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A choice experiment to compare preferences for rice in Thailand and Japan: The impact of origin, sustainability, and taste

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ABSTRACT

Japan and Thailand have joined the Trans-Pacific Partnership, which introduces cheaper US-produced rice into the domestic markets of these countries. This study investigates consumers' preferences for cheaper US-produced rice in Japan and Thailand. To compare the willingness to pay for rice in these two countries, we employ a choice experiment that comprises five attributes: country of origin, fair trade label, cultivation method, taste ranking, and price. The random parameter logit model estimation results show that Japanese people prefer organic rice more than Thai people do and dislike US rice much more than Thai people do. Thai people prefer fair trade more than Japanese people do. The willingness to pay for taste ranking is identical across these countries. Taste ranking has the lowest and second lowest willingness to pay in Japan and Thailand, respectively. Further, gender is the most influential socioeconomic characteristic. Japanese women prefer premium rice with various attributes and dislike US-produced rice more than Thai women do. These results suggest that US-produced rice is unacceptable for Japanese people regardless of the price level, while it could be acceptable for Thai people if the price level is adequately low. Additionally, it is reasonable for Japanese rice producers to grow organic rice to compete in the market, while Thai rice suppliers prefer to enhance their fair trade labels.

1. Introduction

Rice is one of the principal foods consumed worldwide. The global consumption of rice in 2014 was about 484 million tons and this is continually increasing worldwide. Similarly, global production in 2014 was 478 million tons and this is also increasing (USDA, 2015). Almost 90% of rice is produced in Asia and the top three exporters are Thailand, India, and Vietnam (USDA, 2015). However, rice is also produced outside Asia, especially in the United States and northern Africa. Rice exports from these countries account for over 30% of total exports worldwide (FAOSTAT, 2015). More than 50% of all importers of rice are outside Asia. The population in Asia constitutes over 60% of the world, which implies that more than half of the global population consumes rice. Thus, the Asian rice market is huge, and thus its production has a significant impact on the world market.

This Asian rice market is now at a major turning point because of the Trans-Pacific Partnership (TPP), which targets free trade in Asia–Pacific countries. With respect to agricultural products, the TPP requires releasing a tariff on rice. Traditionally, Asian countries set high tariff rates to protect domestic rice producers from the cheaper rice produced outside the region, especially in the United States. For instance, in Japan, the tariff on rice is over 700%. Therefore, the TPP agreement has been criticized for negatively affecting many domestic rice producers. Japan and Thailand have expressed interest in participating in the TPP. However, the related discussion is ongoing in Japan and is dividing public opinion. A similar scenario is observed in Thailand, and hence the new government has refused to participate in the TPP thus far. This does not apply to only these two countries, and there is still an open discussion on whether participating in the TPP to release the tariff on rice will improve the welfare of people living in Asian countries. This social background prompts us to investigate peoples' preferences for domestic and US-produced rice in Japan and Thailand.

In previous studies of the country of origin of rice, Yong Lee, Bong Han, Nayga, and Min Yoon (2014) conduct auction experiments to compare Korean, Chinese, and US rice for Korean people and find that these consumers place the highest premium on their own product. The present study builds on their findings by additionally examining the taste and sustainability of rice. Country of

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origin affects the perception of product quality for consumers (Agrawal & Kamakura, 1999; Verlegh & Steenkamp, 1999). However, the results of the country of origin effect found in previous studies are conflicting (Samiee, 1994) because of the use of different methods (single-cue vs. multi-cue models) and information (descriptive vs. tangible; Peterson & Jolibert, 1995). Sharma, Shimp, and Shin (1995) imply that the consumer's ethnocentrism, which means his or her belief in purchasing imported products, is a factor of the country of origin effect (see also Shimp & Sharma, 1987). Klain, Lusk, Tonsor, and Schroeder (2014) show that the WTP for origin information of beef steak and pork chops from the direct estimation approach exhibits the higher value than that from the indirect approach by using the field experiments and the ethnocentrism induces the higher WTP. In social psychology, ethnocentrism describes the relation between in-groups and out-groups, called social identity theory (Tajfel, 1982). Schnettler, Ruiz, Sepúlveda, and Sepúlveda (2008) find that rice does not show a country of origin effect for consumers in Chile.

As the other attributes, first, we consider the effect of taste evaluation, which is the most important aspect of any food. After the TPP is introduced, consumers in both countries will be confronted with US rice. Since coming across US rice in the market in their daily lives is currently rare, it is difficult to judge their decision based on the taste experience. In such a situation, the evaluation or reputation of the taste of rice is too important to ignore. In particular, the taste of rice in Japan is evaluated by the Japan Grain Inspection Association (2015) in terms of the chemical (e.g., amylose content) and fiscal (e.g., viscoelasticity) qualities of each rice variety. This rank is then often used to advertise rice in the market. Our central question is thus whether the consumers in each country prefer domestic rice even though US rice has the same taste evaluation level. Previous studies of the quality or taste evaluated by authorities have been investigated by Lusk, Roosen, and Fox (2003), who include marbling and tenderness of beef evaluated by U.S. Department of Agriculture (USDA), Gunderson, Lusk, and Norwood (2009), who include USDA grade of stakes, and Lockshin, Jarvis, d'Hauteville, and Perrouty (2006) who include the award of wine.

Second, to examine the sustainability of food, we consider consumer preferences for organic and fair trade labels because these provide people with the satisfaction that they are supporting the long-term balance between ecology and the economy. For example, Vermeir and Verbeke (2006) suggest that sustainable food consumption raises the aspect of sustainability as a social norm. In addition, Lusk, Nilsson, and Foster (2007) suggest that altruistic people place a high weight on food with affiliated public good dimensions such as fair trade labels. Focusing on organic and fair trade labels to study sustainability is also important because organic rice is becoming more popular in Japan and Thailand despite having a higher price than conventional rice. On the other hand, fair trade is not so popular. Thailand is one of the big three exporter of rice but the exportation from Japan is much relatively low. Measuring the willingness to pay for protecting the rice farmer brings us a policy implication how to protect the domestic rice farmers after introducing TPP.

Although the cultural and social aspects of food are too important to be ignored, there remains an open question about how many people spend money on food sustainability and whether developed or developing countries spend more. Apart from food-related aspects, one of the key answers to this question is derived from experimental economics. This field has tried to answer this question by using a dictator game, in which the first player (or the sender) decides the amount of money (provided by the experimenter) to be given to his or her counterpart (the second player or the recipient). Engel (2011) carries out a meta-analysis of the results of the dictator game by using over 100 experiments undertaken over 25 years and finds that subjects in developing countries are much less selfish than those in western countries. For social preferences, as proposed by Camerer (2003), culture thus has the most significant and robust effects.

Applying the question above to food preferences encourages us to investigate the effect of origin, sustainability, and taste in the daily eating behavior of developing and developed countries. To analyze these research questions, we employ a choice experiment (CE) with five attributes: country of origin (domestic vs. United States), cultivation method (organic vs. conventional), fair trade label (with fair trade vs. without fair trade), taste level (top 20% of good vs. normal), and price.

Before comparing the eating behavior of Japan and Thailand, we summarize the economic specification and rice consumption and production in these two countries. First, there is a large difference between the economies of these two countries. According to IMF (2015), GDP per capita (based on purchasing power parity, or PPP) is $37,390 and $14,354 in Japan and Thailand, respectively. Moreover, according to USDA (2015), the variety of rice used as the main food is *japonica* in Japan and *indica* in Thailand. Rice production is much higher in Thailand (20,500 t) than in Japan (7700 t), while rice exports from Thailand amount to 10,000 t, which is within the top three worldwide. By contrast, exports from Japan are 200 t, which is relatively low. Thus, Japan requires imported rice (700 t in 2014), whereas Thailand produces a sufficient amount to cover domestic consumption (i.e., imported rice is rare).

With respect to the combination of the attributes of interest in this study, the pioneers of CE were Onozaka and McFadden (2011), who examine apples and tomatoes in the United State and find that people prefer fair trade labels to carbon footprint and organic labels. Kimura et al. (2012) examine chocolate in Japan and find that the domestic attribute is preferable to fair trade. Jaeger and Rose (2008) analyze apples, bananas, kiwifruits, and oranges in New Zealand and find that the domestic attributes of apples, kiwifruits, and oranges are preferable to organic attributes. Pouta, Heikkilä, Forsman-Hugg, Isoniemi, and Mäkelä (2010) assess broilers in Finland and find that domestic attributes are more preferred to organic ones. Rousseau (2015) employs chocolates in Belgium and finds that the domestic and fair trade attributes are more preferred to the organic. Rousseau and Vranken (2013) employ apples in Belgium and find that the domestic is more preferable to the organic. Denver and Jensen (2014) employ apples in Denmark and find the domestic attribute to be more preferable to the organic. Comparing these studies, Rousseau (2015) is similar to Onozaka and McFadden (2011), except that the former includes flavor instead of carbon footprint used by the latter. Although our design is similar to Rousseau (2015), we employ the ranking of taste as the top 20% good taste among all varieties of rice.

Regarding the international comparison of our attributes of interest by using CEs, pioneering work was conducted by Tonsor, Schroeder, Pennings, and Mintert (2009), who compare beef in the United States, Canada, Mexico, and Japan and find that the domestic attribute has a significant positive effect. Janssen and Hamm (2012) compare apples and eggs in the Czech Republic, Denmark, Germany, Italy, Switzerland, and the United Kingdom, finding that people in the Czech Republic and Italy prefer organic apples and eggs to the non-organic varieties. These studies do not include the quality of taste or evaluation of taste. On the other hand, apart from our interest attributes, Lusk et al. (2003) focus on cattle feed and compare the values of ribeye steak in France, Germany, the United Kingdom, and the United States, finding that European consumers place a much higher value on beef from cattle that have not been fed genetically modified corn than US consumers. As variables of signal of taste quality, they use the marbling and tenderness evaluated by the USDA. However, apart