-286.28394	0.08	0.780
model(lambda) both sides Box-Cox model with same parameter	lambda = -1	-283.81744	-4.70	1.000
	lambda = 0	-288.93533	5.53	0.019
	lambda = 1	-286.28394	0.23	0.632
model(theta) both sides Box-Cox model with different parameters	theta=lambda=-1	-283.81744	-2.52	1.000
	theta=lambda=0	-288.93533	7.71	0.005
	theta=lambda=1	-286.28394	2.41	0.120

**Table V**  
Powers of the procedure of Box-Cox  
*Poderes do procedimento de Box-Cox*

	Powers	Std. Coef.	Err.	z	P>z	Log likelihood
model(lhsonly) left-hand-side Box-Cox model;	/theta	0.5227056	0.2824196	1.85	0.064	-285.07891
model(rhsonly) right-hand-side Box-Cox model	/lambda	1.049204	0.1755811	5.98	0.000	-286.24486
model(lambda) both sides Box-Cox model with same parameter	/lambda	0.9198024	0.1694795	5.43	0.000	-286.16912
model(theta) both sides Box-Cox model with different parameters	/lambda	1.005189	0.1741683	5.77	0.000	-285.07847
	/theta	0.5249766	0.2920816	1.80	0.072	

The Ramsey specification test was applied and, among those that resulted with a correct specification, the Corrected Determination Coefficient and the Mean Quadratic Error Root was obtained, selecting

the model with the highest Determination Coefficient, lowest Error, and more coherent economic results (Table VI).

**Table VI**  
Global Model Selection.  
*Seleção Global de Modelos*

	Test $H_0$ :	Ramsey RESET test		
		Ho: model has no omitted variables	Adj R-squared	Root MSE
model(lhsonly) left-hand-side Box-Cox model;	theta = 0	F (3, 1) = 0.46 Prob > F = 0.7619	0.9988	0.00974
	theta = 1	F (3, 1) = 0.86 Prob > F = 0.6394	0.9988	3.4e-08
model(rhsonly) right-hand-side Box-Cox model	lambda = 1	F (3, 1) = 0.86 Prob > F = 0.6394	0.9988	3.4e-08
	lambda=1.049204	F (3, 1) = 1.20 Prob > F = 0.5713	0.9988	3.4e-08
model(lambda) both sides Box-Cox model with same parameter	lambda = -1	F (3, 1) = 0.35 Prob > F = 0.8123	0.9932	2.2e-13
	lambda = 1	F (3, 1) = 0.86 Prob > F = 0.6394	0.9988	3.4e-08
	lambda=.9198024	F (3, 1) = 0.46 Prob > F = 0.7640	0.9988	4.5e-07
model(theta) both sides Box-Cox model with different parameters	theta=lambda=-1	F (3, 1) = 0.35 Prob > F = 0.8123	0.9932	2.2e-13
	theta=lambda=1	F (3, 1) = 0.86 Prob > F = 0.6394	0.9988	3.4e-08

The functional form for the model was that of (theta = lambda = 1), so the specification of the model is described by the Equation 3).

$$WC_t = \beta_0 + \beta_1 WPx_t + \beta_2 Income_t + \beta_3 BPx_t + \beta_4 Age_t + \beta_5 Gender_t + \beta_6 MaritalStatus_t + \beta_7 Education_t + \beta_8 GeoArea_t + \beta_9 Tourism_t + u_t$$

**Eq. 3**

where  $u_t$  is the random perturbation that  $u_t \sim N(0, \sigma_u^2)$

The estimated model that has the following expression (Equation 4).

$$WC_t = 2.63356e^{10} + 3.40024e^9 WPx_t + 2.02583e^8 Income_t - 1.71146e^{10} BPx_t + -6.37433e^8 Age_t - 2.92660e^9 Gender_t + 648.534 MaritalStatus_t - 25280.7 Education_t + 9.29469e^8 GeoArea_t + 243.087 Tourism_t$$

**Eq. 4**

The F-Snedecor, with p-value less than 0.05 and a Coefficient of Determination of 99% show the global capacity of all the explanatory variables of the model.

It is a model without multicollinearity, with a reciprocal condition number less than 50. The Harvey-Collier contrast indicated the stability of the coefficients estimated throughout the period with  $P(t(3) > 1.8419) = 0.162731$ . On the other hand, the Breusch-Pagan contrast, with p-value higher than 0.05, shows the absence of heterocedasticity and the Durbin-Watson contract, with a value close to two, the absence of self-correlation; therefore, random perturbations maintain the same dispersion for all observations and a zero covariance. Finally, the residual sum of squares is close to zero (Table VII).

## RESULTS AND DISCUSSION

The results of this estimation allow us to draw conclusions about the adequacy of the different factors and the results of their significance. Of the group of traditional variables all have been significant and with a positive sign, except the price of beer that, being significant, is accompanied by a negative sign. On the variable price of wine, it is of note that the Chinese consumer is not significantly influenced by the price increases to stop consuming. This result is linked to the fact that the consumption of wine is



**Table VII**

Estimation Demand Model

*Modelo de procura estimado*

	Coefficient
const	2.63356e+010*** (2.31394e+09)
Wine Price (WPx)	3.40024e+09*** (3.60186e+08)
Income	2.02583e+08*** (3.59710e+07)
Beer Price (BPx)	-1.71146e+010*** (1.61533e+09)
Age	-6.37433e+08*** (1.05061e+08)
Gender	-2.92660e+09*** (1.59705e+08)
Marital Status	648.534 ** (153.300)
Education	-25280.7** (5928.76)
Geographical Area	9.29469e+08* (4.91398e+08)
Tourism Activities	243.087*** (21.8631)
R-square	0.999622
R-square (corrected)	0.998773
F (9,4)	43478.34 Value p (F) 1.29e-09
SCR	3.4e-08
RESET Contrast	(squares and cubes) F = 0.036310, p = 0.965 (only squares) F = 0.092966, p = 0.78 (only cubes) F = 0.102561, p = 0.77
Reciprocal condition number	30.5063
Harvey-Collier t(3) = 1.8419	P(t(3) > 1.8419) = 0.162731
Heterocedasticity Contrast of Breusch-Pagan	LM = 11.855 P(Chi-square(9) > 11.855) = 0.221608
Durbin-Watson	2.268731

In parentheses, Typical Deviation of the coefficient estimates; \* denotes significance at the 10-percent level; \*\* denotes significance at the 5-percent level; \*\*\* denotes significance at the 1-percent level.

associated with a high purchasing power; the consumer prefers to opt for a higher price to demonstrate their social status or economic capacity. These results corroborate the work of Hu *et al.* (2008), Zhang *et al.* (2008), Somogyi *et al.* (2011), and Labanda and Ruenes (2016). The income variable shows that an increase in economic capacity leads to increased consumption of wine in China, and this is consistent to the work of Huang and Rozelle (1998), Sun (2009), Camillo (2012), Liu *et al.* (2013), International Wine and Spirit Research (2013), and Muhammad *et al.* (2013). On the other hand, the price of beer has been significant, but with a negative sign, which tells us that the wine, still, is not a real substitute for beer, contrary to the conclusions of Mitry *et al.* (2009) and Wang (2013), which point out that wine is a compelling substitute for beer and

spirits in China. Even so, the June 2018 report of Euromonitor International (2018a) indicates that sales of total volume of beer fell both in 2016 and in 2017, with 2017 being the fourth consecutive year of decline. This was due to several factors, including the declining population of beer drinkers and changes in consumer lifestyles, such as increased consumption of alternative alcoholic beverages, such as wine.

The same report states that wine continues to expand its presence in China with stable growth of total volume in 2017.

Of the sociodemographic factors, age has been a significant variable, but with a negative sign. That is, the younger generations are presented as the main wine buyers. These results are the same as shown in Li *et al.* (2011), Camillo (2012), and International

Li *et al.* (2011), Camillo (2012), and International Wine and Spirit Research (2013). In contrast, in other studies such as Liu *et al.* (2013) the results are inconclusive. The gender variable is negative and significant, which implies that being a man does not mean consuming more wine, contrary to the results of the studies done by Bretherton and Carswell (2001), Liu and Murphy (2007), and Liu *et al.* (2013). They concluded that a Chinese man is more likely to be a wine buyer than a woman. Mitry *et al.* (2009), Chen (2012) and Liu *et al.* (2014) indicate an increase in the consumption of wine by women due, on the one hand, to that gender equality continues to increase in China and, on the other hand, to the increase of their knowledge about wine. Marital status is also a significant and positive variable in wine consumption, like what is presented in Mercer (2016). Other authors, however, point out that married men and women have lower rates of wine consumption compared to their unmarried peers (Temple, 1991; Chilcoat and Breslau, 1996; Bachman *et al.*, 1997; Curran *et al.*, 1998). In other studies, such as Liu *et al.* (2013), the results are inconclusive. The level of education, although significant, obtains a negative sign, contrary to the profile given by different Chinese consumer studies (Gong *et al.*, 2004; Balestrini and Gamble, 2006; Sun, 2009; China Economic Information Network, 2012; Liu *et al.*, 2014). Regarding the differentiation of rural and urban regions, the model indicates that in urban areas they are more prone to consume wine, since these areas are linked to patterns of success and modernity, with better access to consumer goods, and more disposable income. This result follows those of Li *et al.* (2011), and International Wine and Spirit Research (2013). Even so, the last year's Euromonitor International report (2018b) indicates that in 2017 the decrease in demand in tier-one cities for wine forced manufacturers to seek growth in lower-level cities through the opening of stores specialized in beverages and the development of solid relationships with local retailers. Tourism has also been significant and positive, related to the growing interest in wine tourism (Hall, 2000; Charters and Ali- Knight, 2002; Getz and Brown, 2006; Mitchell *et al.*, 2012).

In short, the consumption of wine in China, although linked to a higher level of income, is introduced with force in the country, reaching the younger generations, women, individuals with different

academic degrees, and living in urban areas. Beer, in the period analyzed, is not a substantial substitute. Wine tourism play an important role in the increase of wine consumption.

## CONCLUSIONS

This study attempts to describe the growing wine market of China identifying various factors for the increase in wine consumption, describing an average wine Chinese consumer. China does have a history and tradition for wine drinking and the booming wine consumption in China in recent years can be a comprehensive result of the fast-growing Chinese economy, improved standards of living, interest of the Western culture, and improved health and social reasons. China has recently been one of the most important wine markets in the world and the largest wine market in Asia, importantly contributing to the growth of the world's wine consumption. In the coming decade China will even become the first wine-consuming market.

With the development of an econometric model combining several influencing factors (wine price, income, beer price, age, gender, marital status, level of education, geographical area, and tourism) for wine consumption in China in the period 2000-2014, this article reveals that an increased income, a married marital status, living in an urban area, and tourism activities, significantly and positively contributed to the increase of wine consumption in China. In addition, the article demonstrates that wine is not a substitute of beer in China, and that it is hard to associate an increase of wine consumption with the gender and the educational level of the average Chinese. In contrast, age negatively and significantly influenced the wine consumption in China, meaning that wine consumers are becoming younger.

This article shows certain limitations. The data adopted are for the whole country of China, which is geographically huge and densely populated, without considering regional differences and development gaps. Hence more research in the topic is needed in the future, considering that the results of this study point to a wine consumption market segmented by territories (urban-rural) and income levels.

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