**Title**
A "Reading" of Consumer Preference for Craft Beer in Japan - a Scanner Panel Data Analysis Using Topic Modeling

**I want to submit an abstract for:**
Conference Presentation

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**Keywords**
Craft Beer, Japan, Consumer Preference, Scanner Panel Data, Topic Modelling

**Research Question**
This study clarified the characteristics of the increasingly diverse Japanese craft beer market

**Methods**
This study analyzed long-term scanner panel data that is revealed preference data and recorded the actual purchase behavior of consumers using a biterm topic model

**Results**
The result suggested that the possibility of strong corporate brand influence. Japanese consumers recognize differences in craft beer types which determines their consumption behavior.

**Abstract**
The consumption of craft beer is increasing around the world. The beer market in Japan is an oligopoly, dominated by five major brewing companies, and pilsner-type beer is the norm. However, in recent years, the demand for craft beer has increased and diversified (e.g. Koganei, 2012; Minakawa, 2018). Craft beer production in Japan began with...
the 1994 revision of the Liquor Tax Law, which significantly lowered the minimum annual beer brewing volume. This deregulation led to the entry of many companies, including tourism companies, into the beer manufacturing industry, resulting in a temporary boom. However, the demand for quasi-beer products, which are in the low-tax category, increased due to the economic downturn, but the quality of the beer was unstable due to the immaturity of the brewing technology of these companies. Additionally, the Road Traffic Law imposed stricter regulations on drinking and driving which caused a decrease in craft beer consumption, therefore, many companies exited the beer business. The number of brewers has gradually declined after peaking in 2003.

In recent years, craft beer has attracted renewed attention as its quality has improved and market shakeouts have continued. The number of craft beer makers has also gradually increased. The share of craft beer in the overall beer market has exceeded 1% and continues to increase (National Tax Agency JAPAN, 2020). Major Japanese beer breweries have begun to pay attention to craft beer because of its increasing popularity and have started selling products under the name "craft beer" since 2014-2015. The Japanese domestic alcoholic beverage market is shrinking due to the decreasing population caused by the declining birthrate and aging population, and so, craft beer is becoming increasingly important as a product that stimulates alcoholic beverage consumption.

However, there are few studies on craft beer in Japan, and even lesser that focus on consumption behavior for craft beer (e.g. Shimizu and Ujiie, 2015). As craft beer has become a well-established beer genre in other countries, studies on consumption behavior using the stated preference method have been accumulated (e.g. Murray and O'Neill, 2012; Toro-González et al., 2014; Aquilani, B., et al., 2015; Carvalho et al., 2018; Betancur, M. I. et al., 2020; Carbone and Quici, 2020; Jaeger et al., 2020). This study analyzed scanner panel data that is revealed preference data and recorded the actual purchase behavior of consumers, with the aim of clarifying the characteristics of the increasingly diverse Japanese craft beer market.

The scanner panel data set, which recorded the purchase histories of beer products for five years from 2017 to 2021 for approximately 5,000 consumers selected from all over Japan, was used as the analysis data set. The analysis employed a topic model (Silge and Robinson, 2017), which has been used in natural language processing, to summarize the diversity of craft beer product attributes from the viewpoint of consumer behavior. Individual craft beer purchase histories were interpreted as "documents" and purchased products as "words," and the scanner panel data set was formatted into bag-of-words format to create a data set with a structure that is similar to text analysis. A biterm topic model (Yan et al., 2013), one of the topic models known for its high ability to analyze short sentences, was employed as the analysis model. A collapsed Gibbs sampling technique was adopted to estimate model parameters such as the probability of the occurrence of topics and the probability of the occurrence of products for each topic. Various craft beer products were categorized based on consumer purchase behavior and the characteristics of consumer preferences were analyzed.

The analysis revealed six product groups (topics). Products from the same manufacturer and brand tend to appear within the same group, suggesting the possibility of strong corporate brand influence. Differences in beer style also influenced product groups, suggesting that Japanese consumers recognize differences in craft beer types which determines their consumption behavior.

The domestic craft beer market has changed significantly since its entry into the market in 1994. The entry of major manufacturers into the craft beer market has made it possible to purchase craft beer products at relatively low prices. This has broadened the scope of consumption of craft beer in Japan and has made it an easy "high-quality consumption product" with rich taste, as well as a product that is enjoyed for its various beer styles, its seasonal and special qualities, and the craft brewer's attention to detail.

Reference
National Tax Agency JAPAN. 2020, Overview of the Microbrewery (in Japanese)

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