Pricing strategies for organic vegetables based on Indonesian consumer willingness to pay

Ma'mun Sarma[a*], Marthin Nanere[b] and Philip Trebilcock[b]

[a]Department of Management, Faculty of Economics and Management, IPB University, Bogor, Indonesia
[b]La Trobe Business School, La Trobe University, Australia

C H R O N I C L E	A B S T R A C T
	An awareness of the dangers of chemicals contained in food could potentially have led to a significant increase in demand for organic food in Indonesia. Yet the demand for organic products remains relatively low. This could be attributed to high price, limited product choice, consumer distrust toward organic products, satisfaction with conventional food, or a lack of consumer perceived differences in the taste of organic products. The purpose of this article is threefold. First, to analyze the factors that influence the Indonesian consumers' willingness to pay (WTP) for several types of organic vegetables. Second, to calculate the price increase incurred by consumers of organic vegetables. Third, to determine a recommended pricing strategy based on consumers' WTP for certain common organic vegetables, including broccoli, cauliflower, cabbage, pak choi, lettuce, and carrots. Using an accidental sampling technique, samples were derived from 154 respondents living in urban areas. Descriptive analysis, crosstab, logistic regression analysis and the contingent valuation method were all employed. Findings suggest that the variables of age and income significantly affect WTP. The highest percentage of WTP was for cabbage, followed by carrots, broccoli, cauliflower, pak choy, and lettuce. The recommended pricing strategy is the default value pricing method.

1. Introduction

Increased public awareness of the importance of health and the environment has caused significant changes in the selection of consumer products. In the last 30 years industrialized countries have increasingly examined the affect of many modern farming methods which use pesticides, herbicides and chemical fertilizers (Sutanto, 2002). A subsequent result of modern agriculture has been accumulated the proliferation of cancer triggering substances (Salikin 2003). In addition, the use of agricultural chemicals have shown to result in an increasing number of degenerative diseases such as coronary heart disease, stroke and diabetes (Subroto 2008; Alavi et al., 2019). Since the 1980's healthy lifestyle movements depicted by the Indonesian slogan "Back to Nature" have sprung up. Such campaigns indicate a common Indonesian concern that is also a common global concern (Subroto 2008). The healthy lifestyle movement commonly includes health awareness by combining a healthy lifestyle with a disposition towards choosing organic foods. Thio et al. (2008) in a Surabaya study demonstrated that the most significant reason why people chose organic foods was the perceived health benefit that they derived. This perceived benefit exceeded other factors such as food quality, price, environmental friendliness, and food safety. The general view was that organic vegetables have a higher nutritional content and that the consumption of organic vegetables will improve health (Smed & Andersen, 2012).

Organic products have a 30 percent lower risk of pesticide contamination than inorganic products (Misner & Florian 2013). A study by Nugroho and Novalinda (2007) found that organic plant products have a perceived sweeter taste than inorganic plants, yet their physical appearance was not considered to be as attractive. The study found that organic plant products were considered to be smaller in size and their leaf matter was perceived to contain more undesirable holes. In most studies on organic products, consumers persisted with the ubiquitous complaint that organic products were more expensive (Muljaningsih, 2011; Abdulsalam & Babatunde, 2019; Kermanian et al., 2019). Perhaps as a result of these perceptions, consumers in Jakarta, Bogor, Denpasar and Malang demonstrated preference for "their" organic products to be a narrow group consisting of organic rice, fruits and vegetables. What is relevant for Indonesia is the scarcity of organic products in general. Availability is perhaps still limited due to low production volumes. This may be the cause of organic products being relatively expensive compared to inorganic ones (Subroto 2008). There is also a general lack of knowledge about organic products and confusion caused by the proliferation of labels (Diaz et al. 2010). Acnielsen (2005) revealed that the reasons why consumers do not buy organic foods include the price being too high, the availability limited, and that they are too difficult to obtain. There is also uncertainty felt by consumers concerning the labelling of organic products. It is felt that some are not really organic as is claimed. Similar to Nielson, Makatouni (2002) and Ozguven (2012) found that the main reason why consumers don't buy organic food is the high price, the lack of availability, the lack of trust, satisfaction with conventional food, limited choice and a lack of perceived value. Consumers expect that organic products will be clearly certified (50%); independent of synthetic pesticides, synthetic fertilizers and other chemicals (40%); and (perhaps surprisingly) expect them to be less expensive, whilst at the same time complaining that they are not (Deliana 2012; Mathew & Thomas, 2019). Based on this background, this study was conducted to analyze those factors influencing the willingness to pay (WTP) for organic vegetables, to calculate the percentage increase in the price of organic vegetables which consumers are willing to pay, and to formulate a pricing strategy for organic vegetables based on the WTP principle. This article is divided into 5 sections. The Literature Review will be discussed next. The Research Methodology will then be discussed prior to Findings. Summary and Conclusions are then presented.

2. Literature review

Ameriana (2006) examined consumer willingness to pay a premium for safe tomato pesticide residues with the contingency valuation method (CVM) and the factors that influence it with the logit model. The findings from 162 respondents showed that the WTP based CVM method was 59.26%. This represents the percentage of customers willing to pay a premium for tomatoes with safe pesticide residues if the added price selling is up to Rp 2000/kg. The WTP is influenced by factors of age, family size, family expenses, consumer concern and the consumer confidence factor with the product. Significantly, the level of education and the status of work were seen to have no effect on the WTP. It is possible that this study only sought formal levels of education. Yet much informal education could also be an influence on the decision making process in regards to paying a premium for tomatoes with safe pesticide levels. Furthermore, while the status of work in this study (with only two categorics - work and no work) had no influence, the status of work could conceivably be argued to influence purchase decisions in buying tomatoes at a higher price if safe pesticide levels could be guaranteed to exist. By contrast, Radam (2010) undertook research using the CVM method and logistic regression analysis. The results show that the willingness of consumers to pay for products labeled "Additional Without MSG" is positively related to income factors, to households with children, to gender and to the level of formal education. It was negatively related to price. Phillip and Dipeolu (2010) conducted research on Willingness to Pay towards organic vegetables by the Abeoukuta community in Nigeria. They employed the dichotomous response data analysis model (logit). Dependent variables included options of healthier, more expensive, and better tasting. The independent variables included total income, age, gender, household size, marital status, religion, ethnicity, formal education and work experience. The results indicated that the limited ethnic background of the respondents and their perception of organic vegetables did not influence their willingness to pay a premium price for organic vegetables. Age, experience and the size of the household clearly influenced the perception that organic vegetables were healthier than conventional vegetables. Similarly, ethnicity, work experience and the size of households correspondingly indicated that the respondents felt organic vegetables had a higher cost, while the variable, flavor, was more influenced by age and household income. Lee and Yoo (2011) conducted a study on the Willingness to Pay with labeling policies of genetically engineered products (Genetically Modified Organism/GMO) in Korea. Their study showed that the price range was from 1000 - 8000 KRW. A total of 53.3% of respondents were willing to pay an annual fee for GMO labeling of 1,000 KRW, while only 22.9% were willing to pay 8,000 KRW each year. This study also observed the relationship between social demographic variables and purchase propensity (consumer habits). The age average of the respondents was 36.4 years, they held a high level of education and had an average 0.94 children per household.

2.1 Uniqueness of this research

This study analyzes demographic factors that influence the Indonesian consumer's willingness to pay (WTP) for several organic vegetables; broccoli, cauliflower, cabbage, pak choy, lettuce, and carrots. Demographic factors include gender, age, marital status, education, employment, income, and family size. Data was analyzed using logistic regression analysis. In addition, this study also measured how much greater the WTP price can be for organic vegetables compared to inorganic vegetables. The WTP calculations were made using the contingent valuation method (CVM) through the bidding method. The marketing mix and pricing strategy of the organic vegetable products is discussed.

3. Research methodology

This study was conducted in urban areas (Bogor and Jakarta, whereas they are included as Greater Jakarta Metropolitan City), Indonesia from March to April 2013. Both primary and secondary data were used in this study. Primary data was obtained through observation and interviews using a semi-structured questionnaire instrument, with a list of both closed and open-ended questions. Secondary data was obtained such as from government publications. The sampling method was the non-probability sampling technique, which is an accidental sampling method. The samples used were 154 respondents in urban areas (Bogor and Jakarta). The following sections will discuss the relevant terms used in this article.

3.1 Purchasing power

The term 'purchasing power' alludes to the many goods and services that can be enjoyed by a consumer. According to Sumarwan (2011) there are several demographic characteristics that affect the consumer purchasing power of a product. Such characteristics include gender, age, marital status and education.

3.2 Willingness to pay

In the context of this article, Willingness to Pay (WTP) is an individual's willingness to pay extra for a product in order to improve environmental conditions, preserve natural resources, and/or improve one's own health. WTP calculates how far an individual (or a society in the aggregate) will go in order to achieve a (often unstated) goal. To many, WTP is the value of the potential utility of natural resources and environmental services (Hanley and Spash 1993). In this scenario, WTP calculations can be undertaken directly through surveys (direct method) and indirectly by the calculation of the value of environmental degradation which has occurred (the indirect method).

Hanley and Spash (1993) identify four elicitation methods of evaluation used to obtain the value of WTP by respondents, namely:

1. Bargain Method (Bidding Game). This method is executed by asking respondents whether they are willing to pay a certain starting amount of money. If "yes", then the value is raised up to the respondent's limit.
2. Open-ended questions method. This method asks respondents directly the maximum amount they are prepared to pay to improve environmental quality.
3. Payment card method. This method offers the respondent a card with various values representing the respondent's ability to pay. The respondent can choose the maximum or minimum value according to his/her preference. This method requires a relatively good understanding of statistics.
4. Dichotomous question choice method. This method offers a fixed monetary figure to the respondent and asks whether or not the respondent is willing to pay the given amount to obtain a specified improvement in the environment.

In addition to the above four methods, there is also the 'asked-contingent-ranking method'. This method does not directly ask respondents how much they want to pay, rather the ranking of the respondents is shown in different combinations of environmental quality and monetary value. The respondents are then asked to rank some their choices from most preferred to least preferred. Whilst the above methods focus primarily on WTP for environment benefit, the WTP concept can also be extrapolated to use WTP for the benefit of improved health.

3.3 Logistic regression model

Logistic regression analysis explores the relationship between the response/dependent variable from dichotomous or binary data with the independent variable(s) form of data and the interval scale or categorical (Hosmer and Lemeshow 1989). This analysis examines the relationship between variable descriptors (x) on the response to the variable (y) by a mathematical equation model. Statistical tests use logistic regression to examine the validity of a model. The statistical tests used in this study are as follows:

1. Significance Test Model

This test is used to determine the overall effect of the independent variables to the dependent variables in the logistic regression model. This test employs the Likelihood Ratio Test with the following hypothesis:

H_0: $\beta_1 = \beta_2 ..... = \beta_i = 0$ (there is <u>not</u> at least one independent variable affecting the dependent variable)

H_1: $\beta_i \neq 0$ (there <u>is</u> at least one independent variable affecting the dependent variable) for i = 1,2,3, ... n

The statistical test used in this test is:

$$G^2 = -2ln\left(\frac{lo}{li}\right)$$

(1)

where:
l_0 = Maximum likelihood value of the model reduction (Reduced Model) or a model that consists only of constants alone (without explanatory variables).

li = Maximum likelihood value of the full model (full model) or a model with all independent variables.

The G2 value distribution follows the Chi-squares with independent degree p, so the hypothesis is rejected if $G^2 > X^2_{(\alpha,p)}$ or p-value $<\alpha$, which means that the independent variable (X) jointly simultaneously affects the dependent variable (Y).

2. Parameters Model Test

This test is undertaken after finding from the significance test results that there is at least one independent variable affecting the dependent variable. The purpose of this test then is to determine the independent variables which significantly affect the dependent variable. Testing was conducted by the Wald test (W) in order to test the significance of the coefficient β partially with the following hypothesis:

$H_0 : \beta_i = 0$ (the i-th independent variable has no real effect on the dependent variable)

$H_1 : \beta_i \neq 0$ (the i-th independent variable has a real effect on the dependent variable)

for i = 1,2,3, ... n

The Test statistic used is:

$$W = \left(\frac{\beta i}{SE\,(\beta i)}\right)^2 \tag{2}$$

where W = Value of Wald and βi = vector of coefficients associated with the predictor (coefficient X) SE (βi) = error of βi

Here H_0 will be rejected if $W > X^2_{(\alpha,p)}$ or p-value $<\alpha$ which means that the independent variable Xi partially affects the dependent variable Y.

3. Odds Ratio Test

This test is a measure of risk or tendency to certain experienced events from one category to the other category, where the category of the Xi = 1 towards X_i = 0. The odds coefficient exp (β), which states the risk or predisposition influence of observations with category Xi = 1 is how many times more when compared with observations by category Xi = 0.

3.4 Marketing mix

The marketing mix is a collection of tactical marketing tools basically consisting of product, price, place, and promotion of the combined company to produce the response it wants in the target market (Kotler & Armstrong 2008). The marketing mix is also defined as a set of marketing tools a company uses mainly to pursue marketing objectives (Kotler & Keller 2009). The marketing mix for tangible products is usually referred to as the 4P's strategy. The marketing mix for intangible products (services) includes the marketing mix component for tangible products (product, price, place, and promotion) plus the components of people, physical environment, and process (Lovelock et al. 2010). This is then called the 7P's strategy. This strategy has further been developed into 8P's, with the addition of Productivity & Quality. The marketing mix of tangible products is presented in Fig. 1.
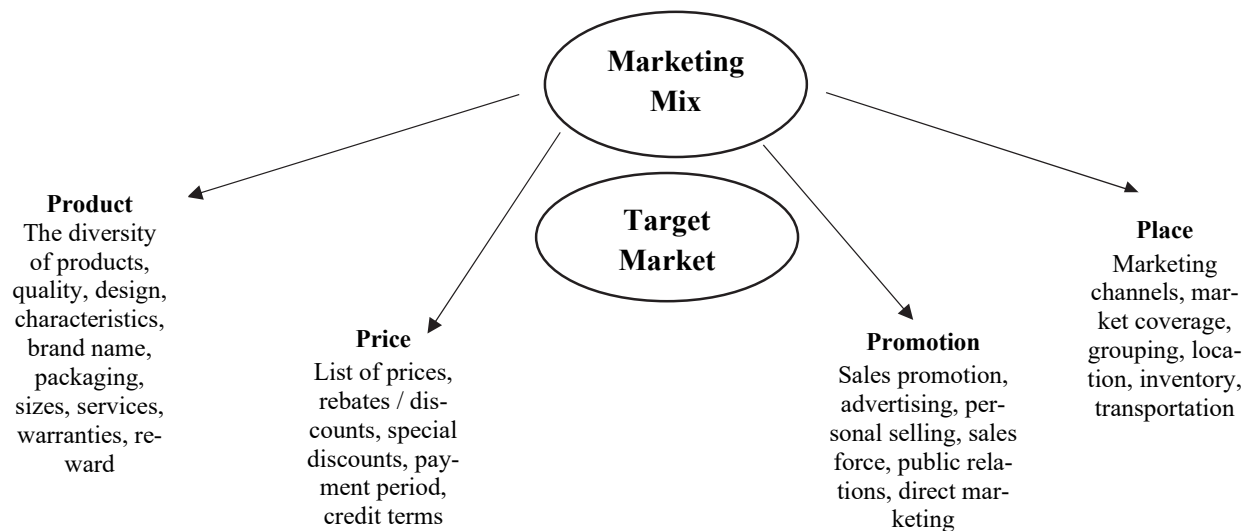

Fig. 1. Four P components in the marketing mix (Kotler and Keller 2009)

3.5 Pricing strategy

Pricing strategy is related to strategic and economic objectives desired by management in determining the price of a product that is produced by the company. This can be considered as the basis for determining methods and pricing policies set by the company (Snieskiene & Pridotkiene 2010; Khot & Thiagarajan, 2019). Snieskiene and Pridotkiene (2010) outline many pricing objectives pursued by companies as follows:

- Satisfactory achievement gains;
- Maximization of profit;
- Achievement of satisfaction in sales;
- Maximization of sales;
- The achievement and maintenance of liquidity;
- Increase market share;
- Achievement of a satisfactory market share;
- Stabilization of sales in the market;
- Market leadership;
- Scope of existing capacity;
- A targeted rate of the return on investment (ROI);
- Discouragement of new entrants to the market;
- Stabilization of prices in the market;
- Avoidance of a price war;
- The price equation with competitors;
- Avoidance of investigations and government intervention;
- Maintenance of existing customers;
- Attracting new customers;
- Creating a prestigious image for the company;
- Long-term survival;
- Meeting customer needs;
- The cost of coverage;
- The achievement of social goals;
- Determining a fair price for the customer;
- Price differentiation.

A pricing decision is set by a company in achieving overall company goals, including profit strategy in both the short and long term. Companies need the right method in their determination of the price. According to Kotler and Keller (2009), pricing methods may include:

1. Mark-up pricing: the company adds a standard markup to the cost of the product to make a profit;

2. Pricing rate of return target (target-return pricing) to determine the price that will yield an adequate return of investment (ROI);

3. Value pricing assumption (perceived value) to deliver the value promised by the company and for the customer value proposition to accept it as a suitable value;

4. Pricing based on product value (value pricing) whereby the price is set low enough whilst maintaining high quality. This value pricing method includes everyday low pricing and high-low pricing;

5. Going-rate pricing by basing the price on the price of most competitors. Therefore, the choice can be to use the same price, a more expensive price, or to reduce the price down below the competitor's price;

6. Auction pricing is aimed to dispose of excess inventory or sometimes used goods.

Fig. 2 shows the framework of this research. The framework starts with the awareness of public health, followed by implementation of the organic vegetables campaign as part of the Indonesian "back to nature" program. Since most consumers are less likely to purchase organic products due to reasons such as price, this research employs descriptive analysis, cross tabulation, logistic regression and Contingent Valuation Method (CVM). Subsequently, a pricing strategy is proposed. Based on the logistic regression, the hypotheses of this study are as follows:

H_0: None of the independent variables significantly affect WTP.

H_1: There is at least one independent variable that significantly affects WTP.

The independent variables are determined by community demographics including gender, age, marital status, education, employment status and income (Sumarwan 2011). WTP is the dependent variable. The data processing procedures used in this research were descriptive analysis, cross tabulation, logistic regression analysis and the contingent valuation method (CVM). Analysis tools were Microsoft Excel 2010 and the Statistical Package for Social Science (SPSS) version 17.
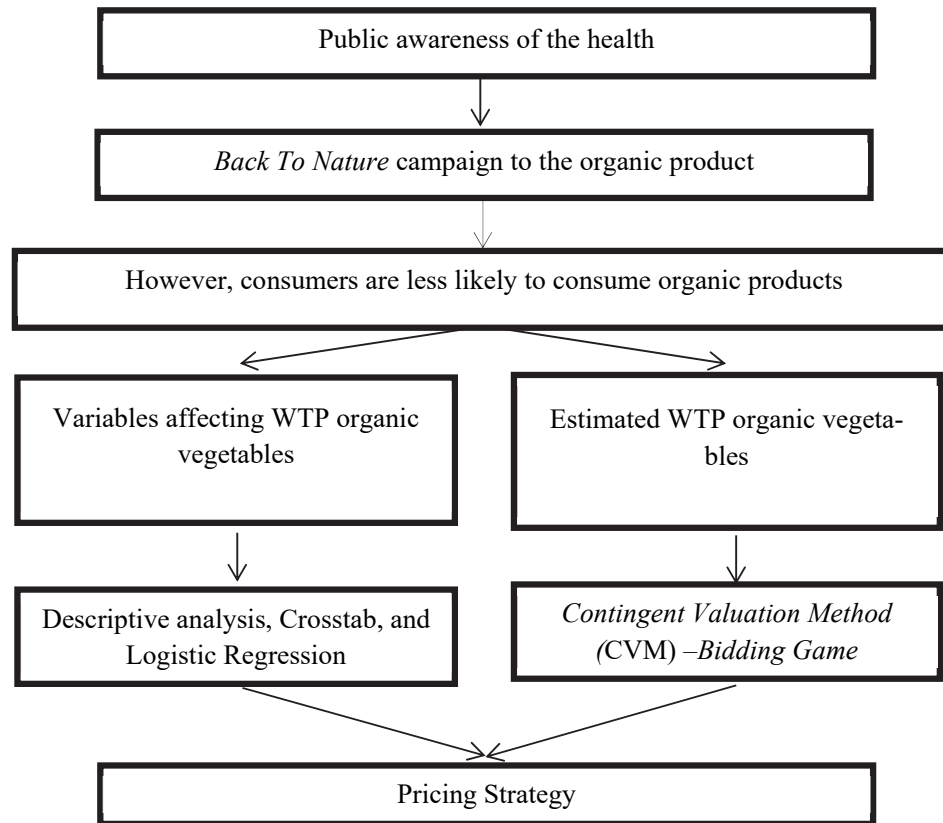
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│               Public awareness of the health                │
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│        Back To Nature campaign to the organic product        │
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│      However, consumers are less likely to consume organic products      │
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│  Variables affecting WTP  │    │  Estimated WTP organic    │
│     organic vegetables    │    │       vegetables          │
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│ Descriptive analysis,     │    │ Contingent Valuation      │
│ Crosstab, and Logistic    │    │ Method (CVM) –Bidding     │
│ Regression                │    │ Game                      │
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│                      Pricing Strategy                        │
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Fig. 2. The research framework

Table 1
Research variables

Variable	Dimension of variable	Indicator	Scale
Willingness to pay	Willingness to pay more expensive	Willing-Unwilling to pay more than WTP	Ratio
Gender	Gender of respondents	Male -Female	Nominal
Age	Age of respondents	Year	Interval
Marital status	Marital Status of respondents	Married-not married	Nominal
Education	Education of respondents	Non-University-University	Nominal
Employment	Type of employment	Employed-unemployed	Nominal
Family size	Number of family members	People	Interval
Income	Family income	Net monthly family income	Interval

Descriptive analysis was used to describe the characteristics of respondents. Crosstab analysis was undertaken to describe the characteristics of the cross-tabulation respondents with WTP and other data processing results. The following logistic regression equation is used in this study:

$$\text{Log} (Y) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e \qquad (3)$$

where:

Y = WTP (0 = Unwillingness to pay more, 1 = Willingness to pay more)
b_0 = Intercept
$b_{1,2,3....7}$ = Coefficient regression of gender, age, marital status, education, employment, and family income
$X1$ = Gender (0 = Male, 1 = Female)
$X2$ = Age (1 = 17-25 years, 2 = 26-35 years, 3= 36-45 years, 4= 46-55 years, 5= 56-65 years, 6= >65 years)
$X3$ = Marital status (0 = Not married, 1 = Married)
$X4$ = Level of education (0 = Non-university, 1 = University)
$X5$ = Employment (0 = Not employed, 1 = Employed)
$X6$ = Income (1 = Rp 0,00 – Rp 3,000,000,00; 2 = Rp 3,000,001,00 – Rp 6,000,000,00; 3 = >Rp 6,000,000,00). Note Rp is Indonesian Rupiah currency)
$X7$ = Family size (1= 0-2 people; 2= 3-5 people; 3= 6-8 people, 4= >8 people

e = Error

The contingent valuation method (CVM) was used to calculate the magnitude of the WTP by the respondents. This method uses illustrations depicting hypotheses of the potential results which may occur. In this study the conditions described are the emergence of public awareness as a result of the negative effects of foods containing chemicals. The hypothesis of this study is based on the following:

> "The increase in degenerative diseases such as stroke, coronary heart disease, diabetes and cancer occur as a result of modern lifestyles that happily consume food products that harm human health. This raises awareness of the need to transition to natural products, or the need to go "Back to Nature". One way to achieve this is through the consumption of organic products such as organic vegetables. Organic vegetables contain nutrients proven to be beneficial to human health. This is important even though in general organic products are more expensive than others."

The next step was to estimate the average WTP values using the following equation:

$$EWTP = \sum_{i=1}^{n} Wi\,(Pfi) \qquad\qquad (4)$$

where
EWTP = Average estimation of WTP
Wi = Value of WTP to-i
Pfi = Relative
i = i-th respondents willing to pay for organic vegetables.

An estimation of the average value was used to calculate the total WTP aggregation. Calculation of the total WTP was made using the following equation:

$$TWTP = EWTP i.P \qquad\qquad (5)$$

where TWTP, EWTPi and P represent total WTP (Rp), Means of WTP values of respondent (Rp) and population (people), respectively.

4. Empirical findings

4.1 Characteristics of respondents

Table 2
Characteristic of respondents (n=154)

Characteristic of respondent		Frequency	Percentage (%)
Gender	Male	30	19.48
	Female	124	80.52
Age (years)	17-25	21	13.64
	26-35	39	25.32
	36-45	59	38.31
	46-55	25	16.23
	56-65	6	3.90
	>65	4	2.60
Marital Status	Not Married	32	20.78
	Married	122	79.22
Education	Non-University		
	• Not finished school	1	0.65
	• Elementary/equivalent	2	1.30
	• Junior High School/equivalent	0	0.00
	• Senior High School/equivalent	20	12.99
	• University/equivalent	131	85.06
Employment	Employed		
	• Public Sector	18	11.69
	• Private Sector	55	35.71
	• Self employed	32	20.78
	Unemployed	49	31.82
Average family income per month (Rp/month)	Rp. 0,00 -Rp. 3,000,000.00	44	28.57
	Rp. 3,000,001.00-Rp. 6,000,000.00	38	24.67
	>Rp. 6,000,000.00	72	47,06
Number of family members	0-2	16	10.39
	3-5	77	50.00
	6-8	58	37.66
	>8	3	1.95

This study surveyed respondents who consume organic vegetables more than twice per week. Data captured included gender, age, marital status, education level, employment status, family income and family size. The number of respondents involved was 154 from the cities of Bogor and Jakarta. The demographic characteristics of respondents can be used by marketers to define the marketing strategy for organic vegetables for related parties.

- 80.52% of the respondents were female
- The largest age demographic of respondents was 36 to 45 years (38.51%)
- 80% rrespondents were married
- Most respondents (85.06%) had a university level of education.
- 35.71% of respondents worked in the private sector.
- 47% of respondents had an average monthly income over Rp 6,000,000 (A$600 p/m)
- Families with 3-5 members constituted 50.00% of the sample population.

4.2 Sources of information

An accurate knowledge of the benefits of healthy organic vegetables is one significant Indonesian community need. This is certainly applicable as consumers become increasingly aware of the dangers of consuming foods containing potentially dangerous chemicals. To meet these growing information needs, consumers generally seek additional product information from various sources (Sumarwan 2011). According to Kotler and Keller (2009), consumer sources of information consist of four categories namely personal sources (family, friends, neighbors, acquaintances), commercial sources (advertising, salespeople, dealers, packaging, in-store displays), public sources (mass media, consumer ratings), and from the source of experience (handling, assessment, and use of the product). The results show that the most common source of information for respondents was the internet and public awareness through mass media and magazines (22% each). Advertising in the form of banners, billboards, and pamphlets only accounted for 2% of the sources of information for the respondents – thus a very ineffective method of marketing organic vegetables (see Fig. 3).
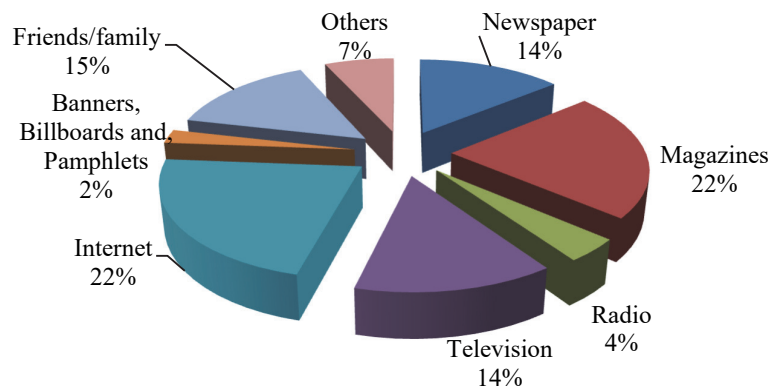

Fig. 3. Sources of information for organic vegetables

Based on the results in Table 4, the variables of age (X_2) and income (X_6) at the 90% confidence interval indicate a significance value of <0.1 with Wald values of 4.441 and 3.356 respectively. This means that both variables significantly affect the dependent variable. Regression equations are obtained as follows:

$$\text{Log }(Y) = 4.445 - 0.576 + 0.656X_6 \tag{6}$$

The age variable value Exp (B) of 0.562 indicates older consumers are .562 more willing to pay more for organic vegetables compared with younger consumers. The income variable of 1.926 indicates that the higher the income, the greater the willingness of consumers to pay more for organic vegetables - 1.926 times higher when compared to low-income consumers.

Table 3
Results from the logistic analysis of the models with the enter method

Omnibus Tests of Model Coefficients (Model)		
Chi-square	df	Sig,
12.819	7	.077
Model Summary		
-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
85.537[a]	.080	.169
Hosmer and Lemeshow Test		
Chi-square	df	Sig,
8.278	8	.407
Classification Table		
Overall Percentage (%)		90.90

Table 4
Results of logistic analysis on the independent variables using the Enter method

Variable	Value of B	Exp (B)	Wald	Sig	Remark
Gender (X1)	.640	1.896	.567	.452	Not supported
Age (X2)	-.576	.562	4.441	.035	Supported*
Marital Status (X3)	-.764	.466	.813	.367	Not supported
Education (X4)	-1.116	.328	2.097	.148	Not supported
Employment (X5)	-.633	.531	.808	.369	Not supported
Income (X6)	.656	1.926	3.356	.067	Supported**
Size of family member (X7)	-.444	.641	.942	.332	Not supported
Constant	4.445	85.220	6.734	.009	-

**Significant at $\alpha=0.10$

Cabbage shows the largest percentage (66.98%) of WTP, followed by carrots (59.56%). See Table 5.

Table 5
Additional WTP price and the relative percentage of the price of the additional WTP of respondents in organic vegetables

Vegetable products	Price of inorganic vegetables (Rp/kg)*	Additional price (calculated from WTP) (Rp/kg)	Percentage of additional price (%)
Broccoli	23,000	8,601	37.40
Cauliflower	24,475	8,938	36.52
Cabbage	12,825	8,590	66.98
Pak choi	28,500	9,089	31.89
Lettuce	27,995	8,685	31.02
Carrots	13,000	7,743	59.56

* Price is determined based on the average inorganic vegetable price survey conducted in a shopping center in Bogor and Jakarta (as of March 2013).

Table 6
The total price of the additional WTP and the relative percentage of the total price of the additional WTP of respondents in organic vegetables (population of 2,350 people over a period of 1 week)

Vegetable product	Total price of inorganic vegetables (Rp/week)	Total additional price (calculated from WTP) (Rp/kg)	Percentage of additional price (%)
Broccoli	54,050,000	20,212,419	37.40
Cauliflower	57,516,250	21,004,481	36.52
Cabbage	30,138,750	20,186,500	66.98
Pak choi	66,975,000	21,358,605	31.89
Lettuce	65,788,250	20,408,978	31.02
Carrots	30,550,000	18,195,471	59.56

4.4. Marketing Mix

The marketing mix is often used to set marketing strategy. In this case it is the marketing of organic vegetables which are encapsulated in the four components of the marketing mix. The marketing mix for organic variables includes the following:

1. Product
   The Product with the largest WTP percentage increase is cabbage. A marketing mix could potentially be formulated for the product "cabbage" and other vegetables. This could include aspects such as packaging and sizes offered or the overall need to focus on the quality of the products. Important in marketing of organic vegetables will be the provision of accurate package labeling with a clear brand that can be a powerful force in attracting new customers and increasing consumer confidence in the product itself.

2. Price
   The selling price of organic vegetables is much higher than that of inorganic vegetables. A marketing mix needs to be formulated at relevant price points. Regular discounts and special pricing for targeted products can be undertaken. Thus consumers will be encouraged to buy organic vegetables more regularly and will be educated to look for the special pricing being offered.

3. Promotion
   The internet and magazines are the medium most commonly accessed by consumers in obtaining information about organic products. A promotional marketing mix could be formulated to undertake sales promotion and advertising through these popular channels.

4. Place
   The marketing mix of "place" could focus on increasing the number of distribution channels that supply organic vegetables to shoppers. This would entail looking at potential new places where customers may be able to purchase

organic vegetables. Extra places could potentially be via the internet, phone services, drive through and farm-gate sales. None of these "place" channels are common in Indonesia for vegetable sales.

4.5. Organic Vegetable Pricing Strategy

By referring to the respondent characteristics, farmers and related marketers may determine the appropriate market segments to target in promoting their organic vegetable products. Targeting these appropriate segments will optimize the potential for increased profitability within the industry. In addition, knowing the factors which influence a consumer's WTP for various types of products, will enable marketers to devise appropriate marketing strategies. A recommended pricing strategy could be based on the consumer's WTP. The value-pricing-assumption method (perceived value) could be used by marketers to communicate value in the minds of customers. The default value of customers could potentially consist of several elements including the image that the buyer will expect from the quality of the products, the success of the channel delivery, the level of quality assurance, available customer support and other less dominant attributes such as supplier reputation, reliability and self-esteem (Kotler and Keller 2009). Targeting sales through suppliers who have obtained organic certification from relevant authorities could be an important path in establishing consumer perception of value with organic vegetables. This certification could then be identified via organic labeling on the product package. This certification could thus provide quality assurance for the customer and improve the perception that the product really is organic. A price adjustment strategy could develop a pricing structure which reflects various irregularities such as variations in geographical demand and costs, market segment needs, differing purchase times, the frequency of delivery and the service contracts established. A price adjustment strategy could be set up through: firstly, educating consumers about the importance of organic vegetables for health in an attempt to attract more consumers to purchase organic vegetables, secondly, setting up business partnerships with farmers that will create a relatively constant supply of organic vegetables, so that the product availability remains stable, and finally, delivering technology provision and cost of capital provision to partner farmers (as takes place in developed countries) by major purchasers such as supermarkets.

5. Summary and conclusion

The Indonesian public awareness of health has only slowly begun to shift consumption patterns towards organic products, one of which is organic vegetables. It has been demonstrated that age and income variables significantly affect the consumers' WTP. Cabbage shows the highest percentage mark up for WTP, followed by carrots, broccoli, cauliflower, pak choy and lettuce.

Pricing strategies for organic vegetables could be achieved through the value pricing assumption method (perceived value). This is based on the willingness of consumers to pay more for organic vegetables.

Based on these research findings, several recommendations are made.

1. Product marketers should segment their markets on the basis of the respondent characteristics identified in this study.

2. In order to increase profitability, the selling price of organic vegetables could possibly be increased based on the WTP percentages.

3. Marketers should provide high quality products to their customers.

4. Strict governmental regulations on the behavior of organic product traders should be put in place in order to avoid violations in business conduct and to avoid non-competitive trade monopolies.

5. The government should be encouraged to give special attention to organic farming.

6. There is a need for additional study with broader scope so that greater numbers of Indonesian consumers can be represented in the research.

7. There is a need for non-commercial education encompassing the benefits of organic food. The general public will thus benefit from an increased awareness and understanding of the characteristics and benefits of organic products.

It is hoped that this should all result in the long term in better community health for the people of Indonesia.

References

Abdulsalam, K., & Babatunde, O. (2019). Electrical energy demand forecasting model using artificial neural network: a case study of Lagos State Nigeria. *International Journal of Data and Network Science*, *3*(4), 305-322.

Alavi, S., Mehdinezhad, I., & Kahshidinia, B. (2019). A trend study on the impact of social media on advertisement. *International Journal of Data and Network Science*, *3*(3), 185-200.

Ameriana, M., Majawisastra, R., & Basuki, R. S. (2006). Kesediaan konsumen membayar premium untuk tomat aman residu pestisida. *J. Hort*, *16*(2), 165-74.

Deliana, Y. (2012). Market segmentation for organic products in Bandung West Java, Indonesia [Internet]. [diunduh 2013 Des 17]; Research Journal of Recent Sciences ISSN 2277-2502, *1*(3), 48-56.

Díaz, F. J. M., Pleite, F. M. C., Paz, J. M. M., & García, P. G. (2012). Consumer knowledge, consumption, and willingness to pay for organic tomatoes. *British Food Journal*, 114(3), 318-334.

Hosmer, D. W., Lemeshow, S. (1989). *Applied Logistic Regression*. Canada: John Wiley & Son, Inc.

Hanley, N. S. (1993). *Benefit Analysis and The Enviromental Methods and Case Studies*. United Kingdom (UK): Edward Elgar Publishing Limited.

Kermanian, M., Rafiei, S., Keyvanfar, H., & Sadi-Nezhad, S. (2019). Corporate Governance: A scientometric analysis. *Accounting*, *5*(4), 153-168.

Khot, S., & Thiagarajan, S. (2019). Resilience and sustainability of supply chain management in the Indian automobile industry. *International Journal of Data and Network Science*, *3*(4), 339-348.

Kotler, P., & Armstrong, G. (2008). Prinsip-prinsip Pemasaran, jilid 1. *Jakarta: erlangga.*

Kotler, P., & Keller, K. L. (2009). *Manajemen Pemasaran Ed Ke-13 Jilid 2*. Bob S, penerjemah; Adi M, Yayat SH, editor. Jakarta (ID): Penerbit Erlangga. Terjemahan dari: *Marketing Management Thirteenth Ed.*

Lee, Y. S., & Yoo, S. H. (2011). Willingness to pay for GMO labeling policies the case of Korea. *Journal of Food Safety 31*(2011), 160-168.

Lovelock, C., Wirtz, J., & Mussry, J. (2010). Pemasaran Jasa – Pespektif Indonesia Ed Ke-7 Jilid 1. Dian W, Devri BP, penerjemah; Novietha IS, editor. Jakarta (ID): Penerbit Erlangga. Terjemahan dari: Services Marketing Seventh Ed.

Mathew, M., & Thomas, J. (2019). Interval valued multi criteria decision making methods for the selection of flexible manufacturing system. *International Journal of Data and Network Science*, *3*(4), 349-358.

Makatouni A., (2002) What motivates consumers to buy organic food in the UK. *British Food Journal*, *104*(3/4/5), 345-352.

Misner, S., & Florian, T. (2013). Organically grown foods versus non-organically grown foods [Internet]. [diunduh 2013 Mar 03]; College Of Agricultureand Life Sciences Cooperative Extension. Tersedia pada: http://az1603.pdf.

Muljaningsih, S. (2011). Preferensi konsumen dan produsen produk organik di Indonesia. *WACANA, Jurnal Sosial dan Humaniora*, *14*(4), 1-5.

Acnielsen, A. (2005). global Acnielsen Online Survey-Consumer attitudes Towards Functional foods and organics.

Nugroho, H., & Novalinda, D. (2007). Usaha sayuran sehat di dataran rendah [Internet]. [diunduh 2013 Mar 03]; Balai Pengkajian Teknologi Pertanian Balai Besar Pengkajian Dan Pengembangan Teknologi Pertanian Badan Penelitian dan Pengembangan Pertanian Departemen Pertanian. Tersedia pada: http://buklet sayur07.pdf.

Ozguven, N. (2012). Organic foods motivations factors for consumers. *Procedia - Social and Behavioral Sciences, 62*, 661 – 665.

Philip, B., & Dipeolu, A. O. (2011). Willingness to pay for organic vegetable in Abeokuta South West Nigeria. *African Journal of Food Agriculture Nutrition and Development (AJFAND) Online, 10*(11), 4364-4378

Radam, A., Yacob, M. R., Bee, T. S., & Selamat, J. (2010). Consumers' perceptions, attitudes and willingness to pay towards food products with" No Added Msg" labeling. *International Journal of Marketing Studies*, *2*(1), 65.

Salikin, K.A. (2003). *Sistem Pertanian Berkelanjutan*. Yogyakarta (ID):Kanisius.

Smed, S., & Andersen, L. M. (2012). Information or prices, which is most powerful in increasing consumer demand for organic vegetables?. *International Business Research*, *5*(12), 175.

Snieškienė, G., & Pridotkienė, J. (2010). Export pricing objectives and factors influencing them. *Ekonomika ir vadyba*, *15*, 248-254.

Subroto, M. A. (2008). *Real Food True Healthy Cetakan I*. Jakarta (ID): PT. Agromedia Pustaka.

Sumarwan, U. (2011). *Perilaku Konsumen: Teori dan Penerapannya dalam Pemasaran Edisi ke-2*. Sikumbang R, editor. Bogor (ID): Ghalia Indonesia.

Sutanto, R. (2002). *Pertanian Organik: Menuju Pertanian Alternatif dan Berkelanjutan*. Yogyakarta (ID): Kanisius.

Thio, S. (2012). Persepsi konsumen terhadap makanan organik di Surabaya. *Jurnal Manajemen Perhotelan*, *4*(1), 18-27.

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