RESEARCH ARTICLE

Awareness and intention to register halal certification of micro and small-scale food enterprises [version 2; peer review: 2 approved with reservations]

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Abstract

Background: This paper discusses halal awareness of MSE food producers in West Java Province, Indonesia. Halal awareness is the first step toward obtaining halal certificates, which confirm that the product is lawful according to Islamic Sharia. Unfortunately, despite Islam being the religion of most Indonesians, most food sold in the market lacks a halal certificate due to a lack of awareness among food producers about the importance of selling halal-certified foods.

Methods: This study aims at measuring the level of halal awareness and the intention of MSE food producers to register halal certification. Halal awareness is assumed to be influenced by knowledge of halal and the food producers’ perception of the benefits of halal certificates. Furthermore, halal awareness, attitudes, and perception of ease of procedures will encourage the intention to register halal certification. An electronic Google Form with a cover letter and a set of questionnaires was distributed to collect data. Partial Least Square - Structural Equation Modelling (PLS-SEM) was chosen to evaluate the adopted theoretical models in the exploratory research.

Results: The results show that halal awareness is influenced by knowledge of halal and perception of its benefits. Moreover, halal awareness influences positively the intention to obtain a halal certificate, but the intention is not significantly affected by attitudes to produce halal foods and perception of procedures for obtaining halal certification. This shows that halal awareness will increase the intention to register halal certification. However, misconceptions about the procedures for obtaining halal certificates keep them from registering.

Conclusions: MSE food producers in West Java Province, Indonesia have a good level of awareness about halal food. However, their products are not halal-certified due to the perception of the
procedures for obtaining halal certificates are relatively complicated and costly for them.

**Keywords**
halal awareness, intention, halal certification, food micro and small enterprise, Islam

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Introduction

A halal certificate is a symbol of ethical behaviour in the food industry that can help entrepreneurs expand their businesses.\cite{1,2} Halal certificate or halal logo is regarded as a quality-control standard which is an important consideration when consumers of both Muslim and non-Muslim,\cite{3,4} or Muslim gen Z,\cite{2} purchase products, especially for products made by non-Muslim producers.\cite{6} Many non-Muslims have no qualms about eating halal food, but they may react negatively if they eat accidentally halal food and feel cheated.\cite{7} The halal logo is even recognized in Japan,\cite{8} where Muslims constitute a minority. Furthermore, non-halal restaurant owners in Manila, Philippines are generally aware of the halal certification standards and ‘Willing’ to become halal certified.\cite{9} These studies show the necessity of halal certificates for a product.

Indonesia is a country where Islam is the majority religion. The Indonesian government has mandated that food producers have halal certificates to protect consumers, particularly Muslim consumers when purchasing food, by issuing Undang-Undang Republik Indonesia No 33 Tahun 2014\footnote{Law of Republic Indonesia No 33/2014 - English} regarding halal product guarantees. However, statistics show that the majority of food micro, small, and medium-scale enterprises (food MSMEs) do not register their products for halal certification. According to the Association of Food and Beverage Entrepreneurs (GAPMMI) in June 2019, only 10% of MSMEs have halal certificates.\cite{10} This contradiction indicates that the intention of SMEs to sell halal-certified products remains low. They may be unaware of the benefits of halal certification or have a negative perception of halal certificates. Several studies on the perception of halal certificates have been conducted in various cities in Indonesia.

The majority of MSME entrepreneurs in some cities of East Java Province, Indonesia, such as Bangkalan, Pamekasan, and Pasuruan, understand the significance of halal certificates. However, they consider halal certification to be unimportant.\cite{11} In East Kalimantan Province, Indonesia the MSME entrepreneurs even underestimate the halal certificate due to believing that their business is running smoothly despite the lack of a halal certificate.\cite{12} Meanwhile, entrepreneurs in other Indonesian cities such as the Greater Jakarta Area,\cite{13} Malang City East Java Province,\cite{14} and Surakarta City Central Java Province\cite{15} did not register halal certification because they perceive the process as difficult and costly. These cases indicate MSME entrepreneurs’ lack of necessity for obtaining halal certificates.

In another case, most street vendors (‘kaki lima’) in the nearby area of Universitas Islam Bandung (Unisba), which is located in Bandung, the capital of West Java Province, Indonesia, do not have halal certificates, although they serve...
According to our observations, the majority of MSE food producers in West Java Province, Indonesia, come from low- to middle-income families with limited educational opportunities. Many of them are solely concerned with producing and selling goods. They have had enough as long as they have sold it. As a result, it led to the assumption that halal certificates are not important. The problems are that the MSE food producers may be unaware that raw materials are being processed or that the processing method, how to store, and how to send products do not meet halal standards, resulting in a low intention to obtain a halal certificate. Hence, this study aims at measuring the level of halal awareness and the intention of MSE food producers in West Java Province, Indonesia to register halal certification.

This paper is organized as follows; the literature review, the proposed conceptualizing model, the research method, the results, discussion of the results, the conclusions, and data availability.

**Literature review**

Studies on halal awareness and intention to register halal certification have been carried out in the last decade. Giyanti and Indriastiningsih hypothesized that awareness/intention to register a halal certificate is influenced by knowledge of halal, perception of benefits, and perception of procedures. The study results show that most SMEs food in Surakarta City, Central Java Province, Indonesia have a good knowledge of halal and agree that halal certification benefits their business. However, knowledge of halal does not significantly affect halal certification. Only the perception of the benefits of halal certification significantly influences the intention to obtain halal certification. They do not register halal certification due to a lack of understanding of the procedure for obtaining a halal certificate.

Abdul et al., investigated the perception of halal certification among SME food entrepreneurs in Yogyakarta City, Indonesia. Food entrepreneurs who already have halal certificates report that the halal certification process is not tedious or stringent. They learn a lot about halal while going through the certification process. They also believe that halal certificates can increase market share and expand their business by instilling consumer trust in their products, i.e., providing a sense of security. Furthermore, halal-certified products are more competitive. On the other hand, SME food entrepreneurs who do not have halal certificates, suppose that the certification process is complicated and time-consuming. This was also stated by Viverita and Kusumastuti, Giyanti and Indriastiningsih, and Santosa et al. It could be due to insufficient information about the process of obtaining a halal certificate and the benefits of having halal-certified products. These studies indicate that intention to obtain halal certification is affected by the perception of the procedure.

According to Liba et al., Elias et al., and Masithoh et al., awareness of halal is positively correlated with the intention to obtain halal certification. Meanwhile, Dinev and Hu, Bachok et al., Lee and Shin, Rezai et al. state that customer awareness is a strong predictor of a customer’s intent to buy or select a product. These indicate that awareness influences intention.

Waluyo presumes that religious understanding, profit motivation, and level of education influence the awareness of halal-certified food producers in Sleman and Bantul, Yogyakarta Special Region, Indonesia. The significance test results show that the variables of religious understanding and profit motivation have a significant effect on awareness of being certified halal.

**Halal awareness**

The Law of Republic Indonesia No. 33/2014 describes halal products as those that conform to Islamic Sharia (principles). Carrions, blood, pigs, and/or halal animals (e.g., chicken, cow, goat, etc.) slaughtered in a manner inconsistent with Islamic Sharia are all considered non-halal (haram) materials. Furthermore, non-halal materials also include intoxicating plants or drinks, material that is harmful to one’s health, and microbes contaminated with non-halal materials. Halal encompasses substances (dzaitih), the nature of the substances, processes, processing areas, processing instruments, product storage, product distribution, and serving. Based on these explanations, this study defines halal as what is permissible for Muslims to eat, drink, and use under Islamic law.

Awareness is defined as the state of being aware: knowledge and understanding that something is happening. According to the definition of halal used in this study and the definition of the word awareness in the dictionary, halal awareness is then conceptualized as a process of being aware of what is allowed for Muslims to eat, drink, and use. The level of halal awareness is influenced by religious beliefs, exposure, the role of halal certification through the halal logo/label, health-related reasons, genders, marital status, religious knowledge, and motivation to gain profit.
The religious knowledge of halal considers knowledge of the laws relating to what allowed Muslims to eat, drink, and use as described in the Quran and Hadith. All foods are generally permitted except for those derived from prohibited animals such as pigs, dogs, and carrion, as well as foods and beverages containing alcohol and other toxic or dangerous substances. Slaughter must be carried out following Sharia, to do so in the name of God.30 Allah says in the Quran Surah (chapter) 2 (Al Baqarah) ayah (verse) 173 as follows31:

*He has only forbidden to you dead animals, blood, the flesh of swine, and that which has been dedicated to other than Allah. But whoever is compelled (by necessity), without (willful) disobedience nor transgressing (the limits) then there is no sin on him. Indeed, Allah is Oft-Forgiving, and Most Merciful.*

Meanwhile, motivation to gain profit is defined as the food entrepreneur’s perception of the effect to be gained by producing halal food or having halal certificates and labels. The benefits of producing halal food include increasing market share and competitiveness,32 business growth,1 or business development.2

**Attitude and intention to register halal certification**

Several previous studies show that there is a positive relationship between attitude and intention to buy or choose a product.33–35 According to the Planned Behavior Theory, the intention is determined by three independent factors, i.e., attitude toward behaviour, subjective norm, and perceived behavioural control. Supposing that there is a positive attitude that is supported by people around (as a subjective norm) and there is a perception of ease to perform the behaviour under consideration (as a behavioural control), then an individual’s intention to behave will be higher.36

From an Islamic perspective, every Muslim must have an attitude to like and want to do a good job. In a broader context, attitude means to do good deeds due to Allah (God) loves those who do good as Allah (God) commands in Quran surah (chapter) Al-Baqarah ayah (verse) 195:31

*And spend in the way of Allah and let not your own hands throw yourselves into destruction. And do good; indeed, Allah loves the good-doers.*

Attitude is also associated with two conditions i.e. good (‘mahmudah’) and bad (‘mazmumah’).37 Hence, from an Islamic perspective and according to the Planned Behaviour Theory, if a Muslim produces halal foods as a do good (as an attitude toward a behaviour), supported by an awareness that Allah promises to love the good-doers (as a subjective norm), and there is a perception of ease of the procedure to obtain halal certification (as a behavioural control), then the individual’s intention to register halal certification will be higher.

The procedure to obtain the halal certificate is conceptualized as the food entrepreneur’s perception of the steps that must be taken to obtain a halal certificate and label. Standards for gaining halal certification in Indonesia are explained in the Law of Republic Indonesia No. 33/2014 concerning the guarantees of halal products.10

**Conceptualizing awareness and intention to register halal certification**

**Identification of variables**

According to Waluyo,26 motivation to obtain halal-certified is significantly influenced by religious understanding and motivation to gain profit, because SME entrepreneurs generally agree that Halal Food Certification provided benefits.16 However, the procedure for obtaining halal certificates is relatively complex, thereby reducing the intention of SMEs to register halal certification. Referring to the Planned Behavior Theory36, the intention to register for halal certificates is influenced by attitude to produce halal products, supported by halal awareness (as a subjective norm), attitude to produce halal foods (as a positive attitude), and MSEs’ perception of ease of procedures (as a behavioural control) will encourage the intention for registering halal certification. The relationship of these variables represents the conceptual model of halal awareness and intention toward halal certification.
We introduce a halal awareness between knowledge of halal or perception of benefit and intention to register halal certification.

As can be seen in Figure 1, halal awareness is a dependent variable, while knowledge of halal and perception of benefits are independent variables. Furthermore, halal awareness, perception of procedures, and attitude to produce halal foods are independent variables, while the intention to register halal certification is a dependent variable.

**Hypothesis**

The conceptual model (Figure 1) shows that the level of halal awareness is influenced by the knowledge of halal which may include MSEs’ understanding of the types of non-halal food as mentioned in Law of Republic Indonesia No. 33/2014. Therefore, we hypothesize that:

**H1:** The knowledge of halal/non-halal levels (KH) positively affects Halal Awareness (HA) of the MSE food producers.

Halal certificates and halal logos are perceived to have benefits in increasing consumer confidence and competing with other producers, using as a promotional tool. Hence, halal certificates are expected to improve the MSEs’ performance. Based on this point of view, we hypothesize that:

**H2:** Perception of benefits (PB) positively affects halal awareness (HA).

Halal awareness is measured by awareness of the importance of using halal materials in producing halal products, and perceiving the benefits to be gained despite the process being very strict.

Consumer awareness is a strong predictor of their intention to consume/purchase foods. In this study, halal awareness is expected to influence on intention to register halal certification. Hence, we hypothesize that:

**H3:** Halal awareness (HA) positively affects the Intention to register Halal certification (IHC).

MSE entrepreneurs perceive that the procedure to achieve halal certification is complex due to the lack of information from respondents regarding halal certification procedures. This will negatively influence the intention of producers to register halal certification. In the light of this, we hypothesize that:

**H4:** The MSEs’ perception of ease of the procedures (PP) positively affects the Intention to register halal certification (IHC).

A positive relationship between attitude and intention has been shown by Rezai and Teng, Jaafar et al., Yang et al. These show that attitude influences intention. Hence, we hypothesize that:

**H5:** Attitude to produce halal foods (AHC) positively affects the Intention to register halal certification (IHC).

**Methods**

**Study design and participants**

This study adopts a quantitative method to evaluate the hypothesis, i.e., analyze the data using descriptive statistics. This study has followed the STROBE guidelines/checklist for cross-sectional research.
**Measurement items**
The measurement items for each variable are identified in the following explanation. All variables, indicators, and measurement items are described in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Indicators</th>
<th>Measurement items</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of Halal (KH)</td>
<td>KH1</td>
<td>Halal animals are slaughtered not following Islamic Sharia is non-halal (haram)</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>KH2</td>
<td>Products containing alcohol used in the production process are non-halal (haram)</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>KH3</td>
<td>Pork and its derivation used in the production process are non-halal (haram)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>KH4</td>
<td>Equipment used to produce halal food must be kept separate from equipment used to produce non-halal food</td>
<td></td>
</tr>
<tr>
<td>Perception of Benefits (PB)</td>
<td>PB1</td>
<td>Halal certificate can be used as a promotional tool</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>PB2</td>
<td>The ownership of a Halal certificate increases consumer trust in MSE products</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>PB3</td>
<td>The Halal certificate contributes to the development of MSE performance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PB4</td>
<td>The halal certificate will make MSEs more competitive</td>
<td></td>
</tr>
<tr>
<td>Perception of Procedures (PP)</td>
<td>PP1</td>
<td>The MSE has sufficient information on the halal certification process</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>PP2</td>
<td>Halal Certification is a relatively simple process</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>PP3</td>
<td>The cost of maintaining halal certification is cheap for MSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP4</td>
<td>The time of obtaining halal certification is relatively quick</td>
<td></td>
</tr>
<tr>
<td>Halal Awareness (HA)</td>
<td>HA1</td>
<td>The MSE is aware of the importance of producing halal food</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>HA2</td>
<td>The MSE is aware of the importance of using halal raw materials</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>HA3</td>
<td>The MSE is aware of the importance of a halal certificate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HA4</td>
<td>The MSE is aware of the rigorous certification process</td>
<td></td>
</tr>
<tr>
<td>Attitude to produce halal foods (AHC)</td>
<td>AHC1</td>
<td>The MSE is always concerned about a product's halal issue</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>AHC2</td>
<td>As a food producer, the MSE is always concerned that its customers purchase products that follow Islamic Sharia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AHC3</td>
<td>The MSE is always concerned with producing halal products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AHC4</td>
<td>The MSE ensures that the raw materials are halal at all times</td>
<td>10</td>
</tr>
<tr>
<td>Intention to Register Halal Certification (IHC)</td>
<td>IHC1</td>
<td>Although the MSE ensured that halal materials were used, the MSE is still in charge of halal certification</td>
<td>32,38</td>
</tr>
<tr>
<td></td>
<td>IHC2</td>
<td>The MSE must try to comply with halal quality standards to obtain halal certification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IHC3</td>
<td>The MSE will apply the Halal assurance system in their business</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>IHC4</td>
<td>The MSE will register the products of MSEs to obtain halal certification</td>
<td></td>
</tr>
</tbody>
</table>
(i) Knowledge of halal (KH)

According to the previously defined, knowledge of halal in this study only includes knowledge about halal/non-halal (haram) materials according to the Quran and Hadith, as well as knowledge about the separation of equipment used to process halal/non-halal (haram) materials. The measurement items for the knowledge halal variable were adapted from Giyanti and Indriastiningsih\(^16\) and Waluyo.\(^26\) The survey section includes four items, such as knowledge of; slaughtering methods (KH1), haram material and products (KH2 and KH3), and processing equipment (KH4).

(ii) Perception of benefits (PB)

The measurement items for the perception of benefits variable were adapted from Giyanti and Indriastiningsih\(^16\) and Abdul.\(^29\) These items asked about respondents’ perception of the benefits they would get if they had a halal certificate, such as a promotional tool (PB1), more convincing consumers to buy (PB2), improving business performance (PB3), and more competitive (PB4).

(iii) Perception of procedures (PP)

In this study, food entrepreneurs’ perception of the procedure for obtaining halal certificates in Indonesia involves the availability of information about the certification process and the fact that the certification process is simple, inexpensive, and quick. The measurement items for the perception of the procedure variable were asked about the respondent’s perception of the procedure for obtaining halal certificates in Indonesia, such as the existence of information about the certification process (PP1), the certification process is easy (PP2), cheap (PP3), and fast (PP4). These items were adapted from\(^16,28\).

(iv) Halal awareness (HA)

The Law of Republic Indonesia No. 33/2014 defines the halalness of products, including material supply, processing, storage, packaging, distribution, sales, and product presentation. According to our observations, most MSE food producers in West Java only produce one type of food, either sold directly at their “warung” (a little shop) or entrusted to someone else’s “warung”. Thus, they buy raw materials, process them into finished goods, and then store or ship one kind of product only. Hence, this study limits the scope of halal awareness as the awareness of using halal materials and processing them in a halal manner.

The measurement items for the halal awareness variable were asked about the awareness of respondents about the importance of producing halal food (HA1), using halal raw materials (HA2), the importance of having a halal certificate (HA3), and the rigorous of the halal certification process (HA4). These adapted from Abdul\(^22\) and Law of Republic Indonesia No 33/2014.\(^10\)

(v) Attitude to produce halal foods (AHC)

This study conceptualizes attitude as thinking about producing a halal product that includes a focus on halal issues, a guarantee of selling halal products, halal product attention, and checking to use of halal raw materials. Hence, the measurement items for attitude to produce halal foods variable include respondents’ attitudes to always pay attention to halal issues (AHC1), ensure consumers buy halal products (AHC2), pay attention to halal products (AHC3), and use halal materials (AHC4). These items were adapted from Ambali and Bakar\(^21\) and Menteri Hukum dan HAM (Minister of Law and Human Rights-English).\(^10\)

(vi) Intention to register halal certification

The intention is conceptualized as an act of registering the product to obtain a halal certificate. The measurement items for the variable of intention to register halal certification were adapted from Law of Republic Indonesia No 33/2014,\(^10\) Abdul et al.,\(^32\) and Ngah et al.\(^38\) These items include respondents’ intention to be responsive to the certification process (IHC1), strive to meet halal quality standards (IHC2), immediately implement halal assurance system (IHC3), and immediately register halal certification (IHC4).

Population and sample

The study was carried out in West Java Province, Indonesia. The population is the MSE food producers listed in the Central Bureau of Statistics of West Java, such as producers of cassava chips, shredded catfish, “bagelen” cakes,
Table 2. Category of micro, small and medium business in Indonesia according to Law of the Republic of Indonesia No. 20/2008.

<table>
<thead>
<tr>
<th>Category</th>
<th>Net assets (in million Rp.)</th>
<th>Annual sales turnover (in million Rp.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>50 (max)</td>
<td>300 (max)</td>
</tr>
<tr>
<td>Small</td>
<td>50 – 500</td>
<td>300 – 2,500</td>
</tr>
<tr>
<td>Medium</td>
<td>500 – 10,000</td>
<td>2,500 – 50,000</td>
</tr>
</tbody>
</table>

The convenience sampling technique was used in this study. The total food producer of MSE listed in the Central Bureau of Statistics of West Java was estimated to be around 2300 people. We worked with “Sahabat UMKM Jawa Barat” (West Java MSME association-English), a local association of micro, small, and medium-scale entrepreneurs who are engaged in a variety of fields such as culinary, fashion, crafts, and other businesses or industries. The local association has over 1000 members, with 68 percent of them being food and beverage entrepreneurs, or approximately 680 entrepreneurs. This study’s sample consists of food producers who meet the predetermined criteria among the 680 entrepreneurs.

We received written permission from the Chairman of the West Java MSME association to contact his members for data collection. The written consent to participate from the Chairman of the West Java MSME Community was gained according to document number: 015/SKIP/IV/2020. To guarantee that there is no conflict of interest in this study, survey responses are kept anonymous.

Ethical consideration
The Ethical Licensing Committee of the Islamic University of Bandung approved this study by Protocol number: 495/B.04/Bak-k/XII/2019. We provided all respondents with a consent statement after consultation. In the questionnaire, there is a statement that by filling out the questionnaire the respondents gave their consent to participate. Respondents gave their consent to take part when they filled out the questionnaire. Respondents had given their consent truly and without coercion. Furthermore, to protect respondents’ rights and privacy, all forms of data obtained will be kept confidential.

Data collection
A questionnaire is chosen as the research instrument. The questionnaires were re-translated from English to Indonesian, except for those references that were already in Indonesian. Each variable is made up of measurement items which are scored on a Likert scale of 1 (strongly disagree) to 5 (strongly agree).

A Google Form with a cover letter and a set of questionnaires were sent out to the potential respondents who are members of the West Java MSME association WhatsApp groups. This method was chosen because of the COVID-19 pandemic outbreak. In addition, the designed questionnaires could be collected without conducting direct visits to the respondents. The respondents could not participate in the survey unless they gave their written consent. Data were collected from March to May 2020. A copy of the distributed questionnaires can be found in Extended Data.

The questionnaire was pretested with a small sample of members of the West Java MSME association before being distributed to the actual respondents. Based on pretest feedback, the wording of some items was refined and modified to guarantee that the validity and reliability of each variable meet the required standard. The question items were scored on a Likert scale of 1 (strongly disagree) to 5 (strongly agree). The follow-up of this plan is described later in the data preparation section.

The convenience sampling method is used in the following manner.

1) Distribute questionnaires.

2) Wait for responses to the distributed questionnaire.
3) Collect data until the sample count is adequate.

4) Screen participants based on the criteria specified.

**Structural model analysis**

Data are analyzed with descriptive statistics to provide a description of the respondents’ profile, and to describe the results of the assessment of the level of knowledge of halal, perception of benefits, halal awareness, perception of procedure, attitude, and intention to register halal certificates. The research analysis is intended to assess the model and objectively describe the hypotheses.

The adopted theoretical models are evaluated using Partial Least Square – Structural Equation Model (PLS-SEM) with a path model because this study is exploratory research to predict certain constructs by focusing on explaining the variance in the dependent variables when examining the model. A Smart-PLS software is chosen for data processing.

There are two elements in the PLS-SEM with path models: the outer model and the inner model. The outer model (also known as the measurement model) describes the relationships between latent variables and their indicators, whereas the inner model (also known as the structural model) depicts the relationships between latent variables.

The assessment of the PLS-SEM model begins with the measurement models (outer model) by evaluating the quality of the reflective or formative measurement models. The reflective measurement models are estimated by assessing the construct measures’ reliability and validity. Composite reliability (as a means of assessing internal consistency reliability), convergent validity, and discriminant validity are among the specific measures. Formative measures are evaluated for convergent validity, indicator weight significance and relevance, and the presence of collinearity among indicators.

Following confirmation that the construct measures are reliable and valid, the structural model (inner model) results are evaluated. This entails investigating the model’s predictive abilities for theory testing, as well as the relationships between the constructs. The PLS-SEM model fit is evaluated using standardized root mean square residual (SRMR), root mean square residual covariance (RMS\textsubscript{theta}), or the exact fit test to determine how well it predicts endogenous variables/constructs.

The first step in evaluating the PLS-SEM results for the structural model is to look at the significance and relevance of the coefficients. The bootstrapping routine and examining \( t \) values, \( p \) values, or bootstrapping confidence intervals are required to test the significance. Despite this, the bootstrapping confidence interval is less common. Following that, the relative sizes of path coefficients, total effects, \( f^2 \) effect size, \( Q^2 \) effect size, and \( q^2 \) effect size can be compared. By interpreting these findings, the key constructs with the greatest relevance to explaining the endogenous latent variable(s) in the structural model can be identified. Concisely, the systematic evaluation of PLS-SEM output is shown in Table 3.

<table>
<thead>
<tr>
<th>Criteria Assessed</th>
<th>Acceptable value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. Evaluation of the reflective measurement model</strong></td>
<td></td>
</tr>
<tr>
<td>Convergent validity</td>
<td>Loading ( &gt;0.7 )</td>
</tr>
<tr>
<td>Indicator Reliability</td>
<td>( &gt;0.5 )</td>
</tr>
<tr>
<td>AVE</td>
<td>( &gt;0.5 )</td>
</tr>
<tr>
<td>Internal Consistency Reliability</td>
<td>CR ( &gt;0.6 )</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td>( &gt;0.6 )</td>
</tr>
<tr>
<td>Discriminant Validity</td>
<td>Fornell-Larcker</td>
</tr>
<tr>
<td>The square root of each construct's AVE should be higher than the correlations among the latent variables</td>
<td></td>
</tr>
<tr>
<td>Cross-loading</td>
<td>An indicator has a lower correlation with another latent variable than with its respective latent variable</td>
</tr>
</tbody>
</table>
Table 3. Continued

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Assessed value</th>
<th>Acceptable value</th>
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</thead>
<tbody>
<tr>
<td>II. Evaluation of the structural model</td>
<td>SRMR</td>
<td>&lt;0.08</td>
</tr>
<tr>
<td></td>
<td>RMS_{Theta}</td>
<td>&lt;0.12</td>
</tr>
<tr>
<td>$R^2$ of endogenous latent variables</td>
<td>$R^2$ values of 0.75, 0.50, or 0.25 for endogenous latent variables are considered substantial, moderate, or weak, respectively</td>
<td></td>
</tr>
<tr>
<td>Estimates of path coefficient</td>
<td>For one-tailed tests, the critical values are 1.28 (significance level = 10%), 1.65 (significance level = 5%), and 2.33 (significance level = 1%) To conclude that the relationship under consideration is significant at a 5% level, the p-value must be less than 0.05 when assuming a significance level of 5%</td>
<td></td>
</tr>
<tr>
<td>Effect size $f^2$</td>
<td>Small, medium and large effects of the exogenous latent variable are represented by $f^2$ values of 0.02, 0.15, and 0.35, respectively</td>
<td></td>
</tr>
<tr>
<td>Predictive Relevance $Q^2$</td>
<td>$Q^2$ values greater than zero for a specific reflective endogenous latent variable indicate that the path model is predictive of a specific dependent construct</td>
<td></td>
</tr>
</tbody>
</table>

Sample size
Barclay, Higgins, and Thompson (1995) in Hair et al. explain the Ten Times Rule in determining the number of PLS-SEM samples, which states that the sample size must be greater than (1) ten times the greatest number of formative indicators used to measure a single construct, or (2) ten times the greatest number of structural paths directed at a specific construct in the structural model. In other words, the minimum sample size is equal to 10 times the maximum number of arrows in the PLS path model pointing to the latent variable.41

In this study, the IHC variable is the latent variable with the maximum number of arrows, i.e., 3 (see Figure 1). As a result of the Ten Times Rule, 3.10 = 30 represents the bare minimum of observations required to estimate the PLS path model depicted in Figure 1. In terms of Cohen’s (1992) recommendation for multiple OLS regression analysis, or running a power analysis using the G*Power program, as cited in Hair, et al., 33 observations are required to detect an $R^2$ value of about 0.25, assuming a statistical power of 80% and significance level of 5%.

Results
Participants
The questionnaires were distributed to the members of the West Java MSME association’s WhatsApp groups. The questionnaires were returned by 376 respondents. The returned questionnaires were then sorted using predetermined criteria, yielding 137 respondents that met the criteria.

We examined the responses of early and late respondents to see if there was any possibility of non-response bias. According to Lindner et al., respondents were classified into two groups: early and late respondents. Late respondents were operationally and arbitrarily defined as the last half of respondents. Because there were 137 respondents in this study, 69 were identified as early respondents and 68 as late respondents. Hence, the independent samples t-test was then used to compare the two groups’ responses to Likert scale questions. The findings show that there is no significant difference in key metrics responses between early and late respondents.

Table 4 displays the percentage of respondents for each indicator where 98.5% of respondents have Islam as their religion (Muslim), 67.9% are female, and 38% are 26 years old or older. In terms of business size, 89% of respondents are micro-scale entrepreneurs. Non-Muslim respondents are involved because producing halal food regardless of the religion of the food producers.

Descriptive statistics of the research variables
Table 5 shows the descriptive statistics for each measurement indicator. The knowledge of halal (KH) has a high average perception value.

Data preparation
A copy of the dataset of the questionnaire result can be found in Underlying Data. There are no missing values, invalid observations, or outliers in this data set, which has a sample size of 137.

Initially, the questionnaires were first to be pretested in a small sample of MSE food producers in West Java, Indonesia, to assess the research instrument’s validity and reliability. The questionnaires are planned to be distributed in person starting...
### Table 4. Respondent’s profile.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quantity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion: Islam</td>
<td>135</td>
<td>98.5%</td>
</tr>
<tr>
<td>Catholic</td>
<td>1</td>
<td>1.5%</td>
</tr>
<tr>
<td>Protestant</td>
<td>1</td>
<td>1.0%</td>
</tr>
<tr>
<td>Gender: Male</td>
<td>44</td>
<td>32.1%</td>
</tr>
<tr>
<td>Female</td>
<td>93</td>
<td>67.9%</td>
</tr>
<tr>
<td>Age: &lt;17 years</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>17-20 years</td>
<td>7</td>
<td>5.1%</td>
</tr>
<tr>
<td>21-25 years</td>
<td>10</td>
<td>7.3%</td>
</tr>
<tr>
<td>26-40 years</td>
<td>52</td>
<td>38%</td>
</tr>
<tr>
<td>&gt;40 years</td>
<td>67</td>
<td>48.9%</td>
</tr>
<tr>
<td>Business scale: Micro</td>
<td>122</td>
<td>89.0%</td>
</tr>
<tr>
<td>Small</td>
<td>15</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

### Table 5. Descriptive statistics measurement indicators.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Total mean</th>
<th>Deviation standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>KH1</td>
<td>1</td>
<td>5</td>
<td>4.650</td>
<td>4.621</td>
<td>0.885</td>
</tr>
<tr>
<td>KH2</td>
<td>1</td>
<td>5</td>
<td>4.460</td>
<td></td>
<td>1.025</td>
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<tr>
<td>KH3</td>
<td>1</td>
<td>5</td>
<td>4.723</td>
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<td>0.886</td>
</tr>
<tr>
<td>KH4</td>
<td>1</td>
<td>5</td>
<td>4.650</td>
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<td>0.842</td>
</tr>
<tr>
<td>PB1</td>
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<td>5</td>
<td>4.591</td>
<td>4.584</td>
<td>0.859</td>
</tr>
<tr>
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<td>5</td>
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<td>4.577</td>
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<td>PB4</td>
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<tr>
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<tr>
<td>PP1</td>
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<td>5</td>
<td>4.526</td>
<td>4.591</td>
<td>0.889</td>
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<td>4.628</td>
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<td>5</td>
<td>4.511</td>
<td></td>
<td>0.919</td>
</tr>
<tr>
<td>IHC1</td>
<td>1</td>
<td>5</td>
<td>4.526</td>
<td>4.591</td>
<td>0.889</td>
</tr>
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<tr>
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<tr>
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<td>5</td>
<td>4.526</td>
<td>4.591</td>
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<tr>
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<td>AHC3</td>
<td>1</td>
<td>5</td>
<td>4.699</td>
<td></td>
<td>0.758</td>
</tr>
<tr>
<td>AHC4</td>
<td>1</td>
<td>5</td>
<td>4.511</td>
<td></td>
<td>0.919</td>
</tr>
</tbody>
</table>
Measurements model (Outer model) analysis

Based on the conceptual model shown in Figure 1 and the measurement items in Table 1, the structural model involves the following 2 models:

1. Model of the influence of KH and PB on HA, where HA is an endogenous latent variable, while KH and PB are exogenous latent variables.

2. The influence model of HA, PP, and AHC on IHC, where IHC is an endogenous latent variable, while HA, PP, and AHC are exogenous latent variables.

The constructs or latent variables in this structural model are KH, PB, HA, PP, AHC, and IHC. Each latent variable is made up of some indicators that are highly correlated and interchangeable, allowing them to be reflective. Hence, the causality flow is going from the construct to the indicators. It means that any changes in the construct are expected to be reflected in all of its indicators (see Figure 2). Reflective measurement models should be evaluated for their reliability and validity. The path analysis for the proposed model is obtained by running Smart PLS-SEM software, as shown in Figure 2.

Outer model loading

The correlation between the latent variable and the indicators in its outer model is evaluated by an outer loading. The outer loading of the first path model is shown in Table 6 where the outer loading of all indicators is greater than 0.7, indicating that it meets the convergent validity criteria. However, when the discriminant validity was examined, it was discovered that the correlation between AHC-HA is higher than AHC-AHC, while the correlation between IHC-HA is higher than HA-HA (see Table 7), indicating that the path model does not meet the Fornell-Larcker criterion.

Hence, the model’s feasibility must be reconsidered by analyzing the multicollinearity to determine whether any indicators should be merged into one or eliminated. Collinearity is assessed by calculating a variance inflation factor (VIF) for each indicator and comparing these VIFs to a threshold. The VIF threshold values of 10, 5, and 3.3 are commonly recommended for collinearity, which means that a VIF equal to or greater than the threshold value indicates a potential collinearity problem. As a result, the corresponding indicators should be considered to be removed.

Table 8 displays the VIF value of each indicator of the first path model. As can be seen, it was discovered that the HA2 indicator had a VIF value greater than 10, so the HA2 indicator was considered to be discarded. After the HA2 indicator is removed, the processing is performed on the second path model, which does not include the HA2 indicator. Based on the...
### Table 6. Outer loading of the first path model

<table>
<thead>
<tr>
<th></th>
<th>AHC</th>
<th>HA</th>
<th>IHC</th>
<th>KH</th>
<th>PB</th>
<th>PP</th>
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</tr>
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<td></td>
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</tr>
</tbody>
</table>

### Table 7. Discriminant validity construct of the first path model.

<table>
<thead>
<tr>
<th></th>
<th>AHC</th>
<th>HA</th>
<th>IHC</th>
<th>KH</th>
<th>PB</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHC</td>
<td>0.924</td>
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</tr>
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<tr>
<td>IHC</td>
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<td>0.945</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>KH</td>
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<td>0.735</td>
<td>0.687</td>
<td>0.875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PB</td>
<td>0.849</td>
<td>0.911</td>
<td>0.897</td>
<td>0.696</td>
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<tr>
<td>PP</td>
<td>0.304</td>
<td>0.249</td>
<td>0.304</td>
<td>0.269</td>
<td>0.303</td>
<td>0.872</td>
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</table>

### Table 8. Outer VIF values of the first path model.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>VIF</th>
<th>Indicators</th>
<th>VIF</th>
<th>Indicators</th>
<th>VIF</th>
<th>Indicators</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHC1</td>
<td>4.467</td>
<td>IHC1</td>
<td>5.711</td>
<td>PB1</td>
<td>5.647</td>
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</tr>
<tr>
<td>AHC2</td>
<td>5.226</td>
<td>IHC2</td>
<td>9.020</td>
<td>PB2</td>
<td>7.203</td>
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</tr>
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<td>AHC3</td>
<td>3.873</td>
<td>IHC3</td>
<td>3.857</td>
<td>PB3</td>
<td>5.527</td>
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</tr>
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<td>AHC4</td>
<td>3.355</td>
<td>IHC4</td>
<td>7.774</td>
<td>PB4</td>
<td>5.105</td>
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<td>HA2</td>
<td>11.475</td>
<td>KH2</td>
<td>2.678</td>
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<td>3.732</td>
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<tr>
<td>HA3</td>
<td>6.741</td>
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<td>3.449</td>
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<td>HA4</td>
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<td>PP4</td>
<td>4.207</td>
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</tbody>
</table>
discriminant validity analysis, it was discovered that the correlation between IHC-HA is higher than HA-HA. Hence, the VIF value should be checked again. The calculation result shows that there are no VIF values greater than 10, but the IHC2 indicator has close to 10 values of 9.02. To meet the Fornell-Larcker criterion, the IHC2 indicator is being considered for removal. The third path model is then constructed without the use of the HA2 and IHC2 indicators. When the discriminant validity of the third path model was examined, it was discovered that all latent variables met the Fornell-Larcker criteria. Consequently, the final path model for the problem discussed in this study is the third path model.

The assessment of PLS-SEM output

In this study, both validity and reliability tests are carried out to measure the goodness of the shared questionnaires. Validity is a test of how well the developed instrument measures the particular construct being measured, while reliability is a test of how the developed instrument consistently measures the construct being measured.\(^{47}\) The assessment’s steps are as follows:

(i) Checking to construct reliability and validity

According to the Systematic evaluation of PLS-SEM output described in Table 3, the findings of the reflective measurement model evaluation are summarized in Table 9. As can be seen, all items’ loadings exceed 0.7, the AVEs for the indicators are within the range of 0.760 and 0.893, all CR values are higher than 0.6, and the Cronbach Alpha’s are within the range of 0.892 and 0.960. Therefore, all model evaluation criteria have been met, indicating that the instruments are reliable and valid.

### Table 9. Result summary for the reflective measurement model.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Indicator</th>
<th>Convergent validity</th>
<th>Internal consistency reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Loading factor</td>
<td>Indicator reliability (i.e. loading(^2))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;0.7</td>
<td>&gt;0.5</td>
</tr>
<tr>
<td>KH</td>
<td>KH1</td>
<td>0.901</td>
<td>0.871</td>
</tr>
<tr>
<td></td>
<td>KH2</td>
<td>0.849</td>
<td>0.889</td>
</tr>
<tr>
<td></td>
<td>KH3</td>
<td>0.910</td>
<td>0.836</td>
</tr>
<tr>
<td></td>
<td>KH4</td>
<td>0.838</td>
<td>0.818</td>
</tr>
<tr>
<td>PB</td>
<td>PB1</td>
<td>0.941</td>
<td>0.856</td>
</tr>
<tr>
<td></td>
<td>PB2</td>
<td>0.959</td>
<td>0.917</td>
</tr>
<tr>
<td></td>
<td>PB3</td>
<td>0.945</td>
<td>0.698</td>
</tr>
<tr>
<td></td>
<td>PB4</td>
<td>0.936</td>
<td>0.894</td>
</tr>
<tr>
<td>HA</td>
<td>HA1</td>
<td>0.925</td>
<td>0.876</td>
</tr>
<tr>
<td></td>
<td>HA3</td>
<td>0.958</td>
<td>0.906</td>
</tr>
<tr>
<td></td>
<td>HA4</td>
<td>0.835</td>
<td>0.811</td>
</tr>
<tr>
<td>PP</td>
<td>PP1</td>
<td>0.822</td>
<td>0.720</td>
</tr>
<tr>
<td></td>
<td>PP2</td>
<td>0.921</td>
<td>0.828</td>
</tr>
<tr>
<td></td>
<td>PP3</td>
<td>0.870</td>
<td>0.701</td>
</tr>
<tr>
<td></td>
<td>PP4</td>
<td>0.871</td>
<td>0.886</td>
</tr>
<tr>
<td>IHC</td>
<td>IHC1</td>
<td>0.946</td>
<td>0.919</td>
</tr>
<tr>
<td></td>
<td>IHC3</td>
<td>0.936</td>
<td>0.893</td>
</tr>
<tr>
<td></td>
<td>IHC4</td>
<td>0.952</td>
<td>0.876</td>
</tr>
<tr>
<td>AHC</td>
<td>AHC1</td>
<td>0.933</td>
<td>0.676</td>
</tr>
<tr>
<td></td>
<td>AHC2</td>
<td>0.943</td>
<td>0.848</td>
</tr>
<tr>
<td></td>
<td>AHC3</td>
<td>0.915</td>
<td>0.757</td>
</tr>
<tr>
<td></td>
<td>AHC4</td>
<td>0.904</td>
<td>0.758</td>
</tr>
</tbody>
</table>
(ii) Checking Discriminant validity

The square root of the AVE of each construct should be greater than its highest correlation with any other construct, according to the Fornell-Larcker criterion. Table 10 shows that the average variance extracted by the indicators measuring that construct is less than the squared correlations for that construct. To put it another way, the measurement model represents adequate discriminant validity.

Another method to determine discriminant validity is assessed by looking at loading and cross-loading to identify problem items if there are any. The validity test using cross-loading is patterned in that the main loading factor originating from its construct is greater than the correlation value built from these variables on other constructs. Table 11 presents an evaluation of validity based on the value of the main loading factor to the value of cross-loading factors with other constructs. As shown in Table 11, the value of the main loading factor of each construct is higher than the value of cross-loading.

### Table 10. Discriminant validity construct Fornell-Larcker criterion.

<table>
<thead>
<tr>
<th></th>
<th>AHC</th>
<th>HA</th>
<th>IHC</th>
<th>KH</th>
<th>PB</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHC</td>
<td>0.924</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HA</td>
<td>0.912</td>
<td>0.908</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IHC</td>
<td>0.861</td>
<td>0.900</td>
<td>0.944</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KH</td>
<td>0.729</td>
<td>0.720</td>
<td>0.674</td>
<td>0.875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PB</td>
<td>0.848</td>
<td>0.909</td>
<td>0.890</td>
<td>0.696</td>
<td>0.945</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>0.304</td>
<td>0.246</td>
<td>0.313</td>
<td>0.269</td>
<td>0.302</td>
<td>0.872</td>
</tr>
</tbody>
</table>

### Table 11. Cross-loading for construct validity.

<table>
<thead>
<tr>
<th></th>
<th>AHC</th>
<th>HA</th>
<th>IHC</th>
<th>KH</th>
<th>PB</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHC1</td>
<td>0.933</td>
<td>0.846</td>
<td>0.815</td>
<td>0.706</td>
<td>0.770</td>
<td>0.335</td>
</tr>
<tr>
<td>AHC2</td>
<td>0.943</td>
<td>0.869</td>
<td>0.820</td>
<td>0.734</td>
<td>0.836</td>
<td>0.266</td>
</tr>
<tr>
<td>AHC3</td>
<td>0.915</td>
<td>0.855</td>
<td>0.774</td>
<td>0.628</td>
<td>0.799</td>
<td>0.235</td>
</tr>
<tr>
<td>AHC4</td>
<td>0.904</td>
<td>0.802</td>
<td>0.773</td>
<td>0.620</td>
<td>0.728</td>
<td>0.287</td>
</tr>
<tr>
<td>HA1</td>
<td>0.873</td>
<td>0.925</td>
<td>0.823</td>
<td>0.719</td>
<td>0.841</td>
<td>0.192</td>
</tr>
<tr>
<td>HA3</td>
<td>0.873</td>
<td>0.958</td>
<td>0.907</td>
<td>0.698</td>
<td>0.906</td>
<td>0.256</td>
</tr>
<tr>
<td>HA4</td>
<td>0.728</td>
<td>0.835</td>
<td>0.706</td>
<td>0.528</td>
<td>0.714</td>
<td>0.220</td>
</tr>
<tr>
<td>IHC1</td>
<td>0.812</td>
<td>0.839</td>
<td>0.946</td>
<td>0.600</td>
<td>0.831</td>
<td>0.337</td>
</tr>
<tr>
<td>IHC3</td>
<td>0.784</td>
<td>0.824</td>
<td>0.936</td>
<td>0.613</td>
<td>0.820</td>
<td>0.296</td>
</tr>
<tr>
<td>IHC4</td>
<td>0.843</td>
<td>0.886</td>
<td>0.952</td>
<td>0.693</td>
<td>0.868</td>
<td>0.255</td>
</tr>
<tr>
<td>KH1</td>
<td>0.641</td>
<td>0.635</td>
<td>0.601</td>
<td>0.901</td>
<td>0.608</td>
<td>0.225</td>
</tr>
<tr>
<td>KH2</td>
<td>0.569</td>
<td>0.551</td>
<td>0.530</td>
<td>0.849</td>
<td>0.513</td>
<td>0.253</td>
</tr>
<tr>
<td>KH3</td>
<td>0.611</td>
<td>0.630</td>
<td>0.575</td>
<td>0.910</td>
<td>0.615</td>
<td>0.198</td>
</tr>
<tr>
<td>KH4</td>
<td>0.711</td>
<td>0.686</td>
<td>0.638</td>
<td>0.838</td>
<td>0.679</td>
<td>0.266</td>
</tr>
<tr>
<td>PB1</td>
<td>0.827</td>
<td>0.866</td>
<td>0.850</td>
<td>0.702</td>
<td>0.941</td>
<td>0.297</td>
</tr>
<tr>
<td>PB2</td>
<td>0.861</td>
<td>0.890</td>
<td>0.879</td>
<td>0.684</td>
<td>0.959</td>
<td>0.283</td>
</tr>
<tr>
<td>PB3</td>
<td>0.782</td>
<td>0.869</td>
<td>0.837</td>
<td>0.619</td>
<td>0.945</td>
<td>0.280</td>
</tr>
<tr>
<td>PB4</td>
<td>0.730</td>
<td>0.808</td>
<td>0.794</td>
<td>0.622</td>
<td>0.936</td>
<td>0.284</td>
</tr>
<tr>
<td>PP1</td>
<td>0.320</td>
<td>0.276</td>
<td>0.329</td>
<td>0.284</td>
<td>0.321</td>
<td>0.822</td>
</tr>
<tr>
<td>PP2</td>
<td>0.258</td>
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<td>0.284</td>
<td>0.223</td>
<td>0.264</td>
<td>0.921</td>
</tr>
<tr>
<td>PP3</td>
<td>0.268</td>
<td>0.213</td>
<td>0.253</td>
<td>0.218</td>
<td>0.259</td>
<td>0.870</td>
</tr>
<tr>
<td>PP4</td>
<td>0.154</td>
<td>0.103</td>
<td>0.158</td>
<td>0.177</td>
<td>0.146</td>
<td>0.871</td>
</tr>
</tbody>
</table>
of the loading factor outside of the main loading factor, so it can be concluded that all constructs are declared valid. For example, the loading factor of indicator AHC1 in the AHC construct is highest than its loading factor in HA, IHC, KH, PB, and PP.

(iii) Model fit

This study uses the standardized root means square (SMSR) to assess model fit. The SMSR is 0.067, less than 0.08, indicating that the model meets the model fit criteria. Furthermore, the data can be used to estimate the model.

(iv) Hypothesis testing by checking structural path significance

Significance testing of both the inner and outer model in SmartPLS uses bootstrapping procedure to give approximate \( t \)-values. In this study, the hypotheses are represented with a positive path coefficient, so that the \( t \)-value is determined by the one-tailed \( t \)-test. By using a significance level of 5%, the path coefficient will be significant if the \( t \)-value is larger than 1.65. Figure 3 shows the path analysis result of halal awareness and the intention to register halal certification using SmartPLS software, while Table 12 represents the hypothesis testing results of each path.

The path analysis is addressed to ascertain the hypotheses put forward. As can be seen in Figure 3, the \( R^2 \) value of 0.825 for IHC indicates that 82.5% of the variance in IHC can be explained by HA, PP, and AHC. In addition, Figure 3 also shows that HA, PP, and AHC are positively related to IHC among MSE entrepreneurs with \( \beta = 0.696, 0.080, \) and 0.202, respectively. According to the \( t \)-value of the path coefficients, HA has a significant impact on IHC, while AHC and PP do not have a significant impact on IHC. Besides, the \( R^2 \) value of 0.841 for HA means that 84.1% of the variance in HA is influenced by KH and PB, with values \( \beta = 0.169 \) and 0.791 respectively. Hence, KH and PB have a strong and significant impact on the halal awareness of MSE food producers.

![Figure 3. Result of the final path analysis.](image)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Coefficient</th>
<th>( t )-value</th>
<th>( p )-value</th>
<th>Remark (( p &lt; 0.05 ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>KH-HA</td>
<td>0.169</td>
<td>1.944</td>
<td>0.026</td>
<td>Significant</td>
</tr>
<tr>
<td>H2</td>
<td>PB-HA</td>
<td>0.791</td>
<td>9.062</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>H3</td>
<td>HA-IHC</td>
<td>0.696</td>
<td>5.824</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>H4</td>
<td>PP-IHC</td>
<td>0.080</td>
<td>1.633</td>
<td>0.052</td>
<td>Not significant</td>
</tr>
<tr>
<td>H5</td>
<td>AHC-IHC</td>
<td>0.202</td>
<td>1.586</td>
<td>0.057</td>
<td>Not significant</td>
</tr>
</tbody>
</table>
According to Hair, et al., $R^2$ values of 0.75, 0.50, or 0.25 for the endogenous construct, respectively, can be described as substantial, moderate, or weak. The $R^2$ value of an endogenous latent variable (i.e., halal awareness) described by the two predictive constructs in this study is 84.1% (see Figure 3), which is substantial. Hence, KH and PB are genuine predictors of halal awareness of food producers of MSE. The same goes for the $R^2$ value of the endogenous latent variable (i.e., Intention to register halal certification) is 82.5% which is substantial. However, the genuine predictor of MSEs’ Intention to register halal certification is only HA.

(v) $f^2$ effect size

In addition to evaluating the $R^2$ values of all endogenous constructs, the contribution of an exogenous latent variable to the $R^2$ value of an endogenous latent variable, known as the $f^2$ effect size, must be evaluated. In simpler words, the $f^2$ effect size measures the strength of the relationship between the latent variables. Table 13 displays the $f^2$ values for all endogenous construct combinations (represented by columns) and corresponding exogenous (i.e., predictor) construct combinations (represented by the rows). As can be seen, HA has a large effect of 0.462 on IHC, while PB has a large effect of 2.035 on HA. Meanwhile, AHC (0.037) and PP (0.033) have a medium effect on IHC, and KH (0.093) has a medium effect on HA.

(vi) Predictive relevance $Q^2$

Predictive relevance is another aspect that can be investigated for the inner model. The value of cross-validated redundancy ($Q^2$) can be used to calculate the predictive value of relevance. If the $Q^2$ value is greater than zero it indicates that the model has predictive relevance accurate to certain constructs, otherwise the model lacks predictive relevance. The blindfolding procedure in SmartPLS can be used to calculate the $Q^2$ value. The output of the blindfolding procedure of the model discussed is shown in Table 14. In the table, SSO represents the sum of squared observations, SSE represents the sum of squared prediction errors, and the final column (i.e., $1 - \frac{SSE}{SSO}$) represents the final value $Q^2$, which is interpreted to assess the model’s predictive relevance for each endogenous construct.

As can be seen, the $Q^2$ values of two endogenous constructs (HA and IHC) are significantly higher than zero where the $Q^2$ value of IHC is greater than HA. These findings provide strong support for the model’s predictive relevance for endogenous latent variables. Hence, predictions for HA and IHC are accurate.

| Table 13. The $f^2$ effect size of the final path model. |
|-----------------|-----------------|
| AHC             | HA              |
|                 | 0.037           |
| HA              | 0.462           |
| IHC             |                 |
| KH              | 0.093           |
| PB              | 2.035           |
| PP              | 0.033           |

| Table 14. The $Q^2$ value of the final path model. |
|--------------|-------------|-----------------|
| SSO          | SSE         | $Q^2 = 1 - \frac{SSE}{SSO}$ |
| AHC          | 548.000     | 548.000         |
| HA           | 411.000     | 137.423         |
| IHC          | 411.000     | 114.042         |
| KH           | 548.000     | 548.000         |
| PB           | 548.000     | 548.000         |
Discussion

As can be seen in Table 5, the findings of the descriptive statistics indicate that most of the respondents are highly aware to have a halal certificate because they have a high level of knowledge of halal and generally agree that Halal Food Certification provides benefits. These findings have confirmed the findings of Waluyo,26 that religious knowledge and motivation to benefit have a significant impact on the awareness of food producers to certify their products. The finding that knowledge of halal has a significant impact on halal awareness is different from the finding of Giyanti and Indriastiningsih.16

As shown in Figure 3, halal awareness and intention to register halal certification have a correlation coefficient of 0.696. It means that the awareness of halal certification is a strong indicator of the intention to register halal certification. It aligns with Bachok et al.,23 Lee and Shin,24 and Rezai et al.25 The descriptive statistics also show that most of the respondents have a high intention to register halal certification with a total mean of 4.544 on a 5 scale (Table 5).

This study finds that attitudes to produce halal products and perception of halal certification procedures have a positive correlation with intentions, but both do not significantly affect intentions. According to the Planned Behavior Theory, when there is support and a sense of ease that there are no barriers to behaviour, the intention to behave will increase.36 This study shows that intention to register a halal certificate is not supported by the attitude because West Java MSE food producers perceive the procedures to obtain halal certification to be complex.

The findings also indicate that MSE food producers are aware of the benefits of the halal certificate. However, our observation revealed that they perceive obtaining a halal certificate as prohibitively expensive. It will cause the halal-certified product’s selling price to rise. They are concerned that increasing selling prices will reduce sales. As a result, they perceive that obtaining a halal certificate is unnecessary. In any case, their business is running smoothly without the halal certificate. It aligns with the findings of Prabowo et al.13

Another factor that hinders the desire to obtain a halal certificate is the lack of consumer pressure. Furthermore, MSE food producers are unaware of the risks of violating the halal product guarantee law if they do not have a halal certificate. This is alleged to lead to that attitude to produce halal foods having little bearing on their desire to register for halal certification.

These are the study’s main findings. We observe that the local community culture and mindset of micro and small-scale food entrepreneurs appear to be driving this lack of intention to obtain a halal certificate. In general, West Java MSE food producers are low- to middle-income communities with limited educational opportunities, so they rarely have broad perspectives or are willing to progress and develop. It is already a good thing that they can sell every day without having to develop their business.

Furthermore, by selling halal products, they have aided people who follow the Islamic faith to practice the Quran surah (chapter) 2:(Al Baqarah, ayah (verse) 168):  

O mankind! Eat from whatever is on the earth - lawful and good and do not follow the footsteps of Shaitaan devil. Indeed, he is your clear enemy.

The MSE food producers’ perception of complicated and costly certification procedures for their scale of operation also hampered their desire to register for halal certification. This finding supports Giyanti and Indriastiningsih,16 and Abdul et al.,18 whose study found that MSEs’ food awareness/intention is hampered by a lack of socialization and the complexity of the procedure for handling halal certification. Hence, socialization and training on halal certification are required to raise the level of intention. Oemar et al.17 proved that socialization and training on halal awareness, halal assurance systems, and halal certification increase the understanding and awareness about halal-certified food so that all participants intend to obtain a Halal Certificate after completing the training.

This research could aid efforts to increase food entrepreneurs’ desire to obtain halal certifications. Micro and small businesses must be educated about the benefits of obtaining halal certificates and the ease with which they can do so. Micro and small food entrepreneurs’ halal awareness should be reinforced by the availability of a readily accessible halal information centre and innovative ecosystems.

Conclusions

It can be concluded that micro and small-scale food producers in West Java Province, Indonesia has a good level of awareness about halal food even though they do not have a halal certificate. They pay attention to the halalaness of the material used and of its processing. However, the perception of the procedures to obtain halal certificates which are
relatively complicated and expensive for micro and small-scale businesses discourage the MSEs to register halal certification.

The hypothesis test shows that knowledge and perception of benefit have positive and significant correlations to halal awareness. In addition, halal awareness, attitude to produce halal foods, and perception of the procedure have a positive influence on the intention to register halal certification. However, attitude to produce halal foods and perception of procedure do not have a significant impact, while halal awareness has a significant effect on intention. This shows that halal awareness among MSE food producers can increase the intention to register their products to be halal certified. However, the reality shows that many products sold in the market do not have halal certificates. It indicates that the halal awareness of MSE food producers does not have an impact on real actions to register halal certification. They will take action when they gain real benefit/profit.

Finally, we recognize that this study has some limitations, including 1) The study focuses on micro and small food businesses. Perhaps in the future, research can be done for medium-scale food businesses that have a unique character due to the entrepreneur’s higher level of education. 2) The research was conducted in West Java, which has a distinct culture and mindset. In the future, perhaps research can be conducted in other Indonesian provinces with different characteristics. 3) The research was conducted for the food producers. Perhaps, study on other products will be possible in the future. 4) There are six variables in this study. Other estimated variables may be added in the future.

Further research may be undertaken to measure the level of halal awareness and intention to obtain the halal certificate for medium-scale entrepreneurs with other kinds of products in the other provinces and consider other related variables.

Data availability
Underlying data
Figshare: Dataset of Questionnaire Result from the respondents of Awareness and Intention to Register Halal Certification; https://doi.org/10.6084/m9.figshare.20488317

This project includes the following underlying data:
- Questionnaire results from 137 West Java MSE food producers.

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

Extended data
Figshare: List of questions of descriptions of the questionnaire of Awareness and Intention to Register Halal Certification; https://doi.org/10.6084/m9.figshare.20488590

This project includes the following extended data:
- A copy of the questionnaire

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

Figshare: The Profile of Respondent of Awareness and Intention to Register Halal Certification; https://doi.org/10.6084/m9.figshare.20488650

This project includes the following extended data:
- Profile of respondents

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

Acknowledgments
The authors would like to thank the Rector of Universitas Islam Bandung and Universiti Utara Malaysia for their support and for creating a conducive research environment. Furthermore, we would like to thank the members of the Industrial Engineering Department of Universitas Islam Bandung for their support in this research. The author also thanks the Chairman of the Regional Management Board for the West Java MSME community for allowing the distribution of
questionnaires, as well as the West Java SMEs Community members who participated in this study. Also, a heartfelt thank you to the Research Synergy Foundation for the recommendations.

References


Open Peer Review

Current Peer Review Status: ? ?

Version 1

Reviewer Report 31 March 2022

https://doi.org/10.5256/f1000research.79916.r127721

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Ai Chin Thoo
Azman Hashim International Business School, Universiti Teknologi Malaysia, Skudai, Malaysia

The practical gaps are not aligned with the research objectives. What is the relationship between the global market and the intention of local MSEs for the halal certificates? Need to include practical and theoretical gaps in the Introduction part.

The literature review is not coherently discussed. Lack of justifications for the hypotheses development.

The population, sample, sample size, sampling technique, and data collection procedure need to be highlighted and discussed in detail.

Please justify why 100 samples were used for data analysis. ‘The questionnaires were distributed electronically to the West Java MSME community. The questionnaires were returned by 376 people. The returned questionnaires were then sorted using predetermined criteria, yielding 137 questionnaires that met the criteria. However, due to the limitations of the software features used, this study only processed 100 questionnaires at random.’

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Are the conclusions drawn adequately supported by the results?

Partly

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** marketing and supply chain management

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

**Author Response 29 Aug 2022**

**Endang Prasetyaningsih,** Universitas Islam Bandung, Bandung, Indonesia

Thank you for your insightful comments. Each comment is addressed in a point-by-point format.

1. The practical gaps are not aligned with the research objectives. What is the relationship between the global market and the intention of local MSEs for the halal certificates? Need to include practical and theoretical gaps in the Introduction part.

**Response:**
We have rewritten the introduction section.

The purpose of this study is to assess the level of halal awareness and the intention of food producers in West Java Province Indonesia to register for halal certification. Hence, we rewrite the introduction section to describe the gap between the necessity of having a halal certificate and the negative perception of halal certification among food entrepreneurs in several Indonesian cities.

2. The literature review is not coherently discussed. Lack of justifications for the hypotheses development.

**Response:**
We have rewritten the literature review section

3. The population, sample, sample size, sampling technique, and data collection procedure need to be highlighted and discussed in detail.

**Response:**
We have added a new sub-section called "Population and Sample." and the data collection's description.

"Population and sample
The study was carried out in West Java Province, Indonesia. The population is the MSE food
producers listed in the Central Bureau of Statistics of West Java, such as producers of cassava chips, shredded catfish, “bagelen” cakes, chocolate “rangginang”, candied vegetables, market snacks, and so on. Categorization of business scale refers to the "Undang-Undang Republik Indonesia Nomor 20/2008" (Law of the Republic of Indonesia Number 20/2008). Table 2 shows the categorization of the business scale. The population chosen consisted of those who met the criteria 1) a food producer of micro and small-scale with annual sales turnover of fewer than 2,500 Rupiahs and net assets of fewer than 500 million Rupiahs; 2) have an ongoing business, and 3) no halal certificate.”

The convenience sampling technique was used in this study. The total food producer of MSE listed in the Central Bureau of Statistics of West Java was estimated to be around 2300 people. We worked with “Sahabat UMKM Jawa Barat” (West Java MSME association-English), a local association of micro, small, and medium-scale entrepreneurs who are engaged in a variety of fields such as culinary, fashion, crafts, and other businesses or industries. The local association has over 1000 members, with 68 percent of them being food and beverage entrepreneurs, or approximately 680 entrepreneurs. This study’s sample consists of food producers who meet the predetermined criteria among the 680 entrepreneurs.”

“Data collection
A questionnaire is chosen as the research instrument. The questionnaires were re-translated from English to Indonesian, except for those references that were already in Indonesian. Each variable is made up of measurement items which are scored on a Likert scale of 1 (strongly disagree) to 5 (strongly agree).
A Google Form with a cover letter and a set of questionnaires were sent out to the potential respondents who are members of the West Java MSME association WhatsApp groups. This method was chosen because of the COVID-19 pandemic outbreak. In addition, the designed questionnaires could be collected without conducting direct visits to the respondents. The respondents could not participate in the survey unless they gave their written consent. Data were collected from March to May 2020. A copy of the distributed questionnaires can be found in Extended Data. The questionnaire was pretested with a small sample of members of the West Java MSME association before being distributed to the actual respondents. Based on pretest feedback, the wording of some items was refined and modified to guarantee that the validity and reliability of each variable meet the required standard. The question items were scored on a Likert scale of 1 (strongly disagree) to 5 (strongly agree). The follow-up of this plan is described later in the data preparation section.
The convenience sampling method is used in the following manner.
1. Distribute questionnaires,
2. Wait for responses to the distributed questionnaire,
3. Collect data until the sample count is adequate.
4. Screen participants based on the criteria specified.”

4. Please justify why 100 samples were used for data analysis. ‘The questionnaires were distributed electronically to the West Java MSME community. The questionnaires were returned by 376 people. The returned questionnaires were then sorted using predetermined criteria, yielding 137 questionnaires that met the criteria. However, due to the limitations of the software features used, this study only processed 100 questionnaires at random.’
Response:
In the revised manuscript, we recalculated by increasing the number of respondents from 100 to 137 based on the reviewers' recommendations.

Competing Interests: We declared no competing interests

Yukichika Kawata
Faculty of Economics, Kindai University, Higashiosaka, Japan

I found that the topics of this study reflect the current Indonesian status of halal certification and would attract the interest of both scholars and the general public. However, some significant issues remain unaddressed.

Major comments:

M1) The procedure for constructing the sample is not appropriate. The authors state that:

“The questionnaires were returned by 376 people. The returned questionnaires were then sorted using predetermined criteria, yielding 137 questionnaires that met the criteria. However, due to the limitations of the software features used, this study only processed 100 questionnaires at random.”

It is not acceptable to select 100 out of 137 questionnaires, even if they are randomly selected. The limitations of the software may not be reasonable ground for such an exclusion because other open-source and academically-sound software such as “R” is available, which provides packages to conduct PLS-SEM or other SEMs.

M2) The explanations on how the final model is constructed are insufficient. For example, the authors do not report any indices of goodness-of-fit such as AIC, GFI, AGFI, and CFI.

M3) What is the purpose of this study? The main targets of this study are micro and small-scale food enterprises, and the authors state that:

“Hence, this study aims at measuring the level of halal awareness and the intention of food MSE entrepreneurs in West Java Province, Indonesia to register halal certification.”
I do not understand why the authors repeatedly explain the situation of exports to other countries and the status of importing countries such as the Philippines. Such descriptions seem to be redundant. For example,

“The globalization of the halal industry provides an opportunity for local micro and small-scale enterprises (MSEs) to sell halal products. Local MSEs, on the other hand, are hesitant to compete in the global market because they lack halal certificates, which are one of the most important requirements for entering the global market. Halal certifications are also regarded as a quality-control standard among Muslim consumers. Many non-Muslims have no qualms about eating halal food, but they may react negatively if they eat halal food accidentally and feel cheated. As a result, MSEs that want to enter the global market must have a halal certificate.”

“Non-halal restaurant owners in Manila, Philippines are generally aware of the 12 halal certification standards (raw materials, tools and equipment, facilities, buildings, exterior areas, location, halal documentation, staff characteristics, staff policies, pest controls, management responsibilities, and waste management), and the majority are ‘Willing’ to be halal certified.”

“Halal food certificates are required to increase self-confidence, customer trust, and customer satisfaction, although SMEs in Hat Yai, Thailand are dissatisfied with the poor dissemination of halal hub information.”

If the authors intend to examine the possibility of food exports by MSEs in West Java Province, the discussion section would require to be revised to meet such objectives.

M4) The explanation of the basic information regarding food micro and small-scale enterprises (food MSEs) in West Java Province is inadequate. The authors state that:

“According to our observations, the majority of micro and small-scale food entrepreneurs in West Java purchase raw materials and process them into finished products without storing and shipping.”

Is the authors' main target traditional restaurants such as “Kaki lima,” “Warung,” and “Rumah makan”? Please explain the types of food MSEs in greater detail. Which of the following are included under food MSEs in this study: producers, wholesalers, retailers, distributors, or restaurants? Also, please specify or give examples of what foods (e.g., carcasses at the middle, or dressed meats at almost the final stage of the food system) MSEs mainly treat.

Minor comments:

S1) The authors state the following:

“With the issuance of “Undang-Undang Republik Indonesia No 33 Tahun 2014” (Law of Republic Indonesia No 33/2014 - English) regarding halal product guarantees, the halal certification has become a requirement for producers in Indonesia.”

They also state,

“Although Islam is the majority religion in Indonesia, most micro, small, and medium enterprises (MSMEs) do not register their products for halal certification. Only 10% of MSMEs have halal certificates,
according to the Association of Food and Beverage Entrepreneurs (GAPMMI) in June 2019."

It appears that these two explanations are contradictory. Kindly elucidate further.

S2) I do not agree with the following description,

"These indicate the food MSEs' lack of understanding and awareness of the importance of halal products."

It is untrue that food MSEs lack understanding and awareness of the importance of halal products. However, they lack the necessity to obtain halal certificates. Most target local markets and may not intend to export their products to Muslims in other countries. If so, they have no incentive to acquire a halal certification for trade within Indonesia or export outside Indonesia.

S3) Is the following extract from the paper related to “halal awareness”? Since CSR is a broader concept, it might be beneficial for readers if you add an explanation of CSR in Islamic or Indonesian contexts.

"Meanwhile, the procedure for obtaining halal certificates is relatively complex, thereby reducing the intention of SMEs to register halal certification. Meanwhile, Lee and Shin37 found that consumers' awareness of Corporate Social Responsibility (CSR) activities and purchase intentions are positively related."

S4) The authors write “attitude to produce halal product (AHC)” in the body text.

"Referring to Giyanti and Indriastiningsih,14 Waluyo,19 and Lee and Shin,37 and the Planned Behavior Theory,32 this study identifies that the variables are knowledge of halal (KH), perception of benefits (PB), perception of procedures (PP), halal awareness (HA), attitude to produce halal product (AHC) and intention to register a halal certificate."

However, they write “Attitude to register halal product” in Figure 1. Are they both correct?

S5) Please add a brief explanation on "green foods" and possibly also on the relationship between the halal concept and green foods.

"Consumer awareness of the green concept is a strong predictor of their intention to consume green foods,17 while customer awareness towards the halal logo fosters purchase intention."

S6) Please explain the following in more detail:

"Initially, 680 micro and small-scale food and beverage entrepreneurs in the West Java MSME community were targeted."

It is not clear if 680 is the total number of micro-and small-scale food and beverage entrepreneurs in West Java or if it is the number of entrepreneurs selected by the authors. Please consider adding the total number of micro, small, and medium food and beverage entrepreneurs in West Java in Table 1 and the number of micro and small entrepreneurs that were targets of this study.
S7) Please specify if those involved in the pilot survey are from West Java or other provinces.

“The questionnaire was pretested with a small sample of food MSE entrepreneurs before being distributed to the actual respondents.”

S8) Please consider using "Partial Least Squares Structural Equation Modeling (PLS-SEM)” instead of “Structural Equation Model-Partial Least Square (SEM-PLS).”

S9) The following literature is not cited in the body text:


S10) Please consider quoting references for this procedure:

“We analyzed the chi-square of early and late respondents’ responses to see if there was any potential for non-response bias (the first and last 20 percent of responses received).”

S11) Please also explain how many responses are considered: "376 people", "137 questionnaires", or "100 questionnaires”? If either 137 or 100 questionnaires are used, the results may be inaccurate if only earlier replies are considered for examination. This would hinder possible differences among respondents and may potentially cause biases.

I also did not understand the procedure followed while gathering questionnaires. The following two descriptions appear inconsistent:

“As a result, the data collected reached 100 respondents in just a matter of days. Due to the limitations of the software features used, the distribution of the questionnaire was halted. As a result, all collected data was subjected to validity and reliability tests.”

“The questionnaires were distributed electronically to the West Java MSME community. The questionnaires were returned by 376 people. The returned questionnaires were then sorted using predetermined criteria, yielding 137 questionnaires that met the criteria. However, due to the limitations of the software features used, this study only processed 100 questionnaires at random.”

As pointed out in the major comment, I do not agree with the use of 100 samples.

S12) Please add the corresponding population statistics to Table 7 and briefly discuss the possible biases, if any.

“Table 7 displays the percentage of respondents for each indicator. As shown in Table 7, 98% of respondents have Islam as their religion (Muslim), 71% are female, and 88% are 26 years old or older.”

S13) Why do the authors not remove Christians from the selected 100 respondents? (Table 7 shows one Catholic and one Protestant.)

S14) Please consider aligning digits in Table 8, e.g., "3.2225" maybe "3.223", etc.
S15) Please specify the percentage selected by the authors as statistically significant (e.g., 5%) in Table 9.

S16) Please use a period instead of a comma as a decimal point. For example, the authors used both in the following paragraph (82,6% and 82.6%, respectively).

“Besides, the R2 value of 0.826 for HA means that 82.6% of the variance in HA is influenced by KH and PB, with values $\beta = 0.292$ and 0.683 respectively. Hence, KH and PB have a strong and significant impact on the awareness of MSE entrepreneurs about the importance of halal products. According to Hair, et al.41 R2 values of 0.75, 0.50, or 0.25 for the endogenous construct, respectively, can be described as substantial, moderate, or weak. The R2 value of an endogenous latent variable (i.e., halal awareness) described by the two predictive constructs in this study is 82.6% (see Figure 2), which is substantial.”

S17) The intended meaning of the following sentence is ambiguous.

“The finding that knowledge of halal has a significant impact on knowledge of halal is different from the finding of Giyanti and Indriastiningsih14”

The phrase “knowledge of halal has a significant impact on knowledge of halal” is not clear. Please consider rewording it.

Please also add a period at the end of this sentence.

S18) I do not understand the following paragraph. Did the MSE find it beneficial or unnecessary to obtain halal certificates?

“The findings also show that MSEs are aware of the benefits of the halal certificate. Based on our observation, we find that they do not require a halal certificate because they have satisfied with the sales/performance that has been achieved.”

Similarly, I also do not understand why the authors conclude “[h]alal certificates will therefore increase sales and revenue” in the following context? Please consider a more logical construction of the sentence.

“They are unaware that halal certificates will increase consumer trust and help food businesses compete more effectively. Halal certificates will therefore increase sales and revenue.”

S19) Please explain the relationship between respondents of this study and “street vendors around Universitas Islam Bandung (Unisba)” that is mentioned in the “Discussion” section.

“Socialization and training on halal awareness, halal guarantee system, and halal certification for street vendors around Universitas Islam Bandung (Unisba) which is located at Bandung, the Capital of West Java Province Indonesia have been conducted by Oemar et al.13 The trainees gain a better understanding and awareness of halal food as a result of the training. Consequently, all trainees intend to obtain a Halal Certificate.”

S 20) Please recheck the references carefully. For example, you can quote my work (reference 9), but the publication year, pages, etc., are incorrect.
Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** applied economics

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

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**Author Response 29 Aug 2022**

**Endang Prasetyaningsih,** Universitas Islam Bandung, Bandung, Indonesia

Thank you for your insightful comments. Each comment is addressed in a point-by-point format.

**Major comments:**

M1) The procedure for constructing the sample is not appropriate. The authors state that:

"The questionnaires were returned by 376 people. The returned questionnaires were then sorted using predetermined criteria, yielding 137 questionnaires that met the criteria. However, due to the limitations of the software features used, this study only processed 100 questionnaires at random."

It is not acceptable to select 100 out of 137 questionnaires, even if they are randomly selected. The limitations of the software may not be reasonable ground for such an exclusion because other open-source and academically-sound software such as “R” is available, which provides packages to conduct PLS-SEM or other SEMs.
Response: We recalculated by increasing the number of respondents from 100 to 137 in the revised manuscript.

**M2)** The explanations on how the final model is constructed are insufficient. For example, the authors do not report any indices of goodness-of-fit such as AIC, GFI, AGFI, and CFI.

Response: PLS-SEM uses SRMS, and RMS\textsubscript{\theta} to test the model fit. We state that

“The PLS-SEM model fit is evaluated using standardized root mean square residual (SRMR), root mean square residual covariance (RMS\textsubscript{\theta}), or the exact fit test to determine how well it predicts endogenous variables/constructs.\textsuperscript{41}”

We choose SRMR where the result is stated as follows

“This study uses the standardized root means square (SRMR) to assess model fit. The SRMR is 0.067, less than 0.08, indicating that the model meets the model fit criteria. Furthermore, the data can be used to estimate the model.”

**M3)** What is the purpose of this study? The main targets of this study are micro and small-scale food enterprises, and the authors state that:

“Hence, this study aims at measuring the level of halal awareness and the intention of food MSE entrepreneurs in West Java Province, Indonesia to register halal certification.”

I do not understand why the authors repeatedly explain the situation of exports to other countries and the status of importing countries such as the Philippines. Such descriptions seem to be redundant. For example,

“The globalization of the halal industry provides an opportunity for local micro and small-scale enterprises (MSEs) to sell halal products. Local MSEs, on the other hand, are hesitant to compete in the global market because they lack halal certificates, which are one of the most important requirements for entering the global market. Halal certifications are also regarded as a quality-control standard among Muslim consumers. Many non-Muslims have no qualms about eating halal food, but they may react negatively if they eat halal food accidentally and feel cheated.\textsuperscript{3} As a result, MSEs that want to enter the global market must have a halal certificate.”

“Non-halal restaurant owners in Manila, Philippines are generally aware of the 12 halal certification standards (raw materials, tools and equipment, facilities, buildings, exterior areas, location, halal documentation, staff characteristics, staff policies, pest controls, management responsibilities, and waste management), and the majority are ‘Willing’ to be halal certified.”

“Halal food certificates are required to increase self-confidence, customer trust, and customer satisfaction, although SMEs in Hat Yai, Thailand are dissatisfied with the poor dissemination of halal hub information.”

If the authors intend to examine the possibility of food exports by MSEs in West Java
Province, the discussion section would require to be revised to meet such objectives.

Response:
The purpose of this study is not to investigate the possibility of food exports by MSEs in West Java Province, but to assess the level of halal awareness and the intention of food producers in West Java Province, Indonesia, to register for halal certification. Therefore, we rewrite the introduction section to describe the gap between the necessity of having a halal certificate and the negative perception of halal certification among food entrepreneurs in several Indonesian cities.

M4) The explanation of the basic information regarding food micro and small-scale enterprises (food MSEs) in West Java Province is inadequate. The authors state that:

“According to our observations, the majority of micro and small-scale food entrepreneurs in West Java purchase raw materials and process them into finished products without storing and shipping.”

Is the authors’ main target traditional restaurants such as “Kaki lima,” “Warung,” and “Rumah makan”? Please explain the types of food MSEs in greater detail. Which of the following are included under food MSEs in this study: producers, wholesalers, retailers, distributors, or restaurants? Also, please specify or give examples of what foods (e.g., carcasses at the middle, or dressed meats at almost the final stage of the food system) MSEs mainly treat.

Response:
We revised the statement to be:

“The study was carried out in West Java Province, Indonesia. The population is the MSE food producers listed in the Central Bureau of Statistics of West Java, such as producers of cassava chips, shredded catfish, “bagelen” cakes, chocolate “rangginang”, candied vegetables, market snacks, and so on.”

Minor comments:

S1) The authors state the following:

“With the issuance of “Undang-Undang Republik Indonesia No 33 Tahun 2014” (Law of Republic Indonesia No 33/2014 - English)10 regarding halal product guarantees, the halal certification has become a requirement for producers in Indonesia.”

They also state,

“Although Islam is the majority religion in Indonesia, most micro, small, and medium enterprises
(MSMEs) do not register their products for halal certification. Only 10% of MSMEs have halal certificates, according to the Association of Food and Beverage Entrepreneurs (GAPMMI) in June 2019.”

It appears that these two explanations are contradictory. Kindly elucidate further.

Response:
We rewrite the introduction section and describe the contradiction.

“Indonesia is a country where Islam is the majority religion. The Indonesian government has mandated that food producers have halal certificates to protect consumers, particularly Muslim consumers when purchasing food, by issuing Undang-Undang Republik Indonesia No 33 Tahun 2014” (Law of Republic Indonesia No 33/2014 - English) regarding halal product guarantees. However, statistics show that the majority of food micro, small, and medium-scale enterprises (food MSMEs) do not register their products for halal certification. According to the Association of Food and Beverage Entrepreneurs (GAPMMI) in June 2019, only 10% of MSMEs have halal certificates. This contradiction indicates that the intention of SMEs to sell halal-certified products remains low. They may be unaware of the benefits of halal certification or have a negative perception of halal certificates. Several studies on the perception of halal certificates have been conducted in various cities in Indonesia.”

S2) I do not agree with the following description, “These indicate the food MSEs' lack of understanding and awareness of the importance of halal products.”

It is untrue that food MSEs lack understanding and awareness of the importance of halal products. However, they lack the necessity to obtain halal certificates. Most target local markets and may not intend to export their products to Muslims in other countries. If so, they have no incentive to acquire a halal certification for trade within Indonesia or export outside Indonesia.

Response:
Focus on the purpose of our research; we do not discuss product export; rather, we measure awareness and intention to register for a halal certificate. Several studies on food entrepreneurs’ perceptions of halal certification in several Indonesian cities are as follows.

“The majority of MSME entrepreneurs in some cities of East Java Province, Indonesia, such as Bangkalan, Pamekasan, and Pasuruan, understand the significance of halal certificates. However, they consider halal certification to be unimportant. In East Kalimantan Province, Indonesia the MSME entrepreneurs even underestimate the halal certificate due to believing that their business is running smoothly despite the lack of a halal certificate. Meanwhile, entrepreneurs in other Indonesian cities such as the Greater Jakarta Area, Malang City East Java Province, and Surakarta City Central Java Province did not register halal certification because they perceive the process as difficult and costly. These cases indicate MSME entrepreneurs’ lack of necessity for obtaining halal certificates.”

S3) Is the following extract from the paper related to “halal awareness”? Since CSR is a broader concept, it might be beneficial for readers if you add an explanation of CSR in
Islamic or Indonesian contexts.

“Meanwhile, the procedure for obtaining halal certificates is relatively complex, thereby reducing the intention of SMEs to register halal certification. Meanwhile, Lee and Shin 37 found that consumers’ awareness of Corporate Social Responsibility (CSR) activities and purchase intentions are positively related.”

Response:
We concentrate on the findings of the Lee and Shin 37 study, specifically the relationship between awareness and intention, rather than the case study. Hence, we updated the explanation as follows:

“According to Liba et al.,9 Elias et al.,20 and Masithoh et al.,21 awareness of halal is positively correlated with the intention to obtain halal certification. Meanwhile, Dinev and Hu,22–25 Bachok et al.,23 Lee and Shin,24 Rezai et al.,25 state that customer awareness is a strong predictor of a customer's intent to buy or select a product. These indicate that awareness influences intention.”

S4) The authors write “attitude to produce halal product (AHC)” in the body text.

“Referring to Giyanti and Indriastiningsih,14 Waluyo,19 and Lee and Shin,37 and the Planned Behavior Theory,32 this study identifies that the variables are knowledge of halal (KH), perception of benefits (PB), perception of procedures (PP), halal awareness (HA), attitude to produce halal product (AHC) and intention to register a halal certificate.” However, they write “Attitude to register halal product” in Figure 1. Are they both correct?

Response:
We revised the explanation and Figure 1.

S5) Please add a brief explanation on "green foods" and possibly also on the relationship between the halal concept and green foods.

“Consumer awareness of the green concept is a strong predictor of their intention to consume green foods,17 while customer awareness towards the halal logo fosters purchase intention.”

Response:
We are interested in the study's findings, specifically the relationship between awareness and intention, rather than the relationship between the halal concept and green foods. As a result, we revised the explanation as follows:

“Consumer awareness is a strong predictor of their intention to consume/purchase foods.23,25”

S6) Please explain the following in more detail:

“Initially, 680 micro and small-scale food and beverage entrepreneurs in the West Java MSME community were targeted.”
It is not clear if 680 is the total number of micro-and small-scale food and beverage entrepreneurs in West Java or if it is the number of entrepreneurs selected by the authors. Please consider adding the total number of micro, small, and medium food and beverage entrepreneurs in West Java in Table 1 and the number of micro and small entrepreneurs that were targets of this study.

Response:
We revise the explanation as follows:

“The convenience sampling technique was used in this study. The total food producer of MSE listed in the Central Bureau of Statistics of West Java was estimated to be around 2300 people. We worked with "Sahabat UMKM Jawa Barat" (West Java MSME association-English), a local association of micro, small, and medium-scale entrepreneurs who are engaged in a variety of fields such as culinary, fashion, crafts, and other businesses or industries. The local association has over 1000 members, with 68 percent of them being food and beverage entrepreneurs, or approximately 680 entrepreneurs. This study's sample consists of food producers who meet the predetermined criteria among the 680 entrepreneurs."

S7) Please specify if those involved in the pilot survey are from West Java or other provinces.

“The questionnaire was pretested with a small sample of food MSE entrepreneurs before being distributed to the actual respondents.”

Response:
We included the pilot survey participant in the following statement:

“The questionnaire was pretested with a small sample of members of the West Java MSME association before being distributed to the actual respondents.”

S8) Please consider using "Partial Least Squares Structural Equation Modeling (PLS-SEM)" instead of “Structural Equation Model-Partial Least Square (SEM-PLS).”

Response:
As suggested, we have revised SEM-PLS to PLS-SEM.

S9) The following literature is not cited in the body text:


Response:
We have quoted "Undang-Undang Republik Indonesia Nomor 20/2008“ (Law of the Republic of Indonesia Number 20/2008).39 in body text and Table 2 as follows:

“Categorization of business scale refers to the "Undang-Undang Republik Indonesia Nomor 20/2008“ (Law of the Republic of Indonesia Number 20/2008).39"
“Table 2. Category of micro, small and medium business in Indonesia according to Law of the Republic of Indonesia No. 20/2008."
137 respondents who met the predetermined criteria, so all collected data were subjected to validity and reliability tests.”

As pointed out in the major comment, I do not agree with the use of 100 samples.

S12) Please add the corresponding population statistics to Table 7 and briefly discuss the possible biases, if any.

“Table 7 displays the percentage of respondents for each indicator. As shown in Table 7, 98% of respondents have Islam as their religion (Muslim), 71% are female, and 88% are 26 years old or older.”

Response:
We tested the non-biased response, and the results are as follows:

“We examined the responses of early and late respondents to see if there was any possibility of non-response bias. According to Lindner et al.,44 respondents were classified into two groups: early and late respondents. Late respondents were operationally and arbitrarily defined as the last half of respondents. Because there were 137 respondents in this study, 69 were identified as early respondents and 68 as late respondents. Hence, the independent samples t-test was then used to compare the two groups' responses to Likert scale questions. The findings show that there is no significant difference in key metrics responses between early and late respondents.”

S13) Why do the authors not remove Christians from the selected 100 respondents? (Table 7 shows one Catholic and one Protestant.)

Response:
We state that

“Non-Muslim respondents are involved because producing halal food regardless of the religion of the food producers.”

S14) Please consider aligning digits in Table 8, e.g., ”3.2225" maybe "3.223", etc.

Response:
We have revised the numbers

S15) Please specify the percentage selected by the authors as statistically significant (e.g., 5%) in Table 9.

Response:
We add the significance level of 5% in the body text and Table 12.

“By using a significance level of 5%, the path coefficient will be significant if the t-value is larger than 1.65.”

S16) Please use a period instead of a comma as a decimal point. For example, the authors
used both in the following paragraph (82.6% and 82.6%, respectively).

“Besides, the $R^2$ value of 0.826 for HA means that 82.6% of the variance in HA is influenced by KH and PB, with values $\beta = 0.292$ and 0.683 respectively. Hence, KH and PB have a strong and significant impact on the awareness of MSE entrepreneurs about the importance of halal products. According to Hair, et al. R2 values of 0.75, 0.50, or 0.25 for the endogenous construct, respectively, can be described as substantial, moderate, or weak. The $R^2$ value of an endogenous latent variable (i.e., halal awareness) described by the two predictive constructs in this study is 82.6% (see Figure 2), which is substantial.”

Response:
We use a period as a decimal point in the following paragraph

“Besides, the $R^2$ value of 0.841 for HA means that 84.1% of the variance in HA is influenced by KH and PB, with values $\beta = 0.169$ and 0.791 respectively. Hence, KH and PB have a strong and significant impact on the halal awareness of MSE food producers.”

“According to Hair, et al. R2 values of 0.75, 0.50, or 0.25 for the endogenous construct, respectively, can be described as substantial, moderate, or weak. The $R^2$ value of an endogenous latent variable (i.e., halal awareness) described by the two predictive constructs in this study is 84.1% (see Figure 3), which is substantial.”

S17) The intended meaning of the following sentence is ambiguous.

“The finding that knowledge of halal has a significant impact on knowledge of halal is different from the finding of Giyanti and Indriastiningsih14”

The phrase “knowledge of halal has a significant impact on knowledge of halal” is not clear. Please consider rewording it.

Please also add a period at the end of this sentence.

Response:
We revised the explanation as follows:

“The finding that knowledge of halal has a significant impact on halal awareness is different from the finding of Giyanti and Indriastiningsih16”

S18) I do not understand the following paragraph. Did the MSE find it beneficial or unnecessary to obtain halal certificates?

“The findings also show that MSEs are aware of the benefits of the halal certificate. Based on our observation, we find that they do not require a halal certificate because they have satisfied with the sales/performance that has been achieved.”

Response:
The explanation has been revised as follows:
“The findings also indicate that MSE food producers are aware of the benefits of the halal certificate. However, our observation revealed that they perceive obtaining a halal certificate as prohibitively expensive. It will cause the halal-certified product’s selling price to rise. They are concerned that increasing selling prices will reduce sales. As a result, they perceive that obtaining a halal certificate is unnecessary. In any case, their business is running smoothly without the halal certificate. It aligns with the findings of Prabowo et al.13”

Similarly, I also do not understand why the authors conclude “[h]alal certificates will therefore increase sales and revenue” in the following context? Please consider a more logical construction of the sentence.

“They are unaware that halal certificates will increase consumer trust and help food businesses compete more effectively. Halal certificates will therefore increase sales and revenue.”

Response:
We delete this statement due to the contradiction with the previous statement.

S19) Please explain the relationship between respondents of this study and “street vendors around Universitas Islam Bandung (Unisba)” that is mentioned in the “Discussion” section.

“Socialization and training on halal awareness, halal guarantee system, and halal certification for street vendors around Universitas Islam Bandung (Unisba) which is located at Bandung, the Capital of West Java Province Indonesia have been conducted by Oemar et al.13 The trainees gain a better understanding and awareness of halal food as a result of the training. Consequently, all trainees intend to obtain a Halal Certificate.”

Response:
The explanation has been revised as follows.

“Oemar et al.17 proved that socialization and training on halal awareness, halal assurance systems, and halal certification increase the understanding and awareness about halal-certified food so that all participants intend to obtain a Halal Certificate after completing the training.”

S 20) Please recheck the references carefully. For example, you can quote my work (reference 9), but the publication year, pages, etc., are incorrect.

Response:
The reference writing has been corrected.

**Competing Interests:** We declared no competing interests
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