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Abstract

Purpose: The purpose of this paper is to analyse consumer buying behaviour in the Japanese rice wine, also known as sake, market.

Design/methodology/approach: The study applies a novel qualitative and quantitative analytical methodology to an off-license channel in Japan. The methodology involves the use of anchoring-and-adjustment theory and simulation to a large set of point of sale data. The selection of the brands used for the study are more than 230 brands and more than 150 sake breweries.

Findings: Age and gender are important factors determining recurrent patterns of purchasing behaviour. Small size packaging, e.g. one cup, has the highest volume in sales, e.g. convenience shopping, but it depends on exogenous factors, e.g. summer season or festive events.

Research limitations/implications: Limitations are related with the lack of specific personal data from consumers that impedes to test behavioural attitudes driving loyalty to brands. Anchoring-and-adjustment theory can be a valid approach to evaluate large longitudinal data sets of purchasing behaviour.

Practical implications: Results indicate that fragmented markets tend to over-expand the assortment affecting volume stability. However, this dynamics is difficult to avoid when all participants are engaged in this behaviour and market is strongly segmented by age and gender.

Originality/value: The paper contributes to the body of knowledge of buyer behaviour in relation to purchasing and consumption for other types of wine. It is the first application in alcoholic beverages of anchor-and-adjustment theory.

Keywords: Japan, Wines, Purchasing behaviour, Asian wine consumption, Marketing analytics.

Introduction

Wine is a global and highly fragmented industry with multiple producers and product-styles. Wine making and drinking has a rich tradition in many cultures. For Europe and the Western world, wine is made of grapes. While Asian countries have been embracing wine made of grapes in recent years, Asian countries also consume wine made out of fermented rice: rice wine known as sake in Japan. Sake is considered a spirit from some perspectives (Camillo, 2012) but sake is part of the wine category in China, Japan and Korea (Anderson, Nelgen and Pinilla, 2017). While the production of sake has been declining over many years, from 513 (2006) to 444 (2015) million litres (Satista, 2015), the importance of sake is growing in different markets due to the globalisation of Japanese food, increasing number of tourists arriving at Japan, news coverage in western countries, implementation of premium sake category and internationalisation of sake brewers. For example, Japanese sake brewers have established and expanded capacity in the U.S. in recent years followed the increasing recognition of sake and Japanese food (Otsuka, 2015). Sake consumption is becoming global and competing with wine in food pairing and cooking, especially among millennials. However, there is no enough information about the market for sake. This paper presents an exploratory study of the market for sake with three objectives. Firstly, a qualitative description of the market in Japan. Secondly, a quantitative description of the dynamics of purchasing sake in an off-trade channel using a large data set of point of sale transactions. Thirdly, a quantitative analysis of purchasing behaviour using point of sales data and a behavioural theory with simulation.

After 2003 deregulation in alcohol retailing, supermarkets, convenience stores and drugstores have been acquiring an increasing share of the distribution of alcoholic beverages from specialty stores (Canada, 2012). Supermarkets and other stores account for more than 60% of sales value in alcohol beverages. Japan's off-trade alcoholic drinks market was US$50.3 billion in 2011 and included beer, wine, spirits, ready-to-drink/high-strength premixes (RTD/HSP), and cider (Canada, 2012). While beer is the main alcoholic drink, the consumption of alcoholic beverages in Japan also involves wines and spirits. Japan has a long tradition of wine making from grapes that started nearly 1200 years ago, which benefited from the arrival of missionaries in the 16th century, but it was hold until late 19th century when Japan opened to the Western world (Holden, 1995). Nowadays, wine mostly comes from Europe and Chile and Japan accounts for 5% of the world wine imports in value (Anderson et al, 2017). In terms of rice wine, there are more than 150 competitive producers in the sake market but the five largest manufacturers have approximately 40% of the market (Canada, 2012). Sochu (a spirit made of fermented barley or sweet potato that is considered the equivalent to vodka) and whisky are the two most important spirits. Interestingly, Japanese whisky has achieved international recognition in recent years due to its quality (Albright, 2018). To summarise, the Japanese alcohol beverage market is highly competitive, fragmented and deregulated; however, the Japanese alcoholic drinks market experienced stagnation for many years (Euromonitor, 2018).

Traditional research on wine consumption considers consumers as thoughtful people who evaluates multiple dimensions of the wine in order to make a decision (King et al, 2012; Platania et al, 2016). However, there is a number of marketing and psychology scholars who suggest people use less thoughtful processes when they are confronted with repetitive activities, e.g. shopping daily products (Wegener et al, 2010). People use autonomous (or intuitive) processes, e.g. an anchor on previous purchases, that do not require attention so it makes minimal demands on working memory resources (Evans and Stanovich, 2013). Anchoring-and-adjustment is a robust theory to explain behaviour in multiple everyday situations such as purchasing activities (Turner and Schley, 2016) and quantity decisions (Wansink, Kent, and Hoch, 1998). Applying the concepts from the theory, the study proposes that consumers become loyal towards a certain sake style and brand after the first purchases and trial. Then, the level of loyalty determines the likelihood of buying again the same product/brand and in similar quantities when there is a need for the product. In other words, purchasing sake, or any wine, is a routine decision making that follows an anchor-and-adjustment process with minimal adjustments over time rather than a sophisticated exploration of multiple brands and types.

Tests of anchoring-and-adjustment theory has been performed through experiments, e.g. Evans and Stanovich (2013), but the existence of large longitudinal purchasing data allows observing the existence of repetitive purchases in real contexts, which is still under-researched. In this paper, routine purchasing behaviour is evaluated using a large longitudinal dataset from a retail channel that covers weekly purchases over five years to uncover the existence of anchoring-and-adjustment process. Moreover, the analysis is also performed in terms of gender.

Consistent with the three objectives mentioned previously, this paper contributes to three areas of research. Firstly, the paper presents an analysis of the market of rice wine, which is a strong competitor to grape wine in Asia. Secondly, it offers a quantitative analysis of the dynamics of one retail channel in Japan, which is one of the largest Asian markets for alcoholic beverages. Thirdly, an approach to understand purchasing behaviour of alcoholic beverages based on anchoring-and-adjustment theory, which benefits from the increasing availability of longitudinal large data (big data) on purchasing patterns, complements traditional studies in this area.

Literature review

The literature review comprises three areas: recent studies on Asian wine consumption, consumer behaviour models and empirical studies on wine purchasing behaviour.

Studies in Asian wine markets

Beverland (2002) suggests there is a distinctively Asian culture and Asian consumer behaviour in his study of the attempts to sell wine in Asian countries. He also suggests there

is greater value on personal relationships and contextual aspects. Moreover, stability and uncertainty avoidance is a cornerstone in Asian societies so there is an emphasis on dealing with old established entities so age and family are critical dimensions in defining consumer behaviour (Beverland, 2002).

Unfortunately, there are no studies on wine consumption in Japan, for an exception see Galati, Crescimanno and Tinervia (2017). Most of the recent studies on wine consumption have been performed in China, e.g. Balestrini and Gamble (2006), Liu and Murphy (2007), Somogyi et al (2011), Camillo (2012), Corsi, Marinelli, Sottini (2013), Agnoli, Capitello, and Begalli (2014), Liu et al (2014), Tang, Tchetchik and Cohen (2015), Williamson et al (2018), due to the attractiveness of the market in terms of size, and important advice on how to do research in wine marketing (Cohen and Lockshin, 2017). For example, Liu and Murphy (2007) indicate spirits are consumed for all occasions but special alcohol beverages, e.g. wine, are only for special occasions and public occasions imply purchasing products that are more expensive. Some alcoholic beverages have symbolic rather than necessity value. Camillo (2012) suggests word-of-mouth is a strong influencer on the adoption of wine. Among the intrinsic factors affecting the decision to purchase wine are education, lifestyle, age, gender, marital status, image, willingness to try new things, simplicity, special occasions, taste and previous experience (Camillo, 2012). Extrinsic factors are marketing strategies by resellers, positioning (price and labels), visit to wineries, availability, state of the economy, convenience shopping and brand. Another important stream of research is related with the country-of-origin effects on Chinese consumers, e.g. Agnoli et al (2014), Balestrini and Gamble (2006), especially in terms of Italian red wine, e.g. Corsi et al (2013), Galati et al (2017), Galati et al (2018). Purchasing and consumption behaviour in Japan may not be completely different than Western and Asian consumption patterns so testing their behaviour based on research performed in other wine drinking countries' behaviour is a suitable approach.

Studies on wine purchasing behaviour

Brand size and perceived brand attributes affect consumer behaviour. Ehrenberg (1988) suggests that there is a positive relationship between brand size (market share) and brand attributes. Dall'Olmo-Riley et al. (1999) concurs with Ehrenberg's findings and cites that there is a strong correlation between current and past usage of a brand and consumers' attitudes toward it (Ehrenberg, 1988). Jenster and Jenster (1993) also found the most important criteria for purchasing wine is personal familiarity or consumer awareness of the brand.

There is mixed evidence on the factors affecting buying wine in the off-trade channel. Olsen et al (2003) suggested buying wine in the off-trade is easier due to lack of public nature of the act, and the lower financial risk, compared with on-trade. Quester and Smart (1996) provided the opposite argument: since consumers need reassurance about their purchase they use price and awareness as cues to reduce the complexity of choosing a wine. Nevertheless, purchasing

and consumption reflects national cultural identities (Ritchie, 2009). Concluding on a review of the literature, Ritchie (2009) suggested that behaviour depends on the occasion and situation of purchase and consumption. For example, there is synergy between food and wine when it is the beverage of choice with meals. Sometimes, wine is a gift for special occasions, especially parties. Thus, the consumption occasion influences the purchase of wine so there seems to be a high (special) or low (everyday) proactive behaviour.

In terms of gender approach to wine purchasing, Cockburn-Wootten (2002) suggested women see grocery shopping for family consumption as a repetitive and functional task. Moreover, Quester and Smart (1996) found that more women buy wine than men in Australia off-trade. Ritchie (2009) confirmed the involvement of women on purchasing wine but they took it as a daily activity like buying milk due to the accessibility in the off-trade channel in the UK. For women, buying wine for informal home usage is a quick low risk activity (Olsen et al, 2003). Ritchie (2009) observed men tend to buy wine to pamper themselves so they purchased in other places than supermarkets. Moreover, men try to demonstrate knowledge about wine purchasing expensive wine or in specialist stores rather than convenience stores.

The impact of age cohorts on wine consumption has been studied in different contexts, e.g. New Zealand (Pickering and Thomas, 2005), Italy (Agnoli, Begalli and Capitello, 2011) and multiple country (Mueller, Remaud and Chabin, 2011), but all studies coincided that older generations tend to drink more wine than young generations. Young wine consumers do not buy wine, as they prefer other people, e.g. parents, purchasing wine for them (Ritchie, 2009). The purchasing behaviour of young wine consumers is erratic due to impulse buying and exploratory behaviour, which can also be associated with single people with knowledge about wine (Ritchie, 2009). Agnoli et al (2011) indicated that Italian younger generations tend to drink more spirit and beer than wine, and Mueller et al (2011) reached similar conclusion. Among the reasons mentioned for the choice of alcohol beverages are contextual drivers such as the consumption situation, e.g. home means wine but pubs imply beer or spirits (Agnoli et al, 2011). Younger generations tend to be more open to innovations, such as packaging and mixed drinks (Mueller et al, 2011). From a generational perspective, there are differences in terms of the degree to which wine has been part of the food culture (Mueller et al, 2011). However, Mueller et al (2011) concluded there are no significant generational effects on purchasing and consumption behaviour related to wine. Nevertheless, aesthetic and health concerns constitute new values for young consumers when making decisions about what they consume that impacting on the consumption of wine.

Empirical analysis of purchasing behaviour in wine

Barber and Taylor (2013) suggest three measures to assess purchase behaviour: asking individuals to state their purchase intentions through surveys, interview or focus groups; assessing the willingness to pay for a product; or obtaining information about actual purchase behaviour using market transaction data or auction processes.

Most of the studies on consumer behaviour in Asia are either interviews, e.g. Lui and Murphy (2007), surveys to specific consumers, e.g. Camillo (2012), or laboratory experiments (Williamson et al, 2017). Interviews to small number of consumers provide depth to ask and evaluate their intentions and drivers affecting their behaviour but they lack broad coverage and the observation of performing the real activity. Thus, there may be a disconnection between reported and real purchasing behaviour. Surveys to consumers increase coverage but they also lack the observation of their behaviour. Moreover, these studies do not discriminate in terms of retail channels. In the case of experiments, consumers may face a hypothetical situation where they need to choose a wine on a computer screen and using questionnaire to identify their preferences (Williamson et al, 2017).

Studies in only wine consumption markets, e.g. markets without a traditional wine industry, may share the similarities of the Japanese context in terms of retail channel. Ritchie (2009)'s study on the culture of wine buying in the UK off-trade employed focus groups to evaluate the level of involvement with the activity of purchasing wine. The use of focus group allowed discovering unaddressed areas in previous research related to the impact of context on purchasing. This is clearly an advantage with empirical studies such as using surveys or transactional data.

Large scale and multiple countries studies can offer more robustness. For example, a survey study involving more than 10000 subjects found the effect of age is not significant on wine consumption (Mueller et al, 2011). However, they also suggested that studies using actual sales data should test the validity of generational differences reported in the study.

Very few studies present experiments to test drivers related to wine purchasing. For example, Agnoli et al (2011) presented a choice experiment to detect the drivers influencing consumption and purchasing. While experiments increase the robustness of findings under controlled environments, they also suffered from limitations due to small number of subjects.

Obtaining information about actual purchases involves the access to point of sale data. Point of sale data offers the possibility of having longitudinal behavioural patterns of millions of consumers but it does not provide the drivers for the purchasing behaviour. It offers a window to consumers' buying behaviour but not their motivations determined by, e.g. lifestyle profiles (Ritchie, 2009). Clearly this type of empirical studies are not specifically designed to test hypotheses using pre-defined variables, such as in econometric analysis of survey data (Hussein, Colette and Castaldi, 2007), so the findings are more speculative.

Anchoring-and-adjustment models to represent purchasing behaviour

In traditional marketing models, consumers go through a set stages (e.g. need recognition, information searches, alternative evaluation, purchase and post-purchase) to make a purchase decision. These stages are captured in models such as the AIDA model, hierarchy of effects, hierarchy of sequence and Howard Sheth's buying behaviour model (Wolny and Charoensuksai, 2014). Jenster and Jenster (1993) indicates the most important criteria for

purchasing wine is personal familiarity. For example, a returning customer will most likely buy the same wine consumed during a previous visit because of the experience and familiarity with the product. Consumer perceptions of wine's quality are also important factors that may differ in terms of demographic and psychographic variables, e.g. gender may affect the search for information regarding wine quality (Atkin, Nowak and Garcia, 2007).

Some scholars suggest people use less thoughtful process than depicted in consumer models when they are confronted with repetitive activities, e.g. shopping daily products. People use higher cognition type 1 process (Evans and Stanovich, 2013). This process is autonomous (or intuitive) and it does not require attention so it makes minimal demands on working memory resources (Evans and Stanovich, 2013). One process that fits this description is anchoring and adjustment theory (Kahneman and Tversky, 1974). This theory has generated multiple streams of research and debate but empirical tests have demonstrated the theory is robust in multiple situations including purchasing activities (Turner and Schley, 2016). Scholars have shown that anchors influence purchase quantity decisions but it also depends on the type of anchors (Wansink, Kent, and Hoch, 1998). There are two types of anchors: anchors that are provided by an external source and anchors that are self-generated (Epley and Gilovich, 2006). For example, a price promotion based on quantity purchased may be an example of an anchor provide by an external source and the simple repetition of the quantity purchased last time is a self-generated anchor. Ritchie et al. (2010) found that supermarkets advertised wine through price discounting which caused the price to be the focus rather than other attributes, as well as encouraging stockpiling. These scholar support the view of Williams (2003) who indicates the consumers buying wine in supermarket take 'less than a minute" to select their wine. Purchasing wine for informal home usage is a quick activity involving only recognised brands (Ritchie, 2009).

After the purchase and trial, consumers become loyal towards the product and brand determining the likelihood of buying again the same product/brand and in similar quantities when there is a need. Past experience influences current experience leading to stickiness in evaluations (Lervik-Olsen, Van Oest, and Verhoef, 2015). Therefore, customer decisions become routinized (Sheth and Parvatiyar 1995) and anchors for customers' purchasing behaviour. Loyal customer will stock out products of their favourite brand when a retailer promotes them (Ritchie, 2009). Loyal customer will stock more units than needed of their favourite brand when a retailer promotes them (Ritchie, 2009) so customers may be less loyal to retailers than brands. Customer loyalty results in consistent purchases over time, except when they are influenced by promotions.

The use of a simple behavioural model, such as anchor-and-adjustment model, fits well with the concept of 'loyalty loop'. When consumption is driven by goal-seeking feedback process, e.g. the goal that drives the consumption is the need, satisficing (Simon 1955, 1956) is the key behavioural process that captures the process of goal attainment through the use of an existing anchor. Adaptation starts when the existing anchor, which reflects a balanced situation between a consumption behaviour and need, does not satisfy the goal and adjustment is performed through a search for options (Kunc, 2016a). In other words, when a

loyalty loop is operating, purchasing is routine decision making that follows an anchor-and-adjustment process with minimal adjustments over time.

To summarise, purchasing tends to be stable over time (anchor), as consumers tend to repeat their purchasing patterns, and it is influenced by external events, e.g. seasons or promotions, (adjustments).

Research method

The research consists of mixing three methods: qualitative and quantitative analysis to described the dynamics of the market for sake and a simulation to explore the proposition related with anchoring-and-adjustment theory that a loyalty loop exists for some brands.

The analysis of the market for sake is performed using information sources such as papers and industry reports complemented with a quantitative analysis, which is mostly descriptive, presented in the results section. The quantitative analysis consists of the evaluation of point of sale data from purchasing transactions from drugstores in Japan totalling more than 1400000 transactions. This data covers all drugstores[1] in Japan. The database was provided by True Data Inc. (True Data, 2018). True Data Inc. consolidates point of sale data into one place for the use of companies in their marketing analysis. The database was shared during the research but the researcher has not access to the database after the research has finished in October 2018. The database can be obtained directly from True Data Inc., see www.truedata.com for more information. The information contains weekly purchases for 261 weeks until 31/12/2017 in terms of brand, product, units and price together with age group and gender. Demographic information for the transactions in terms of gender is: 52% female, 41% male, and 7% of the transactions does not contain any gender information because the data was incomplete. In terms of age group, the distribution of the data is: 2% corresponds to 'up to 29', 5% corresponds to age between '30 and 39', 12% corresponds to buyers between '40-49', 17% corresponds to the age '50-59', 46% for more than 60, and 18% of the transactions does not have any age related information.

To verify the existence of anchoring-and-adjustment in the purchasing behaviour, a model is developed with an anchor on previous purchase volume and then adjusting the decision based on additional or updated information (Remus and Kotteman, 1995). To develop the model, this study employed a modelling method described in Kunc(2009). The basic model contained few pieces of information: the anchor, which is the value of the previous volume purchased (D(t-1)), with its weight (w_d), and the size of adjustment (A(t)), which is an exogenous behavioural source of adjustment with its respective weight (w_m). The value of the anchor for at time t (D(t)) follows the equation:

[1] There are more than 18000 drugstores in Japan with sales of US$ 60billions, which is larger than department stores. Five chains concentrate 40% of the total market share. Drugstores sell pharmaceutical products together with food and drinks and many times at discounted price. People are attracted to drugstores because they can buy food, drinks and other items while filling prescriptions.

$$dD(t)/dt = D(t-1)\ w_d + A(t)\ w_m$$

The exogenous behavioural source of adjustment is an index indicating the volume adjusted to different factors, e.g. summer, events, etc., based on past data. If the consumer is loyal and buys following its needs, the weight for the anchor w_d will be higher than the weight for the exogenous adjustment w_m. Therefore, the loyalty loop operates when the weight for the past decision is higher, e.g. the consumer buys the same volume repetitively. There are other factors affecting the purchase decision such as promotions or personal events (parties, etc.) so a difference between real and simulated data may exist. Differences are compensated over a period of four years so the accumulated deviation between the model and the real sales should be small if the purchasing behaviour is stable. The model is applied to five products, which are selected following a judgmental sampling approach (reference). The data has been employed to calibrate the model in order to obtain the value of the anchor and check the accuracy of the simulated result with respect to real data, e.g. model validation (Kunc, 2008).

Results

This section contains two parts. Firstly, there is a general description of the market based on established concepts in the wine consumption literature. The following section presents the evaluation of the anchoring-and-adjustment theory for selected products.

General description of the sake market

Rice wine is produced by yeast-induced fermentation of glutinous rice starch that has been converted to sugars. Considering that many sake breweries are more than hundred years old, which are called 'Shinise' firms (Sasaki and Sone, 2015), the process of making sake has used similar traditional processes over many centuries. An interesting account of the process can be read in detail in Atkinson (1881). Traditionally, sake production involves important research on the use of yeast to achieve the right fermentation process that continues nowadays (Kitagaki and Kitamoto, 2013). Interestingly, sake fermentation techniques, e.g. low-temperature fermentation, have also been applied to grape wine production in Japan with excellent results and transferred to grape wine making countries (Holden, 1995). The diverse location of the breweries across Japan, the production of rice in different regions that provides diversity in the raw material and methods of brewing allow breweries to claim differences in taste (dry, sweet, etc.) and quality (basic, premium, etc.). This critical aspect makes the market highly fragmented and resembling to the wine market. Moreover, there is also important innovation in other aspects of sake. For example, the packaging is highly diverse with multiple sizes, 3 litres, 2 litres, 1.8 litres, 0.90 litres, 0.72 litres, 0.30 litres, 0.20 litres (one cup) and 0.18 litres (one cup), and materials such as coated paperboard and glass. Glass bottles have many variations and styles to make the sake distinctive in the shelf, which together with the boxes, position sake as a gift. Price is highly diverse from ¥400 to more than ¥1000 per litre.

While the Japanese alcohol beverage market in general, like the sake market, is fragmented, there are large beverage groups, e.g. Kirin, Asahi, Takara and Suntory, with participations in

all segments and products. The stagnation in the market has resulted in attempts to attract female and younger drinkers introducing RTD/HSP (Euromonitor, 2018). Moreover, an amendment to the Japan's liquor tax improved the price advantage of RTD/HSP (Euromonitor, 2018). This segment has the strongest growth in recent years attracting some unexpected firms. For example, Coca Cola has recently entered into this market, called 'Chu-Hi', in Japan (Lewis, 2018). The base spirit for RTD is shochu mixed with carbonated water and fruit juice, tea or herbs. RTDs has impacted on the consumption of sake among young drinkers.

In terms of on-trade consumption, sake is consumed in restaurants as well as specialised bars that offer 100s of different type of sake similarly to wine bars in other Asian countries (Hwang and Kunc, 2015). There is also tourism offerings associated with sake breweries that resemble traditional wine tour offerings (Kunc, 2010) such as restaurants in the brewery, museums detailing the history of sake-making and outdoor activities.

Figure 1 presents the time series for volume purchased. The data shows peaks in specific celebrations, such as cherry blossom season (April), fireworks festivals (July-August), Emperor's birthday (December) and New Year (December), which indicates the celebratory use of sake. The increasing peaks may indicate growth in the consumption of sake or a switch in retail channels towards drugstores due to price competition. The data indicates prices tend to decrease (-5%) during the peaks but this is not uniform across all brands. Purchasing activities are higher during winter and decline during summer as figure 1 shows.

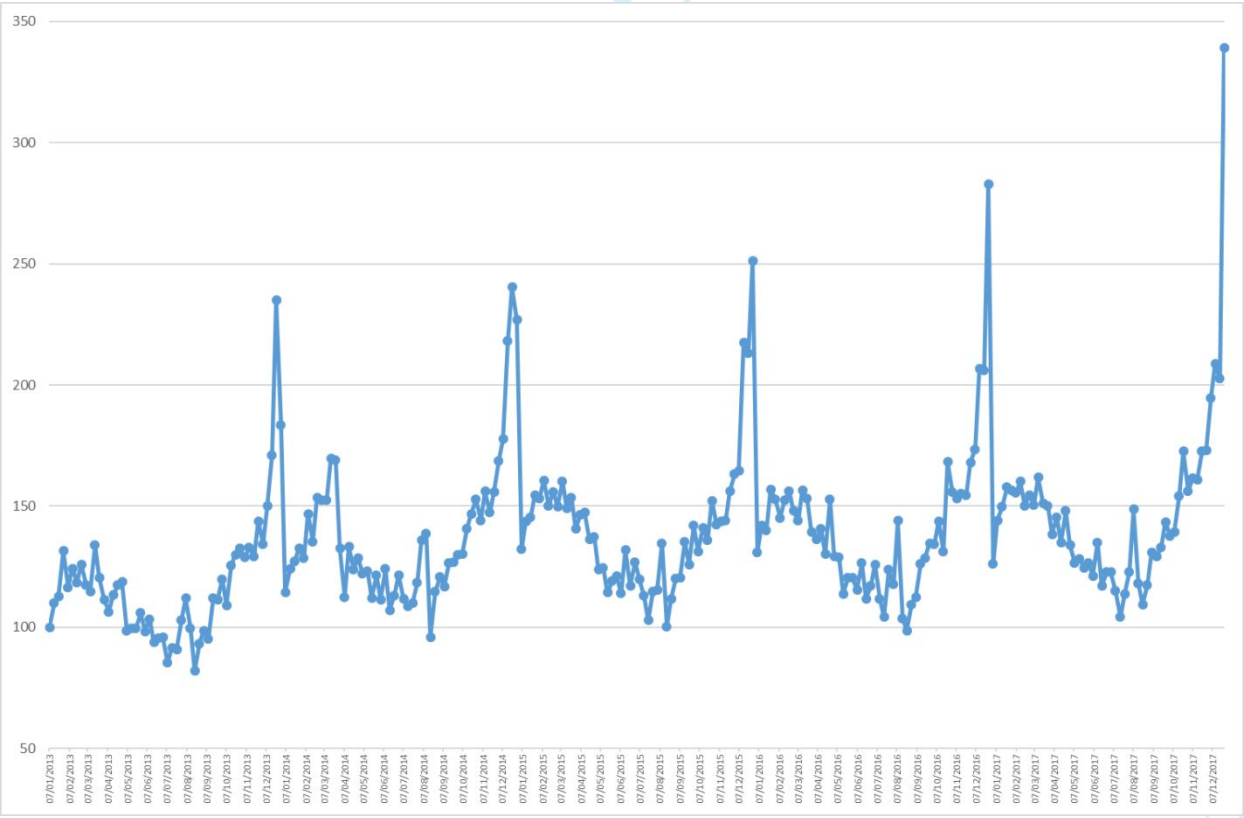

Figure 1. Sales volume from 2013 until 2017 (Index=100 for first data point)

Table 1 presents the share of transactions included in the selection of the brands for the study from more than 230 brands and more than 150 sake breweries in the data. Table 1 shows a fragmented market in terms of brands and low number of units purchased per transaction, which is consistent with convenience shopping rather than stockpiling behaviour. Additionally, the table classifies the size that drives most sales for each brand in terms of large (equal or more than 1.8l), medium (less than 1.8l and more than 0.3l) and small (less or equal to 0.3l). In terms of sake brewery, three breweries have 45% of the items purchased in the sample.

Brand #	Most sold packaging	Share of Items purchased	Share of transactions in the dataset	Average number of items purchased per transaction	Percentage of items purchased by female	Percentage of items purchased by male
1	Large	12.2%	10.0%	1.51	57%	43%
2	Large	7.5%	6.2%	1.50	56%	44%
3	Large	7.1%	5.6%	1.58	60%	40%
4	Large	6.8%	4.2%	1.99	50%	50%
5	Medium	6.0%	2.9%	2.59	41%	59%
6	Small	5.3%	3.3%	2.03	50%	50%
7	Small	4.2%	2.5%	2.05	51%	49%
8	Medium	3.8%	2.5%	1.88	49%	51%
9	Medium	3.6%	3.2%	1.39	52%	48%
10	Medium	3.3%	1.7%	2.39	45%	55%
11	Medium	3.3%	1.8%	2.24	52%	48%
12	Large	3.3%	3.1%	1.31	59%	41%
13	Medium	3.2%	1.4%	2.94	54%	46%
14	Medium	3.0%	1.9%	1.94	56%	44%
15	Medium	2.7%	1.4%	2.37	56%	44%
16	Large	2.5%	1.9%	1.61	51%	49%
17	Small	2.5%	2.0%	1.54	51%	49%
18	Medium	2.2%	1.6%	1.76	56%	44%
19	Large	2.2%	2.3%	1.17	80%	20%
20	Large	2.0%	1.2%	2.06	53%	47%
21	Medium	2.0%	1.8%	1.38	47%	53%
22	Small	1.6%	1.6%	1.24	70%	30%
23	Small	1.3%	0.9%	1.92	62%	38%
24	Medium	1.3%	1.0%	1.59	43%	57%
25	Medium	1.2%	1.1%	1.31	57%	43%
26	Large	1.2%	1.3%	1.17	63%	37%
27	Medium	1.1%	0.7%	1.80	58%	42%
28	Smal	0.9%	1.0%	1.20	56%	44%
29	Small	0.8%	0.8%	1.23	64%	36%
30	Medium	0.7%	0.4%	2.41	56%	44%
31	Medium	0.7%	0.5%	1.85	45%	55%

32	Medium	0.6%	0.4%	1.81	64%	36%
Total		**100.0%**	**72.3%**	**1.72**		

Table 1. Selected brands from the dataset.

In terms of gender, female buyers have a higher share of purchases with 54% over the whole period analysed. However, table 1 indicates the distribution is dissimilar among the selected brands. There are some brands favoured by each gender but most of them present a balanced distribution. Due to confidentiality issues, it is not possible to discuss the positioning of each brand or reveal the characteristics of the brand that attract one gender more than another. However, an analysis at product level reveals that female buyers purchase predominantly large size products, e.g. 2litres or 3litres, which can be associated with family consumption for drinking or cooking. The products with largest proportion of male buyers are in small size, e.g. 0.18litres and 0.27litres, which indicates individual consumption.

In terms of the distribution of items purchased by age, table 2 presents the percentage of sales according to different age brackets. It is important to remember, the data contains 18% of transactions with undefined age, which is excluded from table 2. The age distribution clearly shows 50s and 60s-and-more are the largest purchasing age group in most brands, which is similar to the profile in some wine drinking countries. The only noticeable case is brand 22 due to its balanced age distribution.

Brand #	20 years old	30 years old	40 years old	50 years old	60 and more years old
1	1%	5%	10%	16%	68%
2	1%	5%	13%	19%	62%
3	1%	5%	11%	19%	65%
4	1%	4%	10%	18%	66%
5	0%	3%	11%	18%	67%
6	2%	4%	11%	20%	63%
7	1%	3%	9%	15%	71%
8	2%	5%	11%	22%	60%
9	2%	4%	14%	20%	60%
10	1%	5%	11%	25%	59%
11	0%	3%	10%	20%	66%
12	2%	6%	12%	21%	60%
13	1%	1%	8%	29%	60%
14	1%	3%	8%	20%	67%
15	2%	5%	8%	20%	65%
16	1%	5%	17%	17%	59%
17	1%	6%	11%	17%	65%
18	1%	4%	12%	23%	60%
19	1%	11%	17%	19%	52%
20	1%	3%	12%	15%	69%
21	1%	7%	15%	21%	57%
22	17%	25%	23%	19%	16%
23	1%	5%	11%	16%	67%
24	2%	3%	13%	25%	57%

25	1%	4%	10%	20%	65%
26	1%	6%	14%	26%	53%
27	1%	5%	13%	17%	63%
28	1%	4%	13%	21%	60%
29	2%	7%	15%	26%	51%
30	0%	8%	7%	10%	74%
31	1%	5%	17%	30%	47%
32	1%	5%	12%	24%	58%
Total	1%	5%	11%	19%	63%

Table 2. Sales distribution by age group at brand level

Evaluating the anchoring-and-adjustment theory in wine purchasing behaviour

To test the proposition related with the anchoring-and-adjustment process, the model considers consumers tend to repeat the same volume purchased every week or the volume varies according to repetitive needs, e.g. summer time or annual events, and the anchor is generated endogenously, e.g. there is no impact of promotions. There is a need to consider the impact of product type, e.g. individual vs. family consumption; gender: female vs. male; age: young vs. old consumers; all channels: supermarket, convenience stores, and drugstore, and brand. Ideally, it should be tested at individual level. However, the consumer data available does not fulfil all the requirements so the test has its limitations.

Based on the data available, the model uses the volume purchased by all consumers in one retail channel and for only five different products from the set of brands identified in table 1. Three products are for individual consumptions, e.g. less than 0.30litres (one cup consumption), and two for family consumptions, e.g. 1.8litres and 2litres (large size). Two of the products, individual and family consumption, are under the same brand but the other three products are from different brands. Table 3 presents the five products and their characteristics.

Product #	Size	Percentage of female buyers	Percentage of male buyers	Brand #	Distribution of purchases by age
1	0.20litres	50%	50%	1	Mostly 50s and higher
2	2.00 litres	61%	39%	1	Mostly 60s and higher
3	1.80 litres	40%	60%	5	Mostly 50s and higher
4	0.15 litres	73%	27%	22	Mostly younger than 40s
5	0.27 litres	36%	64%	24	Mostly 40s and higher

Table 3. Selected products for anchoring-and-adjustment testing

Figure 2 presents a stacked line graph comparing the purchasing volumes by female purchasers for five years for product 1. The initial impression shows a clear pattern repeating every year with growth during the first 10 weeks, then a decrease until weeks 23-24 followed with large peaks in weeks 30-32, 37-38 and growth again leading to the end of year.

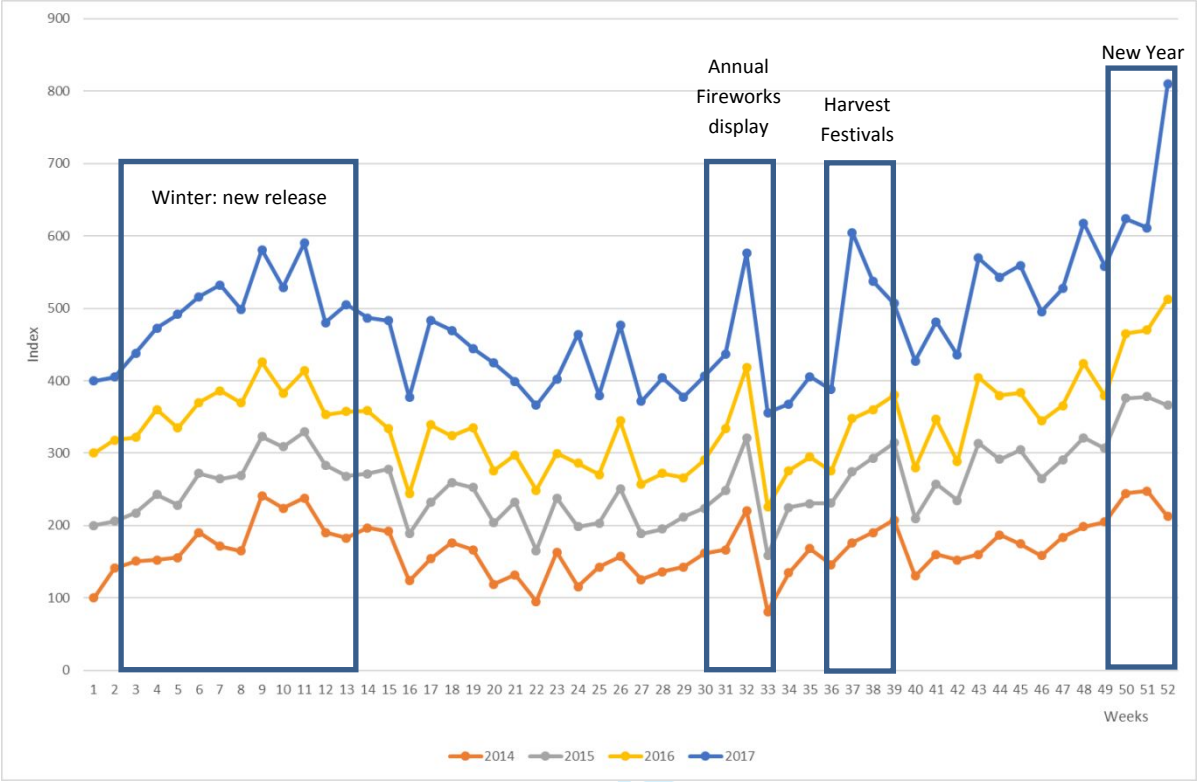

Figure 2. Weekly sales distribution for product 1 and female purchasers using index=100 at the beginning of each calendar year (week 1).

Figure 3 presents a stacked line graph comparing the purchasing volumes by male purchasers for five years for the similar product as figure 2. The initial impression shows a clear pattern repeating every year with growth during the first 14 weeks, then a continuous decrease until weeks 28 followed with large peaks in weeks 30-32, 39 and growth again leading to the end of year. However, the volume during the year did not change substantially since it ended with the same weekly volume as the beginning of the year. This is a stark contrast with figure 2 where the volume ended 100% higher than the beginning of the year. The product seems to be attracting female drinkers.

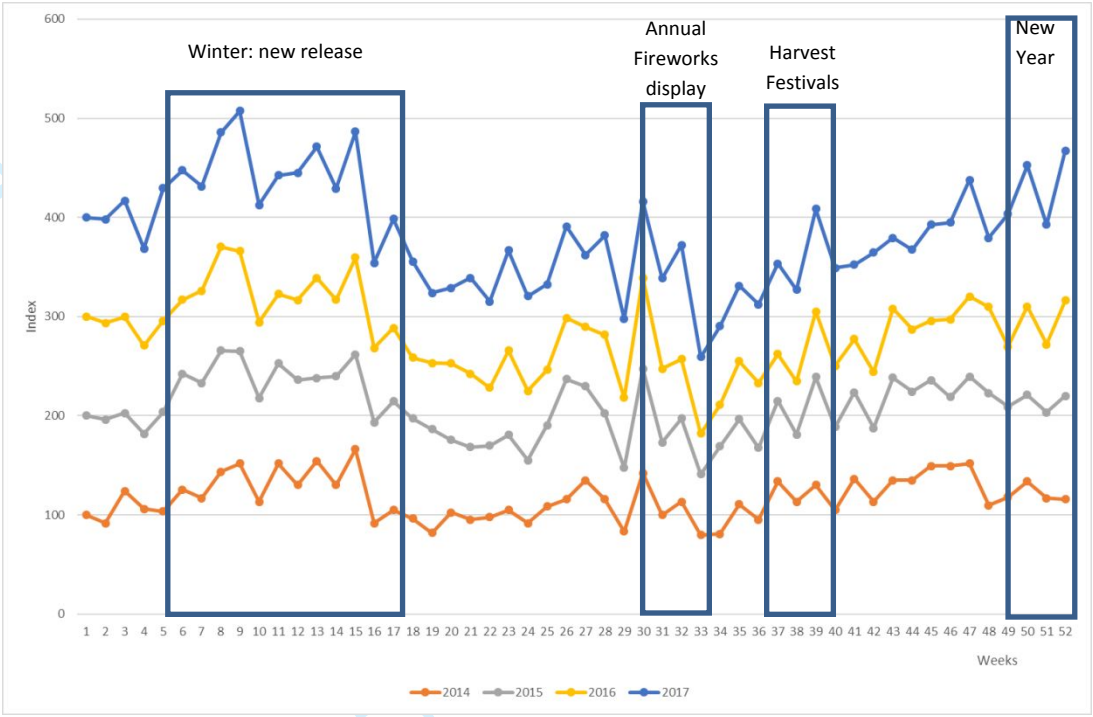

Figure 3. Weekly sales distribution for product 1 and male purchasers using index=100 at the beginning of each calendar year (week 1).

Table 4 presents the results of the model used for testing the anchoring-and-adjustment theory on the five products selected. The table presents three different hypothesis for anchoring-and-adjustment processes: the anchor is fixed with the initial weekly sales at 2014 (no adjustment so $w_d=1$ and $w_m=0$); the anchor follows the seasonal adjustment with one-week lag, e.g. the purchase of the previous week is repeated the next week, (the adjustment has a lag so $0<w_d<1$ and $0<w_m<1$); and the anchor is based on last year behaviour so every week will repeat the same purchase as last year (anchor adjust to the seasonal needs so the adjustment so $0<w_d<1$ and $0<w_m<1$). In all cases, $w_d + w_m=1$. The values in the table indicate the accumulated difference in terms of volume of sales between the anchor and the real time series after four years, as well as the value of w_d and w_m. The lower the accumulated difference, the more exact is the representation of the anchoring behaviour.

Product # and gender	Anchor is fixed	Anchor follows the seasonal adjustments one step behind	Anchor follows exactly the previous year consumption	Conclusion
1 – female	7010 $w_d = 1.00$	109 $w_d = 0.50$	-4 $w_d = 0.06$	Exogenous factors, such as seasonal events, repeated annually determine the anchor rather than constant behaviour.
1 – male	2834 $w_d = 1.00$	68 $w_d = 0.50$	-5 $w_d = 0.08$	Exogenous factors, such as seasonal events, repeated

				annually determine the anchor rather than constant behaviour. However, male behaviour is more stable than female.
2 – female	14153 $w_d = 1.00$	222 $w_d = 0.00$	107 $w_d = 0.50$	Exogenous factors define the behaviour but the behaviour only partially repeats the annual size pattern. There are more short-term factors influencing consumption.
3 – male	2110 $w_d = 1.00$	36 $w_d = 0.00$	-2 $w_d = 0.01$	Exogenous factors, such as seasonal events, repeated annually determine the anchor rather than constant behaviour.
4 – female	3128 $w_d = 1.00$	40 $w_d = 0.00$	-3 $w_d = 0.03$	Exogenous factors, such as seasonal events, repeated annually determine the anchor rather than constant behaviour.
5 – male	785 $w_d = 1.00$	2 $w_d = 0.00$	2 $w_d = 0.06$	Exogenous factors, such as seasonal events, repeated annually determine the anchor rather than constant behaviour.

Table 4. Anchor-and-adjustment model testing

Discussion

I discuss the results in two areas: the characteristics of the market for sake and the use of anchoring-and-adjustment theory for purchasing behaviour.

Characteristics of the market for sake and insights for the wine industry

The market for sake is fragmented and subject to seasonal purchasing patterns. For example, since sake cannot be stored like wine and the release of new sake occurs during the winter months, most consumers buy sake during the winter period. Consumers in the sake market present purchasing behaviour that is associated with different annual events, such as festivities, repeated annually. This behaviour indicates that sake is mostly a celebratory beverage. The seasonal behaviour affects both family (large packs) and individual (small bottles) consumption. From this strong seasonal behaviour, I suggest sake has similar characteristics to sparkling beverages, such as champagne (Charters, 2012), as a celebratory drink associated with special events.

The findings in terms of gender confirm previous studies in the wine industry where female buyers are the main purchasers of wine. This information confirms previous research in the wine industry that female buyers tend to buy more wine for a number of reasons, as discussed in the literature review. This profile is aligned with previous studies (Forbes, 2012; Barber, Almanza and Donovan, 2006) showing female buyers purchase more wine than men. The results also indicate purchasing sake in large size may be only for informal home usage and it is a quick low risk activity involving only recognised brands. However, the origin of the

information in terms of retail channel, drugstore, may indicate the purchasing process is not sophisticated as it will be in a specialty store. The results provides evidence that there is a minimum level of purchases for cooking given the importance of large size packaging. Thus, sake has a use that is not widely exploited in the wine industry: everyday cooking, which may be a potential avenue for selling more wine to households.

Although there may be a retail channel effect in the data, e.g. young people prefer buying in supermarkets, the data confirms previous research in wine purchasing that older people tends to be largest age group purchasing and consuming wine. However, when brands launched an innovative sake aimed at young people, e.g. brand 22 in table 2, with low alcohol content and mostly suitable for summer time, the age distribution changes substantially towards younger drinkers. Another important observation related with the age profile indicates either old consumers are the largest purchasing group or young consumers do not want their information to be registered or prefer other retail channel.

The use of anchoring-and-adjustment for evaluating wine purchasing behaviour

The increasing availability of Big Data offers the possibility to complement well-established research performed at experimental level. In this situation, analytics can take increasing importance on evaluating purchasing and consuming behaviour patterns leading to strategic insights (Kunc, 2018; Kunc and O'Brien, 2018). While the customer journey starts with purchasing, successful consumption activities reinforces and stabilizes purchasing behaviour, e.g. the development of a 'loyalty loop'. Therefore, purchasing behaviour observed repeatedly can be a good proxy to detect consumption patterns. In this case, anchoring-and-adjustment behaviour, as observed in the point of sale data and associated with purchasing patterns repeated monthly and annually, is a valid theory for describing not only purchasing behaviour but also consumption behaviour.

This study observed important differences between female and male purchasers as well as consumption intention based on the packaging size: family (large size) vs. individual (medium to small size). Individual consumption tends to be more volatile and subject to seasonal events. While anchoring-and-adjustment theory implies a stable volume in laboratory experiments, however, we need to consider anchors that differ significantly over time when we apply this theory on longitudinal data covering seasonal events. This situation brings important considerations on consumption research as the effects of seasons and special events may be more significant than considered in previous research.

Conclusions, Implications, Limitations and Future Research

This study empirically investigates Japanese consumer behaviour in the rice wine market, sake, through the application of theories employed on previous studies on wine purchasing behaviour. This research adds to the literature on purchasing and consumer behaviour new perspectives based on the behaviour observed in an Asian country for a different type of wine. For example, the use of large packaging for embedding wine in everyday cooking. Specifically the study suggests the existence of a 'loyalty' loop as a process of anchoring-

and-adjustment behaviour. The evidence indicates the existence of an anchor in purchasing activities that adjusts with seasons and annual events. This investigation provides the basis for studying consumer behaviour observing anchoring-and-adjustment processes through long-term behavioural data.

The study provides a number of implications from a managerial point of view. Firstly, marketing strategies should consider the importance of identifying products suitable for gender and age. This is not an easy task to achieve because it can fragment the market, but it will provide more stable consumption patterns. Marketing strategies also need to incorporate the context of consumption, e.g. festivals or annual family events, to emphasise products that are more suitable to satisfy contextual requirements. Secondly, managerial strategies depend on the size of the company providing the products. In the case of Japan, regions are important to define identities so small companies tend to highlight their attachment to the geographical and social context. This strategy may be suitable for small companies producing alcoholic beverages in order to attract buyers from the region rather than depend on distant markets, which may not be understood.

This research is not without limitations. Firstly, transaction data has some issues such as non-systematic collection or the effect of buyers not providing information about themselves. This transactional data only portrays the behaviour in one retail channel, which is not a traditional supermarket channel or off-license store. Therefore, multiple influences, which differ from traditional places for purchasing alcohol, on behaviours might have occurred. The distribution of age groups does not map directly on to the categories employed in other papers and generational studies in wine consumption. On the other hand, this study complements and confirms previous small scale, but deeper, studies on consumer behaviour. Additionally, this study also confirms the findings from wine purchasing behaviour are useful to understand other alcohol beverages. Secondly, the transaction data was not complete since there were no other cues to define the drivers of consumer behaviour, such as packaging, design, taste, brand, price, rice variety, label design, bottle shape and recommendation levels due to confidentiality restrictions. However, this study may open the possibility to engage in this interesting market and other markets such as spirits and beer. It will be interesting to validate findings from wine into different alcoholic beverages. Thirdly, the impact of marketing activities, e.g. promotions, price, advertising, affecting the anchoring-and-adjustment process were not tested. Unfortunately, confidentiality restrictions prevented a deeper study on specific factors for the brands and products in the market. However, this paper opens the opportunity to investigate the impact of these factors in more detail in other markets or products.

Future research in wine, or any alcoholic beverage, purchasing behaviour should employ a mixed approach where the clear implications obtained from laboratory experiments are tested in large longitudinal databases containing real purchasing behaviour in order to obtain results that are more robust. Another avenue for future research is to extend the findings from research in wine to other alcoholic beverages, e.g. whisky, as this study demonstrated that research approaches and results obtained from wine are applicable to different alcoholic beverages. Finally, the Asian markets are evolving rapidly and deeper understanding of their

consumption behaviour using local perspectives, e.g. the role of festivals, family relationships and food pairing, can offer useful insights for positioning wine more strongly in those markets.

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