



Optimizing Nazhir: SEM-PLS Modeling for Measuring Waqf Facilities and Effectiveness in Benefiting Islamic Educational Institutions

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ABSTRACT

This study aims to build and test a structural equation model to measure the contribution of waqf facilities to the realization of waqf benefits in Islamic educational institutions. Using the Resource-Based View and Stakeholder Theory as a foundation, this research proposes that waqf facilities, as strategic resources, have a positive and significant influence on multi-dimensional waqf benefits. The research method uses a quantitative approach with an explanatory survey, applying Structural Equation Modeling - Partial Least Squares (SEM-PLS). Data was collected through questionnaires from Nazhir and Islamic boarding school administrators with purposive sampling of 100 respondents. The analysis results show that the measurement model is valid and reliable (Cronbach's Alpha > 0.70, AVE > 0.50). The structural model testing reveals that Waqf Facilities significantly influence Waqf Benefits with an R-square value of 0.415 and a large effect size ($f\text{-square} = 0.708$), thus hypothesis H1 is accepted. The novelty of this research lies in its methodological contribution by positioning SEM-PLS as a diagnostic tool for nazhir, its theoretical contribution in enriching the application of RBV in religious non-profit contexts, and its practical contribution in providing an empirical evaluation model to optimize evidence-based and impact-oriented waqf management

INTRODUCTION

Islamic social finance is undergoing a fundamental evolution from charitable philanthropy to a strategic approach demanding measurable impact. In this context, waqf serves as a pivotal instrument for Islamic educational institutions, whose sustainability and development often depend on waqf assets in the form of land, buildings, and supporting facilities (Ari & Koc, 2021).

Despite modernization efforts, a critical research gap remains. While existing studies productively address legal, productive, and behavioral aspects of waqf—such as donor intention models using frameworks like the Theory of Planned Behavior (Saad et al., 2022; Abdelfattah & Aziz, 2021; Zakariyah et al., 2022) and institutional performance indicators (Oseni et al., 2021; Pratiwi & Juerges, 2022)—there is a notable absence of a comprehensive, quantitative framework to evaluate the outcomes of existing waqf assets. Consequently, nazhir (waqf managers) lack empirical tools to measure how facilities such as classrooms, dormitories, or business units actually contribute to sustainable benefits. This disconnect between asset ownership and optimal benefit realization poses a practical challenge, risking misaligned and inefficient management.

To bridge this gap, this study proposes and tests a measurement model using Structural Equation Modeling – Partial Least Squares (SEM-PLS), a method increasingly applied in Islamic finance research (Ali et al., 2023; Edeh et al., 2023; Hussin et al., 2024) but still underexplored for evaluating waqf asset performance. The research is guided by the following questions:

1. To what extent do waqf facilities influence the realization of multidimensional benefits in Islamic educational institutions?
2. How can SEM-PLS serve as a diagnostic tool to model and measure this relationship?
3. What are the practical implications of this model for optimizing nazhir's decision-making and improving waqf impact?

This research moves beyond descriptive or intention-based studies (e.g., Fauzi et al., 2021; Mohd Noor et al., 2022) by conceptualizing waqf facilities and benefits as latent constructs and quantitatively examining their structural relationship. The study offers threefold novelty: (1) a conceptual model linking asset inputs to outcome benefits, (2) methodological application of SEM-PLS for waqf performance diagnostics, and (3) a practical, nazhir-focused tool for evidence-based management—ultimately aiming to enhance the accountability, strategic impact, and sustainability of waqf in Islamic education.

LITERATURE REVIEW

This study is rooted in a foundational theory that explains how organizational resources and assets contribute to the achievement of goals and value creation. **Resource-Based View (RBV)** and its extension, **Resource-Based Theory (RBT)**, offer a strong logical foundation (Vrontis et al., 2022). This theory states that competitive advantage and sustainable organizational performance come from the management of valuable, rare, inimitable, and organized resources. In the context of waqf, waqf facilities—as physical assets and infrastructure—can be positioned as strategic resources (Abdul Majid et al., 2024).

These assets, especially those that have specific and historical characteristics in Islamic educational institutions, are rare and difficult to replicate, so they have the potential to be the basis for creating unique value. However, the RBV theory itself is less specific in explaining the mechanism of transforming resources into final results. Therefore, this theory is reinforced by **the Stakeholder Theory** approach which emphasizes that the success of an organization depends on its ability to meet expectations and create value for various stakeholders. In the waqf ecosystem, the main stakeholders include wakif (donors), nazhir (managers), mustahik (beneficiaries in this case students and the community), and regulators (Ghلامallah et al., 2021). The sustainability of the institution depends on its ability to provide real and accountable benefits to all parties.

Based on this theoretical framework and a synthesis of the current empirical literature, this research develops a key proposition. Previous studies that have focused on a single aspect, such as the institutional model of productive waqf (Hasanah & Hidayat, 2023; Amiruddin & Ascarya, 2022) and donor behavior (Saad et al., 2022; Abdelfattah & Aziz, 2021)(A. N. Setiawan et al., 2023) have confirmed the importance of structural and psychological factors. However, research that directly links *input* conditions to *outcome* outcomes is still limited and tends to be partial. Studies on performance measurement (Oseni et al., 2021) focus more on financial indicators and internal governance, rather than on socio-educational impacts, which are the *raison d'être* of educational endowments(5). Meanwhile, the application of PLS-SEM in the field of waqf is still dominated to model intentions (Mohd Noor et al., 2022), not to evaluate the objective performance of the assets that have been realized.

Therefore, this study proposes the core proposition that waqf facilities positively and significantly affect the realization of waqf benefits in Islamic educational institutions. This proposition is derived from the RBV logic that well-managed resources (facilities) will result in superior performance (benefits), and the logic of Stakeholder Theory that the fulfillment of those benefits is the key to legitimacy and sustainability. To test this proposition empirically and fill in the existing methodological gaps, a research model was formulated that operationalizes the two main constructs as multidimensional latent variables. The construction of Waqf Facilities is measured through dimensions that reflect the quality of resources, namely: (1) *Adequacy*, referring to quantity and completeness; (2) *Quality*, related to the condition and standards of facilities; (3) *Accessibility*, regarding ease of use; and (4) *Manageability*, which concerns the efficiency of operations and maintenance. On the other hand, the construct of Waqf Benefits is measured through outcomes for stakeholders, including: (1) *Educational Benefits*, such as improving the quality of learning and academic achievement; (2) *Social Benefit*, in the form of contribution to society and strengthening networks; and (3) *Institutional Sustainability*(1), which includes financial independence and organizational resilience(Omar & Sari, 2019) The causal relationship between these two constructs is hypothesized as follows: H1: Waqf Facilities have a positive and significant influence on the Benefits of Waqf in Islamic educational institutions. Testing this hypothesis with PLS-SEM is expected to not only prove the statistical relationship, but also reveal the relative

contribution of each dimension of the facility to each dimension of benefit, thus providing a valuable diagnostic map for improving the effectiveness of waqf management (Windianingsih et al., 2022).

METHODS

This study examines the causal relationship between the management of waqf facilities and the realization of their multidimensional benefits within the operational ecosystem of Pesantren Mambaul Ulum in Cirebon, West Java, Indonesia—a single-case setting that allows for an in-depth, contextually grounded investigation. The research adopts a quantitative, explanatory survey approach and employs Structural Equation Modeling based on Partial Least Squares (SEM-PLS) (Hair et al., 2021). The choice of SEM-PLS aligns with the study's objectives: it is suitable for predictive and theory-testing purposes, accommodates complex models with latent variables, does not require multivariate normality, and performs well with small to medium sample sizes (Edeh et al., 2023).

The unit of analysis is the Islamic educational institution, represented by key informants with comprehensive knowledge of waqf facilities and their impact. Respondents include Nazhir (waqf managers), administrators of the Islamic boarding school (madrasah), and senior lecturers involved in strategic planning. Using a purposive sampling approach, a total of 100 respondents from Pesantren Mambaul Ulum participated in the study. Eligibility criteria required that the institution (1) possesses at least three types of fixed waqf facilities (e.g., dormitories, classrooms, libraries, or productive land), (2) has operated these facilities for a minimum of five years, and (3) is willing to provide data through competent representatives.

Data were collected via a closed questionnaire distributed both online and offline, consisting of three sections: (1) respondent and institutional profiles, (2) indicators measuring Waqf Facilities (X), and (3) indicators measuring Waqf Benefits (Y). All items used a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) to enhance response variance and sensitivity. Ethical considerations were observed throughout the research process. Respondents participated voluntarily, provided informed consent prior to completing the survey, and were assured of the confidentiality and anonymity of their responses. Data were used solely for academic purposes.

Analysis was conducted in SmartPLS 4 in two stages. First, the measurement model (outer model) was evaluated for validity and reliability. Convergent validity was assessed using outer loadings (> 0.70) and Average Variance Extracted ($AVE > 0.50$). Reliability was established through Composite Reliability ($CR > 0.70$) and Cronbach's Alpha (> 0.60). Discriminant validity was examined using the Fornell-Larcker criterion and cross-loading analysis. Second, the structural model (inner model) was tested to evaluate predictive power and hypothesized relationships. The coefficient of determination (R^2) was used to assess the model's explanatory power for the Waqf Benefits construct. Path significance (β) was tested via a bootstrapping procedure, with H1 considered supported if the t-statistic exceeded 1.96 ($p < 0.05$) and the path coefficient was positive.

RESULTS AND DISCUSSION

Results

Loading factor is part of the measurement of a model, and is used to evaluate the validity of the model that has been studied.

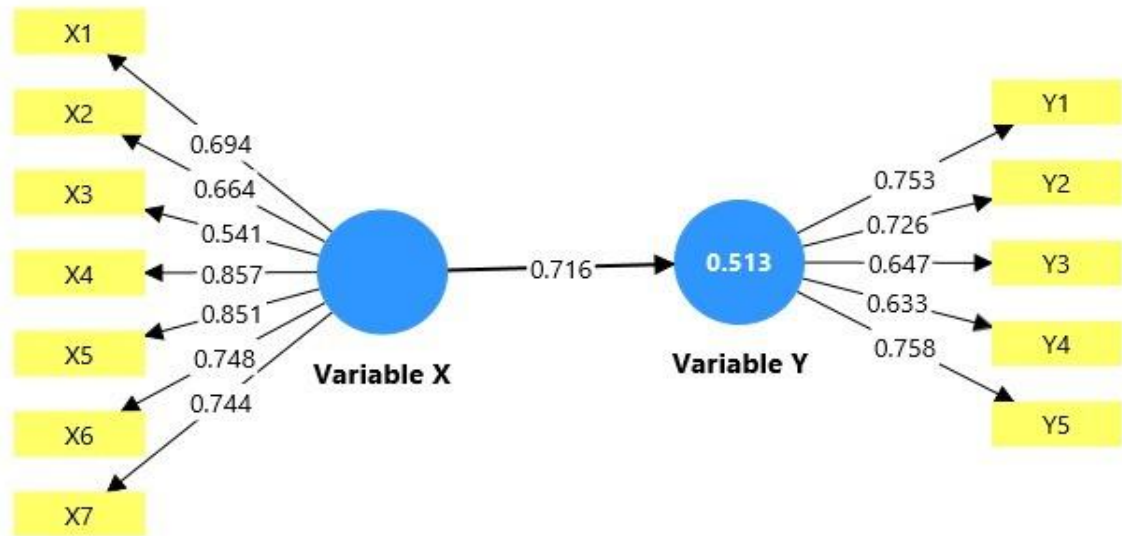


Figure 1. Loading Factor Before X3 Indicator Has Eliminated

Figure 1 shows the results of the measurement of the outer model for the first part of this study, which measures the construction of Waqf Facilities on Waqf Benefits.

It is seen that each indicator (represented by the yellow box) has an *outer loading* value that connects it to the construct (represented by an ellipse). It can be seen that X3 has the lowest number of 0.541 which indicates an invalid and unreliable loading value because it is below 0.6. X3 is an indicator that shows that educational institutions have conducted education and socialization on the importance of waqf.

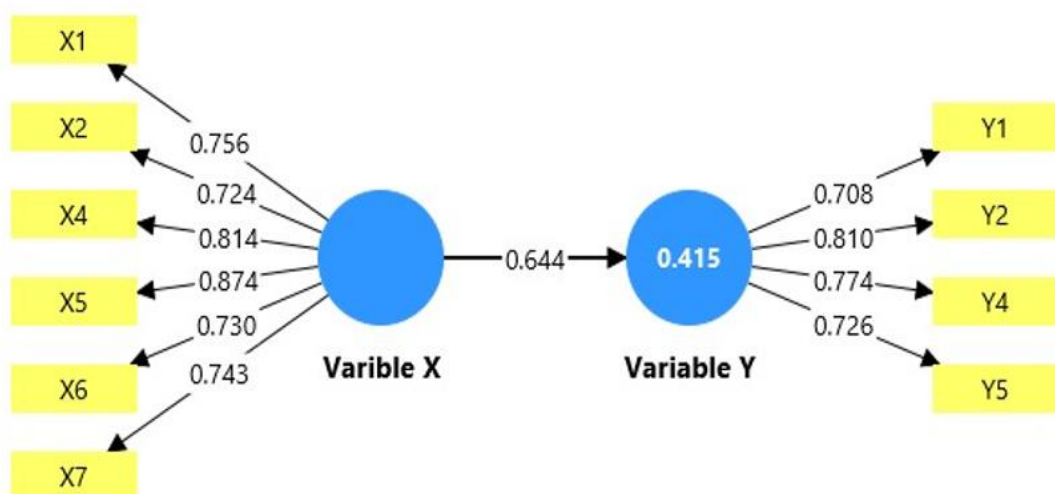


Figure 2. Loading Factor After X3 Indicator Has Eliminated

In this image, after the X3 indicator is dropped, it can be observed that each indicator has a fairly high outer loading on the Waqf Facility construct, indicating that this indicator is the most dominant contributor in representing the construct. Overall, all indicators in Figure 2 show adequate loading values, which reinforces the internal consistency of the research measuring tool. Figures 1 and 2 together provide a complete picture that all manifest variables used have met the initial requirements for further analysis in the *inner model*.

Table 1. Validity and Realibility

| Validity and reliability of constructs - Summary | | | | |
|--|------------------|-------------------------------|-------------------------------|-------------------------------|
| | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | Average of variance extracted |
| Variable Y | 0,752 | 0,753 | 0,842 | 0,571 |
| Variable X | 0,872 | 0,906 | 0,900 | 0,601 |

The results of data analysis using SEM-PLS provide an overview of model validity, measurement reliability, and strength of structural relationships between Waqf Facilities (Variable X) and Waqf Benefits (Variable Y). The evaluation of the measurement model (*outer model*) shows that the research instrument meets the criteria of validity and reliability. Cronbach's alpha values for both variables were above 0.70 (Y=0.752; X=0.872), as well as Composite Reliability (rho_c) (Y=0.842; X=0.900), which indicates excellent internal consistency. The Average Variance Extracted (AVE) for Variables Y (0.571) and X (0.601) exceeded the 0.50 limit, proving a strong convergent validity, meaning that the indicators represent their latent constructs.

Table 2. Discriminatory Validity - Fornell-Larcker Criterion

| Discriminatory validity - Fornell-Larcker Criterion | | |
|---|------------|------------|
| | Variable Y | Variable X |
| Variable Y | 0,756 | |
| Variable X | 0,644 | 0,776 |

Table 3. Discriminant Validity - Heterotrait-Monotrait Ratio (HTMT) - Matrix

| Discriminant validity - Heterotrait-monotrait ratio (HTMT) - Matrix | | |
|---|------------|------------|
| | Variable Y | Variable X |
| Variable Y | | |
| Variable X | 0,712 | |

Furthermore, the validity of the discriminant model is also met. Based on the Fornell-Larcker criteria, the square root of AVE for each construct (Y=0.756; X=0.776) is greater than the correlation between constructs (0.644). This result is reinforced by an HTMT (Heterotrait-Monotrait Ratio) value of 0.712, which is below the conservative threshold of 0.85. *Cross-loading checks* also confirm that each indicator has the highest loading on the intended construct, compared to the other constructs. For example, the Y2 indicator has a loading of 0.810 in the Waqf Benefits construct, but only 0.400 in the Waqf Facility. Similarly, the X5

indicator has a loading of 0.874 on the construct of the Waqf Facility, while the loading on the Waqf Benefits is 0.693. These results collectively confirm that the two variables in this study are measurable and empirically different.

Table 4. R-square - Summary

| R-square - Summary | | |
|--------------------|----------|-------------------|
| | R-square | Adjusted R-square |
| Variable Y | 0,415 | 0,393 |

Table 5. f-square - Matriks

| f-square - Matriks | | |
|--------------------|------------|------------|
| | Variable Y | Variable X |
| Variable Y | | |
| Variable X | 0,708 | |

After the measurement model is declared valid and reliable, the evaluation of the structural model (*inner model*) is carried out. The R-square value for the endogenous variable, the Waqf Benefit (Y), is 0.415, with the *Adjusted R-square* of 0.393. This shows that the variation in Waqf Benefits can be explained by 41.5% by the variation in Waqf Facilities. The strength of the predictor's influence is measured by f-square, which for the path from X to Y is 0.708. This value is categorized as a large effect, indicating that the Waqf Facility is a very substantial predictor of the realization of Waqf Benefits. Thus, based on data analysis, the research hypothesis (H1) which states that Waqf Facilities have a positive and significant influence on the Benefits of Waqf in Islamic educational institutions, is acceptable.

DISCUSSION

The findings of this study strongly confirm the main theoretical propositions built on Resource-Based View (RBV) and Stakeholder Theory. The large *f-square* value (0.708) and the moderately strong R-square (0.415) indicate that waqf facilities – as physical resources that are valuable, scarce, and require specialized management – function as a *crucial strategic asset* for value creation in Islamic educational institutions. This result empirically addresses the identified research gap, namely the lack of quantitative studies testing the causal relationship between *asset condition* and *multi-dimensional outcomes*. Previous studies, such as those by Fauzi et al. (2021), often remained descriptive, while benefit-focused research (Oseni et al., 2021) was fragmented and one-dimensional. This study bridges both streams by demonstrating that the quality, adequacy, accessibility, and manageability of facilities collectively serve as significant drivers of educational, social, and institutional sustainability benefits.

The R-square value of 0.415 provides nuanced insight. On one hand, it confirms that waqf facility management is a *core function* that nazhir cannot

overlook—41.5% of an institution's success in generating benefits depends on how its waqf facilities are managed. On the other hand, the remaining 58.5% of unexplained variance highlights the role of other critical factors. Consistent with Stakeholder Theory, this suggests that beyond physical resources, elements such as nazhir leadership, integration of spiritual values in curricula, community engagement, and transparent governance are also vital. In other words, well-managed facilities are a necessary foundation, but they must be complemented by strong managerial capabilities, organizational culture, and stakeholder relationships.

The novelty and contribution of this research are threefold. First, methodologically, it extends the application of SEM-PLS beyond modeling donor intentions (Mohd Noor et al., 2022) to serve as a *diagnostic tool for evaluating the impact of existing assets*. Second, theoretically, it enriches RBV application in faith-based nonprofit contexts by illustrating how tangible resources translate into measurable socio-spiritual outcomes. Third, practically, the model offers a data-informed roadmap for nazhir and policymakers, enabling targeted interventions based on specific indicator loadings (X5 with 0.874).

Policy and Managerial Implications

For waqf regulators and policymakers, these findings underscore the need to develop standardized impact assessment frameworks that incorporate both facility quality and multidimensional benefit indicators. Regulatory guidelines should encourage—or even mandate—periodic SEM-PLS-based evaluations as part of institutional accountability and reporting. This would not only enhance transparency but also help identify underperforming assets for strategic reinvestment or restructuring.

For Islamic education managers and nazhir, the study advocates an evidence-based, impact-oriented management approach. Investment should extend beyond physical construction to include capacity-building in asset management, performance monitoring, and stakeholder engagement. Nazhir should be trained in using diagnostic tools like SEM-PLS to regularly assess which facility dimensions most significantly drive benefits, allowing for prioritized maintenance, optimized resource allocation, and strategic long-term planning.

Therefore, the main implication is a paradigm shift toward integrated and measurable waqf governance. By aligning facility management with benefit realization through continuous evaluation, the cycle of Islamic philanthropy can be strengthened—from sincere waqf intention to professional asset stewardship, and ultimately to sustainable, sharia-aligned impact for the community.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the results of the analysis and discussion that has been carried out, this study concludes several main things. First, well-managed waqf facilities – characterized by adequacy, quality, accessibility, and manageability – have been empirically proven to be a significant driver for the realization of multidimensional waqf benefits in Islamic educational institutions. Its contribution reached 41.5%, which confirms that the management of physical assets is a core activity that cannot be ignored. Second, these findings succeeded in filling the research *gap* by proving the quantitative causal relationship between *inputs* (facilities) and *outcomes* (benefits), something that has not been touched much in the previous waqf literature that tends to be fragmented in terms of law, model, or intention. Third, this study successfully demonstrates the applicative value of SEM-PLS not only as a theoretical tester, but further as a *performance diagnostic tool* that can be used by nazhir to evaluate the effectiveness of each dimension of the facility and allocate resources more strategically.

RECOMMENDATIONS

The practical implication of this study is the need for a paradigm shift towards evidence-based and impact-oriented waqf management. Nazhir needs to be equipped with the capacity to continuously measure and monitor the contribution of each asset, so that the waqf management cycle – from collection, management, to benefit distribution – can run responsibly and achieve its socio-economic goals optimally. For further research, it is recommended to explore other factors beyond physical facilities (such as transformational leadership, organizational culture, and digital technologies) that could explain the 58.5% variation in unexplained benefits, as well as test these models in more diverse geographic and institutional contexts.

FURTHER STUDY

The model, while robust, explains 41.5% of the variance in Waqf Benefits, indicating that other significant factors (58.5%) remain unmeasured and outside the current analytical framework.

Therefore, building upon these limitations, we propose the following directions for further study:

1. Expand the Scope of Antecedents. Future research should integrate and test other critical variables beyond physical facilities.
2. Conduct Longitudinal and Comparative Studies. To establish stronger causality and understand temporal dynamics, a longitudinal research design is recommended.

3. Employ Mixed-Methods Approaches. While this study established a quantitative model, a sequential mixed-methods design would be highly valuable.
4. Refine the Measurement Model. Further studies can develop and validate more granular or alternative indicators for the constructs. For instance, the dimension of Institutional Sustainability could be operationalized with more specific financial and organizational resilience metrics.

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