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Benefit evaluation of the country of origin labeling in Taiwan: Results from an auction experiment

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ABSTRACT

This research is aimed at investigating the consumer's preference for food produced in Taiwan and the economic benefits for the country of origin labeling (COOL). The study used Vickrey second-price sealed-bid auction to elicit the consumer's willingness to pay (WTP) for products under COOL. The study compared the bid functions estimated with Tobit model and the premium functions estimated with ordinary least squares (OLS). Due to price affiliation, it is more reliable to use the estimated premium functions. The estimated premiums are 67.5%, 84.7% and 99% for Taiwan products over their alternatives of China olives, China oolong tea, and Vietnam oolong tea, respectively. The study concludes that enacting and rigorously enforcing a COOL law would increase economic benefits to consumers in Taiwan, and at the same time, placing the imported products in the leveled playing field.

Introduction

The increasing standards of living and concerns about food safety have raised the consumer's demand for information about the safety, origin, and processes used to produce the food they consume. Since Taiwan joined the World Trade Organization (WTO) in 2002, its agricultural sector has faced great competition from foreign imports of food products, especially from China, the United States, and those from South East Asia like Thailand and Vietnam. Unfortunately, without a rigorously enforced law on the country of origin labeling (COOL), Taiwanese consumers often cannot tell where the food is from. Since there have been numerous news reports on the imported contaminated foods from China and South East Asia, the COOL has become an important public policy issue on food safety in Taiwan.

Taiwan has recently passed an act to mandate COOL on all packaged food in 2006 and the law became effective in January, 2008 for packaged processed foods. This COOL law was further extended to cover unpackaged and fresh products beginning January 2010. Unfortunately the law has not been vigorously implemented and furthermore it does not cover the traditional markets, where most Taiwanese consumers purchase their foods.

Many countries already have enacted mandatory country of origin labeling (MCOOL) law. In the 2002 Farm Bill, the US congress first introduced COOL on beef, lamb, pork, fish, perishable agricultural commodities, and peanuts. The bill states, "...for a commodity to be labeled a USA product, it must be born, raised, and processed in the United States" (US Senate, Farm Bill Conference Framework, 2002). It later became mandatory in 2004, which has become known as MCOOL. In August 2007, the US congress enacted a legislation requiring MCOOL for meat products. The MCOOL provisions were further amended in the 2008 Farm Bill and then implemented in the same year.

The 2002 US COOL law has been studied by numerous economists. Schupp and Gillespie (2001) conducted a survey of food handlers and restaurants on fresh and frozen meats and found that they would support COOL if consumers benefit from the labeling. Umberger et al. (2003) used a forth-price sealed-bid auction and estimated the willingness to pay premiums for the steak labeled with "USA guaranteed, born and raised in the US" to be 19%, which was larger than those from their contingent valuation (CV) survey (11%). They also showed that food-safety concerns, preferences for labeling source and origin information, strong desire to support US products and beliefs on US beef were reasons why consumers preferred COOL. Loureiro and Umberger (2003) also found strong economic benefits from COOL as their estimates of the premiums for "US Certified Steak" and "US Certified Hamburger" were as high as 38% and 58%, respectively The origin label can also indicate a

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signal of enhanced quality for US beef (Loureiro and Umberger, 2007). Although studies show that the COOL benefits the consumer in the United States, it incurs costs to ensure the traceability in the marketing channel. Note that if the consumer prefers domestically produced products, the COOL would increase their demands. Lusk and Anderson (2004) found that the costs of COOL could be shifted from producers to processors and retailers, and in this case, producers would be better off while consumers will be worse off. According to their study, an increase in aggregate consumer demand of 2–3% is likely sufficient to offset the lost producer welfare due to increased COOL costs.

Since the implementation of MCOOL for all products in 2008, there are several studies on the impact of COOL. Jones et al. (2009) simulated the impacts of MCOOL on US and global agricultural markets using a global general equilibrium model. Their results show increased production costs, decreases in the production of covered commodities, increases in covered commodity prices and decreases in producer and consumer welfare. However, these results were based on a crucial assumption of no consumer preference for MCOOL relative to no labeling system. If consumers prefer labeled commodities as often the case, then demand shifts will change all their simulation results. Johnecheck et al. (2010) conducted simulations based on previously estimated demand and supply elasticities of tomatoes to quantify the impacts of COOL on imported Mexican tomatoes. They show that COOL has the potential to reduce the value of Mexican tomatoes exports to the US by 14–32%, The impacts on consumer welfare depends on consumer preferences for US over Mexican tomatoes, but the positive impacts on producer welfare are certain and strong.

The objectives of this paper are to develop a methodology for soliciting the consumer's willingness to pay (WTP) for food products produced in Taiwan as compared with those produced in foreign countries, to analyze factors affecting the consumer's behavior on purchasing products under COOL, and to quantitatively estimate the premiums that Taiwanese consumers are willing to pay for food produced in Taiwan. The estimates of the WTP premiums for Taiwan products can be used to assess the economic benefits for enforcing Taiwan's COOL law and to evaluate the impacts of COOL on the agricultural trade between Taiwan and its trading partners especially China.

Methodology

This study employs auction experiment. It is important to design an experimental auction mechanism correctly. Hoffman et al. (1993) used auction experiment to estimate the willingness to pay premiums for the vacuum-skin packaged steaks over the traditional overwrapped styrofoam tray steaks. Through the auction, they found that the auction order of the products did not affect the estimation results. They also suggested that it is very important to design learning trials and instructions that explain incentive compatible auctions carefully. Specifically, learning trials could teach respondents how to bid and the explanation of the auctions could minimize the impact of strategic behavior. To improve the accuracy on the auction results, Vickrey (1961) suggested that the second-price auction, in which the highest bidder would be awarded the object by just paying the second-highest bid price, is relatively easy to implement and it is a weakly dominant strategy for the participants to reveal their true valuations.

Second-price auction helps revealing the true WTP for the respondents. Therefore, it is adopted in this study. Corrigan and Rousu (2006) suggested that the bids of the auctioned good (coffee mug) would be influenced by posted prices for unrelated goods in trial auction (candy bar). To avoid the posted price effect, they also suggested that we should calculate the WTP of the bid premiums instead of WTP of the bids. Therefore, we also estimate the WTP premiums of the products in this study. Since the value of the willingness to accept (WTA) measure is often larger than WTP, whether to use WTP or WTA is also important to experimental auction. However, previous research suggests that the difference between WTP and WTA can be consistent with economic theory (Hanemann, 1991; Hoffman and Spitzer, 1993). Thus, an observed difference between WTP and WTA is not a per se behavioral violation of the incentive compatibility of the auction mechanism. Shogren et al. (1994) even showed that for market goods with close substitutes, there was a convergence of WTP and WTA measures of value. In this study, various oolong teas as well as preserved olives are market goods with close substitutes, so we consider estimating only Taiwanese consumers' WTP not WTA for preserved olives and tea.[1]

Auction design

Choices of products

Preserved olives and oolong tea are often imported in bulk and unpackaged. Since the retailers often try to fool consumers as though they were produced in Taiwan, those products are usually sold without a country of origin label. There are other unpackaged foods which could be used for the auction experiment, such as preserved mangos and dried mushrooms. But preserved mangos from Thailand look different from Taiwan mangos, which are moister and softer than Thailand mangos. After much search and comparison, we finally decided on preserved olives and oolong tea because these products from different countries look very similar. Another reason is that there were newspaper reports about imported contaminated preserved fruits and oolong tea. Most of the imported contaminated food, such as China olives and Vietnam tea, has too much preservative and insecticide residuals, which may be harmful to human health. The preserved olives have been marinated with Chinese herb and the color of preserved olives is black. It is very hard for us to distinguish their country of origin by their appearances. Oolong teas are also very hard for us to tell their differences by their look.

Experimental design

After the focus group session held in Chiayi (National Chung Cheng University), we conducted three formal auction experiments in Taipei (Academia Sinica) on March 13, 2008, Taichung (National Chung Hsing University) on March 14 and in Kaohsiung (National Kaohsiung Normal University) on March 18. Two sessions were held in each location; the experiments were conducted at 5:30 pm and 7:30 pm each day. Each experimental session recruited 12–13 general public samples: The female ratio is set at 60–76%. Although the ratio of females and males in Taiwan is almost 49% or 50% (Taiwan Ministry of the Interior, 2008), the particular sex ratio in the experiment was chosen because females often play the role of buying food for the household. Therefore, we recruited more female respondents in our study.

We screened potential participants recruited by the Survey Center of Academia Sinica to get a desired mix of sample by age, education and sex for each session. These respondents signed up through the internet or telephone to the Academia Sinica. In most cases, the person who checked our internet advertisement was not eligible. But they instead recruited our needed panels from their

[1] Note that in a second-price auction, with 13 participants in each session, a majority of the participants may change their bids without affecting the outcome of the auction. This is a potential weakness of this auction mechanism.