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Determinants of MSME awareness to register BPOM Certification: An empirical study in the BBPOM Mataram Region

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ABSTRACT

Legal compliance in processed food products is a fundamental aspect of consumer protection and competitiveness for MSMEs in Indonesia. BPOM certification serves not only as a legal requirement but also as a strategic tool to access modern markets, financial support, and consumer trust. However, awareness among MSME actors to register for BPOM distribution permits remains low. This study aims to analyze the influence of knowledge, perceived benefits, perceived procedures, and BPOM support on awareness to register BPOM certification, with compliance as a mediating variable. Specifically, it investigates the indirect effects of knowledge, perceived benefits, and perceived procedures through compliance. The study employed a quantitative survey design involving 71 MSMEs in the jurisdiction of BBPOM Mataram that already possess a BPOM distribution permit (NIE). Data were collected via a Likert-scale questionnaire and analyzed using PLS-SEM with SmartPLS 3, including Importance-Performance Map Analysis (IPMA). Findings show that compliance and BPOM support significantly influence awareness, while knowledge, perceived benefits, and perceived procedures indirectly affect awareness through compliance. IPMA results position BPOM support and compliance in Quadrant I (high influence and performance), making them strategic priorities. The study contributes theoretically to the TPB framework by incorporating compliance as a behavioral mediator and offers practical recommendations for enhancing regulatory literacy, technical assistance, and procedural simplification.

Keywords : Awareness to register BPOM certification; Compliance; Knowledge; Perception of benefits; Perception of procedures; MSMEs.

1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in supporting national economic growth and promoting inclusive development. In Indonesia, MSMEs contribute more than 60% to the national Gross Domestic Product (GDP) and employ approximately 97% of the workforce, with over 64 million business units representing 99% of all companies nationwide (Bhalla et al., 2023). Among these businesses, processed food businesses dominate this sector, given the essential and universal nature of food consumption. Food safety, quality, and nutrition are recognized as constitutional mandates in Law No. 18/2012, which obliges the state to ensure the availability of safe and nutritious food. Recent findings indicate increasing consumer awareness of the importance of consuming healthy, safe, and nutritious food (Tan et al., 2022). However, unsafe food remains a public threat, with potential consequences not only for human health but also for national economic performance, trade competitiveness, and reputational integrity. To mitigate these risks, the Food and Drug Monitoring Agency (BPOM) plays a strategic role by requiring distribution permits as a regulatory mechanism to ensure the safety and quality of processed food. Despite a robust regulatory framework, adoption among MSMEs remains suboptimal. Of the 1.7 million MSMEs registered in the food and pharmaceutical sector, only 11,269 have obtained BPOM distribution permits, with only 9,210 in the processed food category (BPOM, 2025). Similarly, in West Nusa Tenggara, only 93 of 12,258 processed food MSMEs hold BPOM permits, while the majority rely on PIRT licenses issued by local health authorities. Although legal obligations are stipulated in Article 91 of the Food Law, which mandates a distribution permit for all processed food marketed in retail packaging, enforcement remains lax, particularly for micro and small businesses. This regulatory leniency, while intended as an affirmative action, may inadvertently reduce the urgency of compliance and legal awareness among businesses.

Further complexity arises from the dual licensing system: permits issued by the Food and Drug Monitoring Agency (BPOM) (MD for domestic use, ML for imports) and PIRT permits administered by city health offices. Furthermore, certain food products are exempt from licensing requirements under BPOM Regulation No. 23/2023, including ready-to-eat foods, products with a shelf life of less than seven days, and products not sold directly to end consumers. BPOM has implemented various reforms to improve accessibility, including the introduction of the e-Registration Risk-Based Approach (e-reg RBA), which allows businesses to register online with greater efficiency. Additional incentives, such as technical assistance, a 50% fee reduction for MSMEs, and free laboratory testing, have been introduced to encourage formalization (Oemar et al., 2023). However, whether these initiatives are perceived as effective or adequate by MSMEs remains an open empirical question.

Several previous studies have examined similar issues. For example, Khuan et al., (2024) found that regulatory literacy plays a significant role in improving MSME compliance with food safety standards. Permani et al., (2025) emphasized that perceived market benefits from certification, such as access to modern retail outlets, positively influenced MSMEs' intention to register. Hidayat and Pok (2025) showed that perceived complexity of procedures was a major barrier, while simplification of digital systems increased participation by small business owners. Furthermore, Silalahi et al. (2022) highlighted the role of institutional support in the context of halal certification, which is conceptually similar to BPOM certification, where institutional intervention significantly determines business awareness and compliance.

Analysis of previous studies shows that although factors such as knowledge, benefits, procedures, and institutional support have been identified in various regulatory contexts, studies explicitly examining the relationship between these factors and MSMEs' awareness of registering for BPOM distribution permits are still very limited. A limitation of previous research lies in the lack of integration of compliance variables as mediators in theoretical models, resulting in an indirect relationship between internal factors and awareness that remains incompletely understood.

This study argues that MSMEs' awareness of registering for BPOM distribution permits is influenced by both internal and external determinants. Internally, regulatory knowledge, perceived benefits, procedural simplicity, and compliance orientation shape entrepreneurial behavior. Externally,

BPOM institutional support, including easily accessible information, influences entrepreneurial behavior.

Accessibility, training, and digital facilitation play a key role in increasing awareness and compliance intentions. A key barrier lies in the digital divide. Many MSMEs, especially those in remote areas, lack sufficient digital literacy to access and navigate online registration systems. E-government literature indicates that perceived ease of use and usefulness are central to the adoption of public digital services (Aswar et al., 2023; Kurniasari et al., 2022). Therefore, institutional support for digital capacity building is crucial to foster broader adoption of regulatory systems. This challenge mirrors that found in halal certification, where empirical studies reveal similar patterns of underutilization despite proven economic and market benefits (Silalahi et al., 2022). Like the halal certificate issued by BPJPH, the BPOM permit is a formal recognition of product safety and quality. Both function not only as regulators but also as strategic tools for business legitimacy and competitive differentiation (Wahyudi et al., 2025).

The novelty of this research lies in the integration of the compliance variable as a mediator linking internal factors (knowledge, perceived benefits, procedures) and external factors (BPOM support) to awareness of registering for BPOM distribution permits. With an empirical focus on the jurisdiction of BBPOM Mataram, this study not only expands the application of the Theory of Planned Behavior (TPB) framework but also provides evidence-based policy recommendations to improve regulatory literacy, the effectiveness of institutional interventions, and simplify certification procedures for MSMEs. Specifically, the objective of this study is to analyze the influence of knowledge, perceived benefits, procedures, and BPOM support on MSME awareness of registering for BPOM certification, with compliance as a mediating variable.

2. METHOD

This study employed a quantitative explanatory approach to examine the causal relationships among the variables investigated. In accordance with Sedlakova et al., (2025) and Toyon (2021), the research design is systematic, objective, and intended to address the research problem through measurable data. The study adopts an explanatory and descriptive design with a causal-comparative typology, without researcher intervention. The unit of analysis consists of individual MSME actors in the processed food sector, with data collected through a cross-sectional method. To frame the behavioral intentions of MSMEs in adopting BPOM's digital licensing system, this study integrates the Awareness-Intention Model and the Technology Acceptance Model (TAM). This theoretical integration is intended to provide a comprehensive understanding of how knowledge, perceived benefits, procedural perceptions, regulatory compliance, and institutional support affect MSMEs' awareness to registration BPOM certification via the e-Registration Risk-Based Approach (e-reg RBA) system.

Operationalization of variables was conducted by translating each research construct into specific and measurable indicators. According to Hooper et al., (2024) and Cinelli et al., (2024), abstract concepts must be converted into observable variables using appropriate instruments. In this study, variables such as knowledge, perception of benefits, perception of procedures, compliance, BPOM support, and awareness to register BPOM certification were defined and developed into measurable indicators using a Likert-type scale. A five point Likert scale was utilized to assess respondents' attitudes, perceptions, and behaviors. This scale allows for the quantification of agreement intensity toward each statement, as recommended by Leong et al., (2023) and Yahaya & Balan (2025), and is suitable for behavioral and perception studies. The study population included all MSMEs in the processed food sector located in the jurisdiction of BBPOM Mataram that had obtained a BPOM distribution license. Given the relatively small population size (71 enterprises), a census sampling technique was employed, which is consistent with recommendations for small population studies (Dindi & Stiegler, 2025). Primary data were collected using a structured online questionnaire (Google Forms) with Likert-scale items to measure latent constructs. Secondary data were obtained from institutional sources such as BPOM documents, industrial office reports, and relevant academic literature.

The data were analyzed using Structural Equation Modeling - Partial Least Squares (SEM-PLS). The testing procedures followed the steps outlined by Perdana et al., (2023) as follows:

a. Structural Model Design (Inner Model)

The structural model was developed to map causal relationships among latent variables based on the research framework and hypotheses. It illustrates both the direction and strength of relationships (path coefficients) among constructs, including the influence of knowledge, perceived benefits, perceived procedures, BPOM support, and awareness to register BPOM certification.

b. Measurement Model Design (Outer Model)

The measurement model specifies the relationship between indicators and their corresponding latent constructs. All indicators in this study are reflective, indicating they represent manifestations of the underlying constructs. Therefore, internal consistency and convergent validity were evaluated to ensure the indicators accurately reflect the intended constructs.

c. Model Evaluation

The outer model was assessed using three main criteria:

1. Convergent Validity. Measured by outer loadings and Average Variance Extracted (AVE); loadings ≥ 0.70 are ideal, though 0.50–0.60 may be acceptable in exploratory research.
2. Discriminant Validity. Evaluated through cross-loadings, AVE comparison, and Heterotrait–Monotrait Ratio (HTMT). HTMT values < 0.85 (or < 0.90 for closely related constructs) indicate adequate discriminant validity.
3. Reliability. Assessed using Composite Reliability and Cronbach's Alpha; values ≥ 0.70 indicate strong internal consistency.

The structural model was further evaluated through R-square (R^2) to assess explained variance, Q-square (Q^2) for predictive relevance, and F-square (f^2) to estimate effect size of exogenous constructs.

d. Hypothesis Testing

Hypotheses were tested using bootstrapping with 5,000 subsamples. Path significance was determined by T-statistics; a T-value > 1.96 at a 95% confidence level indicates significant relationships. This method ensures robust estimations, even with small sample sizes, and does not assume normal distribution of data.

3. RESULTS AND DISCUSSION

3.1 RESULT

a. Structural Model Design (Inner Model)

The design of the inner model in this study refers to the structural relationships among latent variables, which are constructed based on the logical flow derived from the research objectives, problem formulation, and hypotheses previously developed. The inner model for this study is illustrated in Figure 1 below.

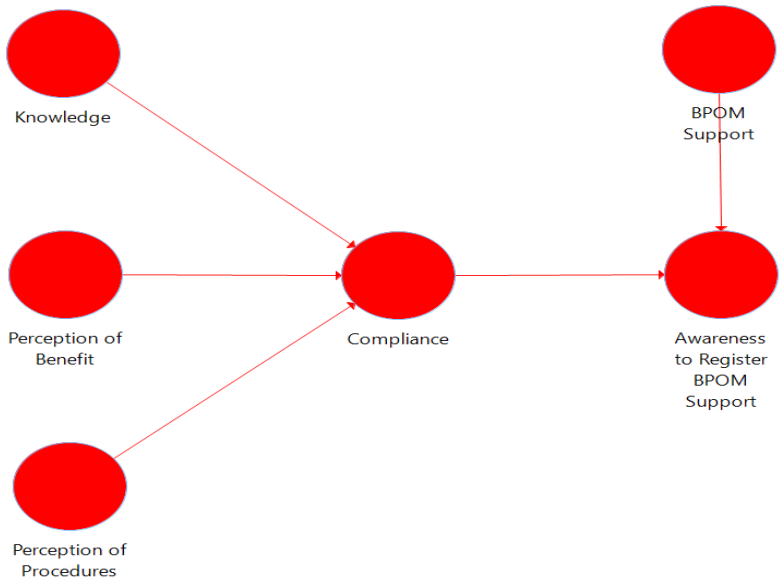

Figure 1. Inner Model

Measurement Model Design (Outer Model)

In the measurement model stage (outer model), all constructs employed in this study namely knowledge, perception of benefit, perception of procedures, BPOM support, compliance, and awareness to register BPOM certification are specified as reflective constructs. In reflective modeling, indicators are considered manifestations of the underlying latent variables, meaning that any change in the construct will be reflected in its indicators. The measurement model was designed and analyzed using SmartPLS, which is suitable for evaluating reflective constructs in terms of validity and reliability. The use of the reflective approach is theoretically justified, as the constructs represent abstract perceptions or subjective responses that cannot be directly measured. The outer model of this study is presented in Figure 2.

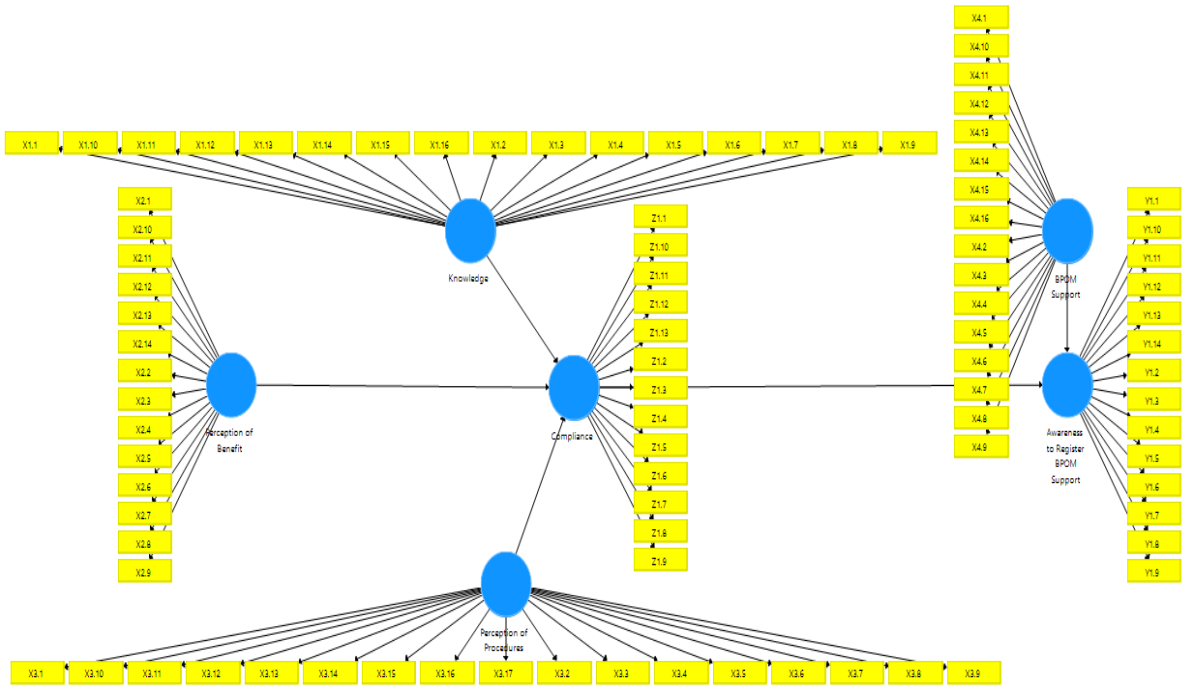

Figure 2. Outer Model

b. Model Evaluation

1) Convergent Validity

The evaluation of the outer model is essential to ensure that the indicators accurately and consistently measure the latent constructs. In reflective measurement models, three primary criteria must be fulfilled: convergent validity, discriminant validity, and composite reliability.Convergent validity assesses the extent to which indicators of a specific construct exhibit high internal consistency and are strongly correlated. According to Rönkkö & Cho (2022), convergent validity is evaluated through two key measures:

a) Loading Factor (Outer Loading), with an ideal threshold of > 0.70. However, for exploratory research, loadings between 0.50 and 0.60 are still considered acceptable. The outer loading results for the constructs of Knowledge, Perception of Benefit, and Perception of Procedures are presented in Table 1.

Table 1. Outer Loading Knowledge, Perception of Benefit, and Perception of Procedures

Indicator	Knowledge	Indicator	Perception of Benefit	Indicator	Perception of Procedures
X1.1	0.780	X2.1	0.735	X3.1	0.818
X1.2	0.743	X2.2	0.724	X3.2	0.771
X1.3	0.727	X2.3	0.765	X3.3	0.806
X1.4	0.635	X2.4	0.857	X3.4	0.847
X1.5	0.789	X2.5	0.848	X3.5	0.810
X1.6	0.731	X2.6	0.879	X3.6	0.899
X1.7	0.809	X2.7	0.848	X3.7	0.788
X1.8	0.778	X2.8	0.836	X3.8	0.799
X1.9	0.819	X2.9	0.780	X3.9	0.814
X1.10	0.813	X2.10	0.812	X3.10	0.743
X1.11	0.774	X2.11	0.766	X3.11	0.880
X1.12	0.716	X2.12	0.837	X3.12	0.784
X1.13	0.824	X2.13	0.827	X3.13	0.862
X1.14	0.703	X2.14	0.835	X3.14	0.859
X1.15	0.857			X3.15	0.875
X1.16	0.831			X3.16	0.878
				X3.17	0.879

Source: Processed Research Data, 2025

Based on the outer loading results presented in Table 4.10, all indicators of the constructs knowledge, perception of benefit, and perception of procedures exhibited values exceeding 0.70. This indicates that each construct satisfies the criterion for convergent validity, in accordance with the established methodological standards adopted in this study. Meanwhile, the outer loadings for BPOM Support, Compliance, and Awareness to Register BPOM Certification are presented in Table 2 below.

Table 2. Outer Loading BPOM Support, Compliance and Awareness to Register BPOM Certification

Indicator	BPOM Support	Indicator	Compliance	Indicator	Awareness to Register BPOM Certification
X4.1	0.892	Z1.1	0.806	Y1.1	0.874
X4.2	0.865	Z1.2	0.838	Y1.2	0.651
X4.3	0.810	Z1.3	0.876	Y1.3	0.854
X4.4	0.908	Z1.4	0.828	Y1.4	0.782
X4.5	0.942	Z1.5	0.901	Y1.5	0.851

Indicator	BPOM Support	Indicator	Compliance	Indicator	Awareness to Register BPOM Certification
X4.6	0.915	Z1.6	0.797	Y1.6	0.856
X4.7	0.907	Z1.7	0.772	Y1.7	0.861
X4.8	0.890	Z1.8	0.808	Y1.8	0.746
X4.9	0.854	Z1.9	0.842	Y1.9	0.688
X4.10	0.873	Z1.10	0.848	Y1.10	0.700
X4.11	0.922	Z1.11	0.764	Y1.11	0.784
X4.12	0.840	Z1.12	0.884	Y1.12	0.827
X4.13	0.868	Z1.13	0.802	Y1.13	0.857
X4.14	0.837			Y1.14	0.854
X4.15	0.891				
X4.16	0.845				

Source: Processed Research Data, 2025

The outer loading results in Table 2 indicate that the majority of indicators for the constructs BPOM Support, Compliance, and Awareness to Register BPOM Certification exceed the minimum threshold of 0.70, thereby demonstrating that convergent validity is generally achieved.

2) Average Variance Extracted (AVE)

AVE is considered acceptable when its value exceeds 0.50, indicating that more than 50% of the variance in the indicators is explained by the underlying construct. Composite Reliability (CR) is used to assess the internal consistency among indicators within a construct. A CR value of ≥ 0.70 signifies satisfactory reliability. CR is preferred over Cronbach's Alpha in the context of PLS, as it accounts for the contribution of each indicator based on its respective loading value.

Table 3. AVE, CR and Cronbach Alpha

Variable	AVE	Composite Reliability	Cronbach Alpha
Awareness to Register BPOM Support	0.644	0.962	0.957
BPOM Support	0.773	0.982	0.980
Compliance	0.688	0.966	0.962
Knowledge	0.597	0.959	0.955
Perception of Benefit	0.659	0.964	0.960
Perception of Procedures	0.691	0.974	0.972

Source: Processed Research Data, 2025

3) Discriminant Validity

Discriminant Validity in this study was evaluated using the Fornell-Larcker Criterion approach. The results are presented as follows:

Table 4. Result Fornell Larcker Criterion

Variable	Awareness to Register BPOM Certification	BPOM Support	Compliance	Knowledge	Perception of Benefit	Perception of Procedures
Awareness to Register BPOM Certification	**0.802**					

Variable	Awareness to Register BPOM Certification	BPOM Support	Compliance	Knowledge	Perception of Benefit	Perception of Procedures
BPOM Support	0.697	**0.879**				
Compliance	0.735	0.775	**0.829**			
Knowledge	0.768	0.733	0.751	**0.773**		
Perception of Benefit	0.587	0.681	0.695	0.769	**0.812**	
Perception of Procedures	0.728	0.710	0.724	0.698	0.584	**0.831**

Source: Processed Research Data, 2025

The results of the discriminant validity test using the Fornell-Larcker criterion, as shown in Table 4, indicate that all constructs in the model meet the requirements for acceptable discriminant validity. Each square root of the AVE (displayed along the diagonal of the table) is greater than the corresponding inter-construct correlations in the same row or column. The results of the inner model assessment in this study are presented in Table 5, which displays the R^2 values for each endogenous construct analyzed.

Table 5. R Square Value

Variable	R Square
Compliance	0.569
Awareness to Register BPOM Certification	0.651

Source: Processed Research Data, 2025

Based on the results presented in Table 4.14, the R-squared value for the *Compliance* construct is 0.569, while the value for *Awareness to Register BPOM Certification* is 0.651. According to Ghozali (2021), these values fall within the moderate category, indicating that the independent variables in the model adequately explain the variance in each dependent construct.

c. Hypothesis Testing

In this study, hypothesis testing was conducted by analyzing the t-statistic values to assess the significance of the relationships among variables in the structural model. Referring to a 5% significance level, the minimum threshold for the t-statistic is 1.995 (df = 71 – 2 = 69). The complete results of the direct effect testing among constructs are presented in Table 6 below.

Table 6. Direct Effect

Construct	Original Sampel	T Statistik	Status > 1.995
Knowledge à Compliance	0.306	2.297	Significant
Perception of Benefit à Compliance	0.246	2.023	Significant
Perception of Procedures à Compliance	0.366	3.444	Significant
Compliance à Awareness to Register BPOM Certification	0.489	3.501	Significant
BPOM Suppor à Awareness to Register BPOM Certification	0.318	2.213	Significant

Source: Processed Research Data, 2025

Based on the hypothesis testing results presented in Table 6, all relationships among constructs in the research model are statistically significant at the 5% significance level, as indicated by t-statistic

values exceeding the threshold of 1.995. These findings confirm that all five direct causal relationships tested in the model are empirically supported, thereby validating all proposed direct effect hypotheses in this study. The indirect effects in this study are presented as follows:

Table 7. Indirect Effect

Variable Relationships	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	P Values
BPOM Support -> Awareness to Register BPOM Certification					
Compliance -> Awareness to Register BPOM Certification					
Knowledge -> Awareness to Register BPOM Certification	0.150	0.146	0.084	1.782	0.075
Knowledge -> Compliance					
Perception of Benefit -> Awareness to Register BPOM Certification	0.120	0.105	0.066	1.810	0.071
Perception of Benefit -> Compliance					
Perception of Procedures -> Awareness to Register BPOM Certification	0.179	0.185	0.071	2.519	0.012
Perception of Procedures -> Compliance					

Source: Processed Research Data, 2025

Based on the analysis of indirect effects, the Compliance variable is confirmed to serve as a mediator in several relationships toward Awareness to Register BPOM Certification. This is evidenced by the indirect effect of Perception of Procedures on Awareness through Compliance, which shows a path coefficient of 0.179, a t-statistic of 2.519, and a p-value of 0.012 indicating statistical significance at the 95% confidence level. Meanwhile, the other two indirect paths, namely Knowledge → Compliance → Awareness (p = 0.075) and Perception of Benefit → Compliance → Awareness (p = 0.071), although not significant at the 5% level, fall within the 10% significance threshold, which can still be considered as evidence of partial mediation in practical terms.

d. Importance Performance Map Analysis (IPMA)

To identify strategic priorities for enhancing MSMEs' awareness of BPOM certification, this study employs Importance Performance Map Analysis (IPMA). The analysis maps each construct based on two key dimensions, total effect (importance) and performance value. This approach enables the identification of constructs that exert a strong influence but exhibit suboptimal performance, thus highlighting areas for improvement. The IPMA in this study focuses on the endogenous variable *Awareness to Register BPOM Certification*, with five main predictor constructs. The results are presented in the following figure.

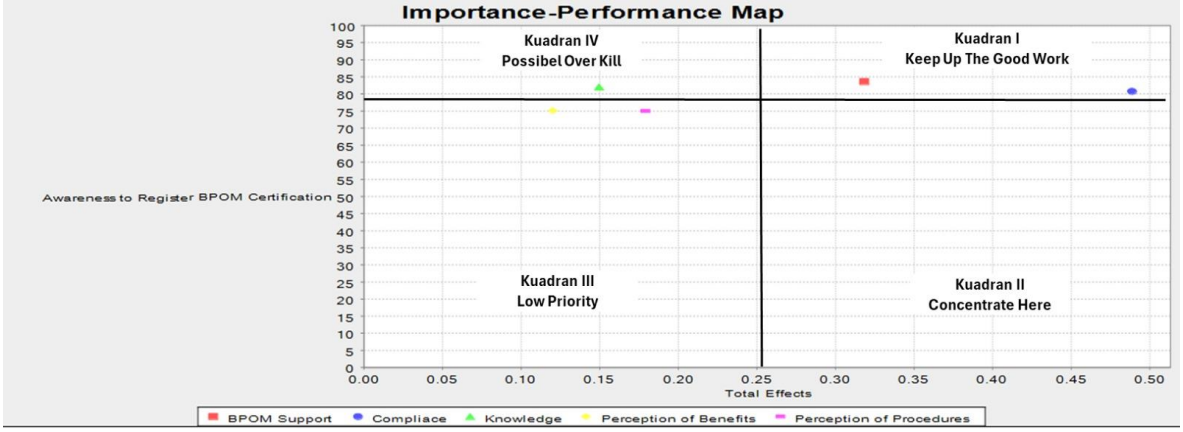

Figure 3. Importance-Performance Map Analysis (IPMA)

Based on the IPMA graph, constructs are categorized into four quadrants using the average total effect value of 0.250 and performance score of 50. Compliance (blue circle) and BPOM Support (red square) are in Quadrant I, indicating both high importance and performance thus, they are key priorities to maintain and strengthen. Perception of Benefit (yellow diamond) and Perception of Procedures (purple rectangle) fall in Quadrant II, showing good performance but lower influence on awareness, making them secondary priorities. Knowledge (green triangle) is in Quadrant III with both low importance and performance, suggesting it is not yet a strategic focus but should be gradually improved to support long-term awareness.

3.2 DISCUSSION

The results of this study indicate that all relationships between constructs in the research model are significant, both direct and indirect, with a moderate contribution to the endogenous variables. Knowledge, perceived benefits, and perceived procedures were shown to significantly influence compliance, while compliance, along with BPOM support, played a crucial role in increasing MSME awareness regarding BPOM certification. Furthermore, the Importance Performance Map Analysis (IPMA) results confirm that compliance and BPOM support are top priorities that need to be maintained, while knowledge still plays a relatively low role but is crucial for long-term improvement.

These findings align with research by Purnomo et al., (2024), which states that MSME administrative compliance is significantly influenced by a clear understanding of regulatory procedures. Similarities are also evident with the study by Singh & Puniya (2024), which found that government support, in the form of regulations and assistance, plays a crucial role in promoting the legality of food products. Furthermore, these results reinforce the findings of Fathoni et al., (2024), which showed that perceived benefits of certification are closely related to MSMEs' willingness to register, despite challenges such as cost and procedural complexity. However, the findings of this study differ from those of Ruiz-Molina et al., (2019), which emphasized that knowledge is the primary determinant of certification awareness. In this study, knowledge was not a strategic priority, demonstrating a gap that may be influenced by the varying education levels of MSMEs and the lack of systematic access to information.

While the results of this study provide important empirical contributions, several limitations should be noted. First, this study used only a quantitative approach with a questionnaire instrument, thus potentially biasing respondents' perceptions. Second, the study sample was limited to MSMEs in a specific region, thus limiting the generalizability of the findings to a national scale. Third, the study did not in-depth explore other external factors such as certification costs, digital technology support, or the role of MSME associations that may influence certification awareness.

Based on these limitations, future research is recommended to use a mixed-methods approach to further explore the contextual factors influencing MSME compliance and awareness. Furthermore, further research could expand the geographic scope to make the results more nationally representative, and include additional variables such as cost barriers, technology support, and the role

of the business community in raising awareness of BPOM certification. Thus, the results of subsequent research are expected to be able to provide more comprehensive recommendations for the formulation of effective policies in supporting MSMEs.

4. CONCLUSION

This study identifies several key findings regarding the determinants of MSMEs' awareness to register for BPOM certification. Knowledge, perceived benefits, and perceived procedures significantly influence compliance, which in turn mediates their impact on awareness. BPOM support also has a direct and significant effect on awareness, establishing both BPOM support and compliance as strategic priority constructs. Meanwhile, the remaining variables despite their strong performance exert lower influence and are not prioritized for short-term improvement. These findings highlight the central role of compliance in bridging attitudinal constructs with administrative awareness in the context of food product legalization.

Practically, regulatory education should extend beyond conceptual socialization toward hands-on approaches, supported by simplified licensing procedures and accessible visual guides such as infographics or video tutorials. Policymakers are encouraged to offer concrete incentives (e.g., market access, financing, training) exclusively for MSMEs that demonstrate compliance or hold BPOM certification. Theoretically, the findings enrich the Theory of Planned Behavior (TPB) by introducing compliance as a mediating behavioral pathway. Future research is advised to incorporate external variables such as market pressure, MSME associations, and peer influence. Additionally, IPMA should be employed for strategic intervention planning, and longitudinal studies or segmentation based on business scale or geographic context are recommended to capture a more nuanced understanding of legalization awareness.

5. REFERENCES

Aswar, K., Julianto, W., Sumardjo, M., Panjaitan, I., & Nasir, A. (2023). An investigation of the factors affecting citizens' adoption of e-government in Indonesia. *Problems and Perspectives in Management*, *21*(2), 187. https://doi.org/10.21511/ppm.21(2).2023.21

Bhalla, N., Sharma, R. K., & Kaur, I. (2023). Effect of goods and service tax system on business performance of micro, small and medium enterprises. *Sage Open*, *13*(2), 21582440231177210. https://doi.org/10.1177/21582440231177210

Cinelli, C., Forney, A., & Pearl, J. (2024). A crash course in good and bad controls. *Sociological Methods & Research*, *53*(3), 1071–1104. https://doi.org/10.1177/00491241221099552

Dindi, P. D., & Stiegler, N. (2025). Charting the future of censuses: Insights, lessons and recommendations for the 2030 round. *Statistical Journal of the IAOS*, *41*(2), 402–420. https://doi.org/10.1177/18747655251335763

Fathoni, M. A., Faizi, F., Suprima, S., Wiryanto, F. S., & Suryani, S. (2024). Exploring halal certification literacy measurement for micro small enterprises (MSEs). *Review of Islamic Economics and Finance*, *7*(2), 1–14. https://doi.org/10.17509/rief.v7i2.73607

Hidayat, A. S., & Pok, W. C. (2025). Empowering SMEs innovation through intangible factors. *Journal of Innovation and Entrepreneurship*, *14*(1), 1. https://link.springer.com/article/10.1186/s13731-024-00437-w

Hooper, R., Goyal, N., Blok, K., & Scholten, L. (2024). A semi-automated approach to policy-relevant evidence synthesis: combining natural language processing, causal mapping, and graph analytics for public policy. *Policy Sciences*, *57*(4), 875–900. https://link.springer.com/article/10.1007/s11077-024-09548-3

Khuan, H., Judijanto, L., & Juminawati, S. (2024). Legal Regulations Pertaining to Product Safety and Quality Standards in MSMEs Business in Indonesia. *The Easta Journal Law and Human Rights*, *2*(02), 97–105. https://doi.org/10.58812/eslhr.v2i02.210

Kurniasari, F., Gunawan, D., & Utomo, P. (2022). Factors influencing small medium enterprise's behavior in adopting e-fulfillment services. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, *7*(3), 9. https://dialnet.unirioja.es/servlet/articulo?codigo=8632965

Leong, M. D., Ismail, T. S. T., & Hwa, G. T. (2023). Anti-hypertensive prescription practices in private hospitals in Malaysia: a prospective, non-interventional, observational study. *MJM*, *78*(3), 350. https://pubmed.ncbi.nlm.nih.gov/37271845/

Oemar, H., Prasetyaningsih, E., Bakar, S. Z. A., Djamaludin, D., & Septiani, A. (2023). Awareness and intention to register halal certification of micro and small-scale food enterprises. *F1000Research*, *11*, 170. https://doi.org/10.12688/f1000research.75968.3

Perdana, P. N., Armeliza, D., Khairunnisa, H., & Nasution, H. (2023). Research data processing through structural equation model-partial least square (SEM-PLS) method. *Jurnal Pemberdayaan Masyarakat Madani (JPMM)*, *7*(1), 44–50. https://doi.org/10.21009/JPMM.007.1.05

Permani, R., Sahara, S., Satria, D., Suprehatin, S., & Nuryartono, N. (2025). The impacts of food certificate adoption on e-commerce income among small online agri-food sellers. *Journal of Agribusiness in Developing and Emerging Economies*, *15*(3), 579–600. https://doi.org/10.1108/JADEE-10-2022-0231

Purnomo, H., Subagyo, S., SEOJOKO, D. K. H., & Leksono, P. Y. (2024). Access to credit, human resource development, market orientation, and regulatory compliance: determinants of MSME sustainability in Indonesia. *West Science Social and Humanities Studies*, *2*(1), 190–199. https://repository.unpkediri.ac.id/12878/

Rönkkö, M., & Cho, E. (2022). An updated guideline for assessing discriminant validity. *Organizational Research Methods*, *25*(1), 6–14. https://doi.org/10.1177/1094428120968614

Ruiz-Molina, M.-E., Gil-Saura, I., Berenguer-Contri, G., & Auch, C. (2019). Determinants of behavioral intentions towards a professional certification scheme at European level. *European Journal of Training and Development*, *43*(7/8), 719–735. https://doi.org/10.1108/EJTD-01-2019-0001

Sedlakova, J., Stanikić, M., Gille, F., Bernard, J., Horn, A. B., Wolf, M., Haag, C., Floris, J., Morgenshtern, G., & Schneider, G. (2025). Refining Established Practices for Research Question Definition to Foster Interdisciplinary Research Skills in a Digital Age: Consensus Study With Nominal Group Technique. *JMIR Medical Education*, *11*(1), e56369. https://mededu.jmir.org/2025/1/e56369/

Silalahi, S. A. F., Fachrurazi, F., & Fahham, A. M. (2022). Factors affecting intention to adopt halal practices: case study of Indonesian small and medium enterprises. *Journal of Islamic Marketing*, *13*(6), 1244–1263. https://doi.org/10.1108/JIMA-05-2020-0152

Singh, R., & Puniya, A. K. (2024). Role of food safety regulations in protecting public health. *Indian Journal of Microbiology*, *64*(3), 1376–1378. https://link.springer.com/article/10.1007/s12088-024-01240-7

Tan, B. C., Lau, T. C., Sarwar, A., & Khan, N. (2022). The effects of consumer consciousness, food safety concern and healthy lifestyle on attitudes toward eating "green." *British Food Journal*, *124*(4), 1187–1203. https://doi.org/10.1108/BFJ-01-2021-0005

Toyon, M. A. S. (2021). Explanatory sequential design of mixed methods research: Phases and challenges. *International Journal of Research in Business and Social Science*, *10*(5), 253–260. https://doi.org/10.20525/ijrbs.v10i5.1262

Wahyudi, T., Pohan, E. S., Utami, F., Nofianti, N., Soleha, N., Syaifudin, R., & Desmawan, D. (2025). Open Innovation Ecosystems and Competitive Advantage in Green Technologies: A

Systematic Review. *Accounting, Organization, and Information System*, *1*(1). https://journalnetworth.com/index.php/aois/article/view/2

Yahaya, A. R., & Balan, E. (2025). Franchise Brand Perception in Malaysia: An Empirical Analysis of Leadership Engagement and Regulatory Frameworks. *Journal of Science, Technology and Innovation Policy*, *11*(1), 1–21. https://doi.org/10.11113/jostip.v11n1.155