

Tbilisi 2022 Abstract Submission

Title

Team Familiarity and Product Quality: Longitudinal Analysis of Japanese Sake Brewing

I want to submit an abstract for:

Conference Presentation

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Keywords

Team Familiarity, Sake Brewing, Quality Competition

Research Question

How does team familiarity influence the sake brewing quality?

Methods

Panel OLS

Results

The level of team familiarity has a significant positive effect on product quality, even after controlling the conventional measures of the experience of individual team members.

Abstract

By empirically examining the lists of brewing team members and the quality competition results from 1955 to

2000, this study aims to explore how team familiarity influences the sake brewing quality.

Sake is an alcoholic beverage made from rice, rice malt, and water, which are fermented and then strained. The main ingredients of sake are rice, rice malt, and water. Various types of sake have been produced all over Japan. Each region has its unique products distributed as local sake. Sake brewing is knowledge-intensive. One of the steps requiring a high level of expertise is the multiple parallel fermentation processes. This simultaneous multiple fermentation processes is defined as the two processes of saccharification and fermentation: enzymes in the rice malt turn starch into glucose, and glucose is fermented into alcohol using yeast, proceeding in parallel within manufacturing-use containers. Multiple parallel fermentation is a distinctive process, in contrast to how wine and beer are made.

Sake brewing is done by a team under a master brewer, called Toji, supervision. In addition to being responsible for sake brewing, a master brewer organizes their sake brewing team, supervises the brewery staff, and manages the brewing process. Multiple master brewers do not co-exist in the brewery. One master brewer is fully responsible for the sake brewing in that brewery.

Master brewer organizes their brewing team. Each member is assigned tasks such as malt making and fermentation. Through its apprenticeship type of division of labor and job rotation, brewers accumulate various skills and move up the career ladder as a brewer. Sake is brewed based on a highly organized division of labor. Not only the level of team member expertise but also the good coordination among processes influence the product quality. Therefore, it is possible to suppose that the product quality improves as the team experiences. However, one might also suppose that new knowledge would flow into the team, which can contribute to the product quality if a new member comes into the team.

Team familiarity is the experience of the team members working together. If the team familiarity is high, it means that the members of the team have a lot of experience working together in the past. When team familiarity is high, the members can deepen their mutual understanding of each other's expertise and work methods. As a result, they will be able to work more efficiently. However, if the team familiarity is too high, it may be difficult to obtain new information or form stereotypes, which may make it difficult to make new attempts. This study uses the list of skilled workers from 1955 to 2000 of the Nanbu Toji Association, the largest industry association of sake brewers in Japan, to conduct the empirical analysis. This list contains information such as the skilled worker's name, address, date of birth, role in sake brewing, and the brewery where he or she worked. Using this information, we can measure not only the experience of each brewer but also the familiarity of the team in which the brewer worked. As for the quality of sake, we use data from the national sake quality competition in Japan, which is known as the Annual Japan Sake Awards. This competition is the most authoritative in the field of sake, and more than 100 experts evaluate sake through blind tastings. This quality competition is conducted via two-stage blind tasting, which allows for the exclusion of reputation bias on evaluation. And the quality competition at the national level has existed in the industry since 1911 and continued with consistent judgment standards, which allows for obtaining enough samples for empirical investigation. In addition, only one sake per brewery is allowed to be entered in the competition. Therefore, a direct link between the team and the results of the competition can be established. We examine how the team familiarity contributes to the odds ratio of winning the gold medal, which is the highest prestige award in the competition.

We find that the level of team familiarity has a significant positive effect on product quality, even after controlling the conventional measures of the experience of individual team members (e.g., the number of years of experience in sake brewing, the number of gold medals won, and the task experience). The empirical results show that the relationship between the level of team familiarity and the gold medal-winning is the inverted U shape as well. Furthermore, this study provides an analysis on how the interaction between the team familiarity and the team member's experience such as working experience in different breweries influences the product quality.

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