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Preferences and Willingness to Pay for Local and Imported Citrus

Aldon MHP. Sinaga, Ery Yusnita A., Ana Arifatus S., and Hanafi Hariantoko

Tribhuwana Tunggadewi University, Indonesia

Abstract

Indonesia horticultural product has experienced major implication from global free trade. Quantity of imported fruits was increased rapidly during the last ten years under implication of free trade. In spite implies market positively by boosting consumption and market growth, imports also implies increasing competition between imported and local fruit. Increase of imports has significantly affect production by decreasing number of certain scale of farm whose growth local product. It is important measuring whether the market and costumer response due the competition between locally grown and imported fruits. The study intended to (1) examined the difference of demands between local citrus and imported one. (2) measured demographic factors that influence costumer choice to buy local or imported citrus, and (3) examined product attributes that influence consumer willingness to pay (WTP) for local and imported citrus. The study was conducted in Malang district, East Java, Indonesia. Respondents were determined by purposive quota sampling method. WTP data was collected refer to modified "Vickrey Auction" principles. Binary Logit Regression and Ordinary Least Square analysis have been employed respectively to measure demographic factor that influenced costumer decision and examine the product attributes related to costumer WTP. The study has revealed that there were a different demand curve pattern and different own price elasticity between locally grown and imported citrus. Higher Income, higher number of dependant and younger costumer has driven higher probability on consuming imported citrus. This research also shown that color, safety, healthy and packaging significantly affect costumer willingness to pay for imported citrus, while taste and safety was significant for local citrus. The findings indicated that in certain market, consumer would pay higher price to afford imported citrus, which placed locally grown citrus in the high competition. Higher incomes will increase imported citrus consumption. Meanwhile, color and packaging are factors that must be considered by citrus local grower to win the competition.

Keywords: import; demand; locally grown; competition; willingness to pay; citrus.

Corresponding Author:
Aldon MHP. Sinaga
a_sinaga@hotmail.com

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1. Introduction

Free Trade is a part of international trade liberalization process, which implies national trading performance. Elimination over some instrumentation on import tariff and tax as a part of the trade agreement between countries will increase the number of imports. Various kind of product could alter the composition of economic activity, and bringing about a change in the techniques of production or consumption. Otherwise it is also conduct more tight competition between local and imported product on the local market.

Agricultural commodities are one of most product which influenced by free trade agreement. Thereby agricultural product as a major product has known been determines in many trade agreement in many countries and many organization.

Indonesia horticultural product, noted to be experienced major implication from global free trade. The quantity of imported fruits is increasing rapidly during the last 10 years due to implication of global free trade. FAO data shows that quantity imports of four kinds of major fruit are increased by 15% during 1995-2005 [1]. Those data was confirmed by other data from Agriculture Department of Indonesia, which noted that there are increasing number of imported fresh fruits about 24% in a periods of 1996-2003 [2].

Free trade agreement has not directly implies local trade performance. Some economic mechanism has theoretically known to generates change in local market performance. The research held to study the economic implication due to implementation of Egypt–US Free Trade Agreement, shown that FTA has implies positive impacts to Household Welfare, Real returns of Capital and Real returns of Labor [3].

The same results were also shown from Indian-EU FTA and Korean-US FTA. In the different way, Korean-US FTA and EU-India FTA has resulted in welfare gains for both parties India and EU and also to Korean and US. However in absolute terms, EU will experience higher gains than India. In terms of share India has a larger GDP growth than EU. India welfare also known has mainly driven by terms of trade gains, whereas, EU welfare has mainly driven by allocative efficiency gains [4, 5].

Otherwise, even though most of macro economics indicator has shown positive response due to implementation of Egypt-US FTA, Egypt Agricultural sectors have experienced negative growth [3]. This response also noted by [6] whose conducting a research *Policies of the European Community and Agricultural Trade with Developing Countries*. The research has shown that a group of African, Caribbean and Pacific countries will suffer an discriminatory philosophy during the periods of European Community (EC) trade implementation. This discrimination has against products which in EC considered sensitive in economic and political terms. In point of fact, the case mostly happened for agricultural products.

In general, implication of international trade could be positive or negative. In some case, it implies market positively by boosting consumption, a market growth. It is also implies negatively by increasing of competition between imported and local fruit which resulted on reduction of local fruits market. These response could be different among countries and depends on the characteristic of fruits market in the country. The implication might be more and more important in the future. Furthermore, tight competition between imported and local product will result in decreasing number of farmers who grow local product. It is triggered by the lower international price of products which cannot be covered by local production cost.

2. Objective

The study was intended to examine the difference of demands between locally grown citrus and imported citrus. Second objective of the research was to measured demographic factors that influence the costumer preference to determine their choice to buy local grown citrus or imported one. And the third objective was to examine product attributes that influence consumer willingness to pay local citrus and imported citrus.

3. Reviewed Literature Studies

3.1. Demographic Attributes Which Influence Preferences and Willingness to Pay

Na He and John C. Bernard [7] on their research on Consumer WTP Of organic and Non Genetic Modified Food, has suggest, that age, income, education, gender and number of child were important to influence WTP of both studied product. Even though the research has found that women were found to have higher WTP for organic, while other demographics did not have a significant effect.

Different results has revealed by Owusu and Anifori [8] research, which found that number of child and education were significantly affected consumer WTP premiums of organic fruit product. Otherwise, gender has shown not significantly affecting the WTP. Another different results also presented by S. Boccaletti, M. Nardella [9] which found that gender, education and income has play the major roles to determine consumer WTP over pesticide residue free fruit product. Three research above has shown that WTP was significantly influenced by demography factors, but the specific attributes depend over certain location and condition of product.

Besides the costumer demographic attributes, WTP has already know influenced also by product attributes itself. Fruit has several product attributes which contribute the WTP and consumer decision to buy certain product. Bernard, Zhang, and Gifford

[10] were studied to determine whether product attributes has influence WTP. They predetermine that freshness of product, size of product, visual insect damage and product hygiene. Bernard, Zhang, and Gifford [10] used auction experiments for processed foods (potato chips, milk chocolate, and tortilla chips) to determine if the organic market well served those seeking to avoid GM food. As a part of results, they were found that heteroskedastic tobit model can be implemented well to suggested the relation of additional attributes of organic foods, to the premium consumers were willing to pay for organic foods. With similar topics, He and Bernard [7] were employed a generalized Vikreys Auction to measure consumer WTP.

3.2. Product Attributes Which Influence Preferences and Willingness to Pay

Skreli et.al. [11] employing conjoint analysis to determine relation between product attributes to WTP and costumer preference over local and imported apples. The research has reported that size of product has significantly affecting consumer WTP and consumer decision to buy imported apples.

By his research Examining Substitution Patterns between Domestic and Imported Agricultural Products for Broccoli, Kiwifruit, Rice and Apples in Japan [12] has mentioned several points. The first result has showed that the substitution of imported products for domestic sources was relatively large in the case of broccoli and kiwifruit and relatively low in the case of rice and apples. Secondly, in apple case, showed, that substitution patterns between domestic and imported products are not necessary fixed according to different kinds of agricultural products.

3.3. Competition Between Locally Grown and Imported Product

Agricultural commodities have a specific behaviour under international trade. Various important aspect makes agricultural commodities has different trading approach in contrast to other products. Aspects of food sovereignty and the sovereignty of the exclusion of agricultural prices and efficiency in production and trade system often becomes an obstacle for agricultural commodities trades to be liberalized. Many countries provide a huge of subsidies to maintain their food sovereignty that gives the effect of "unfairness" in the trade of agricultural commodities, especially food.

McLaren and Josling [13] suggest that there were several "entry points" competition in the agricultural sector, known as follow: (a) input supply competition, (b). agricultural business competition, (c). processing competition, and (d). trade and distribution competition. Among those points, trade competition is the strongest factor influencing the success of free trade scheme. Even though the Uruguay Round has been arranged

every countries to convert their non-tariff barriers (such as subsidies, protection and others) into a tariff, but there still are constraints on the structure of specific agricultural commodity markets.

As a major entry point of import competition, trade is also known as source of market instability for some manufacturers [14]. Market structure of certain specified commodities tend to creates wide range of product variations, thus it becomes risk which vary for different manufacturers.

Huang, Huang and Wells [15] in his research on the effects of imports of fresh products for the US market, noted that imported fresh product has play important roles in creating a narrow fluctuations of price. Although the study did not measure the impact of imports for local producers, this study has given visualization the importance of research on effect of imports in creating the price variations. Imports provide certainty of supply that provide "smoothing effect" on consumer prices and retail price for fresh food product separately.

3.4. Measuring Willingness to Pay

Study about product willingness-to-pay (WTP) on behalf of its customers plays a important role in many areas of marketing management such as pricing decisions or new product development. There are several methods and approaches known to measure willingness-to-pay with different based concept which drive different methodological implications. Many of research have shown its results and have been presented in the relevant literature so far.

Basically WTP measurement was divided into (1) whether we used market data, (2) whether we used as experiments, (3) Whether we used direct surveys and (4) indirect surveys. Over those four criterion, we can describe type of analysis can be employed to measure WTP as follow: (a) Laboratory experiments, (b) field experiments, (c) auction, (d) expert judgement, (e) costumer surveys, (f) conjoint analysis and (g) discrete choice analysis [16].

A special and common application of experiments measurement of WTP is auctions which can be carried out as laboratory and field experiments. In laboratory settings auctions have been intensively employed for WTP elicitation. Auction is useful to gain knowledge of consumers' evaluations of a product or brand and can therefore be used to reveal consumers' valuations to facilitate future pricing decisions.

But, as experimental auction cannot create an incentive effect sensed by costumer, Breidert, Hashler and Reutterer [16] has proposed a suggestion to improve auction method by adding incentive compatibility which ensured, that if a given bid determines the bidder will have the right to buy the good in the end of auction.

4. Material and Method

This study conducted in 5 sub district at Malang district, East Java, Indonesia. Respondent were determined by purposive quota sampling method. Quotas are given to each sub district, thus there were 40 respondents in each sub district. To purposively determine the respondents, we were visiting 4-5 fruit store or traditional retails, and offering citrus buyers to become voluntary for the research. Based on closed questionnaire, the interview with each respondents were held at respondent residences.

WTP data was collected principally as Vickrey Auction methods [16]. As there are some obstacles to do the auction directly, some modification to approaching Vickrey auction has been made. We are predetermined a certain price list for citrus product, start from Rp. 5,000, and increased by 5% to Rp. 40,755. At the interview, we bring 2 kg each product and based on the price list respondent are invited to pick their bid of maximum price per kg to achieve each product (local citrus and imported citrus). This method were similar to close envelope methods which could be applied in Vikrey Auction Method, where consumer bid were free over influence of other consumer bids [16].

To examine the difference of demands on local citrus and imported citrus, collected WTP data were employed to construct Demand Curve and calculating of own price elasticity of each product. Since each respondent has decide their maximum price to buy 2 kg of each kind of citrus, we can plot their decision in the scatter diagram which show a relation between number of respondent and price level. To constructing demand function of local citrus or imported citrus we can use OLS model describe as follow;

$$P_i = \beta Q_{ij} + \varepsilon_i \tag{1}$$

Where P: predetermined price start from Rp. 5000, and increased by 5%, Q: total amunt of product to be purchased by all respondents (i = price level, j = number of respondent = 200)

Binary Probit Regression has been used to measure demographic factor that influence costumer decision in buying local or imported citrus. The equation of the Regression Model to estimate decision of buying local citrus or imported citrus can be describe as follow;

$$Pr(Y_i = 1) = \beta X_{ij} + \varepsilon_i \tag{2}$$

Where Y: probality to choose local citrus (=1) or improted citrus (=0), X: determined demographic factors (j: income, number of dependant, ages, sex)

Table 1: Distribution of Respondent.

Sub District	Population	Household	Quotas
Dampit	116.553	23.311	40
Turen	113.120	25.138	40
Kepanjen	100.389	25.097	40
Singosari	156,338	30.065	40
Pakis	124.217	25.879	40
Total	610.617	129.489	200

To examine the product attributes related to costumer willingness to pay, we used Ordinary Least Square analysis, with regression model as follow;

$$W_{ikl} = \beta_{ikl} C_{ikl} + \varepsilon_i \quad (3)$$

Where W: willingness to pay of costumer I, which determine from maximum price that costumer willing to pay for amount of k citrus (k= local and inported citurs), C: determined attributes of citrus (l: color, taste, safety, healthy and packaging)

5. Results and Discussion

As this research has conducted as a field experiments, we limiting the scope of this research by people whose consume local or imported citrus during the periods of research. The number of quota of each sub districts were 40 people whose represent households (Table 1).

We choose 40 respondents at fruit retail section at the town market at each sub district. Respondents were recruited through expression of willingness to be our respondent. As we meet a citrus consumer, then we were asking her/him to be a respondent for this research. Interview of each respondents were held at respondents residence as we have an appointment to take the interview. Over 200 respondents, we have 87 (44%) female consumer and 113 (56%) male consumer. The Composition of our respondents by their age has shown that our 68% of respondents came from range of 25-55 (Table 2).

Number of dependant has ranged between 0–7 people. Respondent mostly have 4 dependents (41%). Number of dependency has related to decision on consume citrus. Range of household income of a respondent has ranged from <Rp. 500,000,-/mo (17%), Rp. 600,000-1.000.000/mo (66%) and >Rp. 1,000,000,-/mo (26%). This range of income has representation of various of occupation of the respondent. Most of respondent were working as labor for several small to medium scale manufacturing industries (82%).

As we asking about the intensity of purchasing citrus, 48.5% of respondent has answer that they were rarely consume citrus. Only 46.5% respondent has often or

Table 2: Distribution of Ages.

Ages	Num. Respondent	Pecentage	Ages	Num. Respondent	Pecentage
15-25	28	14%	>45-55	39	20%
>2;5-35	52	26%	>55-65	28	14%
>35-45	43	22%	65+	10	5%

quite often, purchase citrus. There was no specific period that marks the term of purchasing citrus. There were only 14% of respondent whose regularly consume citrus. The amount number of each purchased has dominate by respondent whose bought 1-2 kg (60%), while 36% of respondent has purchased 3-4 kg.

Preferences of purchasing have shown that 64% of respondent has chosen local citrus, while 36% has consumed imported ones. Intensity on purchasing local fruit or imported fruit tends to be similar. An average of intensity to purchase imported fruit was 2.86 times per month slightly higher than local citrus which average has reach 2.79 times per month. Imported citrus costumer has purchase the product 2-5 times in a month, while consumer of local citrus has bought 1-5 times a month. Average Quantity of purchasing has shown that consumer of imported citrus tend to buy a large quantity of product in each times (2.87kg) compare to consumer of local citrus (2.56).

5.1. Demand of local and imported citrus

Collected WTP data were employed to construct Demand Curve, which is shown in Figure 1. The graph shown that the percentage of respondents who was willing to buy a certain number of local and import citrus. There are difference on both commodities. A difference was shown to be significant at a higher price. Number of costumer who willing to buy local or imported citrus were seems similar as a price has lies between Rp. 5,000 - Rp. 10,000,- per kg. Graph below has shown that respondent were willing to pay higher price to afford imported citrus. As there were no consumer willing to buy local citrus at the price of Rp. 19,000,- there still 18% consumer willing to buy imported ones.

We also drawn the relation between cumulative quantities which consumer willing to pay at certain price level. The relation is shown in Figure 2. From the graph we can conclude that there were different quantities that consumer willing to buy between local and imported citrus at the same level of price. Consumer tends to buy more imported citrus rather than locally grown ones at the certain level of price.

The result described above has shown similar pattern with demand curve constructed by Na He and John C. Bernard [7]. Their research on demand of organic compares to non GM product has similar effect of imported products to the local ones.

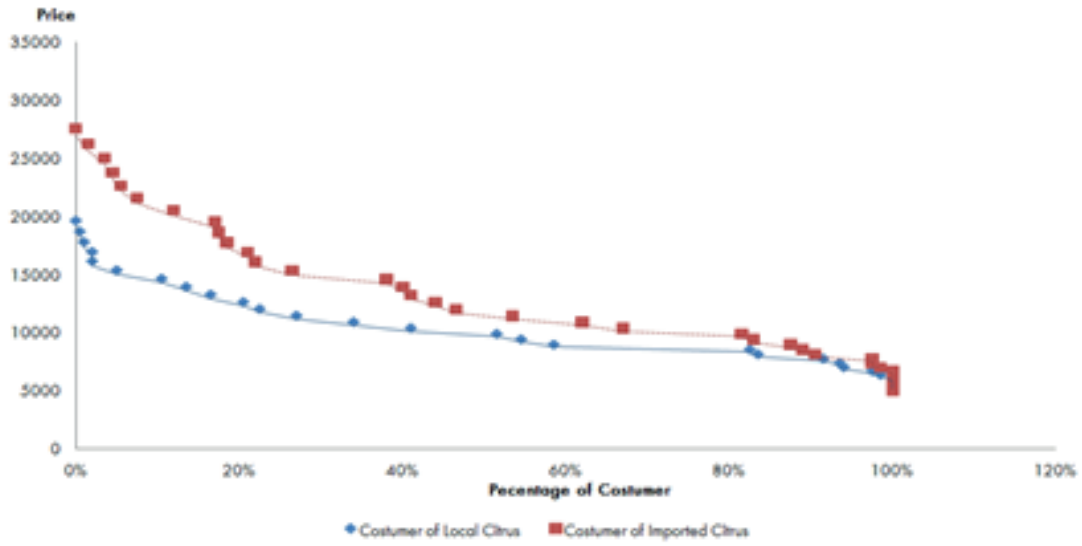

Figure 1: Demand Curve of citrus based on cumulative percentages of consumer.

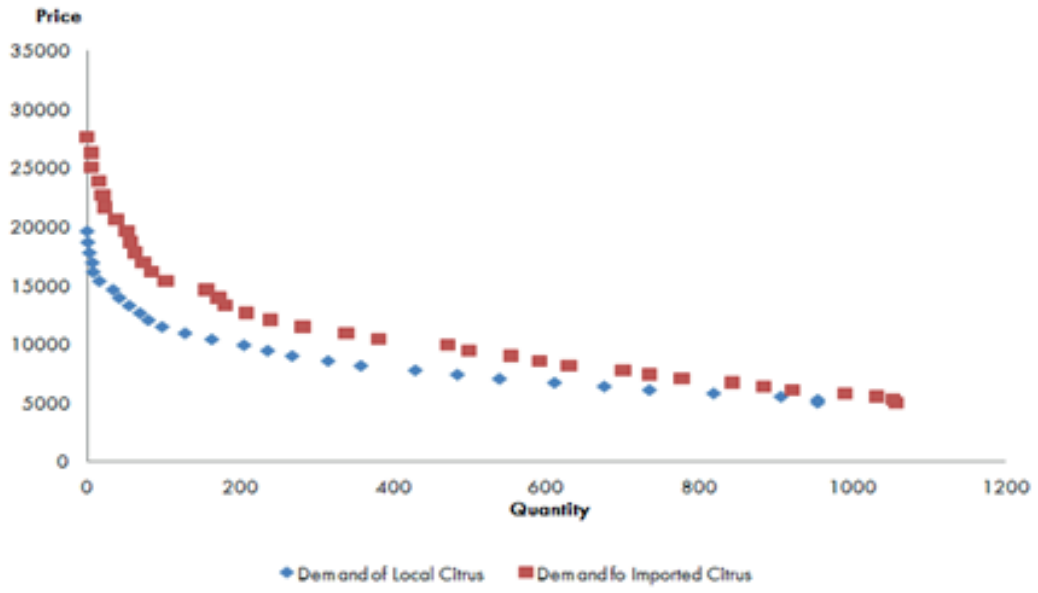

Figure 2: Demand curve of Citrus based on Quantity.

As we collected the amount of product, respondents are willing to purchased, in every level of predetermined certain price list, which ranged from Rp. 5,000, and increased by 5%. We found that the maximum price (where there was no respondent willing to buy) were lied at Rp. 30,412, which means there were 38 level of price. We determined the demand function based on equation (2). Demand function has constructed by total amount of citrus, which 200 respondents willing to buy along the increased level of predetermined price. Employing OLS, we have the results shown below (Table 3).

Table 3: Demand Function of citrus.

	Imported Citrus	Local Citrus
Price	-0.0426	-0.0322
Se	0.0041	0.0045
T	-10.523	-7.171
Prob	0.0000**	0.0000**
R	0.8687	0.7669

Table 4: Consumer decision.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
AGE **	0.037724	0.006821	5.530206	0.0000
SEX	0.028315	0.210262	0.134668	0.8929
DEPEND **	-0.233557	0.076640	-3.047479	0.0023
INCOME **	-0.360299	0.127765	-2.820018	0.0048

The aforementioned results have shown a different demand curve between those two kinds of citrus on research location. Demand of imported citrus has shown to be sloppier than the local ones. This results has stated that demand has to be more sensitive in term of price change for imported consumer citrus to locally grown one, due to its higher own price elasticity. In other way this result has noted that imported citrus will be directly competing the local citrus as the price is similar.

5.2. Consumer Decision in Buying Local or Imported Citrus

There is an important question as we mentioned "how did consumer decide to buy imported citrus or local citrus?" and "what factor has driven this choice?" Employing Binary Probit Regression to equation (1), we can measure demographic factor that influence costumer decision in buying local or imported citrus. Income, number of dependant in the family, ages and gender has been arranged as independent factor affecting probability of costumer choice upon both products (Table 4).

That analysis has reveal that ages of consumer, number of dependant member in the family and level of income has significantly affect the decision to buy imported citrus or local citrus. Negative value of their coefficient has shown that the higher income and the higher number of dependant has contribute to decision to choose imported citrus rather than local ones.

5.3. Product Attributes Influence WTP

As we already answer how consumer choose between imported and local citrus, the next question is what happened to our citrus? Why consumers like imported citrus

Table 5: Product Attributes Influencing WTP.

Local Citrus	Coefficients	Std. Error	t Stat	P-value
Intercept	26942.39	885.1285	30.43896	0.0000
Color	183.4922	186.1502	0.985721	0.3255
Taste **	-1673.993	162.9383	-10.27378	0.0000
Toxidity **	-1443.998	141.6156	-10.19660	0.0000
Vitamins **	-892.0716	148.6873	-5.999648	0.0000
Packaging	234.3470	158.6051	1.477550	0.1411
Imported Citrus				
Intercept	-3636.001	1291.631	-2.815046	0.0054
Color **	1543.017	244.4924	6.311104	0.0000
Taste	-244.9143	249.2434	-0.982631	0.3270
Toxidity **	1279.187	277.3045	4.612932	0.0000
Vitamins **	808.1822	307.2311	2.630535	0.0092
Packaging **	1838.851	278.2740	6.608057	0.0000

Notes: Color: respondent preferences in color of citrus, Taste: preferences in the taste of citrus, Toxidity: consumer views on inherent harmful substances which might be contaminate the citrus. Vitamins: consumer knowledge on healthy fact of the citrus. Packaging: consumer preferences in packaging appearance.

rather than locals? Employing OLS we had measure whether product attributes influence consumer willingness to pay for local and also imported citrus. In order to implement the equation, we had tested the data for BLUE Assumption. We use pair wise correlation to detect muticolinearity and white heterokedasticity test to detect heterokedasticity problems. As we found heterokedasticity disturbance for local citrus data sets, then we applied white heterokedasticity procedures. The results is given in Table 5.

From the table we can see that local citrus has chosen by consumer because its taste and they know well that local citrus are healthy and safety. Different with imported citrus which chosen by its color, its safety, its healthy and also its package.

This results has guided and point us to an attribute which need to be improved. According to consumer preferences, local citrus has a comparative advantage since its tastes better than imported ones. Improving the color, healthy facts and packaging will increase consumer preferences. Consumer Interest in various local foods will be reflected in the increased number of farmers who grow local product [17]. As the consumption of local fruits grows, it will trigger production increased. Thereby learning about consumer interest which is represented by their willingness to pay and preference to choose is important.

6. Conclusion

The study has revealed that there are significant differences between local and imported citrus. Even though both has a similar shape of demand curve, the demand curve has shown that consumer has a higher willingness to pay for imported citrus compared to locally grown ones. It's also shown that imported citrus price elasticity tend to be higher than locally grown citrus. The higher the income, the higher number of dependent and the younger the consumer, the higher the probability in deciding to consume imported citrus. This research also shown that color, healthy matters and packaging was playing important roles to influence costumer willingness to pay for imported citrus. Meanwhile taste and healthy matter was a major factor for local citrus.

The findings indicated that in certain market, consumer has a higher willingness to pay imported citrus rather than locally grown ones. Consequently, local product has to face competition with imported products. Increasing competition in some cases has resulted to the decreasing number of production and productivity of local product due decreasing price.

Competition against imported product was also recognized become an important issue for many countries. Norway allocates more attention (the budget) to strengthen the farmers who suffered the competition with imported products; the budget is even bigger than the budget used to build export capacity. Norway government provide substantial amount of subsidies and construct a guidance to strengthen the competitiveness capacity of farmers in facing competition with imported products [18]. On the other hand, Chinese government discriminates sales tax for imported products, which never applied to local products. This gives Chinese products the competitiveness as the production and distribution costs are lower than imported ones [19].

Since we found that higher incomes will increase the amount of consumption of imported citrus, while, color, healthy fact and packaging is a factor that must be considered by citrus local grower to win the competition, we can formulate an effort to help local citrus to deal with competition.

Government roles are very important to prepare local product to have the ability face free competition. Providing several budget and programs could be helpful for farmer to improve their product, increasing their efficiency and maintain their competitive advantage over imported ones.

Since this research was conducted to perform an experimental approach by employing "Aukrey auction", this research has able to gain the knowledge of consumer to reveals consumer valuation to the product. The results will help us to determine the consumer preferences which will be useful for us to determine characterization of demand driven product. Since Aukreys auction as an experimental approach has a limitation to measure the actual environment, such as a distance, the easiness to obtain

the commodities and its distribution, further direct surveys research will be needed. It's important to take environmental factors into account to determine stated preferences and WTP.

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