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Analysis of the Impact of Halal Certificate on the Performance of Micro and Small Enterprises (SMEs) with the Propensity Score Matching (PSM) Method

Cover Page Footnote

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The Analysis of the Impact of Halal Certificate on the Performance of Micro and Small Enterprises with the Propensity Score Matching Method

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ABSTRACT

The government passed Article No. 33, 2014 concerning Halal Product Guarantee as a mandatory halal regulation in the hope of realizing protection for Muslim consumers and to provide added value for SMEs. However, until 2019, only 1% of SMEs have been certified halal (MUI, 2021). Therefore, it is important to know the impact of halal certificates on the performance of SMEs. Researchers compared the performance of SMEs that are halal certified with SMEs that have not been halal certified using quantitative research designs with the Propensity Score Matching method. The PSM method can balance or equalize groups of research subjects with the matching method. With this method the treatment group is paired with the non-treated group based on the observed covariates. This method is used to reduce bias in the estimation of treatment effects on observational data due to confounding factors. Propensity Score is a conditional probability of getting a certain treatment based on the observed covariates. The results of the study stated that there was a difference in performance between MSEs that were halal-certified and SMEs that were not halal-certified, but the effect of the halal certificate was not significant on the performance of SMEs.

Keywords: Halal certification; Micro and Small Enterprises; Propensity Score Matching; confounding; SMEs performance.

1. Introduction

Based on data obtained from the Central Statistics Agency, in 2015 to 2020 the amount of consumption of Indonesian halal products will reach 258.195 million people and is predicted to continue to increase by 262.733 million people in 2025-2030 then increase again by 267.038 million people in 2040-2045. The large contribution of halal product spending for Muslims in Indonesia even on a global scale Indonesia ranked 10th in 2018/2019 according to the State of Global Islamic Report 2019 report. This shows that it is true that there is an increase in the trend

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of halal lifestyle as a form of obedience of Muslims to carry out what Allah commands in the Qur'an verses.

The Ministry of Cooperatives and SMEs of the Republic of Indonesia reported that in terms of the number of units, MSMEs have a share of around 99.99% (62.9 million units) of the total business actors in Indonesia (2017), while large businesses only as much as 0.01% or around 5400 units. This means that MSMEs have a great potential to increase the development of Indonesia's halal industry.

The halal industry is closely related to halal certificates which are a sign that a product is a halal product. In addition, since 2019, halal certificates must be owned by all business actors who are subject to obligations. Law No. 33 of 2014 concerning Halal Product Guarantee article 4 which states that products that enter, circulate and are traded in the territory of Indonesia must be halal certified. Sanctions for these violations are in the form of the threat of imprisonment for a maximum of 5 years or a maximum criminal fine of Rp. 2,000,000,000 (Two Billion Rupiah) as stated in UUJPH Articles 41 and 56. However, according to statistical data on halal products from the Food Assessment Institute for Medicines and Cosmetics of the Indonesian Ulema Council, business units that have been certified halal (without separating micro-enterprises, small businesses and large businesses) until 2019 are 69,577 business units. Thus only 0.11% of businesses are certified halal.

Therefore, the problem is why micro and small enterprises actors do not aggressively want to have halal certificates, how does halal certificate impact on the performance of micro and small enterprises. Departing from the above problems, the researcher wants to further analyze the impact of halal certificate ownership on the performance of MSEs using the Propensity Score Matching method. Some of the results of previous research, one of which was conducted by Ab Talib, M. S., Chin, T. A., and Fischer, J. (2017) stated that food halal certificates have a positive and significant relationship with operational performance and financial performance. However, there has been no previous research that evaluates the impact of halal certification that uses a special method for evaluating a treatment, namely the Propensity Score Matching method.

Difficulty in measuring an impact in this case the halal certificate is the existence of the difference in the characteristics of each respondent who bias may occur. One of the powerful

methods to eliminate bias in measuring impact on an activity is Propensity Score Matching method. In this research, the PSM method is used to measuring the impact of halal certificates to the performance of micro and small enterprises in Indonesia.

2. Literature Review

The literature on use of propensity scores can be attributed to the seminal work of Rosenbaum and Rubin (1983). In true randomization, participants have an equal probability of being assigned to either a treatment or comparison group. As a result, groups can be compared to one another because systematic differences have been controlled through the experimental nature of the design. Conversely, quasi-experimental designs are subject to participant self-selection which introduces bias when comparing differences in the treatment effect between groups. This may threaten a study's internal validity given an unequal and unknown probability of group assignment. As a result, groups may not be comparable at baseline. Propensity score matching accounts for this problem by using regression techniques to predict group assignment from theoretically relevant covariates and then matches participants on these predicted scores.

Propensity score can be used to lower the bias influence of potential confounders (Ariawan, 2007). by minimizing the potential for bias that occurs, the conclusions obtained at the end of the study will be more precise. Theoretically relevant pretreatment variables are used to derive probabilities of group treatment which are then used to match participants in treatment and comparison groups such that both groups have equal means or likelihoods of receiving treatment. Once matched, any differences between these groups should be more reflective of the true treatment effects in the population and analogous to the interpretation of randomized design.

These methods include matching, regression adjustment, and stratification (D'Agostino, 1998). Propensity score matching assumes that, once balanced (i.e., statistically equal group means on propensity scores and covariates), there are no systematic differences between groups. Therefore, treatment effects can be estimated on the outcome variable(s) by testing in newly matched sample through a t -test or appropriate multi-group equivalent analysis.

3. Research Methodology

3.1 Population and Sample

The selection of respondents was carried out using the purposive sampling method, namely the sample was selected directly (purposive) in accordance with the research objectives, which consisted of two groups of SME actors who had halal certificates and the SME group who did not have halal certificates as a comparison (control).

The population in this study is several SME actors spread throughout Indonesia. The sample used was as many as 95 SMEs who were willing to fill out the questionnaire with the criteria for SMEs included in the classification of Micro, Small Enterprises based on those regulated in Law Number 20 of 2008 concerning Micro, Small Businesses including the number of employees, assets owned, average sales results per year, and business profits per year. This study used primary and secondary data collection methods. Primary data collection was carried out using questionnaires, interviews, and observations. Secondary data collection includes literature materials that support research.

3.2 Data Analysis Techniques

According to Shahidur R. Khandker Gayatri B. Koolwal Hussain A. Samad (2010), steps in conducting the analysis by using the first PSM method, namely aestheticizing the propensity score by means of select the model and variables to use in the model. models used in this research is by using regression logit. Variables used in the equation logit among other treatment variables (treatment variable) namely halal certificates and the characteristics of SMEs as independent variables. The characteristics of SMEs that are expected in this study include the age of SMEs, the type of business product, the location of the business, and the level of education of business actors. Dummy variables for this logit equation are 1 for groups that have halal certificates and 0 for groups that do not have halal certificates.

The second step is to choose matching algorithms used to perform the matching process inter-covariate. There are four methods in do this matching. Among them nearest neighbor matching, radius matching, Kernel matching, and stratification matching. Method matching used in the study is Nearest Neighbor Matching (NNM). NNM is a method of being done by the way selecting the nearest score of the covariate in control group.

The third step is to identify overlap and common support between the two group and at the time of comparison look its distribution. In this step some observations issued because there is a difference in value the distant one i.e., has too high a score or too low. Then perform the test the balance used to see flat PSM control. Differences in yield variables done by knowing the average difference in the treatment group, which is usually known as the average effect of treatment for the treated.

The last step is to assess the matching quality to Measure the quality matching between SMEs that are halal certified and SMEs that are not halal certified with the method used, namely using a t-test. matching quality will be good when the calculated t value obtained is high or t count from t table.

4. Results

4.1 Statistic Descriptive of SMEs Characteristics

From the results of a survey that has been conducted on 95 respondents, there are 48 SMEs that are halal certified and 47 SMEs that are not halal certified. Table 1 shows the comparison of characteristics SMEs that are halal certified and SMEs that are not halal certified.

Table 1. Comparison of Respondent Characteristics

| Variable | Halal Certificate | | N | P | OR (95% CI) | |
|--------------------|--------------------|----|----|----|-------------|---------------------|
| | Yes | No | | | | |
| Age of SME | < 3 years | 3 | 9 | 12 | 0.002 | 3.44 (1.596-7.434) |
| | 1-3 years | 8 | 20 | 28 | | |
| | > 3 years | 37 | 18 | 55 | | |
| Type of product | Food and Beverages | 47 | 35 | 82 | 0.009 | 17.37(2.033-148.35) |
| | Others | 1 | 12 | 13 | | |
| Business location | Outside | 27 | 20 | 47 | 0.238 | 1.39(0.805-2.391) |
| | Jabodetabek | 7 | 11 | 18 | | |
| | Outside Java | 14 | 16 | 30 | | |
| Level of Education | High | 38 | 40 | 78 | 0.650 | 1.33(0.384-4.622) |
| | Low | 10 | 7 | 17 | | |

There are two variables that have significant differences between SMEs that are halal certified and SMEs that are not halal certified, including the age of SMEs and the type of business

products. The age of business products that have halal certificates is significantly longer than the age of business products that do not have halal certificate. Types of business products that are halal certified are almost mostly in the field of food and beverages.

4.2 Logistic Regression Analysis

Table 2 shows logistic regression analysis results. Explanatory variables consist of the age of SMEs, types of business products, business locations, and the level of education of business actors.

Table 2. logistic regression analysis

| Variable | Coef. | Std. Err. | t-value | Significance |
|--------------------|---------|-----------|---------|--------------|
| Age of SME | 0.24782 | 0.68491 | 3.62 | 0.000* |
| Type of Product | 0.47060 | 0.13386 | 3.52 | 0.001* |
| Business Location | 0.72434 | 0.05237 | 1.38 | 0.170 |
| Number of Customer | 0.26630 | 0.05247 | 0.51 | 0.613 |
| Level of Education | 0.05637 | 0.12217 | 0.46 | 0.646 |

Logistic regression analysis results illustrating the influence of the characteristics SMEs to the ownership of halal certificates. There are two variables that have a significant effect on halal certificates including the age of SMEs and types of business products. The age of SMEs has important implications for the ownership of halal certificates. In the logit results, it can be seen that the P-value (significance) of the MSE age variable is 0.000 so that it can be concluded that there is a significant influence of the age of MSEs on the ownership of halal certificates with a real level of 5%. The variable coefficient of estimating the age of MSEs is positively marked (0.2478) meaning that the age of SMEs that are getting longer affects the possibility of increasing SMEs having halal certificates. This proves that the longer the age of the SME, the higher the desire of the SME actor to have a halal certificate. the more information obtained, the more knowing the importance of halal certificates for the performance of MSEs, the higher the desire to improve their business performance.

The type of business product based on the results of the logit test has a P-value of 0.001 so that this test can be concluded that there is a significant influence of the variable type of business product on the ownership of the UMK halal certificate with a real level of 5%. The variable coefficient of the type of business product is marked positively (0.47060) meaning that MSEs

whose business products in the food and beverage sector cause higher causes the possibility of respondents to have a halal certificate. SMEs in the food and beverage sector are the most crucial businesses in having halal certificates compared to businesses in other fields because the obligation of Muslims is to choose halal food and beverages.

4.3 Identifying Overlap and Common Support

In the PSM method, observations that have different propensity scores will be eliminated. The matching process of propensity scores allows all covariates to get a matching pair or from the results of the analysis obtained a total of 95 common support consisting of 47 control groups and 48 treatment groups. The common support can be seen in table 3. Thus, no observations are discarded during the matching process.

Table 3. Common Support

| Treatment | Off Support | On Support | Total |
|---------------------|-------------|------------|-------|
| Non Halal Certified | 0 | 47 | 47 |
| Halal Certified | 0 | 48 | 48 |
| Total Covariate | 0 | 95 | 95 |

5. Discussion

5.1 The Impact of Halal Certificates on SME Performance

The impact of halal certificates was analysed using the PSM method, namely matching the closest propensity value of each respondent of the treatment group (halal certified) with the control group (non halal certified) with one match. From this matching, the Average Treatment Effect on The Treated (ATT) value will be generated, which is the difference (different) value between the treatment group and the control group. This ATT value is a different value between the treatment group and the control group.

Insignificant variables influence the decision of SMEs to have halal certificates, namely business location and education level are discarded as covariates in calculating the Average Treatment Effect on The Treated (ATT). Table 4 shows the differences in the performance of the halal certified SME and non halal certified SME using the psmatch2 on STATA ver.16.

Table 4. the impact of halal certificates on the performance of SMEs

| Variable | Sample | Certified | Non Certified | Difference | S. E. | T-stat |
|--------------------|-----------|------------|---------------|------------|------------|--------|
| Profit | Unmatched | 11,354,167 | 8,085,106 | 3,269,060 | 1,562,178 | 2.09 |
| | ATT | 11,354,167 | 9,353,213 | 2,000,953 | 2,059,448 | 0.97 |
| Sales | Unmatched | 73,958,333 | 68,510,638 | 5,447,695 | 12,453,996 | 0.44 |
| | ATT | 73,958,333 | 58,828,426 | 15,129,906 | 16,332,748 | 0.93 |
| Number of Customer | Unmatched | 2.1458333 | 1.72340426 | 0.4224290 | 0.1919635 | 2.20 |
| | ATT | 2.1458333 | 1.97570804 | 0.1701252 | 0.2485182 | 0.68 |

In Table 4. shows impact halal certificate on the performance of micro and small businesses in Indonesia. From the results of the propensity score matching analysis before matching is done, the profit of SMEs that are halal certified and not halal certified has a difference of 3,269,060, which means that SMEs that are halal certified have a higher profit of Rp.3,269,060, compared to SMEs that are not halal certified. After matching the difference in SME profits halal certified is higher than profits non halal certified 2,000,953 which means SMEs with halal certificates have higher profit of Rp. 2,000,953 compared to SMEs that are not halal certified. This is not in line with the literature put forward by AB Talib et al (2018) where the halal certificate needs to be owned by SMEs to improve performance.

Same in the case of other performance, sales. The sales of SMEs that are halal certified and not halal certified has a difference of 5,447,695, which means that SMEs that are halal certified have a higher sales Rp. 5,447,695, compared to SMEs that are not halal certified. After matching the difference in SME sales halal certified is higher than sales non halal certified 15,129,906 which means SMEs with halal certificates have higher sales Rp. 15,129,906 compared to SMEs that are not halal certified.

In number of customer variable, the number of customer of SMEs that are halal certified and not halal certified has a difference of 0.4224290, which means that SMEs that are halal certified have a higher number of customers 0.4224290 compared to SMEs that are not halal certified. After matching the difference in SME number of customer halal certified is higher than number of customers non halal certified 0.1701252 which means SMEs with halal certificates have higher number of customers 0.1701252 compared to SMEs that are not halal certified.

The results of the T-stat show that before matching is 2.09 (T-stat>2), which means that halal certification has an impact on increasing business profits significantly. Meanwhile, after matching, the business profits of MSEs that have halal certificates and those that do not have halal certificates show insignificant differences with the results of T-stat 0.97 (T-stat<2). For sales, it shows the same results that the average sales of MSEs per month before and after matching are 0.44 and 0.93 (T-stat<2) which means that halal certificates do not have an impact in increasing MSE sales and for the variable average number of customers obtained the T-stat value for the variable number of customers before matching by 2.20 (T-stat>2) which means that halal certification has an impact on increasing the number of MSME customers significantly but after matching, the result of T-stat<2 or by 0.68 which shows that halal certification has no effect on increasing the number of customers significantly.

6. Conclusion

The results of the analysis of the impact of halal certification on business performance as measured in these three variable indicators, it can be concluded that by using the propensity score method there are differences in business performance, including business profits, sales, and the number of customers between MSEs which are halal certified and MSEs that are not halal certified. However, after matching the observed covariates, the results of the analysis showed that halal certificates did not have a significant impact on increasing profits, sales, and the number of MSE customers.

This conclusion is not in line with many previous studies that state that halal certificates have a significant effect on improving business performance, namely profit, sales, and the number of customers. In previous studies, no one has used the propensity score matching method so that there is still a considerable bias in the covariates observed in drawing conclusions while by using

the propensity score matching method, the potential for bias that occurs will be minimized so that the conclusions produced will be more precise.

7. Suggestions

BPJPH needs to make a change in the socialization of halal certification so that all information about halal certification is received and understood by all business actors, for example by broadcasting message to all social media accounts of business actors. BPJPH and other relevant government agencies also can appeal to all Muslim consumers to help by not buying products that are not halal certified. This aims to increase the awareness of business actors to have halal certificates.

BPJPH needs to evaluate the implementation of Free Halal Certification for SME that have been held with various institution. One-stop halal certification path can help make it easier for SMEs. Providing a special call center for the UMK halal certification process that is fast, responsive and easily accessible through various media such as WhatsApp, telegram, twitter, Facebook, e-mail, and telephone so that if the SME experiences problems during the halal certification process, it can immediately get a solution and the halal certification process becomes faster.

Business actors must actively access information through social media, read, and understand matters related to how to certify halal certification for SMEs in Indonesia. Halal certification is important for SMEs but there are other things that are no less important to be able to improve performance such as product quality, promotional media, internal sales recording applications, etc. And for the next researcher, it is hoped that they will be able to use a sample of MSEs in a wider business field including halal medicines, halal cosmetics, halal fashion, halal tourism, halal logistics, and others.

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