



Factors Influencing Students Intention to Choose Career of Halal Food Industry in Malaysia using Theory of Planned Behavior

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Abstract:

Background: The food industry in Malaysia has experienced significant development, especially in the halal food sector. The halal food industry is a market segment involved with food items and beverages that are strictly prepared according to rules underlined by the Islamic dietary law. In addition, the concept of halal covers not only Syariah law, but also hygiene, sanitation and food safety requirements. Malaysia has become a major global halal hub in delivering halal food to local and international levels. The significant development of halal food industry in Malaysia creates significant job opportunities for new graduating students. Therefore, this study aims to evaluate factors that influence student intention to choose a career for the halal food industry in Malaysia.

Research Methodology: This study using a quantitative research method with questionnaire development in assessing the factors that influence intention of students to involve in halal food industry as their future career. The underpinning theory is Theory of Planned Behavior (TPB). The independent variables are Attitude (A), Subjective Norm (SN) and Perceived Behavioral Control (PBC). This study developed four questions for each variable. Unit of analysis for respondents is university students in Malaysia. The sample size is 40 students that have an interest in working for halal food industry in Malaysia. The correlation analysis was analyzed using Pearson Correlation coefficient analysis. Meanwhile, the causal relationship was analyzed using multiple regression analysis.

Results: The skewness values for four variables in this study are between -1 and +1 that indicates normal distribution. The value of Cronbach's alpha statistical test for measuring internal reliability is larger than 0.7 for all four variables. Therefore, four constructs exhibit good reliability that indicates the suitability of internal consistency. Next, the value of R-squared for model fit in this study is 0.675 that indicates a good model fit that explained 67.5% of variance in dependent variable. Multiple regression analysis indicates Attitudes (A), Subjective Norm (SN) and Perceived Behavioral Control (PBC) are significant in predicting the value of Intention (I) to select a career in halal food industry.

Conclusion: This study supported the hypothesis that indicates there is a positive and significant relationship of Attitude (A), Subjective Norm (SN) and Perceived Behavioral Control (PBC) towards Intention (I). The findings of this study add value to theoretical knowledge of career selection among university students. At the same time, this study provides guideline for government in developing better policy in cultivating interest among university students to be highly involved in the halal food industry.

Keywords: Halal Food Industry, Malaysia, Theory of Planned Behavior, Intention, Career Selection.

1. Introduction

The halal food industry has become popular among Muslim and non-Muslim companies worldwide. The concept of halal was used in all products that are declared halal, either produced by Muslim or non-Muslim companies. Therefore, the halal food industry is growing rapidly, with the total of global halal market shares is 31.46% (Shahbandeh, 2021). Halal is a term from Al-Quran that means permitted, allowed, lawful or legal. The opposite word for halal is haram that means forbidden, unlawful or illegal. According to Islamic law, all issues concerning halal, haram and even all disputes should be referred to the Al-Quran and As-Sunnah (Tieman, 2011). Thus, the products that are produced by Muslim companies or non-Muslim companies must be in line with halal prescriptions to attract Muslim consumers to buy their products. For

Muslim consumers, halal foods and drinks mean that the products have met the requirements laid down by the Shariah law whereas for non-Muslim consumers, it represents the symbol of hygiene, quality and safety products when produced strictly under the Holistic Halal Assurance Management System (Ambali and Bakar, 2014).

The rapid growth of halal industry gives a good opportunity to halal companies in Malaysia market. Malaysia is the leading global halal hub with an annual export value of RM 35.4 billions for halal products, which contributes approximately 5.1% of the total export for the country (Karia and Asaari, 2016). As reported by the Halal Development Corporation Berhad (HDC), 295 companies are currently operated throughout the 21 halal parks across Malaysia, with 42 companies (14.3%) being multinational corporations (MNCs), while 253 companies (85.7%) are locally-owned corporations. This amount gives an opportunity to local-owned corporations to expand a business due to the high demand for halal industry. However, there are still lack of studies that investigate the opportunity for university students to choose career in halal industry. Currently, the halal food industry is still a new industry if compare with others industry in worldwide. In addition, the rapid development of halal food industry attracts non-Muslim and foreign multinationals company to involve in halal industry (Mohamed et al., 2020). According to Zulkifli (2019) 70% of the halal industries are owned by non-Muslim company that indicate the high number of non-Muslims company involved in halal industry.

Therefore, this study gives a new insight by investigating the opportunity for higher education students to choose a career in halal food industry in Malaysia due to high demand from customers for halal food industry. This study used Theory Planned Behaviour (TPB) to examine the Attitude (A), Subjective Norm (SN) and Perceived Behavior Control (PBC) among university students in choosing the halal food industry as their career after graduating from university.

2. Literature Review

Studies associated with halal management are viewed from various perspectives by many researchers (Salahuddin, et al., 2021; Mohamed, et al., 2020; Othman, et al., 2016). Research regarding the halal food supply chain refers to the process of supplying halal food from the point of origin to the consumption or from farm to plate with the purpose of satisfying the requirements of halal consumers (Zulfakar, et al., 2018). Recent research has suggested that companies play an important role in the adoption of halal food supply chain (Azmi, et al., 2020). This is because consumers are increasingly concerned about the integrity of halal food in terms of production, transportation and storage, along with an entire supply chain network (Mohammed, et al., 2017). In line with the study by Ali et al., (2021) confirmed that supply chain integration including internal, supplier and consumers has significantly affect the dimension of halal food supply chain integrity which is lead to the halal food safety and good quality. According to Tieman (2016), the basic requirements of halal food supply chains are to ensure the integrity of halal food at the point of consumption, which is an obligation for Muslims. Thus, halal supply chain management must avoid the element of haram to ensure the products are in line with the perception and acceptance of the Muslim consumers to use. Besides the issues on halal supply chain, a study that focus on halal food industry was suggested that halal logo was affected customer loyalty (Quoquab, et al., 2020). Attributed with the awareness of consumers toward halal product (Ngah, et al., 2015) and the roles of government in promoting halal product (Ab Talib, et al., 2020) are the main factors of increasing demand for halal industry in Malaysia.

Many studies suggested various variables are influenced customers to use halal products. Study by Ahmad, et al., (2015) suggested the variables knowledge and religiosity are significantly influence the customer acceptance of halal products. While, Bashir (2019) suggested that the variables of halal awareness, halal logo and attitude are significantly influence customer intention in choosing halal products. Othman, et al., (2017) suggested that the variables of knowledge, attitude, sensitivity to government policy and organizational performance have a significant impact on the halal certificate. While Kurniawati and Savitri (2020) found the variables of religious belief, health reason, halal logo certification and exposures have a significant impact on the halal products. Thus, this study tries to fulfil the gap by investigate the factors that influence students to choose career in halal food industry among university students in Malaysia. This study used Theory Planned Behavior (TPB) model to investigate the intention of students in choosing halal career. TPB model has been used in various field. Tucker, et al., (2020) used TPB model to investigate the student banking intentions in understanding the bank satisfaction. Their finding shows that the strong application in predicting customer satisfaction. Then, study by Munir, et al., (2019) was suggested that TPB model was reveal strong influence of personality traits among Chinese students. Study by Shen and Shen (2021) was confirmed that TPB is successfully used to explain the behavioral intention of Chinese traditional village residents to support tourism industry. Besides that, Rahmafitria, et al., (2021) indicated that subjective norm as the external factor of the TPB has a stronger effect than the internal factors; attitude and behavioral

control. Consequently, TPB is the important theory in measure the behavior of consumers.

3. Methodology

The aim of this study is to evaluate student intention to choose career of halal food industry in Malaysia. This study using quantitative research method. This study selected questionnaire as research instrument to measure student intention to choose a career of halal food industry in Malaysia. The underpinning theory is Theory of Planned Behavior (TPB). This study evaluated the reliability of the questionnaire using Cronbach's Alpha. Next, this study using Pearson Correlation in measuring the association between independent variables. In assessing the causal relationship, this study implemented multiple regression analysis.

3.1 Unit of analysis and sampling method

This study selected students in public university of Malaysia as unit of analysis. The reason in selecting university students as respondents is because selection of career is important for them after their graduation from university. In this study, we selected students from two universities in Malaysia. This study using simple random sampling as a sampling method. The number of respondents selected for this study is 40 students.

3.2 Underpinning theory

This study implemented Theory of Planned Behavior (TPB) as underpinning theory for assessing the student intention to choose career for halal food industry in Malaysia. There are three independent variables namely Attitude (A), Subjective Norm (SN) and Perceived Behavioral Control (PBC).

The Theory of Planned Behavior (TPB) is a psychological theory that links beliefs to behavior. The theory maintains that three core components, namely, attitude, subjective norms, and perceived behavioral control, together shape an individual's behavioral intentions. The Theory of Planned Behavior (TPB) started as the Theory of Reasoned Action in 1980 to predict an individual's intention to engage in a behavior at a specific time and place. The theory was intended to explain all behaviors over which people have the ability to exert self-control. The key component to this model is behavioral intent; behavioral intentions are influenced by the attitude about the likelihood that the behavior will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome.

The first independent variable is Attitude (A) that is defined as the degree to which a person has a favorable or unfavorable evaluation of the behavior of interest. Attitude is considered as a consideration of the outcomes of performing the behavior. Next, the second independent variable is Subjective Norm (SN) that defined as belief about whether most people approve or disapprove of the behavior. Subjective Norm (SN) is considered relates to a person's beliefs about whether peers and people of importance to the person think he or she should engage in the behavior. The, the third independent variable is Perceived Behavioral Control (PBC) that indicates person's perception of the ease or difficulty of performing the behavior of interest. Perceived behavioral control varies across situations and actions, which results in a person having varying perceptions of behavioral control depending on the situation.

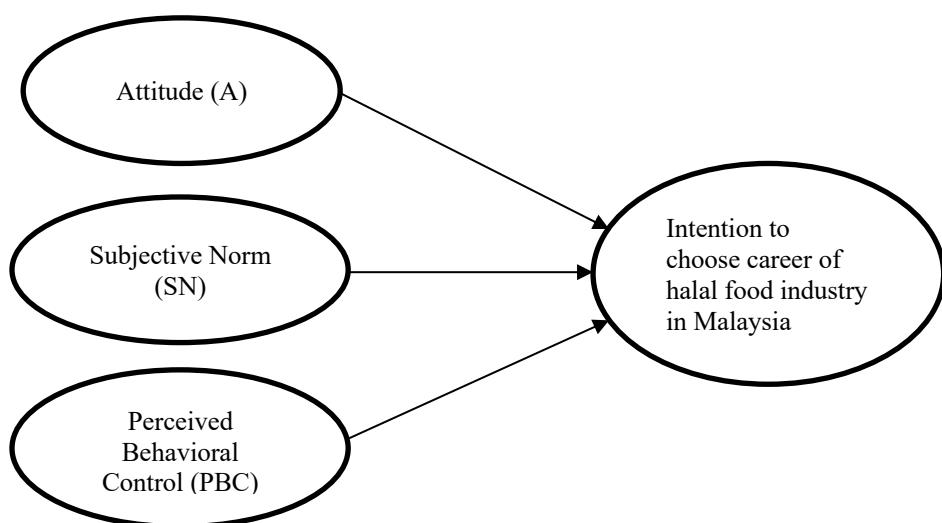


Figure 1: Research framework using Theory of Planned Behavior (TPB)

3.3 Reliability of items in questionnaire using Cronbach's Alpha coefficient

Cronbach's alpha, α , developed by Lee Cronbach in 1951, to measuring reliability or internal consistency of items in questionnaire. Cronbach's alpha or coefficient alpha, is the most common test score reliability coefficient for single administration. Cronbach's alpha test was developed to evaluate reliability of scale in multiple-question. These questions measure latent variables which is considered as unobservable variables. These are very difficult to measure directly in real life because it is involved with perception of respondents. Cronbach's alpha explains about how closely related a set of test items are considered as a group.

The coefficient of Cronbach's alpha is calculated using Equation (1).

The parameters in Equation (1) are described as follows:

α : Coefficient of Cronbach's alpha

N : Number of items that measure a particular variable

\bar{c} ; Average co-variance between items in measuring one particular variable

\bar{v} ; Average variance of items for one variable.

Next, the value of Cronbach's alpha should be in the range of zero to one. The Cronbach's alpha near zero value indicates unacceptable of internal consistency. Meanwhile, value that approaching 1 shows good indicators of internal consistency of items as one group in measuring reliability of scale in multiple questions. Table 1 shows the range of Cronbach 's alpha value to describe the reliability and internal consistency items in measuring variable.

Table 1: Cronbach's alpha interpretation

Cronbach 's alpha value	Interpretation
0.91-0.10	Excellent
0.81-0.90	Good
0.71-0.80	Good and Acceptable
0.61-0.70	Acceptable
0.01-0.60	Non-acceptable

3.4 Pearson correlation coefficient for measuring association between variables

The Pearson correlation coefficient is a measure of the strength of a linear association between two variables. The value of Pearson coefficient is between +1 and -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association; that is, as the value of one variable increases, so does the value of the other variable. A value less than 0 indicates a negative association; that is, as the value of one variable increases, the value of the other variable decreases.

The association of two variables has to be measured on either an interval or ratio scale. The Pearson correlation coefficient is the ratio between the covariance of two variables and the product of their standard deviations; thus, it is essentially a normalized measurement of the covariance, such that the result always has a value between -1 and 1 .

The formula for calculating Pearson correlation coefficient is shown in Equation (2).

The parameters in Equation (2) are described as below:

$\text{cov}(X, Y)$: Covariance between variable X and variable Y

σ : Standard deviation for data of variable X

σ_Y : Standard deviation for data of variable Y

Therefore, Pearson correlation coefficient for sample is calculated using Equation (3) for two variables namely x and y.

Where;

n: Sample size

x_i : Individual data for variable x at observation period of i

y_i : Individual data for variable y at observation period of i

\bar{x} : Mean for sample of variable x

\bar{y} : Mean for sample of variable y

The value of Pearson correlation is classified according to range as shown in Table 2. High value of Pearson correlation coefficient indicates high association between two variables. Meanwhile, low value of Pearson correlation coefficient indicates low association between two variables.

Table 2: Pearson correlation coefficient interpretation

Scale of Pearson correlation coefficient	Interpretation
$0.00 \leq r \leq 0.19$	Very low correlation
$0.20 \leq r \leq 0.39$	Low correlation
$0.40 \leq r \leq 0.59$	Moderate correlation
$0.60 \leq r \leq 0.79$	High correlation
$0.80 \leq r \leq 1.00$	Very high correlation

3.5 Multiple linear regression analysis

Linear regression is a linear approach for modelling the relationship between a scalar response and one or more explanatory variables. The case of one explanatory variable is called simple linear regression; for more than one, the process is called multiple linear regression. Multiple linear regression analysis functions to predict the value of a variable based on the value of two or more other variables. The purpose of multiple regression analysis is to evaluate the effects of two or more independent variables on a single dependent variable.

Multiple regression generally explains the relationship between multiple independent or predictor variables and one dependent or criterion variable. Multiple liner regression analysis should fulfill eight requirements as follows:

- i. Dependent variable should be measured on a continuous scale whether interval or ratio.
- ii. There are two or more independent variables, which can be either continuous as interval or ratio data.
- iii. Data should exhibit independence of observations. The regression should exhibit independence of residuals. Durbin Watson test is an appropriate test to perform diagnostics checking.
- iv. There needs to be a linear relationship between the dependent variable and each of your independent variables.
- v. Data needs to show homoscedasticity.
- vi. Data shows no serious multicollinearity among independent variables.
- vii. There should be no significant outliers, high leverage points or highly influential points.
- viii. The residuals are approximately normally distributed.

Simple linear regression was used to test the relationship between independent variables with independent variable. The simple regression can be expressed using Equation (4).

The parameters in Equation (4) are described as below:

Y : Dependent variable or response variable

X : Independent variable or predictor variable

β_0 : Intercept value (value of Y when X=0)

β_1 : Slope of regression for variable X_1

ε : Random error term

Then, using data from sample, this study estimated the coefficient value and intercept value using Equation (5).

Where the parameters in Equation (5) are described as follow:

\hat{Y} : Predicted value of variable Y

b_0 : Estimated value of β_0 , based on sample results.

b_1 : Estimated value of β_1 , based on sample results.

The error of regression analysis is calculated using Equation (6).

Where;

Y : Actual value of dependent variable

\hat{Y} : Predicted value of dependent variable using regression method.

The objective of regression analysis is to find estimated values of b_0 and b_1 for the parameters β_0 and β_1 which would provide the best fit in some sense for the data points. The best fit line regression minimizes the sum of squared errors. The Ordinary Least Squares (OLS) method, the criterion for estimating the parameters β_0 and β_1 is to make the sum of the squared residuals (SSR) of the fitted regression line as small as possible. The Equation (7) shows minimization procedure for sum of the squared residuals (SSR).

R-squared (R^2) is a statistical measure that represents the proportion of the variance for a dependent variable that is explained by an independent variable or variables in a regression model. R-squared explains to what extent the variance of input variable explains the variance of the output variable. Equation (8) shows the derivation of R-squared.

SSR: Sum of squares residual regression

SST: Sum of squares total

SSE: Sum of squares error

The multiple linear regression is model with more than one independent variable. Multiple linear regression is a statistical technique that uses several explanatory variables to predict the outcome of a response variable. Multiple regression is an extension of linear regression that uses just one explanatory variable. Equation (9) shows the structure of multiple linear regression.

Where;

Y : Dependent variable

X_i : Independent variable

ε : Random error

i : Number of independent variables

4. Result and discussion

The aim of this study is to evaluate student intention to choose a career of Halal food industry in Malaysia. This study using a questionnaire in measuring student intention. The result section is divided into three sections namely descriptive statistics and normality checking, reliability analysis and multiple regression analysis with diagnostics checking.

4.1 Descriptive statistics and normality test

This study selected university students as target respondents because they have the ability to choose their future careers. In this study, the questionnaire is measuring intention to choose a career in halal food industry among university students. Table 3 show the distribution of respondent profile according to gender. The number of male respondents is 6 persons which contributes to 15% of total respondents. The number of female respondents is 32 persons that contributes 85% of total respondents for this study. Meanwhile, Table 4 shows the distribution of respondents according to their level of study in university. The number of respondents that belong to undergraduate study is 37 respondents that contributes to 92.5% of total respondents. The number of students from post-graduate study that answered this questionnaire is 3 persons that contributes to 7.5% of total number of respondents.

Table 3: Respondents profile according to gender

Gender	Frequency	Percentage
Male	6	15.0%
Female	32	85.0%

Table 4: Respondents profile according to level of study

Level of study	Frequency	Percentage
Undergraduate	37	92.5%
Post-graduate	3	7.5%

Next, this study evaluated the normality distribution characteristics for each of the variable in this study. There are three independent variables namely, Attitude (A), Subjective Norm (SN) and Perceived Behavioral Control (PBC). Next, there is dependent variable namely Intention (I) to choose career of halal food industry in Malaysia. Table 5 shows the descriptive analysis of variables involved in this study.

First independent variable, namely Attitude has mean of 3.350 with standard deviation of 0.629. A small standard deviation means that the values in a statistical data set are close to the mean of the data set, and a large standard deviation means that the values in the data set are farther away from the mean. The standard deviation value of 0.629 indicates data distributed close to the value of mean which is 3.350, that indicates reliable data. The skewness value for normal distribution is between -1 and +1. The skewness value for data distribution of variable Attitude (A) is 0.151. Therefore, data distribution for Attitude (A) follows normal distribution. The normal distribution for kurtosis also is between -1 and +1. The data distribution for Attitude(A) shows the kurtosis value of -0.130. Therefore, this value proved the data distribution for Attitude(A) follows normal data distribution.

Table 5: Descriptive analysis of variables

Variable	Mean	Standard deviation	Skewness	Standard error	Kurtosis	Standard error	Normal distribution
Attitude (A)	3.350	0.629	0.151	0.374	-0.130	0.733	Yes
Subjective Norm (SN)	3.325	0.608	0.172	0.371	-0.634	0.732	Yes
Perceived Behavioral Control (PBC)	3.338	0.644	0.300	0.380	-0.433	0.741	Yes
Intention (I)	3.375	0.604	0.292	0.378	-0.183	0.730	Yes

Second independent variable is Subjective Norm (SN) that exhibits mean is 3.325 with standard deviation 0.608. A standard deviation is a measure of how dispersed the data is in relation to the mean. Low standard deviation means data are clustered around the mean, and high standard deviation indicates data are more spread out. A standard deviation close to zero indicates that data points are close to the mean, whereas a high or low standard deviation indicates data points are respectively above or below the mean. The standard deviation value of 0.608 indicates good distribution data close to the value of mean which is 3.325, that indicates reliable data. The skewness value for normal distribution is between -1 and +1. The skewness value for data distribution of variable Subjective Norm (SN) is 0.172. Therefore, data distribution for Subjective Norm (SN) follows normal distribution. The normal distribution for kurtosis also is between -1 and +1. The data distribution for Subjective Norm (SN) shows the kurtosis value of -0.634. Therefore, this value proved the data distribution for Subjective Norm (SN) follows normal data distribution.

Third independent variable is Perceived Behavioral Control (PBC) that shows mean value is 3.338 with standard deviation of 0.644. Standard deviation is the degree of dispersion or the scatter of the data points relative to its mean, in descriptive statistics. The standard deviation for reliable distribution should be near to zero. Therefore, the distribution of data for Perceived Behavioral Control (PBC) is reliable. The skewness value for normal distribution is between -1 and +1. The skewness value for data distribution of variable Perceived Behavioral Control (PBC) is 0.300. Therefore, data distribution for Perceived Behavioral Control (PBC) follows normal distribution. The normal distribution for kurtosis is between -1 and +1. The data distribution for Perceived Behavioral Control (PBC) shows the kurtosis value of -0.433. Therefore, this value proved the data distribution for Perceived Behavioral Control (PBC) follows normal data distribution.

The dependent variable is Intention (I) that indicates mean value is 3.375 with standard deviation is 0.604. The standard deviation shows how much variation or dispersion exists from average value. This study shows low value of standard deviation that indicates data distribution is reliable. The skewness value for normal distribution is between -1 and +1. The skewness value for data distribution of variable Intention (I) is 0.292. Therefore, data distribution for Intention (I) follows normal distribution. The normal distribution for kurtosis is between -1 and +1. The data distribution for Intention (I) shows the kurtosis value of -0.183. Therefore, this value proved the data distribution for Intention (I) follows normal data distribution.

Next, this study evaluated data distribution using statistical approach namely Shapiro-Wilk normality test. The Shapiro-Wilk test examines if a variable is normally distributed in some population. The null hypothesis for the Shapiro-Wilk test is that a variable is normally distributed in some population. If the Sig. value of the Shapiro-Wilk Test is greater than 0.05, the data is normal. Table 6 shows Shapiro-Wilk normality test for variables in this study.

Table 6: Shapiro-Wilk normality test for variables

Variable	Shapiro-Wilk normality test			Normal distribution
	Statistics	Degree of freedom, df	Significant p-value	
Attitude (A)	0.954	40	0.107	Yes
Subjective Norm (SN)	0.962	40	0.198	Yes
Perceived Behavioral Control (PBC)	0.965	40	0.256	Yes
Intention (I)	0.958	40	0.145	Yes

The significant p-value for Attitude (A) is 0.107 that is larger than 0.05. Therefore, the data distribution for Attitude (A) follow normal distribution. Next, the significant p-value for Subjective Norm (SN) is 0.198 that is larger than 0.05. Therefore, the data distribution for Subjective Norm (SN) follow normal distribution. Then, the significant p-value for Perceived Behavioral Control (PBC) is 0.256 that is larger than 0.05. Therefore, the data distribution for Perceived Behavioral Control (PBC) follow normal distribution. After that, the significant p-value for Intention (I) is 0.145 that is larger than 0.05. Therefore, the data distribution for Intention (I) follow normal distribution.

The normality test proved that all for variables in this study show normal distribution characteristics. Therefore, this study is appropriate to use parametric statistical analysis in measuring factors that contribute to student intention to choose career in halal industry especially in Malaysia.

4.2 Reliability analysis

This section describes about reliability of items in measuring the intended latent construct. The variables in the research framework is considered as construct because it is unobserved, measured indirectly and based on perception of the respondents. Reliability of questionnaire is a way of assessing the quality of the measurement procedure used to collect data. In order to consider a result valid, the measurement procedure must first be reliable. Reliability refers to the degree to which the results obtained by a measurement and procedure can be replicated.

The first criterion for reliability testing is using Cronbach's alpha statistical test. The function of Cronbach's alpha is to evaluate the internal consistency of the items in measuring a construct. Cronbach's alpha is a widely-used measure of reliability used to quantify the amount of random measurement error that exists in a sum score or average generated by a multi-items measurement scale. Table 7 shows internal reliability test using Cronbach's alpha for four constructs involved in this study.

Table 7: Internal reliability test using Cronbach's alpha

Construct	Cronbach's alpha value	Internal consistency status
Attitude (A)	0.883	Good reliability
Subjective Norm (SN)	0.866	Good reliability
Perceived Behavioral Control (PBC)	0.873	Good reliability
Intention (I)	0.872	Good reliability

The value of Cronbach's alpha for Attitude (A) is 0.883 that shows good level of internal consistency for scale in measuring a particular construct. Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability. Next, the value of Cronbach's alpha for Subjective Norm (SN) is 0.866 that shows good level of internal consistency for scale in measuring a particular construct. Then, the value of Cronbach's alpha for Perceived Behavioral Control (PBC) is 0.873 that shows good level of a measurement of internal consistency, that is, how closely related a set of items are as a group. In addition, the value of Cronbach's alpha for Intention(I) is 0.872 that indicates good reliability for scale in measuring single administration. Therefore, all four constructs exhibit good reliability that indicates suitability of internal consistency for each construct.

The second reliability statistical test is Kaiser-Mayer-Olkin (KMO) and Bartlett test. A Kaiser-Meyer-Olkin (KMO) test is used in research to determine the sampling adequacy of data that are to be used for Factor Analysis. Bartlett's test of sphericity is used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. The KMO and Bartlett test evaluate all available data together. A KMO value over 0.6 and a significance level for the Bartlett's test below 0.05 suggest there is substantial correlation in the data. Table 8 shows the value of Kaiser-Mayer-Olkin (KMO) and Bartlett test for each construct in this study.

Table 8: Kaiser-Mayer-Olkin (KMO) and Bartlett test

Construct	KMO value	Sampling adequacy (KMO>0.6)	Bartlett test significant value	factor analysis suitability (p-value<0.05)
Attitude (A)	0.774	Acceptable	0.000	Acceptable
Subjective Norm (SN)	0.786	Acceptable	0.000	Acceptable
Perceived Behavioral Control (PBC)	0.835	Acceptable	0.000	Acceptable
Intention (I)	0.789	Acceptable	0.000	Acceptable

The KMO value for Attitude (A) is 0.774 that indicates acceptable value for sampling adequacy. The Bartlett test for Attitude (A) shows the p-value is 0.000 that indicates acceptable level for factor analysis suitability. Next, the KMO value for Subjective Norm (SN) is 0.786 that indicates acceptable value for sampling adequacy. The Bartlett test for Subjective Norm (SN) shows the p-value is 0.000 that indicates acceptable level for factor analysis suitability. Then, the KMO value for Perceived Behavioral Control (PBC) is 0.835 that indicates acceptable value for sampling adequacy. The Bartlett test for Perceived Behavioral Control (PBC) shows the p-value is 0.000 that indicates acceptable level for factor

analysis suitability. After that, the KMO value for Intention (I) is 0.789 that indicates acceptable value for sampling adequacy. The Bartlett test for Intention (I) shows the p-value is 0.000 that indicates acceptable level for factor analysis suitability.

Next, this study evaluated the linear relationship between independent variables with independent variable. This study using statistical test namely Pearson correlation coefficient analysis. Table 9 shows Pearson correlation coefficient analysis for evaluating linear relationship between independent variables and dependent variable.

Table 9: Linear relationship between independent variables and dependent variables

Dependent variable	Parameter	Attitude (A)	Subjective Norm (SN)	Perceived behavioral Control (PBC)
Intention (I)	Pearson correlation	0.620	0.646	0.548
	Significant value (2-tailed)	0.000	0.000	0.000
	Number of observation, N	40	40	40
Linear relationship between independent variable and dependent variable		Positive and significant	Positive and significant	Positive and significant

Pearson correlation coefficient for Attitude (A) is 0.620 with significant value of 0.000. The significant value is less than chosen alpha of 0.05. Therefore, there is significant and positive linear relationship between Attitude (A) and Intention (I). Then, Pearson correlation coefficient for Subjective Norm (SN) is 0.646 with significant value of 0.000. The significant value is less than chosen alpha of 0.05. Therefore, there is significant and positive linear relationship between Subjective Norm (SN) and Intention (I). Next, Pearson correlation coefficient for Perceived Behavioral Control (PBC) is 0.548 with significant value of 0.000. The significant value is less than chosen alpha of 0.05. Therefore, there is significant and positive linear relationship between Perceived Behavioral Control (PBC) and Intention (I).

Then, this study evaluated multicollinearity problem using statistical test of Pearson correlation coefficient. The multicollinearity problem evaluated among independent variables. Multicollinearity generally occurs when there are high correlations between two or more predictor variables. It describes a perfect or exact relationship between the regression exploratory variables. Serious multicollinearity exists for Pearson correlation coefficient value larger than 0.85. Table 10 shows the multicollinearity checking using statistical test of Pearson correlation coefficient between independent variables.

Table 10: Multicollinearity checking using Pearson correlation coefficient

Variable 1	Variable 2	Pearson correlation, r	Significant value (p<0.05)	Number of observation, N	Serious multicollinearity (r > 0.85)
Attitude (A)	Subjective Norm (SN)	0.381	0.015	40	No
Attitude (A)	Perceived Behavioral Control (PBC)	0.264	0.099	40	No
Subjective Norm (SN)	Perceived Behavioral Control (PBC)	0.347	0.028	40	No

This study shows the value for Pearson correlation coefficient for association between Attitude (A) and Subjective Norm (SN) is 0.381. This value is less than 0.85 that concluded there is no serious multicollinearity problem between Attitude (A) and Subjective Norm (SN). Next, this study indicates the value for Pearson correlation coefficient for relationship between Attitude (A) and Perceived Behavioral Control (PBC) is 0.264. This value is less than 0.85 that concluded there is no serious multicollinearity problem between Attitude (A) and Perceived Behavioral Control (PBC). Then, this study shows the value for Pearson correlation coefficient for association between Subjective Norm (SN) and Perceived Behavioral Control (PBC) is 0.347. This value is less than 0.85 that concluded there is no serious multicollinearity problem between Subjective Norm (SN) and Perceived Behavioral Control (PBC). Therefore, the data for three independents variables are free from serious multicollinearity in preventing spurious regression.

In addition, this study also evaluated total variance explained for each of the variables in this study. Total variance explained should be larger than 60%. The total variance explained gives the ratio, expressed as a percentage, of the variance accounted for by each component to the total variance in all of the variables. The total variance is the sum of variances of all individual principal components. The fraction of variance explained by a principal component is the ratio between the variance of that principal component and the total variance. For several principal components, add up their variances and divide by the total variance. Table 11 shows analysis of total variance explained for each of the variable in this study.

Table 11: Total variance explained (TVE)

Variable	Total variance explained (TVE>60%)	Reliability of items in measuring a variable
Attitude (A)	74.227 %	Comply with requirement
Subjective Norm (SN)	71.633%	Comply with requirement
Perceived Behavioral Control (PBC)	72.573%	Comply with requirement
Intention (I)	72.763%	Comply with requirement

Table 11 shows the value of total variance explained for Attitude (A) is 74.227% that is larger than requirement level of 60%. Therefore, items that used in measuring Attitude(A) is reliable and sufficient to considered as reliable measurement items. The 74.277% percentage of variance in Attitude(A) is measured by related items in this study. Next, Table 11 shows the value of total variance explained for Subjective Norm (SN) is 71.633% that is larger than requirement level of 60%. Therefore, items that used in measuring Subjective Norm (SN) is reliable and sufficient to considered as reliable measurement items. The 71.633% percentage of variance in Subjective Norm (SN) is measured by related items in this study. Then, Table 11 shows the value of total variance explained for Perceived Behavioral Control (PBC) is 72.573% that is larger than requirement level of 60%. Therefore, items that used in measuring Perceived Behavioral Control (PBC) is reliable and sufficient to considered as reliable measurement items. The 72.573% percentage of variance in Perceived Behavioral Control (PBC) is measured by related items in this study. In addition, Table 11 shows the value of total variance explained for Intention (I) is 72.763% that is larger than requirement level of 60%. Therefore, items that used in measuring Intention (I) is reliable and sufficient to considered as reliable measurement items. The 72.763% percentage of variance in Intention (I) is measured by related items in this study.

In measuring the reliability of questionnaire, this study also implemented statistical test for detecting common method bias using Herman's Single Factor Test. The common method bias is considered as systematic error variance shared among variables measured with and introduced as a function of the same method or source. Sometimes common method bias also represents by common method variance that indicates spurious variance that is attributable to the measurement method rather than to the constructs the measures are assumed to represent. Common method bias can appear when both the independent and dependent variable is captured by the same response method.

Table 12 shows the result of Herman's single factor test in assessing common method bias (CMB). The value of single factor is 41.974% that indicates variance among items in this study. Harman's single factor score, in which all items measuring latent variables, are loaded into one common factor. If the total variance for a single factor is less than 50%, it suggests that CMB does not affect your data, hence the results. Note that, Harman's approach is to test for CMB, but not to control for CMB. Therefore, this study indicates common method bias (CMB) does not affect the items because the Harman's single factor value is less than 50%.

Table 12: Harman's single factor for assessing Common Method Bias (CMB)

Factor	Initial eigenvalues			Extracted sum of squared loadings			Common Method Bias (CMB) Cumulative>50%
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	
1	7.243	45.266	45.266	6.716	41.974	41.974	No

4.3 Multiple regression analysis

Multiple regression analysis allows researchers to assess the strength of the relationship between an outcome (the dependent variable) and several predictor variables as well as the importance of each of the predictors to the relationship, often with the effect of other predictors statistically eliminated. This study explored the relationship between three independent variables with one dependent variable.

The first step in analyzing the causal relationship between independent variable and dependent variable is start with calculation of R-squared (R^2) value. The R-squared value is a statistical measure of how close the data are to the fitted regression line. R-squared value is considered as the proportion of the variation in the dependent variable that is predictable from the independent variables. R^2 assumes that every single variable explains the variation in the dependent variable. The adjusted R^2 tells you the percentage of variation explained by only the independent variables that actually affect the dependent variable. Table 13 shows the R-squared analysis for assessing causal relationship between three independent variables with one dependent variable. In general, if the value of R-squared is greater than 50% or 0.5, then the model is considered as a good model. Table 13 shows the value of R-squared for model fit in this study is 0.675 that indicates good model fit that explained 67.5% of variance in dependent variable. Adjusted R-squared is indicates 64.8% variance of dependent variables explained by independent variables that provides actual affect.

Table 13: Model summary for R-squared (R^2)

Model	R	R-square, R^2	Adjusted R-square	Std. error of the estimate	Good model fit, $R^2 > 0.5$
1	0.822	0.675	0.648	0.35845	Yes

Then, this study calculated F-test to evaluate overall significance indicates whether developed linear regression model provides a better fit to the data than a model that contains no independent variables. The F-test for linear regression tests whether any of the independent variables in a multiple linear regression model are significant. The F-test in regression is the result of a test where the null hypothesis is that all of the regression coefficients are equal to zero. In other words, the model has no predictive capability. Basically, the F-test compares developed model with zero predictor variables (the intercept only model) and decides whether added variables improved the model. If the study shows a significant result, the variables that included in regression model improved the model fit. Table 14 shows the F-test for regression model with independent variables. Table 14 shows the significant value is 0.000 that is less than 0.05. Therefore, this study indicates developed linear regression model provides a better fit to the data than a model that contains no independent variables. Table 14 shows that the independent variables statistically significantly predict the dependent variable, $F (3,36) = 24.969$, $p < 0.05$.

Table 14: F-test for regression model

Model		Sum of squares	Degree of freedom, df	Mean Square	F-test	Significant value	Significant of independent variables ($p < 0.05$)
1	Regression	9.625	3	3.208	24.969	0.000	Yes
	Residual	4.625	36	0.128			
	Total	14.250	39				

Next, this study calculated coefficient for regression model using three independent variables towards one dependent variable. The three independent variables are Attitude (A), Subjective Norm (SN) and Perceived Behavioral Control (PBC). Meanwhile the dependent variable is Intention (I) to choose career in halal food industry. Multiple regression is a statistical technique that can be used to analyze the relationship between a single dependent variable and several independent variables. The objective of multiple regression analysis is to use the independent variables whose values are known to predict the value of the single dependent value. Table 15 shows the coefficient for regression model of this study. The value of unstandardized beta coefficient for Attitude (A) is 0.373. Therefore, one unit increase in Attitude (A) contributes to 0.373 increment in unit of Intention (I). This value indicates Attitude (A) contributes positive influence

towards Intention (I). The significant value for Attitude (A) is 0.001 that less than 0.05. Therefore, the causal relationship of Attitude (A) towards Intention (I) is significant.

Next, the second independent variable is Subjective Norm (SN). Table 13 shows unstandardized beta coefficient for Subjective Norm (SN) is 0.381. Therefore, one unit increase in Subjective Norm (SN) contributes to 0.381 increment in unit of Intention (I). This value indicates Subjective Norm (SN) contributes positive influence towards Intention (I). The significant value for Subjective Norm (SN) is 0.001 that less than 0.05. Therefore, the causal relationship of Subjective Norm (SN) towards Intention (I) is significant.

Then, the third independent variable is Perceived Behavioral Control (PBC). Table 13 shows unstandardized beta coefficient for Perceived Behavioral Control (PBC) is 0.312. Therefore, one unit increase in Perceived Behavioral Control (PBC) contributes to 0.312 increment in unit of Intention (I). This value indicates Perceived Behavioral Control (PBC) contributes positive influence towards Intention (I). The significant value for Perceived Behavioral Control (PBC) is 0.001 that less than 0.05. Therefore, the causal relationship of Perceived Behavioral Control (PBC) towards Intention (I) is significant.

Table 15: Multiple regression model

Model	Variable	Unstandardized Coefficients		Standardized Coefficients Beta	t-statistics	Significant value	Significant influence? (p<0.05)
		Beta	Standard Error				
1	Constant	-0.185	0.416		-0.445	0.659	
	Attitude (A)	0.373	0.101	0.386	3.711	0.001	Significant
	Subjective Norm (SN)	0.381	0.106	0.383	3.588	0.001	Significant
	Perceived Behavioral Control (PBC)	0.312	0.096	0.333	3.249	0.003	Significant

The equation for multiple regression is shown in Equation (10).

Equation (10) summaries that the strongest predictor is Subjective Norm, followed by Attitude (A) and Perceived Behavioral Control (PBC). This study indicates, acceptance from friends and family is the largest effects that affecting student choice to select career for halal food industry in Malaysia.

The objective of this study would like to prove hypothesis testing about relationship between independent variables with independent variables. Table 16 shows result of hypothesis testing for independent variables in this study. The p-value of Attitude (A) is 0.001 that less than chosen alpha of 0.05. Therefore, this study supported the hypothesis that indicates there is positive and significant relationship of Attitude (A) towards Intention (I). Next, the p-value of Subjective Norm (SN) is 0.001 that less than chosen alpha of 0.05. Therefore, this study supported the hypothesis that indicates there is positive and significant relationship of Subjective Norm (SN) towards Intention (I). Then, the p-value for Perceived Behavioral Control (PBC) is 0.003 that less than chosen alpha of 0.05. Therefore, this study supported the hypothesis that indicates there is positive and significant relationship of Perceived Behavioral Control (PBC) towards Intention (I).

Table 16: Hypothesis testing

No.	Hypothesis statement	Result
H1	There is positive and significant relationship of Attitude (A) towards Intention (I)	Supported
H2	There is positive and significant relationship of Subjective Norm (SN) towards Intention (I)	Supported
H3	There is positive and significant relationship of Perceived Behavioral Control (PBC) towards Intention (I)	Supported

4.4 Diagnostics checking

This section developed to perform diagnostics checking for model developed in multiple regression analysis. A regression diagnostic is one of a set of procedures available for regression analysis that seek to assess the validity of a model in any of a number of different ways. This assessment is an exploration of underlying statistical assumptions for developed model and act as an examination of structure for model.

This study, calculated Durbin-Watson test for detecting the independence of residuals from predicted model in regression. The Durbin Watson (DW) statistic is a test for autocorrelation in the residuals from a statistical model or regression analysis. The Durbin-Watson statistic will always have a value ranging between 0 and 4.

If the value of Durbin-Watson test is between 1.5 and 2.5, the residual shows no autocorrelation and exhibits independent of residuals. Table 17 shows the Durbin-Watson autocorrelation test for residual of multiple regression model. Table 17 shows the value of Durbin-Watson is 2.025 that is in the range between 1.5 to 2.5. Therefore, the residuals of multiple regression show no serious autocorrelation. This is defined that the residual distributions are independents. it is assumed that all of the values of the outcome variable are independent.

Table 17: Durbin-Watson statistical test

Durbin-Watson value	Requirement	Result
2.025	$1.5 < DW < 2.5$	No autocorrelation and independent distribution of residual

Next, the second diagnostics test is for testing the existence of serious multicollinearity problem. Variance inflation factor (VIF) is a measure of the amount of multicollinearity in a set of multiple regression variables. The value of VIF should be less than 10 for indicating no serious multicollinearity problem among independent variables in regression model. The variance inflation factor (VIF) is the ratio of the variance of estimating some parameter in a model that includes multiple other terms by the variance of a model constructed using only one term. It quantifies the severity of multicollinearity in an ordinary least squares regression analysis. It provides an index that measures how much the variance of an estimated regression coefficient is increased because of collinearity. The multicollinearity problem reduces independent variable predictive power, that lead to spurious regression. Table 18 shows the VIF value for Attitude (A) is 1.197 that is less than 10. Therefore, there is no serious multicollinearity problem for independent variable, Attitude (A). Next, Table 18 shows the VIF value for Subjective Norm (SN) is 1.266 that is less than 10. Therefore, there is no serious multicollinearity problem for independent variable, Subjective Norm (SN). Then, Table 18 shows the VIF value for Perceived Behavioral Control (PBC) is 1.164 that is less than 10. Therefore, there is no serious multicollinearity problem for independent variable, Perceived Behavioral Control (PBC). Table 19 shows collinearity diagnostics that proved there is no serious multicollinearity problem.

Table 18: Variance Inflation Factor (VIF)

Variable	Collinearity statistics		Serious multicollinearity (VIF>10)
	Tolerance	VIF value	
Attitude (A)	0.835	1.197	No
Subjective Norm (SN)	0.790	1.266	No
Perceived Behavioral Control (PBC)	0.859	1.164	No

Table 19: Collinearity diagnostics

Model	Dimension	Condition Index	Variance Proportion			Multicollinearity problem (Condition index > 30)
			Attitude (A)	Subjective Norm (SN)	Perceived Behavioral Control (PBC)	
1	1	1.000	0.00	0.00	0.00	No
	2	12.512	0.41	0.02	0.72	No
	3	14.301	0.38	0.85	0.11	No
	4	16.820	0.20	0.13	0.17	No

Furthermore, this study performed third diagnostics checking namely outliers detection using Mahalanobis distance detection. Outliers are data points that are extremely distant from most of the other data points. Multivariate outliers can severely distort the estimation of population parameters. In many parametric statistics, univariate and multivariate outliers must be removed from the dataset. Multivariate outliers can be identified with the use of Mahalanobis distance, which is the distance of a data point from the calculated centroid of the other cases where the centroid is calculated as the intersection of the mean of the variables being assessed. Each point is recognized as combination and multivariate outliers lie a given distance from the other cases. Table 20 shows multivariate outliers testing. All observation multi variate sample is classified according to ascending order. Table 20 shows the five observations with small number of probability value (p-value). Multivariate outliers exist when the p-value is smaller than 0.001. However, all p-value are larger than 0.001. Therefore, there is no multivariate outliers exist in this data set.

Table 20: Multivariate outliers checking

Observation No.	Mahalanobis distance	Probability value (p-value)	Multivariate outliers (p<0.001)
3	8.99358	.03	No
11	7.48227	.06	No
5	7.37770	.06	No
14	7.25079	.06	No
27	6.99711	.07	No

Next, this study evaluated the homogeneity of data distribution for residual calculated from regression analysis. Figure 2 shows the standardized residuals are plotted against the standardized predicted values. No patterns should be present if the model fits well. Figure 2 shows no clear relationship pattern between standardized residual and standardized predicted value. Therefore, this finding proved that model and data meet the requirement of linearity and homoscedasticity.

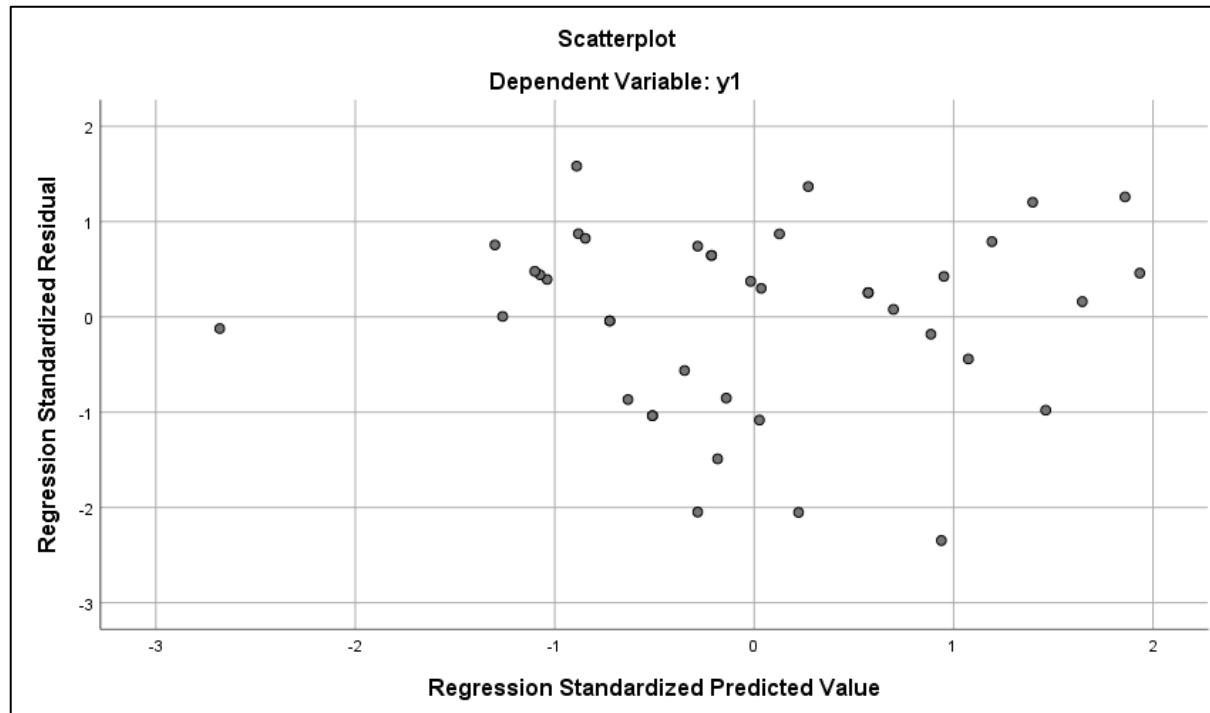


Figure 2: Scatter plot for standardized residuals

The regression model in this study passed all statistical to prove developed model is best fit with actual data. The residuals of multiple regression show no serious autocorrelation. This is defined that the residual distributions are independents. it is assumed that all of the values of the outcome variable are independent. The collinearity diagnostics that proved there is no serious multicollinearity problem. The residual diagnostics proved that model and data meet the requirement of linearity and homoscedasticity

5. Conclusion

Main objective of this research is to evaluate the significant relationship between three independent variables towards Intention (I) to select career in halal food industry among university students. The three independent variables are Attitude (A), Subjective Norm (SN) and Perceived Behavioral Control (PBC). The respondents for this study is university students in Malaysia. This study using Theory of Planned Behavior (TPB) as underpinning theory. The sampling method is using simple random sampling.

From the analysis, this research concludes the research findings as below:

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