



Segmenting wine markets with diverse price functions: Evidence from California red and white wines sold in British Columbia

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Abstract

Previous hedonic price studies on wine market segments, exploring diverse price functions, are constrained by pre-determined price breakpoints, the total number of segments, or both. Using British Columbia Liquor Distribution Branch (BCLDB) retail price data of California red and white wines, this study adopts an endogenous approach to explore the total number of market segments and identify breakpoints in price dispersion simultaneously. Results show that red and white California wines are grouped into two (breaking at Can\$14 per bottle) and three (breaking at Can\$16 and \$30 per bottle) price segments, respectively. Also, implicit prices of wine attributes such as grape variety and geographic origin differ for red and white wines across market segments.

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1. Introduction

To satisfy the needs of heterogeneous consumers over the years, the wine industry in North America has undergone substantive changes with winemakers designing products with multiple attributes. Researchers have employed varied analytical techniques to study differentiated wine products that differ in price and product characteristics across market segments. The existence of segmented markets stems from differences in the structure of demand, supply, or both across segments (Freeman, 1993). Market segmentation does not necessarily imply that consumers are divided into distinct groups; instead, it is more likely that consumer preferences for food products will differ across market segments (Costanigro

and McCluskey, 2011). For example, given that consumers are a heterogeneous group with varied wine preferences, they are likely to buy a wine for a gift at one price segment and purchase another with similar attributes from another price segment. Costanigro et al. (2009), in estimating a multiple-class hedonic model and identifying four wine classes, suggested that as the attributes of wines diverge consumers will purchase and consume wine products for different purposes. Apart from differences in implicit prices across sub-markets, market segmentation can be brought about by the usage of product characteristics.

This paper employs British Columbia Liquor Distribution Branch (BCLDB) retail sales data of California red and white wines and estimates hedonic price functions to determine the existence of different market segments for red and white wines with similar product attributes. Most previous hedonic studies on wine prices ignored the existence of market segments and pooled price functions across product characteristics and geographical boundaries, and with few exceptions examined market segments but constrained with the pre-determined breakpoints

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or the total number of segments (Costanigro et al., 2007; Kwong et al., 2011). The contribution of this study is the adoption of an endogenous approach to identify both the total number of market segments and price breakpoints simultaneously for California red and white wines sold in British Columbia. The structure of the paper is as follows: in the first section we review the wine literature in particular studies related to wine segmentation. This is followed by the theoretical model, data description and sources, and the model specification. The results and discussion are presented in the fourth section which is followed by the conclusion section.

2. Literature review

Previous studies on wine market segments and various price functions are conducted from two strands: one examines consumer characteristics or purchase behavior (for example, the reason to buy wine as a gift or for own casual consumption); the other emphasises the relationship of price categories of products and their attributes. Researchers have applied varied analytical approaches in the investigation of differentiated wine products and potential market segments. Cluster analysis was often employed to examine market segments of consumers, which requires large panel datasets about consumers to ensure reliability and stability of results over time. Food marketers often lack information about consumers (unless they purchase and process data from commercial market intelligence firms such as AC Nielsen) but do have information pertaining to sales and prices of their products and corresponding product characteristics. Such data offer opportunities to conduct hedonic analysis or choice experiments that aim at identifying market segments, but with the emphasis not on consumer characteristics, but on various price functions and effects of their attributes.

2.1. Market segmenting on consumer characteristics or purchase behavior

Marketing researchers employed several clustering algorithms to classify consumers into clusters, especially when the market segment is not clearly defined. This approach was employed to segment U.S. households into four clusters (local enthusiasts, local detractors, local advocates, and local non-advocates), and ascertain their attitudes towards local wines (Kolyesnikova et al., 2008). Johnson and Bastian (2015) used a fine wine technique as a segmentation baseline and then employed cluster analysis to identify three Australian consumer wine segments (wine enthusiasts, aspirants, and no-frills wine drinkers) to study wine-related behavior based on demographics, wine expenditures, and knowledge of wines. The wine-related lifestyle (WRL) technique employed to segment South African wine consumers found that market segmentation based on lifestyle behavior is much more robust when combined with consumer socio-demographic and product involvement decisions (Bruwer et al., 2017). Remaud et al. (2009) combined a choice experiment with segmentation

analysis to show that Australian wine consumers' valuation of eco-friendly wines differs by price segments.

2.2. Market segmenting on price functions and their attributes

The hedonic technique has been applied to improve understanding of how consumers employ labelling and packaging information to make wine purchase decisions. Costanigro et al. (2007) and Kwong et al. (2011) found hedonic price functions that account for different price categories can result in different market segments for product attributes. Frequently, this method has estimated implicit quality signal prices or the implicit value consumers are willing to pay for the attribute. The hedonic technique uses various functional forms and estimation methods to establish a relationship between prices and quality signals or product attributes. The hedonic price function (e.g., Cembalo et al., 2014) has been applied in multiple demand studies to measure the contribution of individual quality attributes to prices. Since wine products consist of multiple attributes, empirical applications have analyzed the contribution of objective and subjective factors such as sensory quality characteristics that are measurable in explaining wine prices.

Wine bottle labels in New World countries were meant to be a true declaration of wine content information and conveyed quality signals in terms of the vintage, geographic origin, and grape variety. The research emphasis of New World wines has been placed on the relationship between brand proxies (e.g., geographic region, variety, vintage, name of winery), expert quality rating scores of sensory traits, specialty labels (e.g., vineyard, estate, reserve), and wine prices or price sub-classes in hedonic model specifications (e.g., Costanigro et al., 2007; Kwong et al., 2011).

In contrast, empirical studies of Old World wines have concentrated on quantifying the effects of reputable production regions (e.g., Landon and Smith, 1998; Caracciolo et al., 2016) and sensory attributes (e.g., Cardebat and Figuet, 2004; Lecocq and Visser, 2006) on consumers' valuation of wine. Recent research has shown the relative unimportance of sensory quality ratings compared to wine reputation variables in affecting prices, which may suggest that consumers rely on wine reputation as quality cues to make purchase decisions (Oczkowski and Doucouliagos, 2014).

California wine brands have expanded over the years and offer consumers a range of wine styles and attribute choices. Wine branding can be considered a multi-faceted (e.g., family brand, vintage, country of origin, regional appellation) hierarchical concept employed by wineries to differentiate their products, while providing consumers with invaluable quality information to recognize a wine label and make a rational product choice (Lockshin et al., 2000). Lockshin et al. (2006) measured the importance of wine region, corporate brand name, awards won, and prices and found low-involvement consumers used price and wine awards, while high-involvement consumers used geographic origin to make their purchase decisions.

The bulk of empirical studies investigating the relationship between wine prices and quality cues (e.g., Cacchiarelli et al.,

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