

Market Feasibility Analysis and Willingness to Pay for Halal Products Based on Digital Traceability

Sabrina Kharisma Suri¹, Sri Hardiyanti², Fatkhur Rokhman^{1*}

¹Islamic Economics Department, Faculty of Islamic Economics and Business, UIN K.H. Abdurrahman Wahid, Indonesia

² Faculty of Islamic Economics and Business, UIN K.H. Abdurrahman Wahid, Indonesia

*Corresponding author: fatkhur.rokhman@uingusdur.ac.id

Abstract

A digital traceability system is required to improve transparency, security, and consumer trust in the halal goods sector as the halal business grows and becomes increasingly connected to digital technology. The deployment of a computerised tracking system is thought to provide consumers with more precise information on the source of raw materials, manufacturing procedures, and halal product distribution. This study's objective is to investigate customer willingness to pay as well as commercial viability for halal products based on digital traceability. The study employs a descriptive design and a quantitative methodology. Purposive sampling was used to gather primary data by distributing questionnaires to Muslim customers who had access to digital technologies and had bought halal goods. Multiple linear regression will be used in the data analysis to examine how market viability and digital traceability factors affect willingness to pay. This will be preceded by traditional assumption testing to make sure the study model is appropriate. This study is anticipated to make a scholarly addition to the advancement of technology-based halal economy studies and to be taken into account by business actors when developing development strategies for halal products based on a digital traceability system.

Keywords: halal products; digital traceability; market feasibility; willingness to pay; halal economy

INTRODUCTION

As the number of Muslims rises and people become more conscious of the need to consume goods that adhere to Islamic values, the worldwide halal business has grown significantly. Because its population is predominantly Muslim, Indonesia has significant potential for growth in the halal industry. According to data, there are over 1.8 billion halal consumers worldwide, and their annual spending is extremely large (Fathoni et al., 2023). Nonetheless, Indonesia continues to present itself in the global halal market more as a significant consumer than a producer. Opportunities and difficulties in maximising the potential of the country's halal economy are reflected in this situation. In this situation, making sure a product is halal becomes an important factor that business actors need to take into account. Halal assurance covers every step of the production process, not just product labelling. From the first step to the point of consumption, a halal assurance system must be able to ensure that items are halal. As a result, industry participants need to build a traceability mechanism throughout the halal supply chain in order to take a holistic approach (Alamsyah et al., 2022).

As the production chain progresses, the halal traceability system is crucial to guaranteeing the accountability and transparency of halal products. Both manufacturers and consumers may thoroughly trace the source of raw materials, manufacturing procedures, and product distribution thanks to this system. Verifying halal items is becoming more difficult, considering the intricacy of contemporary supply chains. According to studies, traceability systems can avoid cross-contamination and preserve the purity of halal products. (Masriani et al., 2025). Furthermore, these methods increase consumer confidence in the goods they use. However, there are still a number of obstacles to overcome before traceability systems can be implemented in Indonesia. Business players still have to deal with low literacy, inadequate system integration, and technological constraints. However, studies show that halal SMEs (small and medium-sized enterprises) can increase their performance and competitiveness by implementing traceability systems (Alourani & Khan, 2025). The sustainability of the halal supply chain is further supported by the appropriate integration of tracking systems. As a result, bolstering the traceability system becomes strategically essential to the growth of the halal sector.

Traceability systems have evolved into digital traceability based on information technology due to the development of digital technology. More precise, transparent, and tamper-resistant data recording is made possible by technologies like blockchain, data mining, and other digital systems. Through a distributed ledger system,

blockchain technology, in particular, improves accountability and transparency within the halal chain of values (Effendi et al., 2023). Additionally, real-time and more effective product tracking is made possible by digital data integration. However, there are still a number of obstacles in Indonesia's digital traceability implementation. Inter-institutional integration and infrastructure preparedness are still underutilised. Studies show that halal traceability systems still have shortcomings, especially when it comes to linking data amongst stakeholders. (Haq & Cotama, 2025). This state implies that technological use has not yet reached its full potential. Therefore, more research is needed to determine whether the market is ready for innovations in digital traceability. The development of an Islamic economy that relies heavily on technology now requires digital traceability (Karyani et al., 2026).

The market's reaction, especially consumer behaviour, possesses a substantial impact in the effective adoption of some goods that are halal based on digital traceability. When making judgments about what to buy, modern consumers frequently take into account factors like product information clarity, security, and transparency. Consumer purchase decisions are significantly impacted by halal awareness, particularly on digital platforms (Fathoni et al., 2023). Additionally, research shows that buyers are prepared to pay more for goods with transparent and unambiguous traceability systems (Siti Sa'diyah & Emi Erawati, 2024). This result implies that traceability systems give halal products additional financial worth. Therefore, determining a product's market viability requires analysing willingness to pay. Customers' willingness to pay is influenced by variables like information openness, halal certification, and income level. This study takes a more thorough approach by combining willingness to pay with market feasibility analysis. Therefore, based on digital traceability, this study is pertinent for assessing market viability and readiness to pay for halal items.

METHODS

Analyse the products and market viability using a digital traceability system. Because the study focuses on objectively assessing the correlations between variables using numerical data collected from respondents, the quantitative technique is employed (Mahsun et al., 2023). Structured questionnaires using a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree), were used to gather primary data. The purpose of using this tool is to get a quantifiable picture of how customers evaluate the variables under investigation. The questionnaire's statements were created using each study construct's theoretical indications. Muslim consumers who have bought halal goods and have access to or knowledge of digital technologies make up the research population. Purposive sampling, which chooses participants based on predetermined standards to support the study's goals, was used to determine the sample. Being Muslim, having bought halal goods, and regularly utilising digital technology or internet-based platforms are among the requirements for respondents. In order to meet the requirements of exploratory quantitative research during the initial testing phase of the research model, a minimum of 20 respondents was required for this study.

This study employs one dependent variable, willingness to pay (Y), and two independent factors, market feasibility (X1) and digital traceability (X2). Indicators of consumer buying interest, market demand for the product, and perceptions of the value of halal products are used to measure the market feasibility variable. The degree of transparency of product information, the degree of consumer confidence in the tracking system, and the ease of access to product information are the three factors used to quantify the digital traceability variable. In the meantime, the degree to which customers are prepared to pay more for halal goods that have a digital traceability system is a measure of the willingness to pay variable (Rasyda, 2023). Multiple linear regression analysis and statistical tools were used to analyse the data in order to determine the influence of independent factors on the dependent variable. Prior to hypothesis testing, the regression model was subjected to several conventional assumption tests, including the normality, heteroscedasticity, autocorrelation, and multicollinearity tests, to ensure that it met the Best Linear Unbiased Estimator (BLUE) assumptions. Following the determination that the model was feasible, the analysis was conducted using the F test to investigate the simultaneous effect of all independent variables on the dependent variable, the t test to ascertain the partial effect of each independent variable on consumers' willingness to pay, and the coefficient of determination test (Adjusted R Square) to evaluate the model's capacity to explain the variation of the dependent variable (Rahmawati & Subardjo, 2023).

RESULT AND DISCUSSION

The classical assumption analysis in this study to confirm which model of several linear regressions meets all statistical requirements so that it produces valid and unbiased estimates. This study conducts normality testing to assess the distribution of residuals, heteroscedasticity testing to identify the equality of residual variances, autocorrelation testing to detect relationships among residuals, and multicollinearity testing to examine the correlation among independent variables. Through these four tests, the study ensures that the regression model satisfies the Best Linear Unbiased Estimator (BLUE) criteria, making it appropriate for further analysis. The results of the classical assumption tests are presented in tabular form to provide an overview of the model's feasibility.

Table 1. Multicollinearity Test Results
Coefficients^a

Model	Collinearity Statistics			
	Tolerance		VIF	
1 (Constant)				
X1	.171		5.864	
X2	.171		5.864	

The purpose of this study's to determine the degree of correlation between the independent variables in the regression model, a multicollinearity test is used. Multicollinearity can make it difficult to evaluate the partial effects of independent variables by causing instability in the estimate of regression coefficients. According to the test results, every independent variable has a Variance Inflation Factor (VIF) value of 5.864, which is less than the threshold of 10, and a Tolerance value of 0.171, which is larger than 0.10. The study concludes that multicollinearity is not a problem for the regression model based on these criteria. This criterion shows that the independent variables' associations stay within reasonable bounds, enabling each variable to independently explain the variable that is dependant. Consequently, the regression model is suitable for further investigation and fulfils the premise that there is no multicollinearity.

Table 2. Autocorrelation Test Results

Model Summary^b

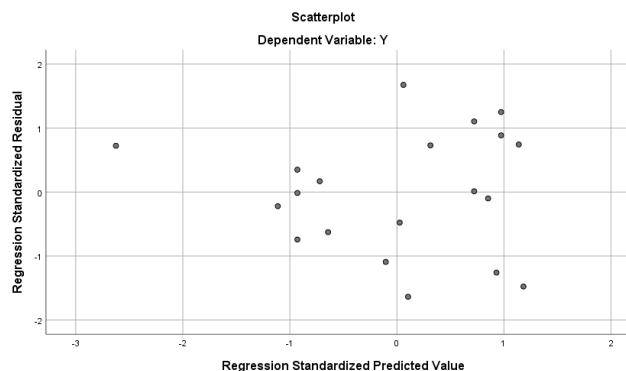
Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	Durbin-Watson
1	.675 ^a	.455	.391	2.74879	1.598

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

This research's, the autocorrelation test seeks to ascertain if residuals from one observation and those from another are correlated. Time-series data with predictable patterns frequently exhibit autocorrelation, which might lower the regression model's effectiveness. The Durbin-Watson test yielded 598, 1.5 to 2.5. This value indicates that the regression model does not exhibit autocorrelation. This condition suggests that the residuals are independent and do not influence one another. Therefore, the regression model satisfies the assumption of residual independence, and the parameter estimates can be considered stable and consistent without distortion caused by serial correlation. This finding strengthens the suitability of the regression model for hypothesis testing.

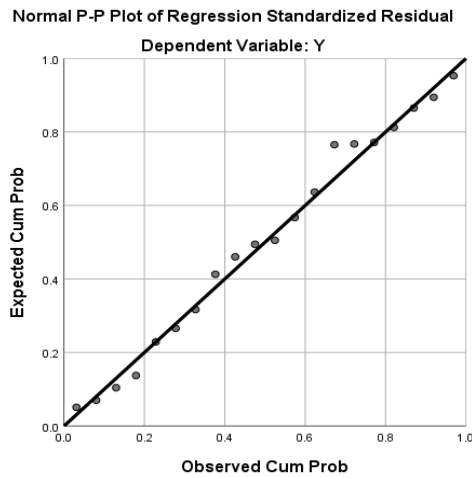
Table 3. Heteroscedasticity Test Result



The purpose of this study's heteroscedasticity test is to determine whether the variance of residuals is consistent across observations. A good regression model requires constant (homoscedastic) residual variance at all levels of the independent variables. The test results indicate that the regression model does not exhibit heteroscedasticity. This finding shows that the residuals have relatively constant variance and do not form a specific pattern. Therefore, the regression model satisfies the assumption of homoscedasticity, meaning that the estimated regression coefficients are efficient and unbiased. The absence of heteroscedasticity also indicates that

residual deviations are not influenced by the predicted values of the independent variables, making the results reliable.

Table 4. Normality Test Result



The purpose of this study's normality test is to determine whether the multiple linear regression model's residuals are normally distributed. For the regression coefficient estimations to be reliable, the residuals must adhere to the normality assumption. The residuals are typically distributed, according to the test results. This criterion shows that there are no extreme deviations and that the residuals are proportionately dispersed around their mean. As a result, regression analysis is appropriate for testing hypotheses and satisfies the normality assumption. Additionally, normally distributed residuals show that the model can accurately predict and explain the empirical relationship between independent and dependent variables.

Table 5. Results of the Coefficient of Determination Test (Adjusted R Square)

R Square	Adjusted R-Square
.455	.391

In this study, the coefficient of determination is employed to ascertain the degree to which the independent variables account for variations in the variable that depends. The results show that the Adjusted R-Square value is 0.391, meaning that the independent variables included in the regression model account for 39.1% of the changes in the dependent variable. In contrast, 60.9% of those not included in this study are affected. This figure shows that the model has a moderate level of explanatory power. Therefore, the model has a fairly good ability to explain the dependent variable, although other variables outside the study also contribute to its variation.

Table 6. F Test Results

F	Sig.
7.100	.006 ^b

In this study, the simultaneous test (F-test) is used to examine if all independent factors have a combined effect on the dependent variable. The findings indicate an F-statistic of 7.100 and a significance level of 0.006. The conclusion can be drawn that all independent variables have a simultaneous effect on the dependent variable, since the significance value is below 0.05. This finding suggests that the analytical model is appropriate for explaining how variables are related to one another as a group. Thus, regression analysis is suitable for testing hypotheses and has statistical significance.

Table 7. T-Test Results

Model		
(Constant)	B	Sig.
X1	11.183	.003
X2	-.103	.739
	.496	.080

The partial test (t-test) conducted in this study attempts to evaluate the effect of the variable individually. The study results showed that variable 739 is greater than 0.05, suggesting it does not significantly affect the dependent variable. The regression coefficient for X1 is negative (-0.103), indicating a negative relationship, but this is not statistically significant. Additionally, variable X2 has a significance value of 0.080, this exceeds 0.05. This suggests that it does not have a significant partial effect. The regression coefficient for X2 is positive (0.496), indicating a positive association with the dependent variable. The results suggest that while the model holds significance as a whole, the individual independent variables do not yet exert a strong effect on explaining variations in the dependent variable.

CONCLUSION

The study's findings enable the conclusion that the used regression model satisfies all traditional presumptions, such as the absence of multicollinearity, autocorrelation, or heteroscedasticity, and that the residuals are normally distributed. The findings imply that the regression model is suitable for additional hypothesis testing since it may be regarded as statistically reliable and impartial. With an Adjusted R-Square of 0.391, the independent variables explain 39.1% of the variation in the dependent variable, with factors not included in this study accounting for the remaining 60.9%. Additionally, the simultaneous test (F-test) shows that the dependent variable is significantly impacted by all independent variables taken together. This suggests that the model can accurately represent the relationships between the variables being studied and has sufficient explanatory power. When examined separately, none of the independent factors had a statistically significant impact on the dependent variable, according to the partial test (t-test) results. Nonetheless, the analysis suggests that variable X1 tends to have a negative relationship with the dependent variable, while variable X2 tends to have a positive relationship. In summary, these findings indicate that the variables analyzed together contribute to consumer interest or decision-making concerning halal products supported by digital traceability systems, even though their individual effects are relatively limited. Consequently, it is deemed crucial to bolster other contributory elements like boosting digital literacy, reinforcing consumer confidence, and advancing the public's comprehension of digital traceability systems to enhance the effectiveness and acceptance of halal products in the online market context.

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