The Country of Origin Effect
A Hedonic Price Analysis of the Chinese Wine Market

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Abstract

Purpose

This study aims at analysing the country of origin (COO) effect on wine purchase in China by considering a sample from an e-commerce website. We contribute to the literature on hedonic pricing by applying this model to the Chinese market and including COO as product attribute.

Design/methodology/approach

A hedonic price model is adopted to measure the effect of search attributes on wine sales in China. A reduced form of the classical hedonic analysis is used as in Nerlove (1995), given the assumption that prices and attributes are taken as exogenous to consumers.

Findings

Results show that the COO represents the attribute that most influences wine sales in China. Protected indicators of origin, which denote wine with recognized certificates, are also significant, reinforcing the importance of the production area. Vintage attribute does not impact sales, suggesting a low level of consumer experience with wine.

Research limitations/implications

The study suffers from the limitations of results' generalisability, given the size and characteristics of the sample. In the future research, the model should be tested on a larger sample. Moreover, it can be applied on other products, in which COO represents an information and quality cue.

Practical implications

Firms operating in sectors where COO implies specific characteristics of quality should enhance this attribute in their marketing strategies to increase their competitive advantage. Also policy implications with respect to the governmental actions to support wine producers are discussed.

Originality/value

Hedonic price analysis represents a well-established model, however to the best of our knowledge it has never been used in China before. This study also highlights the primary role of COO as search attribute in wine purchase.

1. Introduction

In the past few decades, Chinese consumers have been rapidly influenced by Western lifestyles not only in sectors such as fashion and travel, but also in food consumption (Balestrini and Gamble, 2006; Curtis *et al*., 2007; Veeck and Veeck, 2000). Rising incomes and changing lifestyles have contributed to change the diet of urban Chinese consumers (Ortega *et al*., 2011; Veeck and Burns, 2005) and safety has been found to be a main concern in food purchase (Ortega *et al*., 2017; Ruth and Yeung, 2001; Wang *et al*., 2008).

Products that did not belong to local traditions have become widespread in this market, for example cheese, chocolate, pasta but also beverages such as coffee and wine (Euromonitor International, 2015). In particular, the wine sector has been affected by China's recent import growth (Anderson and Wittwer, 2013), following the tariff reductions after China's WTO entry in 2005, from 43% to 14% (Hu *et al*., 2008; Masset *et al*., 2016). According to Anderson and Wittwer (2015), China currently represents the most dominant player in Asia is set to considerably change global markets for wines. In 2016, the total volume of wine sales in China increased by 5%, to reach 4.6 billion litres (Euromonitor International, 2017). 2015-2016 performance improved from the year 2014, when the government activated the anti-extravagance campaign to counteract corruption, which led to a decline in sales of premium wine.

Aside from the decrease in custom duties, there are additional reasons linked to wine's success in China. Grape wine is a symbol of sophistication and social status (Fan, 2007), therefore imported wines are is preferred in order to convey a desirable image of the purchaser, not risking "losing face" (Hu *et al*., 2008). Wine is also considered to have positive heath connotations in China, like other Asian countries (Lee, 2009). The preferred wine category is red because of the symbolic meanings associated with this colour, such as wealth, power, and good luck (Euromonitor International, 2015); red is considered as a sign of celebration and happiness in the Chinese culture (Liu and Murphy, 2007). However, the majority of Chinese consumers still lack knowledge of grape wine, since it represents a relatively new alcoholic drink type and they are traditionally used

to drink non-grape wine such as rice wine (Camillo, 2012; Jenster and Cheng, 2008). In 2013, the per capita consumption of grape wine was only 1.5 litres per person, compared to 51.9-liter average for French consumers.[i] The main importing country is represented by France, which accounts for a total volume of 172.5 million litres, followed by Chile, Spain and Australia (Euromonitor International, 2017).

In order to understand the impact of origin and other attributes on wine prices, a widely used method is the hedonic price analysis (Angulo *et al*., 2000; Combris *et al*., 1997; Schamel and Anderson, 2013). Hedonic price model relates variations in price to differences in goods' attributes, which include quality, reputation and objective characteristics (Oczkowski, 2001). In literature, it has been already applied to analyse wine in several countries (Angulo *et al*., 2000; Combris *et al*., 1997; Golan and Shalit, 1993; Nerlove, 1995; Oczkowski, 1994), including Hong Kong (Masset *et al*., 2016), but it has not been used in Mainland China before.

China can be considered as part of the "New World" of wine, which includes countries where viniculture is still incipient (Roberto Luppe *et al*., 2009) yet they are characterised by a substantial growth in both production and consumption (Kwong *et al*., 2011). On the contrary, "Old World" wine producers are generally referred to European countries with a tradition of thousands of years.

On the one hand, so far hedonic price models have traditionally been used to analyse the wine sector in "Old World" countries, apart from some recent studies in Brazil (Roberto Luppe *et al.*, 2009), Canada (Kwong *et al*., 2011; Yoo *et al.*, 2011) and Russia (Galati *et al*., 2017). On the other hand, previous country of origin (hereafter, COO) research conducted in China has mainly focused on consumers' perception and attitude towards wine (for example, Balestrini and Gamble, 2006; Hu *et al*., 2008), overlooking the analysis on product price and attributes.

Therefore, with this article we contribute both to studies in hedonic pricing and COO literature by adopting for the first time a hedonic model for wine products to China, an increasingly relevant "New World" wine country before. Given the relative newness of wine consumption in the Chinese market, from a marketing perspective it is important to investigate the product

characteristics weighted by consumers in order to define a proper strategy for the destination market.

The remainder of the paper is structured as follows: first, a literature review on the COO issue in China and the use of hedonic price model is provided; second, the hypotheses and methodology are presented; third, the description of the sample follows; then, the results of the study are presented; discussion and conclusion conclude.

2. Literature Review

COO belongs to the category of extrinsic product attributes (together with other cues such as price, brand name, packaging and warranties), used by consumers when intrinsic cues (such as design, taste and performance) are difficult to assess prior to product purchase (Elliott and Cameron, 1994).

Several scholars argue that COO is a positive product attribute that influences judgment (Papadopoulos and Heslop, 1993) and is characterized by symbolic and emotional meanings (Fournier, 1998). In the context of developing countries, research has indicated that consumers tend to prefer imported, branded products over domestic ones because of their higher perceived quality (Batra *et al.*, 2000; Essoussi and Merunka, 2007; Ettenson, 1993). However, other scholars point out that COO is only one extrinsic cue among other extrinsic and intrinsic cues available to the consumer during purchase (Agrawal and Kamakura, 1999).

In the case of wine, retailers tend to display wine by the COO in order to simplify the purchase decision especially for naïve consumers (Chaney, 2002). Production areas such as country, region, sub-region or vineyard constitute "geographical brands", which are part of the label cues of the product (Lockshin and Hall, 2003). The definition "geographical brands" is used differently in a recent paper by Agnoli *et al*. (2014) to indicate those wines with a 'geographical indication', designations of origin which denote raw materials and production processes compliant with specific UE regulations.

Regarding China, previous studies suggest that COO represents an important factor for Chinese consumers in wine evaluation, especially for gift purchase and public consumption since they are exposed to other people's judgement (Balestrini and Gamble, 2006; Hu *et al*., 2008). Therefore, they are more likely to buy foreign goods to gain social approval (Delong *et al*., 2004; Lockshin and Corsi, 2012) and convey a sense of sophistication (Yu *et al*., 2009; Xu *et al*., 2014). Among foreign wines, Xu *et al*. (2014) find that French ones are the most preferred ones.

With regard to demand, Agnoli *et al*. (2014) use an econometric model to estimate the Chinese still bottled wine import demand using data within seven year-timeframe collected from Eurostat and the United Nations Commodity Trade Statistics Database. Their findings show positive effects of COO and geographical brands, meaning wines with a protected indicator of origin.

Since wine is a highly differentiated product, an appropriate type of analysis used to identify the attributes with biggest impact in consumers' willingness to pay is the hedonic price model (Orrego *et al*., 2012; Waugh, 1928). The main assumption of this method is that every commodity is considered as a combination of objectively measurable or rankable traits that differentiate related goods from one another, such as in the wine case. Goods are evaluated by customers for the utility it generates, hence, every consumer evaluates the attributes and the traits of the good when they make the purchase decision (Rosen, 1974).

Since the hedonic price function is determined as the equilibrium between demand and supply conditions, the coefficients in the hedonic regression should be interpreted both by producers and consumers perspective. On the supply side, the coefficients should reflect the marginal implicit cost for the attributes. On the demand side, the coefficient should reflect the consumers' preference – or their willingness to pay – for that specific quality attribute, while the ratios of the attributes should be interpreted as the consumers' marginal rates of substitution between attributes.

Price is considered a good indicator of quality by consumers that are not knowledgeable about wine (Bernetti *et al*., 2006; Lockshin and Rhodus, 1993). In this regard, literature distinguishes

"New World" and "Old World" of wine. The first one includes countries where viniculture is still incipient like South Africa, Argentina, Chile, the United States, Australia or New Zealand (Roberto Luppe *et al*., 2009). New world markets are also characterised by a substantial growth in both production and consumption (Kwong *et al*., 2011), which are also characteristics China presents, emerging as a major producer and consumer of wine (Thorpe, 2009). On the contrary, "Old World" wine producers mainly belong to European countries such as France, Italy, Spain and Portugal with a tradition of thousands of years (Roberto Luppe *et al.*, 2009). Consumer preferences toward New or Old World wines can change throughout the years, for example in the UK market, since the 1990's French wine's share has dropped with demand shifting toward New World wines, such as Australia, suggesting a higher sophistication and new preferences among British consumers compared to a few decades ago (Anderson, 2003; Cholette *et al*., 2005).

So far, the studies that have adopted hedonic price techniques consider a wide range of product characteristics in their analyses. Golan and Shalit (1993) include grape quality characteristics (such as variety, sugar content, proportions of acids etc.) of Israeli wines in order to provide appropriate recommendations to wine producers. Also Nerlove (1995) uses grape chemical properties in his analysis of the Swedish market; however, as in the early 1900's wine represented a state-owned retail monopoly in Sweden, therefore wine prices were exogenously determined, the author uses the quantity sold as dependent variable instead of prices. In addition to objective characteristics that appear on the label of the bottle, Combris *et al*. (1997) use sensory characteristics (like aroma, body and firmness) evaluated by a jury composed of professional wine tasters. The main finding of their study is that sensory characteristics are not significant in explaining the price of wine due to taste differences between wine tasters and consumers and the lack of perfect information among consumers. However, when the regression includes an overall sensory quality score, accessible from published wine guides, it tends to be significant (Combris *et al*., 2000). In this regard, Oczkowski (2001) argues that consumer decisions are affected by a wine's long-term reputation, therefore he analyses multiple reputation ratings given on four different wine

guides for the Australian market. According to his results, reputation is the attribute with the largest effect on wine prices. More recently, Ling and Lockshin (2003) also find a significant effect of winery reputation for Bordeaux wines.

Based on previous studies (Darbi and Karni, 1973; Nelson, 1970), a recent classification of wine attributes in hedonic price models has been provided by Orrego *et al*. (2012). They distinguish three attribute categories: search, experience and credence. Search is represented by those information available to the consumers during product evaluation, which can be distinguished between intrinsic (objective characteristics of the product such as colour, type of wine, brand and alcohol content) and extrinsic (jury grade, cellaring potential, etc.) characteristics. Experience information is based on the attributes that consumers learn during product trial (visual, olfactory and gustatory characteristics). Finally, credence attributes are intangible elements (e.g. variety, place of origin) which cannot be evaluated in normal use. However, these characteristics are transformed in search attributes if they are reported on the label.

Among search intrinsic characteristics, our model includes COO, unlike previous research that has mainly analysed wine products belonging to the same country. A few exceptions, however, include the studies by Schamel (2003) for New World wines in the US market, Druham *et al*. (2004) for world wines in the US belonging to a sample from a restaurant, and Roberto Luppe *et al*. (2009) for South-American wines in Brazil. The results of these analyses show a significant effect of the wine producing country.

Recently, Masset *et al.* (2016) apply a hedonic price model to analyse the price premium Bordeaux fine wine at Hong Kong wine auctions over the period 2007-2014. They show that the premium wines sold on the Hong Kong market has a 19% premium compared to auctions in other countries. In our study, we assume that Hong Kong consumers differ from Mainland China ones as they have gone through a different modernization paths. In this regard, Masset *et al.* (2016) acknowledge that Hong Kong has a longer wine consumption history than China. A recent study by

Ortega *et al.* (2017) on pork products also confirms the demand heterogeneity between from Hong Kong and Mainland China (Guangzhou), suggesting a higher concern for food safety for the latter.

In this study, a hedonic price analysis is adopted to investigate the effect of COO on wine purchase in China, which is not only an increasingly relevant New World market but it is even considered to be the most important wine market (Anderson and Wittwer, 2015). The sample belongs to wine bottles sold on a main Chinese e-commerce website.

3. Hypotheses and Methodology

Based on previous works that show a positive attitude of Chinese consumers towards foreign wines (Balestrini and Gamble, 2006; Hu *et al.*, 2008; Xu *et al.*, 2014), we posit the following research question: *How is the country of origin (COO) effect on wine purchase in China?*

The foreign COO is expected to be a significant characteristic for the purchase of wine in China. Moreover, since it is assumed that prices and attribute contents can be taken as exogenous to Chinese consumers, Nerlove's (1995) approach is adopted to investigate the effect on sales. Therefore, this hypothesis is formulated:

H1. Foreign COO has a positive effect on the sales of wine bottles in China.

Second, given that France is the main importing country of wine sold in China, representing 31% of the imports' total volume in 2015 (Euromonitor International, 2017) and its leadership is confirmed by a recent study (Agnoli *et al.*, 2014), it is hypothesized:

H2. French COO has the highest positive effect on the sales of wine bottles in China.

In order to test these hypotheses, the proper methodology to use is the hedonic price regression since it argues that the utility of the purchaser is enhanced by the characteristics of that commodity, rather than by the commodity itself (Agrawal and Kamakura, 1999; Rosen, 1974).

In the hedonic price analysis, the utility function of each purchaser is determined by the level of characteristics incorporated in the commodity. Thus, the market price of a good is the sum of the implicit price paid for each characteristic.

Let's suppose a variety of wine is represented by a vector Z of n attributes $Z = (z_1, z_2, ...z_n)$. The utility maximization problem that the consumer faces when he chooses one unit of wine can be formulated as follows:

(1)   Max $U(Z,X)$

(2)   Subject to $Y = p(Z) + X$

where X is a composite good, which represents all the other commodities other than wine; Y is the consumer's budget and $p(Z)$ is the market price of Z.

The first order conditions are:

(3) $\dfrac{\partial U/\partial z_i}{\partial U/\partial X} = \dfrac{\partial p}{\partial z_i} = p_i , \forall\, i$

Hence, the marginal rate of substitution between the wine characteristic z_i and X is equal to the implicit price p_i of the characteristic z_i. Such implicit prices are represented by the coefficients of the of the linear hedonic price equation:

(4) $P_j = \alpha + \beta_1\, z_{j1} + \beta_2\, z_{j2} + ... + \beta_n\, z_{jn} + \varepsilon$

where P_j is the market price of wine j, α is the intercept, and ε is the error term.

As in Nerlove (1995), a 'reduced form' is used. Differently from the usual hedonic analysis, in which price is treated as dependent variable, the regression measures the effect of price and attribute measures on quantity sold. This is justified by the assumption that prices and attribute contents can be taken as exogenous to Chinese consumers, as done by Nerlove (1995) for Swedish

consumers. Indeed, wine prices are controlled by the government both in Sweden (back in the 1990's) and China, although in a different way; in the 1990's, the Swedish wine market was under a governmental monopoly, while nowadays in China wine prices are determined by the impact of import duties and free trade agreements (FTAs) with third countries. Consequently, in China wine from certain countries such as Australia, Chile and New Zealand is not subject to import duties thanks to mutual FTAs (the tariff rate on wine from other countries is of 14% for bottled wine or 20% for bulk wine). Regardless of their origin, wine imported into China is also subject to 10% "consumption tax" and 17% "value added tax."[ii]

By using the reduced form, it is assumed that the evaluation of a particular wine attribute is revealed by varying the hedonic demand for it. Following Nerlove (1995), since customers take price *p(Z)* as given, they maximize the utility function (1) by choosing the quantities *q(Z)* of each variety bought at those prices. Hence, in the case in which prices are exogenously determined, Nerlove (1995) proposes to estimate the demand function regressing the quantity of each variety on its price and the quality attributes that characterize the variety:

$$(5) \qquad q(Z) = R[p(Z), a(Z)]$$

where *a(Z)* reflect the customer's evaluation of the attribute *z*, that is, the effect of the attribute *z* on the quantity of variety sold, keeping its price fixed.

While in (4) the coefficient of the attribute represents its implicit price, in (5) the willingness to pay w_i for one more attribute *z*, given variety price, is obtained as follows:

$$(6) \quad w_i = -\left(\frac{\partial R/\partial Z_i}{\partial R/\partial P}\right)$$

Considering the product classification proposed by Orrego *et al*. (2012), which identifies search, experience and credence characteristics, our hedonic model includes search attributes. As done by Galati *et al*. (2017), only this type of attributes is considered as our data are collected from the information provided on the label and product description page of the e-commerce website. Consequently, neither the credence nor the experience attributes are included in the model.

Therefore, the explanatory variables of the hedonic price model include search intrinsic and extrinsic characteristics. The intrinsic attributes are those that are recognized by the consumer since they appear on the label: alcoholic content, vintage year, reserve characteristic, COO and body. On the contrary, extrinsic attributes include reputational signals, represented by rating and protected indicators of origin. Reputation refers to common knowledge or public information about a certain product, which allows high-quality producers to sell their items at a premium (Shapiro, 1983). Differently from previous literature, where reputation attributes are based on ratings published on wine guides (as in Ling and Lockshin, 2003; Oczkowski, 2001), we use rating reported by users given the nature of the sample (collected from an e-commerce website) and the influence of online reviews on Chinese consumer purchase behaviour (Mo *et al*., 2015). The second reputational attribute is represented by protected indicators of origin, previously used in a hedonic price model for Italian wine in the Russian market by Galati *et al.* (2017). They refer to certificates of origin such as "protected designation of origin" (PDO) or "protected geographical indication" (PGI) that denote wines compliant with specific production and quality characteristics established by entities such as the European Union. It is supposed that customers recognize a premium price for a product with a PDO or PGI label, as already shown by Agnoli *et al.* (2014) and Seccia *et al.* (2017) for what concerns the wine market. Indeed, customers can identify a quality signal in the certificate of origin, because it guarantees that the quality of the product is "exclusively due to a particular geographical environment" (Bonnet and Simioni, 2001). Moreover, PGI and PDO-labelled products pass strict quality controls that guarantee the specificity of their properties (Espejel and Fandos, 2009).

Brand is not included as reputation attribute because the large number of different brands in a single market does not allow consumers to have a clear understanding of branding in the wine market (Gluckman, 1990). Table 1 summarizes the independent variables of the model.

Insert Table 1 here

The final specification of the model to be estimated is given by:

(7) $Ln\ (SOLD) = \alpha + \beta_1 ALCOHOLIC\ CONTENT + \beta_2\ INDICATOR + \beta_3\ RESERVE +$

$$\beta_4 ln(PRICE) + \beta_5 RATING * N.REVIEWS + \sum_{i=1}^{n} \gamma_i COO_i + \sum_{j=1}^{m} \delta_i BODY_j + \varepsilon$$

n= number of COO

m= number of BODY types

γ_{CHINA} and $\delta_{LOWMEDIUM}$ are set $= 0$

Some remarks on the final specification of the hedonic regression: first, the double-log relation between the *SOLD* and *PRICE* variables is chosen as it provides the most satisfying value of the Ramsey RESET test (F-test 9.78, p < 0.001). Second, the overall evaluation by users interacts with the number of reviews in order to take into account not only the quality of the wine judged by customers but also the quantity of evaluations made at the same time (indeed, wider the feedback, more reliable is the overall evaluation). Third, the COO variable associated to China is set as the reference variable. By doing so, the first hypothesis is tested, as the coefficients of the foreigners COO will be interpreted with respect to China. With regard to wine body, the dummy

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variable associated to the lightest level of body is set as the base variable in order to analyse the preference of Chinese consumers for a heavier wine body.

4. Sample

The model is tested on a sample of foreign and local wines sold on a local website specialized in wine products, "Yes my wine" (http://www.yesmywine.com). The company was founded in 2008 in Hong Kong and it has currently 8.5 million registered users.[iii] In 2015, Yesmywine's online and offline sales reached one billion RMB.[iv]

E-commerce is chosen as setting of the study since China has the world's largest online retail market, nearly eighty percent bigger than the United States. In 2015, it reached approximately $630 billion of sales (Wang *et al.*, 2016). Among product categories, food and drink have increased by 3,408.8% in value growth within the period 2010–15 and it is expected to grow by 22.2% in the next five years, ahead of all other sectors (Euromonitor International, 2016).

The sample is composed of still red wine as it is the wine category that registered the fastest volume growth of 2016 with a 6.72% sales increase (Euromonitor International, 2017). It does not include bulk wines but only single bottles of 75cl each.

A random sample was collected from 300 items given as results for the category "red still grape wine" on the website within the period of the second week of June 2016. For each item, only search attributes were collected from the information provided on the label or available on the product description page. In details, the analysed dataset includes: number of bottles sold, price, alcohol content, vintage year, variety, COO, body, reserve attribute, protected indicators of origin, number of reviews and percentage of rating from user reviews.

Because of missing data among some variables of the 300 items that were automatically deleted by the software Stata 13, the final sample analysed is composed of 167 items. This constitutes a limitation of this paper, similarly to other studies who have implemented the hedonic

price model in the wine sector (e.g. Nerlove, 1995; Angulo *et al.,* 2000). Table 2 summarizes the sample data.

Insert Table 2 here

5. Results

At first, the model was tested considering age as attribute, however this reduced the sample to 125 items since 42 items, especially among Chinese wines, do not have information about vintage year. The age attribute resulted to be not significant ($p > 0.10$), therefore this attribute was removed from the analysis. The regression based on the final model (7) is run on 167 items. Despite our limited sample, according to Austin and Steyerberg (2015), a minimum of two observations per variables are required for a reliable multiple regression (which means a bias of the estimation coefficient less than 10%), so our model seems to be adequate as it satisfies this requirement. Table 3 presents the results of the hedonic analysis.

Model 1 includes the variables as specified by equation (7). As there is evidence of heteroskedasticity ($p < 0.01$ for the White test), robust standard error estimates are used. The R-square of the model is 0.6917, suggesting a goodness of fit.

As shown by Table 3, COO attributes are the independent variables with the highest coefficients. All COO regressors are highly significant ($p < 0.01$). Therefore, H1 is supported.

Among the countries of the sample, surprisingly France does not have the highest coefficient (3.708) but ranks fourth after Spain (4.722), Chile (3.856) and Australia (3.964). H2 is not supported.

Model 2 adds the variety of wine (such as Cabernet, Merlot, Crianza and so on) as variable in the hedonic regression (5). However, as expected, this leads to multicollinearity issues: indeed, some varieties are produced exclusively by one single country (e.g., in our sample the variety

"Sangiovese" is produced only in Italy). Therefore, a regression removing those varieties associated with only a country was run, lowering the items to 155. The R-square of Model 2 is slightly improved (0.7180) due to the increased number of variables that explain the quantity of bottles sold. However, results show that only two varieties, Malbec ($p < 0.01$) and Merlot ($p < 0.10$), are significant variables.

It was also verified whether the variety itself, rather than COO, can explain consumer preferences (Model 3). A regression removing the COO and including the variety of wine in the equation (5) was run on 165 items (two items are not considered because of multicollinearity). In this case, almost all varieties are significant, but the R-square is much lower (0.5751).

By comparing the three models, the authors can conclude that Model 1 is preferable given the multicollinearity issues in Model 2 and a higher goodness of fit compared to Model 3. Hence, according to these results, it seems that COO effect is stronger than wine variety in explaining consumers' preferences.

With regard to other intrinsic characteristics, it is argued that reserve attribute is not significant, suggesting a more importance attributed to COO and protected indicators of origin, as opposed to vintage year. This confirms the study by Agnoli *et al*. (2014) and also indicates a low level experience of Chinese consumers with wine products. As expected and in line with Nerlove's (1995) results, price taken in its logarithm has a significant negative coefficient of –0.889 on sales ($p < 0.001$).

Regarding average prices, the mean is RMB 126.826 with Australia wines' quotes being the closest to this amount (average price of RMB 126.83). The lowest prices are those of Argentinian wines (average price of RMB 65.33), whereas Chinese wines present the highest average price (RMB 223.27), but they have the highest standard deviation among all wines (127.90) with the most expensive bottle for RMB 518 (however, only one bottle was sold) and the cheapest one costing RMB 58.

Alcohol content does not represent a significant variable, confirming results by Angulo *et al.* (2000) for the Spanish market. On the contrary, alcohol has found to be significant in the Russian market (Galati *et al.*, 2017), denoting a different consumers' taste.

The coefficients of the body attributes are estimated as a dummy variable by considering low-medium level as 0. Results suggest that Chinese consumers prefer wine of medium and medium-high body (coefficients are 1.975 and 1.970 respectively, at $p < 0.01$).

Regarding reputation attributes, protected indicators of origin are significant and increase sales by 104.33%, extending to China the study of Galati *et al.* (2017), which showed a positive effect of designations of origin for the Russian market. Protected indicators of origin also enhance the importance of COO since they are strongly are connected to the production area.

Number of reviews and overall rating are highly significant ($p < 0.001$), however the effect is very small (0.1%).

6. Discussion and Conclusion

In this study, a hedonic price model is used to analyse the effect of wine attributes in the context of China, a New World wine country that had not been considered with this technique before. In China, the consumption of wine products has been largely increased over the past few years, therefore it is relevant for practitioners to adequately manage their strategies in such market.

The first hypothesis is confirmed since a foreign COO has a positive effect on the sales of wine bottles in China. Moreover, from our analysis it is the main attribute that most influences the sales of wine in China, confirming previous research on consumer perception of foreign wine products (Balestrini and Gamble, 2006; Hu *et al.*, 2008; Xu *et al.*, 2014). The four countries with the highest COO coefficients are also the main importers of wine in China, as per the latest sector reports (Euromonitor International, 2017).

The second hypothesis is not confirmed as Spain has the highest positive COO effect on sales instead of France. This is due to the sample size, however it suggests that not only the market leader, French wine, but also other third countries' products take advantage of COO hedonic attribute. Therefore, foreign firms operating in a New World wine country such as China should leverage on the positive effect of COO by developing branding and communications strategies that emphasize their origin. The promotion of brand names is particularly critical in new markets for Old World producers, which have to face a more competitive international wine industry (Bernetti *et al.*, 2006). Given the primary role of the Internet in China, digital media should be adopted as key sales and communications channel. Moreover, third sectors such as tourism could support these strategies, providing consumers with a more immersive experience in the place of origin.

The positive effect of COO is reinforced in the case of wines with protected indicators of origin. The authors agree with Agnoli *et al*. (2014) regarding the importance of recognised certifications in the food sector as specific production processes are associated with quality attributes and influence product purchase. We also assume that COO and protected indicators of origin are also signals of safety for the Chinese market, given its importance in food purchase decisions (Ruth and Yeung, 2001; Wang et al., 2008).

The premium price allowed by COO and protected indicators of origin also has policy implications. The governments of wine producing countries and intergovernmental entities such as the EU should adopt measures that are aimed at increasing their companies' competitiveness in China, e.g. by negotiating the reduction of import duties or promoting the recognition of protected indicators. In this way, Old World producers could reduce their disadvantage position compared with competitors from Australia, Chile and New Zealand. Foreign countries should also activate promotional strategies to convey a positive national image of their wine products.

As for other search attributes, the results suggest that the vintage characteristic is not relevant for Chinese consumers, unlike British and Spanish markets (Angulo *et al.*, 2000; Steiner, 2004). Mainland China consumers also differ from the ones in Hong Kong, where vintage has been found

to be significant (Masset *et al*., 2016). This is attributable to the novelty of the wine product and consumers' inexperience in China (Balestrini and Gamble, 2006; Hu *et al*., 2008). Therefore, firms should implement activities in order to make consumers more knowledgeable about the quality characteristics of wine products, as the rapid diffusion of new food habits will imply higher consumer sophistication in the next few years.

Since the hedonic price model was tested on a small sample, the study suffers from the limitations of results' generalizability and can be considered as a preliminary pilot study. In the future, the model should be tested on a larger sample within a longer timeframe, also adding more variables such as the region of origin. In this study, it was not considered as it is assumed that since wine is a relatively new product for Chinese consumers, it is hard for them to distinguish the product attributes of items belonging to different regions of the same country.

In the future research directions, other categories than red still wine should be considered in order to analyse the attributes' effects on different wines, such as sparkling wine or white wine. Moreover, in our study "Yes my wine" does not provide socio-demographic data of the purchasers; however, in order to investigate purchase motivations the analysis should integrate information about consumers. As "face saving" might be a determinant in purchase decision (Hu *et al*., 2008; Yang and Paladino, 2015), it would be interesting to investigate possible behaviour differences between private and public consumption or among consumers belonging to different social groups.

With regard to reputation variables, our analysis considered the rating provided by consumers of the e-commerce website given the primary importance of the Internet channel in China. This attribute could be however integrated by the rating given by expert tasters or wine guides (Angulo *et al*., 2000; Combris *et al*., 1997; Ling and Lockshin, 2003; Oczkowski, 2001).

This study contributes to the literature on International Marketing and COO by adopting a hedonic price analysis to measure consumer preferences in China. By carrying out an original analysis, this study confirms previous studies on COO positive effect in China (Balestrini and Gamble, 2006; Hu *et al*., 2008). It also identifies the main search attributes that influence wine

purchase in such market. The results of this study are relevant also for other products than wine, in which COO is used as information and quality cue. First of all, hedonic price analysis can be applied to food products that did not belong to the traditions of one country (for example, chocolate and coffee in China), so the origin increases their perceived value. Second, also firms operating in other sectors where the manufacture origin implies specific characteristics of quality for consumers (e.g., fashion or design products) need to improve their COO brand management (Agnoli *et al*., 2014).

Moreover, this study extends the broad research in hedonic price modelling in the wine sector by applying it for the first time in China, an increasingly important New World country, and giving evidence of the most relevant attributes for a traditionally Western product in such market. As consumers progressively gain more experience with products, the analysis will need to include more detailed attributes such as the region of origin and product brand.

References

Agnoli, L., Capitello, R. and Begalli, D. (2014), "Geographical brand and country-of-origin effects in the Chinese wine import market", *Journal of Brand Management*, Vol. 21 No. 7, pp. 541–558.

Agrawal, J. and Kamakura, W. A. (1999), "Country of origin: A competitive advantage?", *International Journal of Research in Marketing*, Vol. 16 No. 4, pp. 255–267.

Anderson, K. (2003), "Wine's new world", *Foreign Policy*, Vol. 136 No. May-June, pp. 47–54.

Anderson, K., & Wittwer, G. (2013), "Modeling global wine markets to 2018: Exchange rates, taste changes, and China's import growth", *Journal of Wine Economics*, Vol. 8 No. 2, pp. 131-158.

Anderson, K., & Wittwer, G. (2015), "Asia's evolving role in global wine markets", *China Economic Review*, Vol. 35, pp. 1-14.

Angulo, A. M., Gil, J. M., Gracia, A. and Sánchez, M. (2000), "Hedonic prices for Spanish red quality wine", *British Food Journal*, Vol. 102 No.7, pp. 481–493.

Austin, P. C. and Steyerberg, E. W. (2015), "The number of subjects per variable required in linear regression analyses", *Journal of Clinical Epidemiology*, Vol. 68 No. 6, pp. 627-636.

Balestrini, P. and Gamble, P. (2006), "Country-of-origin effects on Chinese wine consumers, *British Food Journal*, Vol. 108 No. 5, pp. 396–412.

Batra, R., Ramaswamy, V., Alden, D. L., Steenkamp, J. B. E. and Ramachander, S. (2014), "Effects of brand local and non-local origin on consumer attitudes in developing countries", *Journal of Consumer Psychology*, Vol. 9 No. 2, pp.83–95.

Bernetti, I., Casini, L. and Marinelli, N. (2006), "Wine and globalisation: changes in the international market structure and the position of Italy", *British Food Journal*, Vol. 108 No. 4, pp. 306–315.

Bonnet, C., and Simioni, M. (2001), "Assessing consumer response to Protected Designation of Origin labelling: a mixed multinomial logit approach", *European Review of Agricultural Economics*, *28*(4), 433-449.

Camillo, A. A. (2012), "A strategic investigation of the determinants of wine consumption in China", *International Journal of Wine Business Research*, Vol. 24 No. 1, pp. 68–92.

Chaney, I.M. (2002), "Promoting wine by country", *International Journal of Wine Marketing*, Vol. 14 No. 1, pp. 34–40.

Cholette, S., Castaldi, R. and Fredrick, A. (2005). "The globalization of the wine industry: implications for old and new world producers", in *4th Annual International Business and Economics Conference, Honolulu, HI. Conference proceedings*.

Combris, P., Lecocq, S. and Visser, M. (1997), "Estimation of a hedonic price equation for Bordeaux wine: does quality matter?", *The Economic Journal*, Vol. 107 No. 441, pp. 390–402.

Combris, P., Lecocq, S. and Visser, M. (2000), "Estimation of a hedonic price equation for Burgundy wine", *Applied Economics*, Vol. 32 No. 8, pp.961–967.

Curtis, K. R., McCluskey, J. J. and Wahl, T. I. (2007), "Consumer preferences for western-style convenience foods in China", *China Economic Review,* Vol. 18 No. 1, pp. 1–14.

Darby, M. R., & Karni, E. (1973), "Free competition and the optimal amount of fraud. The Journal of law and economics", Vol. 16 No. 1, pp. 67-88.

Delong, M., Bao, M., Wu, J., Chao, H. and Li, M. (2004), "Perception of US branded apparel in Shanghai", *Journal of Fashion Marketing and Management*, Vol. 8, pp. 141–153.

Durham, C. A., Pardoe, I., & Vega-H, E. (2004), "A methodology for evaluating how product characteristics impact choice in retail settings with many zero observations: An application to restaurant wine purchase", *Journal of Agricultural and Resource Economics*, Vol. 29 No. 1, pp. 112-131.

Elliott, G. R. and Cameron, R. C. (1994), "Consumer perception of product quality and the country-of-origin effect", *Journal of International Marketing*, Vol. 2 No. 2, pp. 49–62.

Espejel, J., and Fandos, C. (2009). "Wine marketing strategies in Spain: A structural equation approach to consumer response to protected designations of origin (PDOs)", *International Journal of Wine Business Research*, Vol. 21 No. 3, 267-288

Essoussi, L. H. and Merunka, D. (2007), "Consumers' product evaluations in emerging markets: Does country of design, country of manufacture, or brand image matter?", *International Marketing Review*, Vol. 24 No. 4, pp. 409–426.

Ettenson, R. (1993), "Brand name and country of origin effects in the emerging market economies of Russia, Poland and Hungary", *International Marketing Review*, Vol. 10 No. 5, pp. 14–36.

Euromonitor International (2015), "Consumer lifestyles in China, July", available at: http://www.euromonitor.com/ (accessed 17 November 2016).

Euromonitor International (2016), "Internet Retailing in China, January", available at: http://www.euromonitor.com/ (accessed 17 November 2016).

Euromonitor International (2017), "Wine in China, May", available at: http://www.euromonitor.com/ (accessed 17 July 2017).

Fan, M. (2007), "Wine seen as social status in China", The Washington Post, 30 January.

Fournier, S. (1998). "Consumers and their brands: Developing relationship theory in consumer research", *Journal of Consumer Research*, Vol. 24 No. 4, pp. 343-373.

Galati, A., Crescimanno, M., Abbruzzo, A., Chironi, S. and Tinervia, S. (2017), "The premium price for Italian red wines in new world wine consuming countries: the case of the Russian market", *Journal of Wine Research*, Vol. 28 No. 3, pp. 1-13.

Gluckman, R. (1990), "A consumer approach to branded wines", *European Journal of Marketing*, Vol. 24 No. 4, pp. 27–46.

Golan, A. and Shalit, H. (1993), "Wine quality differentials in hedonic grape pricing", *Journal of Agricultural Economics*, Vol. 44 No. 2, pp. 311–321.

Hu, X., Li, L., Xie, C. and Zhou, J. (2008), "The effects of country-of-origin on Chinese consumers' wine purchasing behaviour", *Journal of Technology Management in China*, Vol. 3 No. 3, pp. 292–306.

Jenster, P. and Cheng, Y. (2008), "Dragon wine: developments in the Chinese wine industry", *International Journal of Wine Business Research*, Vol. 20 No. 3, pp. 244-59.

Kwong, L. M., Cyr, D., Kushner, J. and Ogwang, T. (2011), "A semiparametric hedonic pricing model of Ontario wines." Canadian Journal of Agricultural Economics, Vol. 59 No.3, pp. 361-381.

Lee, K. (2009), "Is a glass of Merlot the symbol of globalization? An examination of the impacts of globalization on wine consumption in Asia", International Journal of Wine Business Research, Vol. 21 No. 3, 258-266.

Ling, B. H. and Lockshin, L. (2003), "Components of wine prices for Australian wine: how winery reputation, wine quality, region, vintage, and winery size contribute to the price of varietal wines", *Australasian Marketing Journal*, Vol. 11 No. 3, pp. 19–32.

Liu, F., & Murphy, J. (2007), "A qualitative study of Chinese wine consumption and purchasing: Implications for Australian wines", *International Journal of Wine Business Research*, Vol. 19 No. 2, pp. 98-113.

Lockshin, L. S, and Hall, J. (2003), "Consumer purchasing behaviour for wine: what we know and where we are going*", International Colloquium in Wine Marketing*, University of South Australia, Adelaide.

Lockshin, L. S. and Rhodus, W. T. (1993), "The effect of price and oak favour on perceived wine quality", *International Journal of Wine Marketing*, Vol. 5 No. 2, pp. 13–25.

Lockshin, L. S. and Corsi, A. M. (2012), "Consumer behaviour for wine 2.0: a review since 2003 and future directions", *Wine Economics and Policy*, Vol. 1, pp. 2–23.

Masset, P., Weisskopf, J. P., Faye, B. and Le Fur, E. (2016), "Red obsession: the ascent of fine wine in China", *Emerging Markets Review*, Vol. 29, pp. 200-225.

Mo, Z., Li, Y. F., & Fan, P. (2015), "Effect of online reviews on consumer purchase behavior", *Journal of Service Science and Management*, Vol. 8 No. 3, 419-424.

Nelson, P. (1970), "Information and consumer behavior", *Journal of Political Economy*, Vol. 78 No. 2, pp. 311-329.

Nerlove, M. (1995), "Hedonic price functions and the measurement of preferences: The case of Swedish wine consumers", *European economic review*, Vol. 39 No. 9, pp. 1697–1716.

Oczkowski, E. (1994), "A hedonic price function for Australian premium table wine", *Australian Journal of Agricultural and Resource Economics*, Vol. 38 No. 1, pp. 93–110.

Oczkowski, E. (2001), "Hedonic wine price functions and measurement error", *Economic record*, Vol. 77 No. 239, pp. 374–382.

Orrego, M. J. E., Defrancesco, E. and Gennari, A. (2012), "The wine hedonic price models in the "Old and New World": state of the art", *Revista de la Facultad de Ciencias Agrarias*, Vol. 44 No. 1, pp. 205–220.

Ortega, D. L., Wang, H. H., Olynk, N. J., Wu, L. and Bai, J. (2011), "Chinese consumers' demand for food safety attributes: a push for government and industry regulations", *American Journal of Agricultural Economics*, Vol. 94 No. 2, pp. 489–495.

Ortega, D. L., Chen, M., Wang, H. H., & Shimokawa, S. (2017), "Emerging Markets for US Pork in China: Experimental Evidence from Mainland and Hong Kong Consumers", *Journal of Agricultural and Resource Economics*, Vol. 42 No. 2, pp. 275-290.

Papadopoulos, N., and Heslop L. A. (1993), *Product-Country Images Impact and Role in International Marketing*, Routledge, Binghamton, NY.

Roberto Luppe, M., L. P. Lopes Favero, and P. Prado Belfiore (2009). "Hedonic pricing models and the evaluation of attributes: the case of wines from Brazil, Argentina and Chile", *Esic-Market*, Vol. 134, pp. 27-47.

Rosen, S. (1974), "Hedonic prices and implicit markets: product differentiation in pure competition", *The Journal of Political Economy*, Vol. 82 No. 1, pp. 34–55.

Ruth, M. W. and Yeung, J.M. (2001). "Food safety risk: consumer perception and purchase behaviour", *British Food Journal*, Vol. 103 No. 3, pp. 170–87.

Schamel, G. and Anderson, K. (2003), "Wine quality and varietal, regional and winery reputations: hedonic prices for Australia and New Zealand", *Economic Record*, Vol. 79 No. 246, pp. 357–369.

Seccia, A., Carlucci, D., Santeramo, F. G., Sarnari, T., and Nardone, G. (2017), "On the effects of search attributes on price variability: An empirical investigation on quality wines", *BIO Web of Conferences*, Vol. 9 EDP Sciences.

Shapiro, C. (1983). "Premiums for high quality products as returns to reputations", *The Quarterly Journal of Economics*, Vol. 98 No. 4, pp. 659-679.

Steiner, B. E. (2004), "Australian wines in the British wine market: a hedonic price analysis", *Agribusiness*, Vol. 20 No. 3, pp. 287–307.

Thorpe, M. (2009). "The globalisation of the wine industry: new world, old world and China", *China Agricultural Economic Review*, Vol. 1 No. 3, pp.301-313,

Veeck, A. and Burns, A. C. (2005), "Changing tastes: the adoption of new food choices in post-reform China", *Journal of Business Research*, Vol. 58 No. 5, pp. 644–652.

Veeck, A. and Veeck, G. (2000), "Consumer segmentation and changing food purchase patterns in Nanjing, PRC", *World Development*, Vol. 28 No. 3, pp. 457–471.

Wang, K. W., Lau, A. and Gong, F. (2016), "How savvy, social shoppers are transforming Chinese e-commerce", *McKinsey Survey*, April, available at: tttp://www.mckinsey.com/industries/ retail/our-insights/how-savvy-social-shoppers-are-transforming-chinese-e-commerce (accessed 17 November 2016).

Wang, Z., Mao, Y. and Gale, F. (2008), "Chinese consumer demand for food safety attributes in milk products", *Food Policy*, Vol. 33 No. 1, pp. 27–36.

Waugh, F. V. (1928), "Quality factors influencing vegetable prices", *Journal of Farm Economics*, Vol. 10 No. 2, pp. 185–196.

Xu, P., & Zeng, Y. C. (2014), "Factors that affect willingness to pay for red wines in China", *Journal of International Consumer Marketing*, Vol. 26 No. 5, pp. 426-439.

Yang, Y., and Paladino, A. (2015). The case of wine: understanding Chinese gift-giving behaviour. *Marketing Letters*, *26*(3), 335–361.

Yoo, V., Florkowski, W. J. and Carew, R. (2011), Pricing attributes of wines from emerging suppliers on the British Columbia market, *Agricultural and Applied Economics Association 2011 Annual Meeting*, *July*, pp. 24-26.

Yu, Y., Sun, H., Goodman, S., Chen, S., & Ma, H. (2009), "Chinese choices: a survey of wine consumers in Beijing", *International Journal of Wine Business Research*, Vol. 21 No. 2, pp. 155-168.

Zhang, Y. (1996). Chinese consumers' evaluation of foreign products: the influence of culture, product types and product presentation format. *European Journal of Marketing*, *30*(12), 50–68.

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[i] Chow, J. (29 January 2014). China is now world's biggest consumer of red wine. *The Wall Street Journal, Asia Scene*. Retrieved from http://blogs.wsj.com/scene/2014/01/29/china-is-now-worlds-biggest-consumer-of-red-wine/ (accessed 14 July 2016).

[ii] Retrieved from
http://www.austrade.gov.au/Australian/Export/Export-markets/Countries/China/Industries/wine; http://en.wines-info.com/html/2015/9/189-62706.html; https://www.nzte.govt.nz/en/export/market-research/ wine/ regulations-for-exporting-wine-to-china/ (accessed 4 August 2016).

[iii] Retrieved from http://www.yesmywine.com (accessed 14 July 2016).

[iv] The company owns a hundred stores in China. Retrieved from
http://www.beverageinsight.com/2016/04/27/yesmywine/ (accessed 14 July 2016).

Table 1. Independent Variables of the Hedonic Price Model

Variable	Typology	Description
Intrinsic		
Price	Continuous variable	Price in RMB
Alcohol Content	Continuous variable	Alcohol content in %
Reserve	Dummy variable	1 if reserve wine; 0 otherwise
COO	Dummy variable	Country of origin
Body	Dummy variable	Low-medium, medium, medium-high, heavy
Extrinsic (reputation)		
Protected indicator of origin	Dummy variable	1 if the item has a protected indicator of origin (e.g., PDO, PGI); 0 otherwise
Rating	Continuous variable	Overall evaluation by users in %
N of reviews	Continuous variable	N of reviews by users

Table 2. Data Description

Variable	N of observations	Mean	Std. Dev.	Min.	Max.
Price (RMB)	167	126.826	101.597	28	558
Quantity sold	167	28721.590	83419.240	1	729450
Alcohol content	167	13.042	0.731	11	15
Protected indicators of origin	167	0.437	0.498	0	1
Reserve	167	0.132	0.339	0	1
N of reviews	167	191.497	487.873	0	4800
Rating (%)	167	0.970	0.081	0	1
COO - Argentina	3	0.018	0.133	0	1
COO - Australia	12	0.072	0.259	0	1
COO - Chile	36	0.216	0.412	0	1
COO - France	66	0.395	0.490	0	1
COO - Italy	6	0.036	0.187	0	1
COO - Spain	18	0.108	0.311	0	1
COO - China	26	0.156	0.364	0	1
Body - low-medium	7	0.042	0.201	0	1
Body - medium	71	0.425	0.496	0	1
Body - medium-high	73	0.437	0.498	0	1
Body - heavy	16	0.096	0.295	0	1
Cabernet	54	0.327	0.471	0	1
Carmenere	6	0.036	0.188	0	1
Gamay	4	0.024	0.154	0	1
Grenache	8	0.048	0.215	0	1
Malbec	2	0.012	0.110	0	1
Merlot	41	0.248	0.433	0	1
Mixed	7	0.042	0.202	0	1
Monastrell	3	0.018	0.134	0	1
Negroamaro	1	0.006	0.078	0	1
Paez	1	0.006	0.078	0	1
Pinot	3	0.018	0.134	0	1
Sangiovese	1	0.006	0.078	0	1
Shiraz	19	0.115	0.320	0	1
Tempranillo	15	0.091	0.288	0	1

Table 3. Results of the Hedonic Analysis

Variable	Model 1	Model 2	Model 3
Adjusted R-square	0.6917	0.7012	0.5751
No. of observations	167	165	165
Alcohol content	−0.063	−0.112	0.641**
	(0.198)	(0.237)	(0.264)
Rating x no. Reviews	0.001****	0.002****	0.001***
	(0.000)	(0.000)	(0.000)
Protected indicators of origin	1.0433***	0.796**	2.023****
	(0.363)	(0.340)	(0.387)
Reserve	−0.309	−0.263	−0.127
	(0.400)	(0.379)	(0.406)
Argentina	3.100****	3.074****	
	(0.840)	(0.720)	
Australia	3.964****	4.327****	
	(0.731)	(0.788)	
Chile	3.856****	3.907****	
	(0.669)	(0.676)	
France	3.708****	4.174****	
	(0.655)	(0.664)	
Italy	3.274***	3.683***	
	(1.063)	(1.200)	
Spain	4.722****	5.690****	
	(0.680)	(0.755)	
ln(price)	−0.889****	−0.810***	−1.761****
	(0.269)	(0.274)	(0.324)
Heavy	1.366*	1.414*	1.342
	(0.701)	(0.755)	(1.216)
Medium	1.975***	1.976***	2.625**
	(0.611)	(0.647)	(1.038)
Medium high	1.970***	1.828***	2.853***
	(0.621)	(0.642)	(1.051)
Cabernet		0.939	−1.651**
		(0.589)	(0.673)
Carmenere		1.322	−0.182
		(1.077)	(1.124)
Grenache		−0.204	−1.605*
		(0.683)	(0.945)
Malbec		1.729***	−0.845
		(0.536)	(0.699)
Merlot		0.963*	−1.499**
		(0.532)	(0.679)
Mixed		−0.582	−1.719**
		(0.542)	(0.785)
Pinot		0.912	−1.519
		(1.403)	(1.075)
Shiraz		0.560	−0.969
		(0.615)	(0.761)
Gamay			−2.165***
			(0.775)
Monastrell			−2.128**
			(1.009)
Negroamaro			2.013**
			(0.934)
Paez			−1.171*
			(0.695)
Sangiovese			−1.962***
			(0.695)
Intercept	7.149***	6.517**	5.497*
	(2.445)	(2.875)	(3.151)

Coefficients with robust standard errors listed under coefficients
****$p < 0.001$ ***$p < 0.01$ **$p < 0.05$ *$p < 0.10$