What's in a Price? The Impact of Starting Point Bias in WTP for Information in Taiwanese Wet Markets

Shang-Ho Yang

Graduate Institute of Bio-Industry Management

National Chung Hsing University

Taichung City, Taiwan

E-mail: bruce.yang@nchu.edu.tw

Diogo Souza Monteiro

School of Agriculture Food and Rural Development

Newcastle University

Newcastle-upon-Tyne, United Kingdom

E-mail: diogo.souza-monteiro@ncl.ac.uk

Selected Paper prepared for presentation at the Agricultural & Applied Economics Association's 2016 AAEA Annual Meeting, Boston, MA, July 31-August 2, 2016.

What's in a Price? The Impact of Starting Point Bias in WTP for Information in Taiwanese Wet Markets[1]

Abstract

Traditional markets in Asian countries still account for the majority of fresh meat, fish and vegetable purchases. One of the reasons for their popularity is the relational trust between vendors and buyers. This trust may justify the limited availability of information on origin or production methods and other attributes of foods sold in these markets. However, a number of recent food safety outbreaks and food fraud cases raised consumer and government concerns on over the level information in these markets and ignited a reflection of possible action. This study aims to determine the consumer willingness to pay (WTP) for fresh meat traceability and free growth hormone information traditional markets in Taiwan. To estimate the values of information the payment card method was employed and to account for the starting point bias, the sample was divided into different treatments each with a different price of meat. A total of 2,381 completed survey were collected in mid-July, 2015. An interval regression model is utilized to examine how much consumers would be willing to pay for addition product information. The results suggest that WTP of information not consistent among groups with different starting point scenarios. There was a significant difference between respondents that were not given any indication of the price per quantity of meat and those that were prompted with a market price. Interestingly, we found that consumers treat the information of growth hormone-free examination and traceability differently.

Keywords: starting-point bias, WTP, traceability, growth hormone-free, wet markets

[1] This work was supported by the Ministry of Science and Technology, R.O.C. (MOST103-2410-H-5-5-SSS).

Introduction

In Taiwan wet markets still account for a significant share of food purchases, despite the existence of modern retail since 1969 (Huang, Tsai, and Chen, 2015). While the proportion of food purchased in wet markets has been declining, it still represents 60% of fresh foods sales in 2013, and had an annual turnover of US$3 billion (Chang, 2014). According to the Taiwanese Ministry of Economic affairs report there were 640 wet markets across the country and over 50 thousand vendors. Taiwanese consumers mainly buy fresh fish, meat and vegetables in wet markets. Interestingly, wet markets in Taiwan are not necessarily sourcing from local producers alone but actually 55% of the sales of US fruit exports to Taiwan is sold by vendors in traditional markets (Chang, 2014). A number of scholars analyzing food retail formats have examined why wet markets retain such a large market share, particularly in industrialized and medium high income economies such as Taiwan. For example, Goldman, et al. (1999 and 2000) find that traditional markets in Asia have a comparative advantage in the delivery of fresh food, a critical factor in consumers' food choice. Another factor, possibly associated to the long term orientation of Asian cultures (Hofstede and Minkov, 2010), is the value of vendor-client relationships which may be linked to trust and personalized service. Recently, Huang, Tsai, and Chen (2015) investigated why wet markets persist in Taiwan. Confirming findings in the extant literature they show that the ambience and design of a food store is not as critical to Taiwanese fresh food buyers as are: a) the quality of food, particularly its freshness; b) the relational benefits, namely in terms of personalize treatment and c) length of the relation with the vendor.

While it is clear that wet markets provide important benefits to Asian consumers and deeply align with the local culture, they fail to provide some of the services that modern distribution is able to offer. For instance, modern distribution has developed private quality standards based on risk management principles that considerably reduce food safety hazards (Smith, 2009). Moreover, supermarket chains carefully select and manage their suppliers and therefore have the ability to trace their products to sources more effectively (Zheng, 2013). Finally, modern retailers have advanced data management systems that not only enable them to serve their clients more effectively, but also may easily pass on information consumers may demand (Reinartz, et al., 2011). However, recent developments on mobile information technologies may enable vendors in traditional markets to access and provide such information to consumers (Lowe, Fraser and Souza Monteiro, 2015).

A number of recent food safety/food fraud scandals raised consumers' awareness and government's attention to the quality of food sold in different retail formats (Naspetti and Zanoli, 2009). Then a meat adulteration scandal in Taiwan increased consumers' concern of food safety and demand for traceability (Food Safety News, 2010; Food Safety News, 2016a; Food Safety News, 2016b). Food safety and food fraud incidents have the potential to expose the limitations of vendors in wet markets, particularly regarding their ability to provide trusted and reliable information to their customers. This in turn may accelerate the decline of these retail traditional retail formats, which may have broader unintended consequences. For these reasons local

governments in South-East Asian countries are faced with the challenge to increase the availability of information on food safety and product attributes on foods sold in traditional markets. One of the options being considered is to provide information through labels, which may lead to higher prices. However, as we pointed out above, a key feature of these traditional markets is the diversity of vendors and the importance of establishing strong and long term vendor-client relations. Thus it is an empirical question whether consumers of traditional markets are willing to pay extra for additional information, for vendors may already be informally providing additional information to their customers in exchange for a higher price. Berning, et al. (2010) find that consumers may not be willing to pay for additional information as they may rely on their accumulated product knowledge from their shopping experience. Also consumers may not necessarily want to have more information (Stranieri, et al., 2010) or may change their purchasing behavior with the (or lack of) information provided (Carneiro, et al., 2005).

The purpose of this study is then to determine the willingness to pay (WTP) additional information on meat sold at Taiwanese traditional wet markets. Specifically we focus on pork belly, which has a regular feature on Taiwanese daily meals (Liu and Sheu, 2002) and was also indicated as popular choice by our focus group participants. A preliminary investigation of meat price variation within a traditional market, revealed a wide variation across vendors for the same product. Specifically, it was found that the price of pork belly is quite volatile, varying between NT$110 to NT$150 per jin (approximately 600g/1.32 lbs). This variation of prices may be explained with a variation of information provided by vendors, which in turn might bias estimations of WTP for added information on product characteristics. This, following Batte, et al. (2007) we also intend to determine the extent of with which the starting point bias influence the WTP for added information on pork belly attributes.

Literature Review

In the last decade a wide number of studies have been conducted investigating the willingness to pay for additional information on food attributes. Cicia and Colantuoni (2010) conducted a meta-analysis to assess the willingness to pay for different traceable attributes of meat products. They find that one of the critical factors influencing the WTP estimates is the base price and the country where the study was conducted. This, suggest that careful consideration needs to be given when choosing the most suited methodology but also on how it is implemented. Of course this is a well know issue when trying to elicit values for products or services for which there isn't an explicit market. While information on food safety, nutrition, origin, production processes or ethical aspects of production may be important to consumers, it is not necessarily what most consumers have in mind in the act of purchasing food. Thus, protocol designed to elicit willingness to pay for particular aspects of food may be intrusive and force respondents to decompose and expose their act of choice. This inevitably leads to a range of biases that can affect the valuation of the attribute of interest. One well known bias affecting the valuation is the anchoring bias, first described by Twerski (1974) and observed when subjects are asked about a quantity on which they are uncertain

about. The bias can be described as the tendency that most people have to converge to a reference point suggested in the beginning of a valuation process. Green et al (1998) analyze the extent of this problem in the context of the valuation of public goods. Specifically, they examine the importance of anchoring effects relative to incentive effects in contingent valuation referendums of public goods and their impact of willingness to pay estimates. They find that protocols using the payment card to elicit willingness to pay are very susceptible to anchoring biases. Thus, Green et al suggest these biases need to be considered and mitigated either through the experiment protocol or the corrected for in the data analysis.

Several recent studies used experimental methods to estimate the willingness to pay for meat traceable attributes in Asia. Lee, et al. (2011), used an experimental auction to elicit Koreans' willingness to pay for traceability on imported beef. They investigated whether positive, negative or both types of information regarding the usefulness of traceability would affect the willingness to pay. More specifically, Lee, et al. used a random *nth* price auction method, which is a non-hypothetical method designed to remove the competitive bias in auctions, but is also used to engage off margin bidders. They find that subjects in their experiment would be prepared to pay a 50% premium for imported beef with traceability, when only positive information was provided and a 26% premium when only negative information would be provided through a traceability system. Interestingly there is no consideration of the possible effect of the starting point bias in this study. Now, it is true that these types of auctions are relatively immune to anchoring effects. However, each session comprised five rounds and the market price determined in the first round might have been an anchor for bids in subsequent rounds.

Another study analyzed urban Chinese consumers purchases of US imported pork that might be contain a ractopamine, a water-soluble feed additive to increase lean meat production (Ortega, Wang, and Wu, 2009). They used a hypothetical contingent valuation approach to elicit the willingness to pay for imported pork. Specifically, the researchers used a dichotomous, double-bounded framework, first asking whether subjects would consider purchasing US imported pork. If respondents answered affirmatively, they were then asked if they would pay a are higher price for the imported pork. Using an ordered logit model to estimate their results and find that in general consumers are willing to pay a positive amount for imported meat, however those more concerned with food safety, are less willing to pay a premium for imported pork as they associate it with the presence of ractopamine, which they link to unsafe food. Despite the fact that the contingent valuation methodology used in this study is quite sensitive to starting point bias (Green, et al., 1998), the authors don't make any reference to this issue in their discussion of the results or limitations of the study.

In short, there is increasing interest in determining how Asian consumers' value information on food safety attributes on food. A number of studies have been conducted in Europe and North America that provide important guidelines and intuition on how Asian consumer may behave, these studies indicate the baseline prices and nationality of respondents are important determinants of WTP for traceable attributes of food. This highlights the importance of taking into

account possible starting point biases when estimating values for additional information. Recent studies conducted in Korea and China used experimental methods to estimate the willingness to pay for traceability and food safety attributes, however none of these took into account the possible effect of starting point biases in their estimates.

Methodology and Data

The estimation of the willingness to pay for information in traditional markets may be affected by the range of prices practiced by different vendors which may reflect different levels of service. Therefore, a potential starting point bias needs to be taken into account when the estimating the WTP for information.

A pilot field study at traditional markets, revealed that pork belly is the most popular portion meat sold in wet markets and that its price per jin (approximately 600g/1.32 lbs) varies between $110 to $150 New Taiwanese (NT) dollars. Consequently, the questionnaire design must be careful the bias generated by the starting point bias.

Empirical Method and model

Meat product information is very scarce, and so eliciting consumer WTP for meat product information at traditional markets may have certain difficulty and unsure an exact number to point out. Thus, a series of interval choices for WTP would enhance recall and provide some greater anonymity in responses regarding their personal questions (Cameron and Trivedi, 2005). Therefore, a payment card survey was designed as a series of interval choices for WTP associated with respective product information. Each choice of WTP reveals an interval range, and the WTP of consumers' indication is observed through an interval range. Thus, an interval censored regression is an appropriate choice for the econometric analysis in this study.

Unlike the unknown boundaries of the choice variable in an ordered probit model, the interval censored regression model is that the cut-points (i.e., outcomes were separated by different values) are known. Assuming respondents' true WTP can be observed through a latent variable y_i^*, the model is specified as:

$$y_i^* = x_i'\beta + u_i \text{ and } y^*|x \sim Normal(x'\beta, \sigma^2) \quad (1)$$

where the x_i is a set of independent variables, which are consisted of *Shopper*, *Eating*, and *Demographic characteristics*, as the potential effective factors for WTP, the β are the estimated parameters for the models, u_i is a constant variance error term with mean zero, and normality is assumed in the interval censored regression. The interval boundaries γs in y_i^* are mutually exclusive intervals of $(-\infty, \gamma_1]$, $(\gamma_1, \gamma_2]$, . . ., (γ_J, ∞). Thus, a probability function can also be expressed as equation 2:

$$\Pr[\gamma_j \le y^* \le \gamma_{j+1}] = \Pr[y^* \le \gamma_j] - \Pr[y^* \le \gamma_{j-1}] = F^*(\gamma_j) - F^*(\gamma_{j-1}) \quad (2)$$

Therefore, the choice variable for specific product information in this study would be indicated within one of these interval choices:

$$\begin{aligned} & y^* \leq \$0, \\ & \$1 \leq y^* \leq \$3, \\ & \quad \vdots \\ & \$16 \leq y^*. \end{aligned} \tag{3}$$

Normally respondents would be able to indicate their maximum price premium for product information over a given threshold value (Hu, 2006). However, the final valuations of WTP are usually positively correlated with the given threshold value when there is a starting point effect (Boyle, et al., 1985). With the unusual market characteristics across different regions, consumers may not always receive a consistent pricing across traditional markets. Therefore, the indications of the maximum price premium for product information may vary and result in a researcher-introduced bias under a given fixed threshold value (Yang, et al., 2013). When the starting point bias occurs, normality may not hold and would have higher variance. The question is that how we can observe and possibly mitigate this potential starting point bias via survey design.

Two the empirical specifications in this study for growth hormone-free information (*GH_free_Info*), traceability (*Traceability*) are:

$$GH\_free\_Info = y_{GH}^* = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \cdots + \alpha_{22} X_{22} + \varepsilon \tag{4}$$

$$Traceability = y_T^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_{22} X_{22} + \varepsilon \tag{5}$$

where *GH_Info* (y_{GH}^*) and *Traceability* (y_T^*) are the dependent variables, X_s are independent variables, the α_s and β_s are estimated parameters, and ε is assumed to be a normalized error term. The WTP of traditional market consumers associated with different product information can be explained from socio-demographic, shopper, and eating characteristic variables.

Survey Design

In order address the potential starting point bias and observe estimation bias, the elicitation of WTP for pork belly at traditional markets was designed to randomly separate respondents into two different groups: Group A and Group B. Group A is the control group, which was not assigned with a pre-screening question. Group B is the experiment group, which was assigned with a series of pre-screening questions. The pre-screening questions is asking whether respondents know about one jin of pork belly prices at the traditional markets that used to go.

The respondents were randomly assigned into either Group A or Group B selected by their random choice in odd or even number decisions. Therefore, a web-based survey instrumented by Apple iPad was utilized on the street survey. With the feature of web-based survey, the potential bias can be avoided such as a failed scenario for answering all unrelated questions, non-random choices, and unexpected illogical questions.

With above mentioned procedure, respondents were easily to choose a represented pricing of pork belly based on their circumstance at traditional markets, since consumers may face different pricing level at traditional markets. This is the key procedure that is possible to diminish the variation from different levels of threshold values. The represented pork belly pricing was summarized as $110, $120, $130, $140, and $150 per jin from the field study. Therefore, Group B respondents were requested to indicate the pork belly price at their market. When respondents were not able to decide, an unknown or unsure choice category is provided as well for relieving the starting point bias based on respondents' recognition of pork belly prices.

Data Sources and Sample Distribution

The pork belly, a common and highly frequent purchase at traditional markets, was used as a reference meat product for eliciting the WTP. A total of 2,381 completed survey were collected in mid-July, 2015. In order to make sure respondents are valid, the overall screening question was adopted: "During the past 12 months, have you purchased any types of meat at any traditional market?" If respondents answered "Don't know" or "No, I have not," then respondents would be screened out. Since most people have concerned food safety and health issues from previous food product scandals, the information of growth hormone-free examination and traceability are adopted and accounted for the WTP of meat product information.

The definitions and sample statistics for dependent and independent variables are exhibited in Table 1. Overall, respondents, on average, are willing to pay about NT$6 for growth hormone-free examination information, traceability information about NT$5.5. The independent variables are consisted of demographic, shopper, and eating characteristic variables. About 65% of female respondents participated the survey and average age is 40 years old. Most respondents have associated degree in college. The average family income is about NT$65,500. Since housewife may be the major consumer groups at traditional markets, respondents in this study accounts for about 12%. The majority of respondents (52%) were surveyed from Northern Taiwan, about 25% from Central Taiwan.

Shopper characteristics, may highly relate to their WTP, consist of primary shopper in a household, distance to markets, frequency to markets, average time spent at markets, and usual schedule to shop at markets. About 51% of respondents are a primary shopper in a household, 31% for sometimes shoppers. Most respondents (71%) live very closed to traditional markets less than one kilometer, about 18% live between one to three kilometers. Respondents, on average, go to traditional markets about 35 times within a half year; it means that most respondents visit traditional markets more than one time in a week. About 51% of respondents, on average, spent 30-60 minutes at traditional markets on grocer, and only 12% of respondents spend more than one hour to shop at traditional markets. Most respondents (40%) are used to go to morning traditional markets, about 37% to the evening traditional markets.

Eating characteristics can also highly alter to their WTP depending on their cooking behavior at home and types of meat that are highly frequent purchased at traditional markets. Most respondents (about 52%) cook at home about 4-12 times during a week. However, new diet eating behavior potentially decreases the frequency of cooking at home. About 32% of respondents rarely cook at home, 0-3 times a week. Respondents with higher frequently purchased meat behavior can exhibit a potential factor indicating consumer WTP for product information. About 61% of respondents with higher frequently purchased pork reveal a similar real meat purchasing behavior, about 47% for chicken, about 45% for fish, and about 13% for beef.

Empirical Results

The results of the econometric estimation for growth hormone-free information and traceability information are, respectively, shown in Tables 2 and 3 below. The estimations of each product information were examined separately through a Control Group (Group A) and Experiment Group (Group B). Respondents in Group A were given a fixed pricing level for the elicitation of WTP, while respondents in Group B are provided a list of current market pork price that they knew. The potential starting point bias can be observed via the survey design in this study. The indication of Wald χ^2 for the overall estimation of interval regression model in the Control Group and some models in the Group B exhibit a significant level in which is meaning that the model specifications are suitable. Respondents assigned to different pricing level scenario were based on their selection if they knew the prices, so the number of observation for different scenarios reveals differently. Therefore, only small number of respondents receiving higher pork belly pricing represents that the majority of pork belly pricing at different traditional markets tend to be lower.

The indications of Wald χ^2 in Group B in Tables 2 and 3 point out that not all model estimations regarding different starting points reveal a significant level, while the model estimations in the Control Group exhibit a significant level. These overall model estimations with a failed Wald χ^2 may imply that other potential model specifications need to be further controlled. In order to compare research outcomes across different models, the model specification remains the same for all model estimations. Whether there is any potential starting point bias, this study adopts the judgement of AIC, mean, and standard deviation of WTP with regarding to each starting point.

The indication of AIC explains the relative quality of statistical models based on different scenarios. The values of AIC from the sub-group *Selected $110* to the sub-group *Selected $150* reveal that the model specifications can be varied based on different starting points, while it is not hard to notice that the value of AIC in the sub-group *Selected $140* is the lowest in Tables 2 and 3. This represents that the model estimation of the sub-group *Selected $140* performs a relative good quality of statistical model among these models. Moreover, the values of AIC in the Control Group and the sub-group *Selected unknown* are very closed in Tables 2 and 3. Since the starting points in the Control Group and the sub-group *Selected unknown* are provided the same starting point of $130, a similarity of AIC may exhibit that the relative quality of statistical models has no

difference when respondents don't know what is the current pricing. As a result, a Likelihood Ratio test, shown in Tables 4 and 5, is further confirmed and revealed that there is no significant difference for the models of the Control Group and the sub-group *Selected unknown*.

When the starting point bias exists, there is no clear answer that what negative impacts would influence the model estimation. Therefore, this study attempts to estimate a series of different starting point to observe what potential impacts on model specifications. According to the starting point effect in Boyle et al. (1985), the final valuation is often positively correlated with the amount that respondents are initially given to consider. This means that the final valuation of WTP would increase as the starting point increases as well. As a result, the mean and standard deviation of WTP for each different starting point can serve a good judgement. The values of mean and standard deviation of WTP for each group are shown at the bottom of Tables 2 and 3. Note that the mean values across different groups are not changed much from the sub-group *Selected $110* to the sub-group *Selected $140*. Comparing to the sub-groups from *Selected $110* to *Selected $140*, the sub-group *Selected $150* with a higher value of mean may present a potential starting point bias. The density of WTP distributions for each different starting point can also visualize in Figures 1 and 2. In addition to the lowest standard deviation of WTP, the sub-group *Selected $140* in Tables 2 and 3 reveals the lowest standard deviation as well. Hence, this outcome corresponds with the value of AIC, indicating that the sub-group *Selected $140* has less concern of starting point bias. Therefore, the sub-groups *Selected $140* in Tables 2 and 3 are treated as a final outcome for the explanation of WTP.

The WTP of traditional market consumers can be varied depending on different characteristics of product information. Housewife respondents are less likely to pay for growth hormone-free information about $3.4NT; in other words, non-housewife would be willing to pay about $3.4NT for growth hormone-free information. Especially, when respondents with every chance possible to purchase chicken at traditional markets, they are willing to pay additional purchasing cost about $3NT. Noted that the potential starting point bias in the sub-group *Selected $150* shows that respondents with every chance possible to purchase chicken at traditional markets, they are willing to pay additional purchasing cost about $3.5NT. This is also the evidence that the final valuation is positively correlated with the starting point.

Corresponding to previous studies (Lee, et al., 2011; Stranieri and Banterle, 2015; Wu, et al., 2015), this study also confirms that certain groups of consumers reveal a positive WTP in a significant level for traceability information. Housewife respondents reveal similar behavior on the WTP of traceability information at traditional markets. Non-housewife would be willing to pay about $3.2NT for traceability information. Particularly, non-primary shoppers are willing to pay more about $3.5NT for traceability information. The higher frequency to shop at traditional markets, the higher WTP for traceability information, about $1.2NT (= 0.035×34.9). Eating characteristics exhibit a significant difference as well. Respondents with higher frequency to cook at home (more than 13 times a week) are willing to pay about $2.4NT if comparing to those cook at home (about 4-12 times a week). Especially, when respondents with every chance possible to

purchase pork at traditional markets, they are less likely to pay additional purchasing cost about $4.5NT. Taiwanese diet with pork has been a long traditional. Respondents may have more knowledge and experience about pork, so those who with less purchasing frequency on pork would be willing to pay more for traceability information.

In sum, traditional market consumers have different WTP on growth hormone-free information and traceability information. Only few variables in demographic and eating characteristics reveal a significant level for growth hormone-free information; especially, non-housewives and highly frequent chicken buyer are willing to pay a positive amount for growth hormone-free information. The traceability information exhibits higher relationship with demographic, shopper, and eating characteristics. Particularly, non-housewives, non-primary shoppers, higher frequency been to traditional markets, higher frequency to cook at home over 13 times a week, and less chance to purchase pork respondents are likely to pay positive amount for traceability information. Although other groups with different pricing level present a significant level for other variables, the potential starting point bias may exist at certain level that may result in an over- or under-estimated of the final valuation. Therefore, a reasonable explanation for the WTP of product information can be chosen with the lowest value of AIC.

Conclusion

Traditional markets in Asian countries still account for the majority of fresh meat, fish and vegetable purchases. However vendors in these markets traditionally provided limited information on origin or production methods and other attributes of foods to consumers. However, a number of recent food safety outbreaks and food fraud cases raised consumer and government concerns on over the level information in these markets and ignited a reflection of possible action. The purpose of this study is then to determine the willingness to pay (WTP) for additional information on meat sold at Taiwanese traditional wet markets. The results show that there is a significant and positive WTP for product information at traditional markets, however there was not strong evidence that consumer characteristics influenced this willingness to pay. Although younger female with lower education years and lower family income reveal a higher WTP for product information, these factors are confirmed from those models with a concern of starting point bias. In order to not over- or under-estimate for our outcomes, the housewife factor is the only factor with a significant level among of demographic factors for both growth hormone-free and traceability information.

Interestingly, this study found that consumers treat the information of growth hormone free examination and traceability differently. Some factors of shopper and eating characteristics can exhibit a significant level for traceability information, but only one factor in eating characteristics reveals a significant level for growth hormone-free information. Especially, consumers who often and every chance possible purchased chicken would be willing to pay more for growth hormone-free information. This may link to many Taiwanese consumers believe a rumor that farmers may adopt the growth hormone on poultry production (Bartholomew, 2013). However, it is interesting that the WTP of growth hormone-free information does not confirm on pork at traditional markets,

since the growth hormone-free for Taiwanese pork has been widely and politically discussed because the U.S. has used a safety-level of ractopamine pork allowance for a potential entrance of regional trade agreement, i.e., the Trans-Pacific Partnership (TPP). Furthermore, the growth hormone-free in Taiwanese hog production is mandated by government. The growth hormone-free information could be a future issue, but this study did not evidence that consumers care to have such information.

An interesting result shows that consumers with higher purchasing frequency on pork would less likely to pay more traceability information. This may link to consumer knowledge and cooking experience with pork, since pork is one of the common ingredients in Taiwanese diet and the highest volume of meat consumed.

As the previous study (Boyle, et al., 1985) stated that the final valuation, like WTP, is often positively correlated with the amount that respondents were initially given to consider, the starting point bias is not easy to observe and capture. This study contributes to observing and showing how starting point bias can be generated and what impacts would create within an estimation. At least a similar value for the mean and standard deviation across different pricing levels may reveal that there is no positively correlated with the starting point. However, a self-select strategy to ease the potential starting point bias seems working, but the sub-group *Selected $150* still reveals a higher mean for WTP. Therefore, this study suggests a further investigation on the choice.

References

Bartholomew, I. 2013. "Chicken with a Conscience: Free Range "Non-Toxic" Chicken Commands a Premium from those Escaping the Horrors on Industrialized Poultry Production." *Taipei Times*. Accessed on May 20, 2016. Retrieved from: http://www.taipeitimes.com/News/feat/archives/2013/03/06/2003556380

Batte, M.T., N.H. Hooker, T.C. Haab, and J. Beaverson. 2007. "Putting Their Money Where Their Mouths Are: Consumer Willingness to Pay Multi-Ingredient, Processed Organic Food Products." *Food Policy* 32(2):145-59.

Berning, J.P., H.H. Chouinard, K.C. Manning, J.J. McCluskey, and D.E. Sprott. 2010. "Identifying Consumer Preferences for Nutrition Information on Grocery Store Shelf Labels." *Food Policy* 35(5):429-436.

Boyle, K.J., R.C. Bishop, and M.P. Welsh. 1985. "Starting Point Bias in Contingent Valuation Surveys." *Land Economics* 61(2):188-194.

Cameron, A.C., and P.K. Trivedi. 2005. *Microeconomics: Methods and Applications*. New York: Cambridge University Press.

Carneiro, J.D.S., V.P.R. Minim, R. Deliza, C.H.O. Silva, J.C.S. Carneiro, and F.P. Leao. 2005. "Labelling Effects on Consumer Intention to Purchase for Soybean Oil." *Food Quality and Preference* 16(3):275-282.

Chang, C. (2014) Taiwan Retail Foods. GAIN Report Number: TW14046. USDA Foreign Agriculture Service. December 2014.

Cicia, G., and F. Colantuoni. 2010. "Willigness to Pay for Traceable Meat Attributes." *International Journal of Food System Dynamics* 3:252-263.

Food Safety News. 2010. "Taiwan: Pickled, Dried Food Fails Tests." Accessed on May 20, 2016. Retrieved from: http://www.foodsafetynews.com/2010/01/taiwan-finds-30-of-pickled-dried-food-fail-safety-tests/#.V0UIK5F96M8

Food Safety News. 2016a. "Hong Kong Experiences Routine Year for Foodborne Outbreaks." Accessed on May 20, 2016. Retrieved from: http://www.foodsafetynews.com/2016/04/hong-kong-experiences-another-calm-year-for-food-safety/#.V0UEO5F96M8

Food Safety News. 2016b. "Seafood Importer, Processor Warned after Failing Safety Checks." Accessed on May 20, 2016. Retrieved from: http://www.foodsafetynews.com/2016/02/123894/#.V0UKAZF96M8

Goldman, A., R. Krider, and S. Ramaswami. 1999. "The Persistent Competitive Advantage of Traditional Food Retailers in Asia: Wet Markets' Continued Dominance in Hong Kong." *Journal of Macromarketing* 19(2):126-139.

Goldman, A., S. Ramaswami, and R.E. Krider. 2002. "Barriers to the Advancement of Modern Food Retail Formats: Theory and Measurement." *Journal of Retailing* 78(4):281-295.

Green, D., K.E. Jacowitz, D. Kahneman, and D. McFadden. 1998. "Referendum Contingent Valuation, Anchoring and Willingness to Pay for Public Goods. *Resource and Energy Economics* 20:85-116.

Huang, C.-T., K.-H. Tsai, and Y.-C. Chen. 2015. "How Do Wet Markets Still Survive in Taiwan." *British Food Journal* 117(1):234-256.

Jin, S., and L. Zhou. 2014. "Consumer Interest in Information Provided by Food Traceability Systems in Japan." *Food Quality and Preference* 36: 144-152.

Lee, Y.J., D.B. Han, R.M. Nayga, S.S. Lim. 2011. "Valuing Traceability of Imported Beef in Korea: An Experimental Auction Approach." *Australian Journal of Agricultural and Resource Economics* 55:360-373.

Liu, Y.-C., and Y.-J. Sheu. 2002. "Study on Pork Consumption and CAS Sign Recognize for Different Urban Degree." *Chinese Journal of Agribusiness Management* 8(December):223-245.

Lowe, B., Fraser, I. and Souza-Monteiro, D. M. (2015), A Change for the Better? Digital Health Technologies and Changing Food Consumption Behaviors. *Psychology & Marketing*., 32: 585–600. doi: 10.1002/mar.20802.

Naspetti, S., and R. Zanoli. 2009. "Organic Food Quality and Safety Perception throughout Europe." *Journal of Food Products Marketing* 15(3):249-266.

Reinartz, W., B. Dellaert, M. Krafft, V. Kumar, and R. Varadarajan. 2011. "Retailing Innovations in a Globalizing Retail Market Environment." *Journal of Retailing* 87(1):53-66.

Ortega, D.L., H.H. Wang, and L. Wu. 2009. "Food Safety and Demand: Consumer Preferences for Imported Pork in Urban China." *Journal of Food Distribution Research* 40(3): 52-63.

Smith, G. 2009. “Interaction of Public and Private Standards in the Food Chain.” Paris, France: OECD Food, Agriculture and Fisheries Working Paper 15.

Stranieri, S., L. Baldi, and A. Banterle. 2010. “Do Nutrition Claims Matter to Consumers? An Empirical Analysis Considering European Requirements.” *Journal of Agricultural Economics* 16(1):15-33.

Stranieri, S., and A. Banterle. 2015. “Consumer Interest in Meat Labelled Attributes: Who Cares?” *International Food and Agribusiness Management Review* 18(4): 21-38.

Tversky, A. 1974. “Assessing Uncertainty.” *Journal of the Royal Statistical Society.* 36(2):148-159.

Wu, L., S. Wang, D. Zhu, W. Hu, and H. Wang. 2015. “Chinese Consumers’ Preferences and Willingness to Pay for Traceable Food Quality and Safety Attributes: The Case of Pork.” *China Economic Review* 35: 121-136.

Zhang, C., J. Bai, and T.I. Wahl. 2012. “Consumers’ Willingness to Pay for Traceable Pork, Milk, and Cooking Oil in Nanjing, China.” *Food Control* 27(1): 21-28.

Zheng, Y. 2013. “Better supplier management for supermarket chains in China.” HAMK Häme University of Applied Sciences, Master Thesis.

Table 1. Definitions and Sample Statistics of Variables (N = 2,381)

	Variables	Description of Variables, CV=Continuous Variable, BV=Binary Variable	Mean	Std. Dev.	Min.	Max.
	GH_free_Info	CV; respondent's WTP for growth hormone-free information	6.17	4.76	0	17
	Traceability	CV; respondent's WTP for traceability information	5.56	4.64	0	17
Demographic	Female	BV =1 if respondent is female, 0 o.w.	0.65	0.47	0	1
	Age	CV; years of age	40.7	9.92	18	79
	Education	CV; years of education	15.2	2.19	2	18
	Family income	CV; total monthly household income before tax ($1,000)	65.5	31.0	10	105
	Housewife	BV =1 if respondent's occupation is housewife, 0 o.w.	0.12	0.32	0	1
	Northern Taiwan	BV =1 if respondent is from Northern Taiwan, 0 o.w.	0.52	0.49	0	1
	Central Taiwan	BV =1 if respondent is from Central Taiwan, 0 o.w.	0.25	0.43	0	1
Shopper Characteristics	Prim-shopper *(Always)*	BV =1 if respondent is always the only one who buys groceries in a family, 0 o.w.	0.51	0.49	0	1
	Prim-shopper *(Sometimes)*	BV =1 if respondent is sometimes the only one who buys groceries in a family, 0 o.w.	0.31	0.46	0	1
	Distant to mkts *(< 1 km)*	BV =1 if respondent can reach traditional market within 1 kilometer, 0 o.w.	0.74	0.43	0	1
	Distant to mkts *(1-3 km)*	BV =1 if respondent can reach traditional market within 1-3 kilometers, 0 o.w.	0.18	0.39	0	1
	Frequency to mkts	CV; frequency to traditional market within half year	34.9	27.5	0	96
	Time spent *(30-60 mins)*	BV =1 if respondent spends time at traditional market within 30-60 minutes, 0 o.w.	0.51	0.49	0	1
	Time spent *(> 1 hr)*	BV =1 if respondent spends time at traditional market over 1 hour, 0 o.w.	0.12	0.33	0	1
	Schedule2shop *(5-11am)*	BV =1 if respondent used to go to traditional market at morning (5-11 Am), 0 o.w.	0.40	0.49	0	1
	Schedule2shop *(11-5pm)*	BV =1 if respondent used to go to traditional market around 11 AM-5 Pm, 0 o.w.	0.23	0.42	0	1
Eating Characteristics	Cook at home *(0-3 times)*	BV =1 if respondent cooks at home about 0-3 times weekly, 0 o.w.	0.32	0.46	0	1
	Cook at home *(4-12 times)*	BV =1 if respondent cooks at home about 4-12 times weekly, 0 o.w.	0.52	0.49	0	1
	Pork	BV =1 if respondent often or every chance possible purchases pork, 0 o.w.	0.61	0.48	0	1
	Chicken	BV =1 if respondent often or every chance possible purchases chicken, 0 o.w.	0.47	0.49	0	1
	Fish	BV =1 if respondent often or every chance possible purchases fish, 0 o.w.	0.45	0.49	0	1
	Beef	BV =1 if respondent often or every chance possible purchases beef, 0 o.w.	0.13	0.33	0	1

Table 2. The Outcomes of WTP for Growth Hormone-Free Information Regarding Different Scenarios

		Group A	Group B					
		Control Group	**Selected $110**	**Selected $120**	**Selected $130**	**Selected $140**	**Selected $150**	**Selected unknown**
Demographic	Female	0.475	0.179	0.737	-0.247	-1.785	0.582	1.502**
	Age	-0.039*	-0.032	0.005	-0.040	-0.024	-0.057	-0.057*
	Education	0.078	0.268	-0.167	-0.197	0.193	-1.156**	0.141
	Family income	0.005	0.016	0.014	-0.022*	-0.033	-0.019	0.016*
	Housewife	-1.126*	2.238	0.246	-1.034	-3.392**	-3.769	-0.213
	Northern Taiwan	0.115	-1.100	-0.186	-1.023	-2.833	-7.314***	0.381
	Central Taiwan	0.427	1.250	0.221	0.864	0.177	-5.637**	0.056
Shopper Characteristics	Prim-shopper *(Always)*	0.279	0.176	0.637	-0.448	0.118	7.857***	-0.362
	Prim-shopper *(Sometimes)*	0.648	0.897	0.726	0.016	-0.752	6.545***	0.551
	Distant to mkts *(< 1 km)*	-0.720	0.071	-1.666	-2.921	-0.991	-8.481**	-0.216
	Distant to mkts *(1-3 km)*	-0.807	0.052	-0.335	-4.610	(dropped)	-6.729*	-0.082
	Frequency to mkts	0.010	0.030*	0.007	-0.006	0.022	0.040**	-0.006
	Time spent *(30-60 mins)*	0.710*	-0.006	-0.175	1.286*	-0.307	0.773	-0.673
	Time spent *(> 1 hr)*	0.219	2.293	-0.066	0.481	-0.063	1.690	-1.371
	Schedule2shop *(5-11am)*	-0.735*	1.077	-1.595**	0.887	1.075	-4.152***	0.473
	Schedule2shop *(11-5pm)*	-0.374	1.828	-1.828*	2.319**	-0.657	-5.554**	0.581
Eating Characteristics	Cook at home *(0-3 times)*	-0.099	1.787	-1.021	-0.877	1.490	4.318*	0.759
	Cook at home *(4-12 times)*	-0.612	2.239*	-1.186	-0.946	-1.945	2.201**	1.133
	Pork	-0.466	0.988	0.698	0.552	-1.756	2.043	-0.355
	Chicken	1.250***	1.106	-0.647	1.071	3.012*	3.487**	0.355
	Fish	0.056	0.079	0.019	0.073	-0.355	-1.082	1.203**
	Beef	0.182	-0.973	0.850	0.624	-1.431	-2.866	-0.116
Constant		5.330**	-4.250	9.641***	14.002**	10.766**	33.420***	2.888
Observations		928	155	312	223	76	59	628
Log-Likelihood		-2,017.57	-330.64	-676.99	-476.35	-137.61	-104.11	-1,373.22
Wald χ^2		35.27**	42.47***	21.42	30.63	81.08***	83.73***	33.82*
AIC		4.400	4.576	4.494	4.487	4.253	4.343	4.450
Mean		5.99	6.00	6.50	6.00	5.91	8.51	6.20
Standard Deviation		4.71	4.90	4.66	4.69	3.81	4.40	4.97

Note: Asterisks indicate levels of significance: * = 0.10, ** = 0.05, and *** = 0.01.

Table 3. The Outcomes of WTP for Traceability Information Regarding Different Scenarios

		Group A	Group B					
		Control Group	**Selected $110**	**Selected $120**	**Selected $130**	**Selected $140**	**Selected $150**	**Selected unknown**
Demographic	Female	0.341	0.008	0.669	0.493	-1.362	-0.160	1.201**
	Age	-0.027	-0.042	-0.040	-0.009	-0.062	-0.130	-0.052
	Education	0.093	0.015	-0.215	0.090	0.083	-1.299**	0.140
	Family income	-0.005	0.006	0.008	-0.021*	-0.004	0.037	0.002
	Housewife	-0.666	2.712	0.077	-1.899*	-3.150**	-2.560	-0.798
	Northern Taiwan	0.271	-0.303	-0.734	0.013	-3.216	-5.396***	0.308
	Central Taiwan	0.543	1.217	-0.054	0.263	0.578	-5.281**	0.624
Shopper Characteristics	Prim-shopper *(Always)*	0.172	-0.632	0.827	-1.108	-2.894	6.044**	-0.469
	Prim-shopper *(Sometimes)*	0.873	-0.881	1.236	-0.287	-3.544*	6.439***	0.167
	Distant to mkts *(< 1 km)*	-1.072	-0.397	-0.382	-4.831	-0.072	-8.572**	-0.526
	Distant to mkts *(1-3 km)*	-1.214	-1.481	1.006	-6.343	(dropped)	-7.545*	-1.119
	Frequency to mkts	0.009	0.039**	0.007	0.005	0.035*	0.027	0.003
	Time spent *(30-60 mins)*	0.977**	0.149	0.227	1.146	-0.139	0.752	-0.366
	Time spent *(> 1 hr)*	1.095	1.129	0.406	-0.390	1.003	2.683*	-0.974
	Schedule2shop *(5-11am)*	-0.610	1.023	-1.450**	0.537	0.827	-2.256	0.768
	Schedule2shop *(11-5pm)*	0.107	0.841	-2.130**	2.231**	0.851	-3.206	0.620
Eating Characteristics	Cook at home *(0-3 times)*	0.281	2.902*	-1.171	-1.120	-0.890	2.724	1.339
	Cook at home *(4-12 times)*	-0.328	2.026	-1.456	-1.164	-2.414**	0.591	1.342
	Pork	-0.349	0.278	0.776	-0.167	-4.494***	0.869	-0.550
	Chicken	1.375***	2.186**	-0.864	0.568	1.662	3.699**	0.519
	Fish	-0.441	0.775	-0.101	0.927	2.018	-1.569	0.778
	Beef	-0.184	-1.331	1.313	-0.074	0.101	-2.964	0.115
Constant		4.409*	1.031	10.711***	9.496*	13.679***	35.510***	2.608
Observations		928	155	312	223	76	59	628
Log-Likelihood		-1,989.87	-323.29	-665.38	-465.09	-128.42	-109.52	-1,347.13
Wald χ^2		36.99**	29.45	26.48	28.46	69.76***	52.33***	28.04
AIC		4.340	4.481	4.419	4.386	4.011	4.526	4.367
Mean		5.53	5.49	5.84	5.13	5.17	7.51	5.48
Standard Deviation		4.60	4.75	4.54	4.49	3.67	4.37	4.85

Note: Asterisks indicate levels of significance: * = 0.10, ** = 0.05, and *** = 0.01.

Table 4. The LR Test on Parameter Equality among Models for Growth Hormone-Free Case

	Control Group	Selected $110	Selected $120	Selected $130	Selected $140	Selected $150	Selected unknown
Control Group	(1.0000)						
Selected $110	(0.4572)	(1.0000)					
Selected $120	(0.5755)	(0.2164)	(1.0000)				
Selected $130	(0.5171)	(0.5600)	(0.1541)	(1.0000)			
Selected $140	(0.0106)**	(0.0038)***	(0.0058)***	(0.0087)***	(1.0000)		
Selected $150	(0.0001)***	(0.0001)***	(0.0036)***	(0.0001)***	(0.0004)***	(1.0000)	
Selected unknown	(0.4472)	(0.5462)	(0.1115)	(0.0506)*	(0.0003)***	(0.0000)***	(1.0000)

Note: LR test chi-square probability in parentheses.
Asterisks indicate levels of significance: * = 0.10, ** = 0.05, and *** = 0.01.

Table 5. The LR Test on Parameter Equality among Models for Traceability Case

	Control Group	Selected $110	Selected $120	Selected $130	Selected $140	Selected $150	Selected unknown
Control Group	(1.0000)						
Selected $110	(0.3413)	(1.0000)					
Selected $120	(0.3286)	(0.0714)*	(1.0000)				
Selected $130	(0.7867)	(0.3237)	(0.0657)*	(1.0000)			
Selected $140	(0.0220)**	(0.0273)**	(0.0192)**	(0.0535)*	(1.0000)		
Selected $150	(0.0059)***	(0.0229)**	(0.0370)**	(0.0058)***	(0.0042)***	(1.0000)	
Selected unknown	(0.4136)	(0.4275)	(0.0450)**	(0.4559)	(0.0021)***	(0.0020)***	(1.0000)

Note: LR test chi-square probability in parentheses.
Asterisks indicate levels of significance: * = 0.10, ** = 0.05, and *** = 0.01.

Figure 1. The Density of WTP Distribution for GH-Free Info. Regarding Different Starting Points.

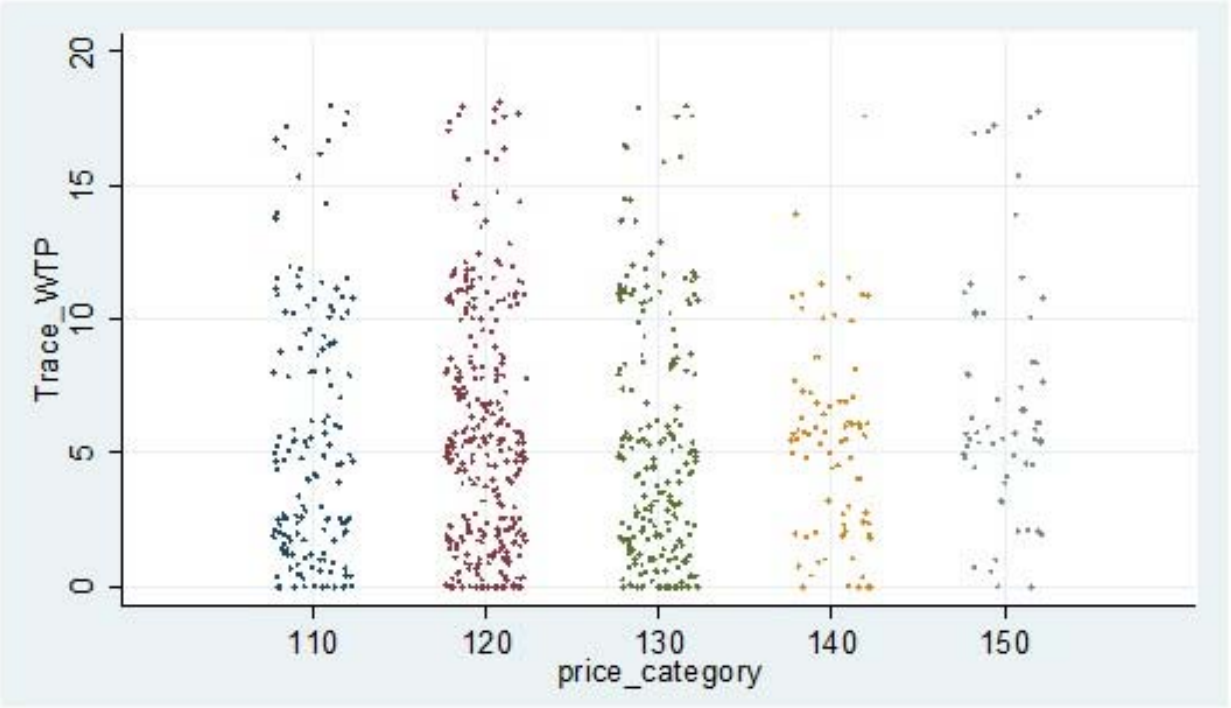

Figure 2. The Density of WTP Distribution for Traceability Info. Regarding Different Starting Points.