

## Islamic Mutual Funds Promotional Activities: Normal Approximation of Binomial Distribution and Type I Error

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**Abstract.** *The paper applies the normal approximation procedure to a binomial probability distribution. A sample of 392 respondents is surveyed whether they agree or not agree that promotional activities determined the level of awareness of the benefits of Islamic mutual funds. The paper hypothesizes the population mean  $\mu$  of success effects of promotional activities at 68%, and attempts to reduce Type I error—the probability of rejecting the null hypothesis when it is true. This study reveals that 0.68% of respondents agreed that promotional activities determined the level of awareness of the benefits of Islamic mutual funds.*

**Keywords:** *Binomial probability distribution, normal probability distribution, Islamic mutual funds*

**Abstrak.** *Studi ini menerapkan prosedur perkiraan normal untuk distribusi probabilitas binomial. Survey dilakukan terhadap sampel yang terdiri dari 392 responden untuk mengetahui apakah mereka setuju atau tidak setuju bahwa kegiatan promosi menentukan tingkat kesadaran akan manfaat reksa dana syariah. Hipotesis yang diuji adalah rata-rata populasi  $\mu$  keberhasilan kegiatan promosi sebanyak 68% dan berupaya untuk mengurangi kesalahan Tipe I—kemungkinan untuk menolak hipotesis null. Studi ini menemukan bahwa 0.68% dari responden menyetujui bahwa aktifitas promosi menentukan tingkat kesadaran akan manfaat reksadana.*

**Kata kunci:** *Binomial probability distribution, normal probability distribution, Islamic mutual funds*

## Introduction

This paper attempts to estimate a normal probability distribution, which is a continuous probability distribution as a substitute to a binomial probability distribution of promotional activities of Islamic mutual funds. The binomial probability distribution, on the other hand, is a discrete probability distribution. The paper also discusses the risk of committing Type I error, i.e. probability of rejecting the null hypothesis when it is true.

The responses from an opinion polling of effects of promotional activities of Islamic mutual funds are in the form of a binomial probability distribution. The respondents were asked, “*do you agree that promotional activities determined the level of awareness of the benefits of Islamic mutual funds?*”. One obvious reason to substitute using the normal probability for approximating the binomial distribution is for large values of  $n$  (i.e. sample size) a binomial distribution becomes closer and closer to a normal distribution (Lind, Marchal and Wathen, 2015). The opinion polling where the normal approximation applied to approximate the binomial distribution is such an example. Another reason is the estimation procedure becomes more efficient through the use of normal probability approximation for the binomial distribution for a survey with a large value of  $n$ . By extension, the reason to determine the risk of committing Type I error in the estimation procedure is to control Type I error. Ramsey and Ramsey (1988) advocate the view that normal approximation as robust for a given sample size  $n$  and at a given level of  $\alpha$  (the risk of Type I error) if the error never exceeds  $1.5 \alpha$ .

In this paper, the binomial parameter to denote “*success*” of an outcome is when respondents respond as “*agree*” that promotional activities determined the level of awareness of the benefits of Islamic mutual funds. The calculated “*success*” is 68%. This percentage is arrived at because, from the survey, 267 respondents of a total of 392 respondents responded “*agree*” promotional activities determined the level of awareness of benefits of Islamic mutual funds.

As in any binomial distribution, there can be only two mutually exclusive possible outcomes (events or replies) in the opinion polling. The possible outcomes are either “*success*” or “*failure*”. Henceforth, the “*failure*” outcome is when the respondent does not agree (that promotional activity determined the level of awareness of the benefits of Islamic mutual funds). Since the “*success*” outcome is 68% (or 0.68), the “*failure*” outcome is 32% ( $1-0.68=0.32$ ). As stated earlier, a condition for the binomial experiment is that respondent can choose only one of two possible responses either “*agree*” or “*does not agree*”; but the respondent cannot choose both responses at the same time.

Generating a binomial probability distribution for a large number of respondents, for example, for 300 respondents in this paper would become more

efficient using normal probability distribution. Because when the sample size is large and exceeding  $n=30$ , binomial distribution automatically approaches a normal distribution.

## Literature Review

The size of the Islamic capital market in Malaysia stands at RM1,961.73 billion (Securities Commission Malaysia, 2018) as of 31<sup>st</sup> August 2018. It constitutes about 60.33% of the total market share of capital market of RM3,251.67 billion.

Of the total asset of RM790.80 billion (@ 31<sup>st</sup> August 2018), RM171.53 billion (or 21.69%) comprises of Islamic assets (Securities Commission Malaysia, 2018). The composition of Islamic assets of 21.69% as at 31<sup>st</sup> August 2018 is increasing over the years from 19.82% (@ December 2015) to 21.49% (@ December 2016) and then to 22.01% (@ December 2017).

An Islamic mutual fund is a form of collective investment that allows investors to pool their funds to invest by fund professionals in a portfolio of assets or securities that are *Sharia*-compliant. Some examples of the assets or securities that are *Sharia*-compliant are Islamic-counters securities, *sukuk*, Islamic unit trusts, *Sharia* indices, warrants, call warrants, and crude palm oil futures contract. The *Sharia* compliance matter is what makes the Islamic mutual funds differ from that of their conventional counterparts.

The increase in the number of *Sharia*-compliant funds available in the market and the growing units purchase over the years demonstrates the great potential of both the demand and the supply of the funds. But the present market conditions post imminent challenges. The number of investors is increasing at a declining rate, and it gives rise to a question “*why do they prefer to invest in conventional mutual funds?*” There is also a lack of awareness among investors and their understanding of the roles of fund professionals and an understanding of what differentiate Islamic mutual funds from that of their conventional counterparts. A lack of variety in product offerings, according to Yusuff and Mansor, 2014, is another contributing factor. As a result, creating awareness among investors at the basic level is an increasingly important area in promoting and marketing of Islamic mutual funds.

Brand awareness is defined as the level of involvement, which begins with brand name recognition. The lowest level of brand awareness recognizes the brand name, while the highest level is the ability to develop detailed information about the products and services offered based on the brand name. Many studies show the consumers’ behaviours are influenced by awareness and knowledge about the products and services offered. (Chartrand, 2005; Coulter et al. 2005; Dommeyer &

Gross, 2003; Donoghue & De Klerk, 2009; Hartlieb & Jones, 2009; McEachern & Warnaby, 2008; and Thomas & Mills, 2006).

The use of standard normal probability distribution to approximate binomial probability distribution when there is a large value of “ $n$ ” (i.e.  $n$  is a sample size) is an alternative or an option. It is so because as “ $n$ ” increases, a binomial probability distribution becomes closer and closer to resemble a standard normal probability distribution.

Returning to the criteria for the binomial probability distribution, they are:

- i. There are only two mutually exclusive outcomes or outputs either “agree” or “does not agree” to an opinion polling or question “*promotional activities determined the level of awareness of benefits of Islamic mutual funds?*”.
- ii. The probability of “*success*” in each experiment or survey remains the same from one respondent to another. This probability is calculated from the opinion polling or survey response, where 68% (i.e. 267 of 392 respondents) indicate they “*agree*” that promotional activities determined the level of awareness of benefits of Islamic mutual funds. In other words, the level of awareness of the benefits of Islamic mutual funds is determined by promotional activities as the likely response from each respondent remains the same at 0.68. So,  $\pi = 0.68$ .
- iii. The “*trials*” or responses are independent of each other, meaning - for example, if the 10<sup>th</sup> respondent agrees, it does not affect whether the 11<sup>th</sup> respondent agrees. Likewise, if the 10<sup>th</sup> respondent does not agree, it does not affect whether the 11<sup>th</sup> respondent does not agree.
- iv.  $n\pi$  and  $n(1 - \pi)$  are both at least five according to Lind, Marchal and Wathen, 2015. In this paper  $n\pi = 392 (0.68) = 266.56$  therefore  $n\pi \geq 5$ , and  $n(1 - \pi) = 392(0.32) = 125.44$  therefore  $n(1 - \pi) \geq 5$ .

## Methodology

The paper attempts to find from a random sample “*at least 300 respondents*” agree promotional activities determined the level of awareness of benefits of Islamic mutual funds. At a chosen level of significance at 1%, the hypothesis is set as below. We hypothesize the population mean  $\mu$  of *success* effects of promotional activities is 68% (based on 267 of 392 respondents surveyed who indicated they “*agree*”);

$H_0$ :  $\mu \leq 0.68\%$  of respondents agree the promotional activities *did not* determine the level of awareness of benefits of Islamic mutual funds (the hypothesis tested).

$H_0$ :  $\mu > 0.68\%$  of respondents agree the promotional activities *determined* the level of awareness of benefits of Islamic mutual funds (the research hypothesis).

In the procedure where normal approximation substitutes for the binomial probability distribution, a value of 0.5, termed as “*continuity correction factor*” is

applied. In short, it is applied in the estimation procedure to find the probability “at least 300 respondents” agree promotional activities determined the level of awareness of benefits of Islamic mutual funds. In order to apply the “continuity correction factor” to the value of “at least 300 respondents,” the estimation procedure begins from 299.5 (i.e.  $300-0.5=299.5$ ).

The binomial distribution is given by the formula:

$$P(x; n, \pi) = \sum_{x=0}^n \binom{n}{x} \pi^x q^{n-x} \quad \text{for } x=1,2,3,\dots,n.$$

$$P(X \geq 300; 392, 0.68) = \sum_{x=300}^{n=392} \binom{392}{300} \pi = 0.68^{300} q = 0.32^{392-300=92} \quad \text{for } x = 300, 301, \dots, 392.$$

$$P(X = x) = {}_n C_x (\pi)^x (1 - \pi)^{n-x}$$

$$= \frac{n!}{x! (n-x)!} (\pi)^x (1 - \pi)^{n-x}$$

## Results & Discussions

Now returning to the purpose of the paper, to find the probability randomly selected respondents from the 392 total respondents “at least 300 respondents” agree promotional activities determined the level of awareness of benefits of Islamic mutual funds, the construction of the binomial probability methodology is as follows:

### Binomial probability construction

The binomial distribution is calculated as follows;

$$\begin{aligned} \text{Firstly, } P(x = 300) &= {}_{392} C_{300} (\pi)^{300} (1 - \pi)^{392-300} \\ &= {}_{392} C_{300} (0.68)^{300} (1 - 0.68)^{392-300} \\ &= 0.000046391 \end{aligned}$$

We continue further with  $x = 301$ .

$$\begin{aligned} P(x = 301) &= {}_{392} C_{301} (\pi)^{301} (1 - \pi)^{392-301} \\ &= 0.000030131 \end{aligned}$$

And, further with  $x = 302$ , and so forth.

$$\begin{aligned} P(x = 302) &= {}_{392} C_{302} (\pi)^{302} (1 - \pi)^{392-302} = 0.000019293 \\ P(x = 303) &= {}_{392} C_{303} (\pi)^{303} (1 - \pi)^{392-303} = 0.000012178 \\ P(x = 304) &= {}_{392} C_{304} (\pi)^{304} (1 - \pi)^{392-304} = 0.000007576 \\ P(x = 305) &= {}_{392} C_{305} (\pi)^{305} (1 - \pi)^{392-305} = 0.000004645 \end{aligned}$$

In summary, the procedure continues further with  $x = 306$  and so forth for all the 392 respondents until last where  $x = 392$  to find the probability “at least 300 respondents” agree promotional activities determined the level of awareness of benefits of Islamic mutual funds.

We then sum of the total probabilities for all values of x from the first respondent (300<sup>th</sup>) to the last (392<sup>nd</sup>). However, the calculation procedure by this method would be tedious, time-consuming and impractical. Using this method, we measure the probability for 93 times (one time for each value of x from x=300 to x=392 inclusive). In real applications, the binomial tables may not be available because the number of trials (300) is so large.

**Normal approximation to Binomial probability distribution**

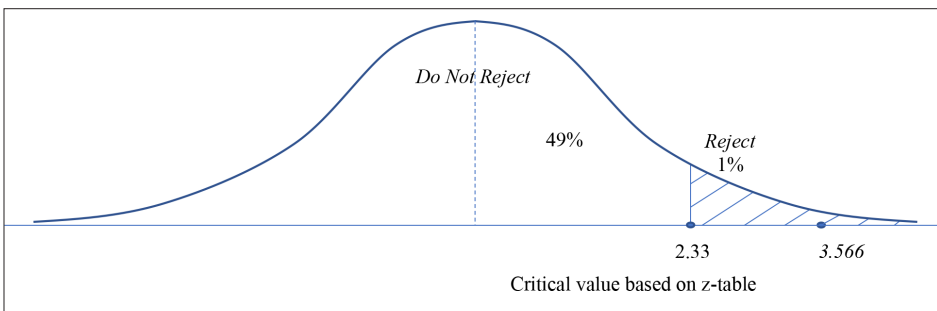
Returning to the purpose of the paper to substitute using normal approximation to binomial probability distribution to determine the probability “at least 300 respondents” agree that promotional activities determined the level of awareness of the benefits of Islamic mutual funds, we use the area below  $x = 300 - 0.5$  (i.e.  $x = 299.5$  after subtracting 0.5 from 300). Therefore,  $x = 299.5$ .

To find the Z-value corresponding to  $x=299.5$  with the  $\mu$  for a binomial probability distribution which is  $\mu = n\pi = 392(0.68) = 266.56$ , and the variance  $n\pi(1-\pi) = 392(0.68)(1-0.68)=85.2992$ , and standard deviation = 9.2357

$$\begin{aligned}
 P(299.5 \leq X \leq 392.5) &= Z\text{-value} = \frac{\bar{x} - \mu}{\text{Std. deviation}} \\
 &= \frac{299.5 - 266.56}{9.2357} = 3.566
 \end{aligned}$$

Under the normal curve with a Z-value = 3.566 lies within rejection region (beyond 2.33),  $H_0$  is *rejected*. It implies the probability of obtaining such an extreme estimate of 2.33 standard deviation above from the  $\mu$  is less than 1% (the chosen level of significance). Therefore, it can be concluded that 0.68% of respondents agree the promotional activities *determined* the level of awareness of the benefits of Islamic mutual funds.

Graph 1: Normal curve with 1% level of significance

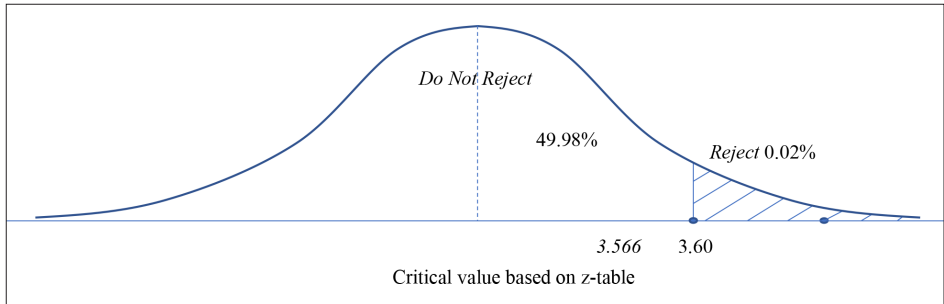


**TYPE I error**

Type I error is the probability of rejecting the null hypothesis when it is true. In the above calculations, suppose that the null hypothesis is true, there is a 1% chance that  $\mu$  is larger than 2.33 that we decide to reject the null hypothesis. In short, there is a 1% chance of committing a type I error.

We can reduce the risk of committing type I error by reducing the size of the rejection region. We could lower (revise) the level of significance from 1% (as in graph 1 above) to 0.02% (as in graph 2 below). With the lower level of significance at 0.02%, it implies that the probability of getting the sample value is now 0.02%. Now our chance to make type I error is 0.02% of the time.

Graph 2: Normal curve with 0.02% level of significance



With the lower level of significance of 0.02%, under the normal curve with a Z-value = 3.566 lies within the non-rejection region (below 3.60),  $H_0$  is *not* rejected.

**Conclusions**

In conclusion, 0.68% of respondents agreed that promotional activities *determined* the level of awareness of the benefits of Islamic mutual funds. As such, the null hypothesis that  $H_0: \mu \leq 0.68\%$  was rejected at 1% level of significance. At the lower level of significance of 0.02% however,  $H_0$  was *not* rejected. Future study may explore the relationship on the level of consumer awareness with purchase intentions of Islamic mutual funds.

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## Public Willingness to Pay for Halal Certified Beef

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**Abstract.** *This research aims at analyzing the scale of public willingness to pay for halal-certified beef and the influence of age, income, awareness, perception, and religiosity on their willingness. This study employs a purposive sampling method to obtain 100 respondents. Descriptive statistical analysis is used along with contingent valuated method and logit regression. The result shows that 77 of the respondents are willing to pay more for halal-certified beef, while the other 23 are not. The average value of WTP obtained is 7% of the ordinary meat price. The result of logit regression analysis shows that awareness variable has a significant effect on willingness to pay halal certified beef, while the income, age, perception, and religiosity do not have a significant effect.*

**Keywords:** *Halal Certificate, Willingness to Pay, Consumer Behaviour, Contingent Valuated Method, Logit Regression*

**Abstrak.** *Penelitian ini bertujuan untuk menganalisis besaran kesediaan membayar masyarakat serta menganalisis pengaruh usia, pendapatan, awareness, persepsi dan religiusitas terhadap kesediaannya membayar daging sapi bersertifikat halal. Penelitian ini dilakukan di Provinsi DKI Jakarta dengan metode purposive sampling dan responden yang berjumlah 100. Metode analisis yang digunakan dalam penelitian ini adalah analisis statistik deskriptif, contingent valuated method, dan regresi logit. Hasil yang diperoleh menunjukkan bahwa 77 responden bersedia membayar lebih daging sapi bersertifikat halal, sementara 23 lainnya tidak. Rataan nilai WTP yang diperoleh adalah 7% dari harga daging sapi biasa. Hasil dari analisis regresi logit menunjukkan bahwa variabel awareness berpengaruh signifikan terhadap kesediaan membayar daging sapi bersertifikat halal. Sementara usia, pendapatan, persepsi, dan religiusitas tidak berpengaruh signifikan.*

**Kata kunci:** *Sertifikat halal, Kesediaan untuk membayar, Perilaku konsumen, Contingent Valuated Methode, Regresi Logit*

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## Introduction

Consuming halal products is an obligation for Muslims and part of the worship of Allah. Disobeying this obligation is a serious violation against Islamic teaching. Besides, Muslims are suggested to consume good (toyyib) food. Ṭayyib or ṭayyiban can be translated as complement and perfectness of halal food in the forms of cleanliness, safety, health, usefulness and other aspects that are in accordance with conditions and needs (Kamaruddin et al. 2013).

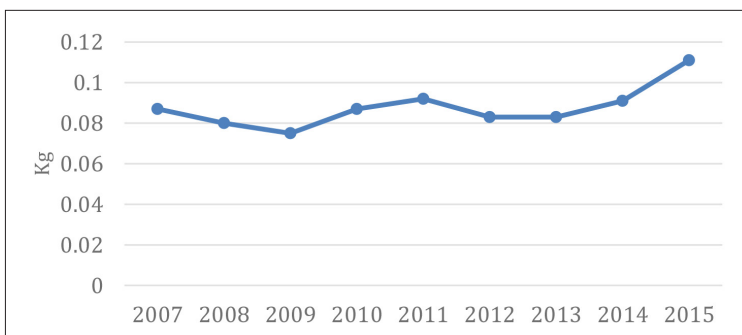
*Halal* literally means “allowed”; in general; it can be translated into something that is allowed based on Islamic laws. *Halal* products are one of the crucial instruments for Muslims in performing various activities, including consumption. This is the order of Allah that has been stated in the Quran, Sura Al Baqara verse 168.

Basically, *halal* is a process of trust of the attribute that cannot be seen and cannot be confirmed, so it is difficult to be evaluated by individual consumers (Verbeke et al., 2013). For example, consumers buy meat at the seller who they think credible enough. This makes them trust the *halal* status of the meat and buy it from the seller. However, because the trust is implicit, it raises trust abuse cases (Zakaria, 2008).

In this case, abusing the trust is in the form of the discrepancy between the expected product with the real one. For example, the expected halal meat is mixed with the non-halal one. An instance for this type of case is the foreclosure of 178.5 kg of beef spindles in Ponorogo Regency (www.kompas.com accessed on 20<sup>th</sup> August 2017).

The selling of meat without halal guarantee has been a problem for Indonesian Muslim people considering that meat is one of the most consumed food. According to the data from the Central Bureau of Statistics, there had been an increasing trend of meat consumption per capita from 2007-2015.

Figure 1. Average of Consumption per Capita of Meat Product in a week in Indonesia in 2007-2015



Source: Central Bureau of Statistics, processed in 2017.

The issue of cross-contamination between the *halal* and *harām* products also increases the consumers' risk in consuming the meat that is not in accordance with their preference (Verbeke, 20015). Such condition makes the consumers search for a guarantee to ensure that the product they buy is *halal*, and the certification of *halal* meat is an answer to provide guarantee and certainty of the meat that the consumers buy (Verbeke et al., 2013).

However, the improvement and implementation of *halal* certification on the chain of *halal* meat may increase the price of the meat (Angulo and Gil 2007). This is because of the additional costs in processing and handling the meat to be in accordance with Islamic law. Therefore, it is crucial to find out the consumers' willingness to pay for the *halal*-certified meat in order to describe the consumers' demand on the product.

This research refers to the previous study by Ibrahim (2011). This particular study aims at analyzing the willingness to pay (WTP) of Muslims in Georgia in buying premium qualified *halal* lamb. Verbeke et al. (2013) researched to find out the value of willingness to pay of the Muslims in Belgium in buying the *halal*-certified chicken in supermarkets and Islamic butcher shops. The research of Bonne et al. (2008) aims at finding out the factors affecting the *halal* meat consumption of the Muslims in Belgium using the planned behavior theory.

A research on the consumers' willingness to pay for *halal*-certified beef has not yet been done. This particular study aims at finding out the scale of consumer's WTP on *halal* certified beef and analyzing whether ages, income, awareness, perception, and religiosity affect the WTP for *halal*-certified beef.

## Literature Review

Kamaruddin, Ibrahim and Shabudin (2013) conducted research entitled "Factors Influencing Customers' Willingness to Pay for *Halal* Logistics". This research was conducted to 221 respondents spread over Selangor, Klang Valley, and Marang, Terengganu. The analysis instrument used is the logit model. The research reveals that the variables of parents' status and perception of *halal* logistics have a negative connection with the WTP for *halal* logistics, whereas the consumers' WTP for *halal* logistics has a positive connection with the demand and procurement cost of *halal* logistics.

Research by Verbeke et al. (2013), entitled "Credence Quality Coordination and Consumers' Willingness to Pay for Certified *Halal* Labelled Meat", was conducted to 202 Muslim respondents. This research is analyzed using the double hurdle model regression. The result concludes that Muslim consumers have been

willing to pay for the chicken meat with a higher price sold by the Muslim sellers rather than those sold in the supermarket. The female consumers pay more attention to the *halal* status of the meat compared to male consumers.

Bonne, Vermeir and Verbeke (2009) conducted research entitled “Impact of Religion on *Halal* Meat Consumption Decision Making in Belgium”. The data was collected from 367 respondents of Muslim migrants living in Belgium. The research reveals that healthy behavior affects the intention to consume *halal* meat. The Muslims with high religiosity intend to consume the *halal* meat because they believe that the meat is healthy, whereas the Muslims with low religiosity intend to consume the *halal* meat because of the influence of their relatives from the same religion and because of their healthy behavior.

Research by Ibrahim (2011), entitled “Consumers’ Willingness to Pay a Premium *Halal* Goat Meat: A Case from Atlanta, Georgia”, was conducted to 89 respondents and used the probit model. The average of WTP for *halal*-certified mutton is 50 cents per pound of meat. The variables of income and amount of family members significantly affect the WTP for *halal* mutton on 1% degree.

Research by Bonne, Vermeir and Blackler (2007), entitled “Determinants of *Halal* Meat Consumption in France”, was conducted by a survey to 576 of Muslim immigrants living in France. This research was analyzed using descriptive statistic and multiple regression methods. The result is that positive attitude towards consuming *halal* meat, relatives with the same religion, and the response for consuming the *halal* meat affect the Muslims’ intention to consume the *halal* meat.

## **Theory of Demand**

Demand is the number of products that a household is going to buy in a certain period if the household is able to meet the necessity in accordance with the determined market price (Case and Fair, 2007). Demand is a multivariate connection, which is not determined only by one factor but by many factors at once. Case and Fair (2007) define that the individual’s demand on a product and its quantity is affected by several factors including the product price, income and wealth, another product price, expectancy, and taste.

## **Theory of Consumers’ Behavior**

Kotler and Keller (2016) state that the consumers’ behavior might be affected by several factors including cultural factors (nation, race, region origin, social class, and religion), social factors (family, friends, and playgroups), and personal factors (ages and lifestyle).

**Method Of Research**

The research population in this study covers all Muslims in Jakarta who have their own income. This research uses non-probability sampling and purposive sampling methods. The determination of the minimal sampling number uses Slovin formula. The formula results in the minimal number of respondents of 100. Contingent Valuation Method is used in the analysis to find out the value the society is willing to pay for the *halal*-certified meat. Employing a Likert scale, the factor analysis is used to reduce the variables, while the logit regression analysis is used to find out what kind of factors influence WTP for the *halal*-certified meat.

**Contingent Valuation Method**

Contingent valuated method (CVM) is a method used to estimate the economic value of a product unsold in the market and is one of the methods for economic valuation. Hanley and Spash (2013) explain the operational stages of CVM application as follows: (1) building a hypothesis market, (2) getting the bidding value, (3) calculating the WTP average, (4) estimating the WTP bidding curve, and (5) aggregating data.

**Factor Analysis**

Factor analysis is a statistic analysis applied to reduce the data or summarize several variables to be the new (construct) variable by still containing the most information in the original variable. Factor analysis identifies the connection structure among the variables or dimensions by seeing the correlation inside them (Ghozali, 2013). Factor analysis in this research is used to summarize the answers of each variable to produce the construct variables that are used in the logistic regression analysis.

**Logit Regression Analysis**

This research uses the logit regression analysis method by the STATA 64 application. The binary logit or binary logistic regression model is the quantitative method of the connection between the probability of two choices of some characteristics chosen (Gujarati and Porter, 2009).

The logit basis used in this research is as follows:

$$WTP = \beta_1 + \beta_2X_1 + \beta_3X_2 + \beta_4X_3 + \beta_5X_4 + \beta_6X_5 + u_i \dots\dots\dots(1)$$

Where:

WTP : willingness to pay

- $\beta_1$  : constanta (*intercept*)  
 $\beta_2, \dots, \beta_6$  : parameters to be estimated  
 $X_1$  : ages  
 $X_2$  : income  
 $X_3$  : awareness  
 $X_4$  : perception  
 $X_5$  : religiosity  
 $\mu$  : error term

## Result And Discussion

### Validity and Reliability Tests

The validity test indicates that the correlation among each indicator of questions on the total construct score has greater value than 0.5, so it can be concluded that each indicator of questions is valid in measuring the three variables by using the Likert scale. On the reliability test, it finds the value of Cronbach's Alpha amounted 0.625 (Awareness), 0.877 (Perception), and 0.933 (Religiosity).

Hair et al. (2010) stated that an item with the Cronbach's Alpha value that is greater than 0.6 is reliable, so it can be concluded that all the answers of the questions of a construct using the Likert scale (variables of awareness, perception, and religiosity) are consistent and reliable.

### Contingent Valuated Method (CVM)

The contingent valuated method in this research is used to find out the value of the respondents' willingness to pay for the *halal*-certified meat. The result of CVM implementation is as follows: 1) building hypothesis market; 2) determining the scale of WTP Bid, and 3) calculating and estimating WTP average value.

The buildings hypothesis market of this research is based on the availability of meat that it's *halal* status and quality are doubted. This is doubled with the risk of non-*halal* substance contamination on *halal* products, which can bring anxiety to Muslim consumers in Indonesia. The government, through LPPOM MUI, has taken action by issuing a *halal* certificate to the meat products. The *halal* certificate guarantees that the process of livestock handling has met the Islamic requirement. This certificate is expected to give safety, comfort, and satisfaction for the Muslim consumers, especially for those who consume the meat.

However, the *halal* meat certificate raises additional costs in its implementation. The certification requires certain activities and additional equipment in the processing and handling of the meat that meets Islamic law. Consequently, *halal*-certified beef becomes more expensive.

The above scenario was explained to the respondents as an effort to provide a guarantee to the consumers. The WTP value of *halal* certified meat will be found out through the questions asked to the respondents, whether the *halal* certification is needed and whether the respondents are willing to pay a higher value for *halal*-certified products.

The determination stage of the auction value on the contingent valuation method should use the bidding game, which is the best model and will not raise the bias. However, the depreciation of the auction value with bidding game cannot be conducted due to various obstacles, so that the auction value bid will be conducted by the payment cards method. This method uses the payment card application with several bidding ranges provided. The respondents will answer by choosing the range of expense they are willing to pay for getting the *halal*-certified meat. The bidding range available is selected from research taken by Tieman et al. (2013) that is 0-5%, 5-10%, 15-20%, and 20-25%.

Calculating the estimation of WTP's average value of this research used an alternative estimation method. The alternative estimation method applied for the interval data is interval midpoint WTP model provided by Hackl and Pruckner (1999). This method assumes that the individual WTP value distributed into the existing interval is among the selected value with the greater next value. Shen (2012) assumes the midpoint of the existing as a WTP value. The distribution data of respondents' WTP is shown in Table 1.

Table 1. Distribution of WTP Value of Respondents Willing to Pay

No	Bid Range	<i>Midpoint</i>	Number of Respondents	Percentage
1	0-5%	2.5	53	0.69
2	5-10%	7.5	17	0.22
3	10-15%	12.5	6	0.08
4	15-20%	17.5	1	0.01
5	20-25%	22.5	0	0
	Total		79	1.00

Source: primary data, processed in 2017.

The WTP average value is acquired by using the following formula:

$$EWTP = \sum_{i=0}^{H-1} \frac{A_i + A_{i+1}}{2} P_i + \frac{A_H + A_T}{2} P_H \dots\dots\dots(2)$$

Where  $A_i$  is the chosen WTP value,  $A_{i+1}$  is the next greater WTP value,  $P_i$  is the percentage of the respondents choosing the I WTP value,  $A_H$  is the highest dealing value,  $A_T$  is the top limited value, and  $P_H$  is the percentage of the respondents choosing the greatest WTP value. The WTP average that is willing to be paid by the consumers to get the *halal*-certified beef is 7.05% over the regular beef price.

**Factor Analysis**

The main object of this method is to reduce the great data into one set of dimension by identifying how far each variable can be explained by each dimension. The factor analysis in this research is used to summarize 28 questions for the variables using the Likert scale (X3, X4 and X6) to produce the score of the variable factor.

Table 2. Variables of Factor Analysis Result

	Variables	Code
Awareness	Awareness of <i>halal</i> aspects	X3_1
	Awareness of MUI label	X3_2
Perception	Perception on <i>halal</i> meat certificate	X4
Religiosity	Religiosity of belief and shall worship dimensions	X5_1
	Religiosity of <i>sunna</i> h worship and <i>hablumminannas</i> dimensions	X5_2

Source: primary data, processed 2017

**Logit Regression Analysis**

The logit regression analysis is the regression analysis used in the research using the data with the binary dependent variables (0 and 1). In this research, value 1 is given to the consumers who are willing to pay more for the *halal*-certified beef. Value 0 is given to the respondents who are not willing to pay more to the *halal*-certified beef product.

The testing is conducted to find out the influence of ages, income, awareness, perception, and religiosity on the willingness to pay more for the *halal*-certified beef. The estimation result of logit regression of the consumers' willingness to pay is conducted by the STATA 64 software and shown in Table 3.



Table 3. Regression Result of Public Willingness to Pay

Variables	Coefisien	dy/dx	Statistic z	Probability z
X1	-0.00293	-0.00036	-0.14	0.889
X2	0.35048	0.43640	0.57	0.572
X3_1	0.52630	0.65531	1.24	0.241
X3_2	1.36655	0.17015	3.71	0.000*
X4	0.74361	0.09259	1.86	0.063**
X5_1	0.39533	0.04922	1.05	0.294
X5_2	-0.01067	0.00132	-0.03	0.976
Constanta	-3.60682		-0.37	0.708

The logit regression result finds that the value of statistic Hosmer-Lemeshow amounted 6.77 and has the probability value of chi-square amounted  $0.56 > 0.05$ , so  $H_0$  is accepted, and the model is stated to be fit. Meanwhile, McFadden R-Squared has the value of 0.342, which means that the dependent variable can only be explained by the independent variable amounted 34%, and the rest is explained by other factors outside the model. The testing result indicates that the LR statistic has the value of 37.72 with the probability of  $0.000 < 0.5$ , so it can be concluded that the independent variables jointly or simultaneously affect the dependent ones.

Table 3 indicates that from 7 independent variables tested there is one variable that significantly affects the dependent variables on 5% level that is variable of Awareness on MUI label (X3\_2) and variable of perception (X4) that is significant on 10% level while the other variables do not significantly affect the dependent ones because they have the probability values of z-statistic greater than 0.05 and 0.1.

### Effect of Income on WTP

The logit regression result indicates that the variable of income has the opportunity coefficient value amounted 0.043 with the probability of  $0.57 > 0.05$ . So it can be concluded that the variable of income (X2) has no significant effect on WTP for the *halal*-certified beef. The opportunity coefficient of the variable of income (X2) indicates the positive sign amounted 0.043, which means that people with higher income will increase the probability of their willingness to pay for the *halal*-certified beef amounted 4.3%.

The result is not in accordance with the hypothesis in which the income

is considered to affect the willingness to pay significantly. This indicates that the income level is not the main factor affecting public willingness to pay for the *halal*-certified beef. The higher ability of purchasing power does not guarantee the people to be willing to pay more.

### **Effect of Ages on WTP**

The variable of ages has the opportunity coefficient amounted  $-0.00036$  with the probability value of  $0.889$ . On the significance level of  $5\%$  ( $0.05$ ), it can be concluded that the variable of ages has no significant effect on the WTP for *halal*-certified beef. The result found is in accordance with the research conducted by Ibrahim (2011) and Kamaruddin et al. (2012), which found that ages do not significantly affect public willingness to pay. This indicates that public WTP for the *halal*-certified meat cannot be predicted through someone's experience, knowledge or belief that is formed during his/her whole period of life.

The opportunity coefficient of the age variable ( $X_1$ ) amounted  $-0.00036$  indicates that people with older ages will reduce the probability of willingness to pay more for the *halal*-certified beef amounted  $0.03\%$ . The connection explains that the respondents with younger ages have more opportunity to be willing to pay more rather than the older respondents.

The result is in accordance with the research of Verbeke et al. (2013), which stated that the *halal* label on the meat product is important for the younger generation, but not for the older one. This is because the younger one has little trust in the *halal* product by only seeing the status and background of the seller. They demand that the labelling should be under a trusted organization to guarantee the *halal* status of the product.

### **Effect of Awareness on WTP**

The variable of awareness on the importance of *halal* labelling affects the willingness to pay for the *halal*-certified beef ( $X_{3\_1}$ ) with the opportunity coefficient amounted  $0.06$ . The probability value found is  $0.214$ , that is fewer than the alpha level of  $5\%$ . The opportunity coefficient of the variable of awareness ( $X_{3\_1}$ ) indicates the positive sign of  $0.65$ , which means that people with higher awareness of the importance of *halal* labelling will increase the probability of willingness to pay for the *halal*-certified beef amounted  $6.5\%$ .

The awareness variable is the *halal* label of MUI ( $X_{3\_2}$ ) having opportunity coefficient value of  $0.1701$  and probability  $Z$  equal to  $0.000$ . It can be concluded that there is a significant influence of the awareness of *halal* label MUI on certified

*halal* certified beef. The opportunity coefficient of MUI *halal* label awareness variable (X3\_1) indicates a positive sign of 0.1701. It means that people with higher levels of MUI label awareness will increase their probability of willing to pay for the *halal*-certified meat of 17.01%.

The result is in accordance with the research of Putri et al. (2016), which stated that public awareness level has a significant effect on the willingness to pay for the *halal*-certified product. The more someone is aware of the *halal* concept in various consumption activities, the greater the probability the person to be willing to pay more for getting a product with a *halal* guarantee. The *halal* certificate on the meat products is considered important enough to keep the product condition from the manipulation and contamination of non-*halal* substances, so people are willing to pay more for the service existence.

### **Effect of Perception on WTP**

The variable of perception has the opportunity coefficient value of 0.092 with the probability  $z$  of 0.06, which means that the variable of perception does not significantly affect the WTP for the *halal*-certified beef. The opportunity coefficient of the variable of perception (X4) is positive of 0.092, which means that people who think that the *halal*-certified meat is important will have a greater probability to be willing to pay for the *halal*-certified meat amounted 9.2%.

The result is in accordance with the research of Fathi, et al. (2016), which found the consumers' perception on the *halal* logistics has a positive correlation with the willingness to pay for the *halal* logistics.

### **Effect of Religiosity on WTP**

The variable of religiosity based on the belief and will-worship shows the opportunity coefficient value of 0.049 with the probability  $z$  of 0.292. It indicates that this type of religiosity variable has no significant effect on the willingness to pay for the *halal*-certified beef. The opportunity coefficient (X5\_1) is positive of 0.049, which means that people with the higher level of religiosity based on belief and will-worship will have a greater probability to be willing to pay for the *halal*-certified beef amounted 4.9%.

The variable of religiosity based on the *sunnah* rituals and *hablumminannas* or relationship with other humans has the opportunity coefficient value of -0.0013 and the probability  $z$  of 0.976, which means that this kind of religiosity variable has no significant effect on the WTP for the *halal*-certified beef. The opportunity coefficient of -0.0013 indicates that people with the higher level of religiosity based

on the *sunnah* rituals and good relationship with other humans have a greater probability of being not willing to pay for the *halal*-certified beef amounted 0.13%.

The result is in accordance with the research of Astogini et al. (2011), which explained that the religious aspect has no significant effect on the decision of buying the *halal* products. This may because the religious aspects like belief, rituals, and consequence are an obligation for a Muslim, apart from his/her consumption activities. So, both factors have no connection with Muslims' decision to use *halal*-certified products/services.

## Conclusion

The existence of the *halal*-certified meat is considered important as an effort to avoid the manipulation and contamination of *harām* substance on the *halal* meat product. Of 100 respondents, 77 are willing to pay more while the rest (23) are not. Of the willing respondents, 53 are willing to pay for the *halal*-certified beef amounted 0-5%, and the rest are willing to pay for more than 5% of the prevailing meat price.

Based on the interview results using the contingent valuated method, the average value of the Muslims in Jakarta who have the willingness to pay for the *halal*-certified beef is 7.05% over the prevailing beef price. The value is acquired by using the interval midpoint method.

The logit regression analysis using the factor variable finds that only the variable of awareness that affects the Muslims in Jakarta to have the willingness to pay for the *halal*-certified beef, while the variables of income, ages, perception, and religiosity have no significant effects on public willingness to pay for the *halal*-certified beef.

## Limitation

This research does not use the bidding game method in estimating public WTP for the *halal*-certified meat. This research was only conducted in Jakarta Province and only used the level of 10% in determining the sample. Therefore, the space of this research is very narrow to find out better responds to *halal*-certified meat.

## Suggestion

Further research is expected to use the bidding game method to find better out the amount of cost of public willingness to pay for the *halal*-certified beef.

Research with greater sample and wider space area is expected to be conducted in the future. The further research is also expected to be able to investigate the *halal* process topics such as *halal* supply chain and *halal* logistics, considering that *halal* process has a very close relationship with various activities in the supply chain.

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