



## ASSESSING MOSQUE FINANCIAL EFFICIENCY THROUGH DATA ENVELOPMENT ANALYSIS

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### ABSTRACT

Although the economic role of mosques is increasing, the financial performance and utilization of mosque funds remain underexplored. This study addresses this gap by examining the financial efficiency of the Masjid Bandar Seri Putra over a five-year period, from 2020 to 2024, using Data Envelopment Analysis (DEA). This study considers each year as a decision-making unit (DMU). It employs an input and output orientations approach in both the CRS and VRS models. This mosque was selected due to its significant role as both a center of worship and a center of social, educational, and community development. The mosque's financial reports were used as the basis for the study, encompassing general funds and specific funds as inputs, while outputs comprised administrative expenses and society contributions/programs. The findings of the analysis indicate that under the CRS model, the mosque achieved full efficiency in 2020 and 2023, while inefficiency was observed in 2021, 2022, and 2024. Conversely, the VRS model indicates that the mosque is at full technical efficiency throughout the study period. Scale analysis revealed that inefficiency arises from operational scale issues, with specific years demonstrating increasing returns to scale (IRS) and decreasing returns to scale (DRS). The years 2020 and 2023 are recognized as benchmarks for enhancing financial strategies in future years. This study provides a theoretical contribution to the literature, specifically in mosque fund management, by providing empirical evidence on financial efficiency issues that have been typically overlooked. The study's findings can assist mosque administration and religious authorities in formulating more effective financial strategies to maximize social benefits for the community.





**Keywords:** Data Envelopment Analysis; Financial Efficiency; Fund Management; Mosque; Returns to Scale

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## INTRODUCTION

Mosques are important institutions in Islamic society that serve a role not only as places of worship, but also as social, educational, and welfare centers for the community. Islamic history shows that mosques have functioned as centers for the spread of knowledge, community discussion, and community administration throughout ancient times. In Malaysia, mosques hold this responsibility in a more comprehensive way, as contemporary society demands mosque management that is not only efficient from an administrative perspective but also efficient in maximizing social impact. The diverse functions performed by mosques require financial efficiency, a crucial aspect, as the effectiveness of their roles significantly relies on the extent to which funds obtained from public donations, government, and third parties can be used optimally for administrative and societal purposes (Adriansyah, 2023; Salafiyah, 2021).

However, current literature shows that the aspect of the financial efficiency of mosques is still not given in-depth attention. Most previous studies emphasize governance issues, activity management, and the social role of mosques (Abdullah et al., 2020; Johari & Arshad, 2021). Studies evaluating efficient utilization of mosque funds remain limited, despite mosques receiving diverse of funds, including general funds and specific funds that are supposed to support administrative expenses and society contributions/programs. The lack of comprehensive financial efficiency analysis creates a significant knowledge gap, while effective financial management is key to ensuring the sustainability of mosque operations (Putra, 2019; McDermott, 2023).

Preliminary analysis using the Data Envelopment Analysis (DEA) method indicates that the problem of financial inefficiency has occurred in several years under the CRS (Constant Returns to Scale) model, indicating that the administration of mosque funds is operating beyond the appropriate scale, either excessively small (increasing returns to scale) or excessively large (decreasing returns to scale). In contrast, the VRS (Variable Returns to Scale) model consistently shows an optimal level of technical efficiency, suggesting that the primary inefficiency arises more from operational scale issues than from the technical utilization of inputs and outputs (Rustyani, 2018; Verge-Jaime, 2023).

This lack of data-driven evaluation is a critical issue, as evidence suggests that mosques exhibit variations in performance that could impact the efficiency of social service delivery. Therefore, the main problem of this study is a lack of systematic and data-driven empirical evaluations to measure the financial efficiency of mosques' funds, particularly in assessing whether existing fund management allows mosques to operate at an optimal scale to maximize social impact on the community.

To address these issues, this study establishes two main objectives. First, to assess the utilization of financial resources, specifically general funds and specific funds, in generating administrative and social contribution outputs in the measurement of mosque funds' financial efficiency. Secondly, to analyze the financial efficiency of mosques' funds using the Data Envelopment Analysis (DEA) method, assessing whether financial inputs are utilized at an optimal scale to produce administrative and societal contribution outcomes.

This study provides several significant contributions. From a government perspective, these findings may serve as a foundation for formulating more effective mosque financial





management policies, as well as improving the monitoring system and transparency of mosque funds utilization. From a community perspective, the results of the study can increase community confidence that their donations are utilized effectively, hence encouraging more continuous participation and support. In the context of the Islamic finance sector, these findings may serve as a benchmark for implementing the financial efficiency analysis concept in non-profit organizations, such as zakat, waqf, and Islamic cooperatives. Despite the extensive application of DEA in evaluating efficiency in sectors such as healthcare, banking, and education (Emrouznejad & Yang, 2018), its utilization in religious non-profit organizations remains limited. Thus, this study contributes to academic knowledge by employing DEA in evaluating the financial efficiency of mosque funds, an area that remains underexplored compared to other Islamic financial institutions (Sufian, 2022; Yusof et al., 2023).

The scope of this study focuses on the Masjid Bandar Seri Putra in Malaysia. The selection of this scope is strategic since the mosque functions not only as a center of worship, but also as a community center for a rapidly developing urban area. Established in 2016, it is located in a strategic location between residential and commercial zones. It is a mosque designed with a contemporary concept, accommodating worshippers, sustainable, and accessible for individuals with disabilities. This mosque has been identified by its organized administrative system, ability to retrieve historical data, particularly the financial reports, and its increasing contribution to community development. This mosque is notable for its proactive promotion of programs, events, and informative content through social media platforms, such as Facebook, TikTok, YouTube, and Instagram, indicating consistent programmatic activities and offering a unique opportunity to analyze longitudinal performance within the context of religion. The funds received by this mosque from the local community and external parties highlight significant issues associated with the financial management of mosques. The study period covers from 2020 to 2024, which is a pivotal timeframe encompassing the COVID-19 pandemic and post-economic recovery, which influences both the level of donations and the effectiveness of financial management. This study evaluates the financial efficiency of five decision-making units (DMUs) representing the years 2020 to 2024, employing constant returns to scale (CRS) and variable returns to scale (VRS) models for both input and output orientations.

This article is systematically organized. The Introduction section presents the background, problems, objectives, significance, scope, and structure of the article. The Literature Review section describes previous studies on mosque financial management, efficiency analysis of non-profit organizations, and DEA applications in the Islamic finance sector. The Methodology section explains the DEA approach, the data employed, and the justification for the chosen methods. The Findings, Interpretation, and Discussion section presents the study findings, encompassing efficiency scores, scale analysis, and comparisons with existing literature. Finally, the Conclusion and Recommendations section summarizes the primary findings, limitations, research, practical and policy implications, and suggests improvements for future mosque financial management. Overall, efficient mosque financial management is essential for the sustainability of this institution in fulfilling its social and administrative functions. By employing the DEA approach, this study offers empirical evidence regarding the level of mosque financial efficiency, identifies influencing factors, and evaluates the optimal utilization of mosque funds. This study emphasizes the Masjid Bandar Seri Putra, allowing this study to provide relevant practical contributions while enhancing the academic literature on the financial efficiency of Islamic institutions.





## LITERATURE REVIEW

Mosques are one of the most important Islamic institutions because they function as centers of worship, education, welfare, and community development. Despite the increasingly significant role of mosques in contemporary society, the literature indicates that the issue of financial efficiency remains insufficiently explored. Most previous studies have focused on the aspects of governance, social activities, and community involvement rather than empirically evaluating the effectiveness of fund utilization (Abdullah et al., 2020; Johari & Arshad, 2021). In the context of the Masjid Bandar Seri Putra, the issue of financial efficiency is particularly relevant due to the mosque's location in a rapidly growing urban area, requiring efficient fund management to address the demands of the local community.

Previous studies on mosques have revealed several significant themes. The financial management of mosques is frequently associated with issues of transparency and accountability. Salafiyah (2021) asserted that inefficiency in managing funds may undermine public trust. Putra (2019) reinforces this, revealing that mosques in Indonesia encounter similar issues, where funds are frequently allocated without a thorough assessment of effectiveness. In Malaysia, although there are guidelines for mosque fund management established by state religious authorities, implementation practices frequently differ and depend on local management capacity (Ismail, 2023).

Further, within the context of non-profit organizations (NPOs), financial efficiency is frequently measured using a quantitative approach. A method that receives increasing attention is Data Envelopment Analysis (DEA). DEA is used to evaluate the relative efficiency of an organization by analyzing inputs such as general funds and specific funds, and outputs such as administrative expenses and social contributions. Studies conducted by McDermott (2023) and Rustyani (2018) indicate that DEA is fit for application in religious and social organizations since it facilitates a more objective evaluation of resource management efficacy.

The literature also emphasizes both internal and external factors influencing the financial efficiency of mosques. Internal factors include the size of the mosque, organizational structure, leadership, and governance practices (Adriansyah, 2023; Auliya, 2014). External factors encompass economic conditions such as household income, inflation, and unemployment rates that influence the amount of donations collected by mosques (Aggarwal, 2022). Mosques in urban areas such as Bandar Seri Putra typically receive higher donations; however, this may not be the case, as the large scale of operations can lead to issues of decreasing returns to scale (Verge-Jaime, 2023).

Although numerous studies on mosque management, significant gaps remain. The financial efficiency of mosques utilizing DEA remains rarely explored. Most DEA studies focus on Islamic banks, cooperatives, and zakat or waqf institutions (Sufian, 2022; Yusof et al., 2023). The correlation between general funds, specific funds, and social contributions of mosques remains inadequately revealed in empirical studies. Most of the literature is mainly more conceptual without quantitative data evidence (Hanoum, 2019). Furthermore, there is a lack of specific case studies at the individual mosque level, as each mosque possesses a distinct context regarding demographics, economics, and social factors. Therefore, it is expected that a study focusing on the Masjid Bandar Seri Putra can provide a novel contribution to the literature.

The conceptual framework for this study is based on Agency Theory and Stakeholder Theory. Agency Theory explains the relationship between mosque administrators and financiers, which requires a monitoring method to avoid inefficiency (Rajasekar, 2014). Based on the theory, mosque management serves as an agency responsible to manage mosque funds received from the community and other stakeholders. In this study, general funds and specific





funds are considered as financial inputs that reflect the trust given to mosque management, whereas administrative expenses and social distribution represent management decisions in utilizing these funds. Financial efficiency, in this context, reflects the ability of agents to optimize the utilization of funds. Simultaneously, Stakeholder Theory emphasizes the importance of accountability to various stakeholders, including donors, communities, and religious authorities (Freeman, 2010). Therefore, administrative and social outputs are not just financial results, but reflect the value and social benefits delivered for stakeholders. Financial efficiency, as measured by DEA, evaluates the relative efficiency of inputs and outputs. Meanwhile, internal factors such as leadership and governance, along with external factors like the economy and community contributions, are considered variables that influence efficiency (Cahaya & Azwari, 2019).

Global studies have yielded inconsistent findings regarding the efficiency of religious organizations. Rustyani (2018) identified significant variation between organizations in Southeast Asia, with certain entities operating below optimal scale. McDermott (2023) also emphasizes that the primary issue is not merely the utilization of inputs and outputs, but rather the appropriate scale of operations. However, there is controversy about the appropriateness of DEA for application in small organizations like mosques, as the results are significantly influenced by the quality of the data and the selection of input and output variables (Asmild, 2007). Moreover, there is a debate over the causes of inefficiency. Certain scholars emphasize internal issues, such as a lack of transparency (Salafiyah, 2021), while others trace external factors, such as economic conditions, as the main cause (Aggarwal, 2022).

Overall, the literature review indicates that although there are substantial studies on the social functions and governance of mosques, the aspect of financial efficiency remains underexplored, particularly concerning the DEA approach. Previous studies have focused on other Islamic financial institutions, although mosques significantly contribute to community development. This gap provides an opportunity for new studies that evaluate the level of financial efficiency of mosques through DEA analysis. By focusing on the Masjid Bandar Seri Putra, this study not only contributes to the academic literature but also offers practical insights for mosque administrators and government policies to strengthen the financial management of Islamic institutions.

## METHODOLOGY

This study employs a quantitative approach that emphasizes analysis based on secondary data. The selection of this approach aligns with the study's objective of evaluating how mosque funds are utilized to generate administrative and social distribution outputs. Neuman (2014) states that the quantitative approach facilitates objective measures derived from empirical data that can be tested statistically. The selected study methodology is applied quantitative inquiry, which is a quantitative approach that emphasizes employing research methods to address practical issues in real-world contexts (Perreca & Curran, 2006). This design seeks to enhance the theoretical framework while also providing practical contributions to Islamic institutions, including mosques. The selection of this approach is due to the study's focus on measuring relative performance, specifically in assessing the mosque's ability to convert financial inputs into outputs that benefit the community. This method is appropriate since it facilitates evaluation based on existing data and subsequently contributes to the understanding of how mosques can improve their level of financial efficiency. Creswell and Creswell (2018) emphasized that applied quantitative approaches are appropriate for researchers aiming to empirically measure specific phenomena and provide suggested solutions to identified practical





issues. To achieve this goal, the Data Envelopment Analysis (DEA) method is employed as the primary analysis technique, as it is well-suited for evaluating the efficiency of non-profit organizations that prioritize resource efficiency over profit generation.

For data collection, this study employed a secondary data collection by using the audited financial records of the Masjid Bandar Seri Putra from 2020 to 2024. Secondary data was selected due to its high level of reliability, time efficiency, and the ability to allow longitudinal analysis to evaluate trends in financial efficiency over a specific timeframe (Boslaugh, 2007). The data used comprises two inputs, general funds and specific funds, and two outputs, administrative expenses and social contributions/programs. The selection of this data aligns with the study's objectives as it directly reflects the correlation between the financial funds received by the mosque and the social benefits channeled to the community.

The sampling strategy used in this study is a purposive sampling technique. This technique is appropriate when researchers aim to focus on units of analysis that have specific characteristics that are relevant to the study objectives (Palinkas et al., 2015). This study focuses on mosques in Malaysia, but the sample selected is specifically for the Masjid Bandar Seri Putra. The justification for this selection is that the mosque functions as a community center in a rapidly growing urban area, possesses varied financial resources, and maintains comprehensive financial records for a period of five years. Despite the sampling of a single mosque, the case study approach allows a comprehensive analysis of financial efficiency and its influencing factors (Yin, 2018).

This study employs Data Envelopment Analysis (DEA). DEA is a non-parametric frontier analysis technique used to evaluate the relative efficiency of decision-making units (DMUs) through the comparison of inputs and outputs (Cooper, Seiford, & Zhu, 2011). This method facilitates evaluation under two models, Constant Returns to Scale (CRS) and Variable Returns to Scale (VRS), thereby identifying whether inefficiency arises from the scale of operations or from the use of inputs and outputs. This study utilized each year of analysis (2020–2024) as a DMU, incorporating two inputs and two outputs. The selection of DEA aligns with the objectives of the study as it provides an objective, transparent, and empirically based measure of efficiency. This study employed both input orientation and output orientation in the analysis to provide a more comprehensive evaluation of the financial efficiency of the mosque. The input orientation approach is used to evaluate the extent to which mosque management can minimize the utilization of financial resources while maintaining administrative expenses and social contributions. This approach is appropriate in the context of a mosque as an NPO that needs to control expenses and prevent the misallocation of funds received from the community. Simultaneously, the output orientation approach is also employed to assess the mosque's ability to maximize administrative and social contributions relative to the amount of mosque funds available. This approach is crucial as the primary aim of the mosque is not to minimize expenses but to maximize social contribution to the community. By employing both orientations, this study can determine whether financial efficiency arises from excessive input utilization or an inability to maximize social outputs, thereby providing a more comprehensive understanding of the mosque's financial performance.

Ethical considerations were also considered in the implementation of this study. Although the data were obtained from secondary sources, official permission from the mosque management was requested and obtained. All data were utilized solely for academic purposes, and the identity of individual donors or other sensitive information was not revealed. This study adheres to the ethical standards of social research, which emphasize the principles of integrity, fairness, and confidentiality (Israel & Hay, 2006).

To ensure validity and reliability, the researcher utilized only financial records that had been audited by the mosque management. The data's validity is confirmed by the records used





are official documents that have been verified. Reliability is further enhanced through cross-checking between annual financial documents to ensure data consistency. Moreover, employing DEA as an analytical tool increases credibility due to its extensive application in evaluating the financial effectiveness of non-profit organizations globally (Cook & Zhu, 2014). The methodology of this study was systematically designed to fulfill the research objectives. The Applied Quantitative Inquiry approach ensures that this study contributes to theory while also providing practical implications for mosque financial management. The utilization of secondary data facilitates empirical research, whereas the purposive sampling technique focuses on specific, relevant case contexts. The DEA analysis methods provide an accurate measure of efficiency, while ethical considerations and data validity and reliability measures enhanced the integrity of the research. Thus, this technique enables the study to significantly contribute to the academic literature and enhance practical efforts in improving mosque financial management.

## FINDINGS AND DISCUSSION

This section presents the findings of the study on the financial efficiency of the Masjid Bandar Seri Putra employing the Data Envelopment Analysis (DEA) method. DEA was applied by incorporating two main inputs, namely general funds and specific funds, as well as two main outputs, administrative expenses and social contributions/programs. The analysis utilized two primary models, Constant Returns to Scale (CRS) and Variable Returns to Scale (VRS), to assess technical efficiency and scale of operations. This approach enabled the study to determine the mosque's financial efficiency concerning funds utilization for social objectives, and identify factors contributing to inefficiency, whether caused by inputs and outputs utilization or from sub-optimal operation scale.

In addition, the findings emphasize the significance of Scale Efficiency (SE) and Returns to Scale (RTS) in determining whether the mosque operates under increasing returns to scale (IRS), constant returns to scale (CRS), or decreasing returns to scale (DRS). The study established a benchmark year that serves as a model of efficiency for other inefficient years. These findings are essential for presenting a comprehensive evaluation of the mosque fund financial efficiency during the research period from 2020 to 2024.

### Results of CRS (Constant Returns to Scale) Analysis

The CRS analysis provides a preliminary evaluation of the mosque's overall efficiency, based on the assumption of constant returns to scale in all operations. The findings demonstrate a different efficiency score between 2020 and 2024. In 2020, the efficiency score reached a maximum value of 1, indicating that the mosque operates at optimal efficiency for the utilization of general funds and specific funds for administrative expenses and social contributions/programs. This finding indicates that in that year, the mosque's financial management was at an optimal level, with every ringgit of donations efficiently allocated for administrative and social purposes.

In 2021, the efficiency score declined below 1, indicating the existence of inefficiency in utilizing resources. This indicates that the funds obtained are not fully allocated appropriately between administrative expenses and social contributions. Correspondingly, in 2022, the efficiency score persisted at a lower level, indicating a continuous trend of inefficiency in financial management. This condition reveals that the mosque is operating beyond the optimal level, either due to the scale of the operation is too small or excessively





large in relation to its actual capacity. However, in 2023, the efficiency score rose to 1, indicating that the year emerged as a principal benchmark demonstrating the efficiency of fund management. This result emphasizes that leadership aspects, management strategies, and more structured financial planning may have contributed to the achievement of full efficiency. In 2024, the score declined below 1, indicating volatility in efficiency levels from year to year. Overall, the CRS results indicate that the level of financial efficiency of mosques varies throughout the study period. The years 2020 and 2023 operated at optimal levels; however, the years 2021, 2022, and 2024 demonstrated inefficiency with an efficiency score of less than 1. This finding aligns with the study's problem statement, which indicates a lack of sufficient attention to the issue of financial efficiency. Table 1 shows the results of the DEA analysis under the CRS (input & output oriented) model.

Table 1: Results of Constant Return to Scale (CRS) Input and Output Oriented

Year	CRS Score	Status	Benchmark	RTS
2020	1	Efficient	2020	CRS
2021	0.8763	Inefficient	2020	IRS
2022	0.9819	Inefficient	2020; 2023	IRS
2023	1	Efficient	2023	CRS
2024	0.9493	Inefficient	2020	DRS

The table showed that only the years 2020 and 2023 reached full efficiency. The years 2021, 2022, and 2024 show below-optimal performance with efficiency scores of below 1. This inefficiency indicates the existence of an inappropriate scale of operations issue.

### Results of VRS (Variable Returns to Scale) Analysis

VRS analysis is used to assess the level of pure technical efficiency while considering the possibility that the mosque does not operate at the optimal scale. The analysis indicates that from 2020 to 2024, all years achieved an efficiency score of 1 under the VRS model. This proved that the mosque consistently operates at optimal technical efficiency when the factor of scale is excluded. In other words, there is no issue regarding the utilization of inputs to generate outputs, since the mosque efficiently allocates both general funds and specific funds to administrative expenses and social contributions/programs. The VRS analysis result indicates that each year achieves a score of 1. This is illustrated in Table 2.

Table 2: Results of Variable Return to Scale (VRS) Input and Output Oriented

Year	VRS Score	Status	RTS
2020	1	Efficient	CRS
2021	1	Efficient	IRS
2022	1	Efficient	IRS
2023	1	Efficient	CRS
2024	1	Efficient	DRS

The primary issue contributing to CRS inefficiency is not the management of input and output, but rather the scale of operations factor. This finding indicates that the primary issue is not technical inefficiency, but inefficiency of scale. In other words, the mosque efficiently manages its resources but encounters difficulties in determining the appropriate scale of operations according to its actual capacity. This clarifies the difference in scores between CRS and VRS, where CRS indicates inefficiency, while VRS shows full efficiency.





The implication is that the mosque management should evaluate its strategy for managing the scale of operations. Challenges may occur when the funds are insufficient to finance social activities or excessive to be properly utilized. Therefore, the emphasis on scale issues is more critical than technical ones.

### Scale Efficiency Analysis

Scale Efficiency (SE) is determined by the ratio of CRS to VRS. Table 3 shows the SE values for the years 2020 to 2024.

Table 3: Scale Efficiency (SE) and Returns to Scale (RTS)

Year	CRS Score	VRS Score	Scale Efficiency (SE)	RTS	Interpretation
2020	1	1	1	CRS	Optimal operation
2021	0.8763	1	0.8763	IRS	Operation is insufficiently scaled, expand the scale of operation
2022	0.9819	1	0.9819	IRS	Almost efficient, but still on an insufficient scale
2023	1	1	1	CRS	Optimal operation
2024	0.9493	1	0.9493	DRS	Operation excessively large, waste of resources

This finding indicates that the years 2021 and 2022 demonstrate increasing returns to scale (IRS), whilst the year 2024 operates under decreasing returns to scale (DRS). The years 2020 and 2023 operated efficiently. Based on the analysis of SE, derived from the comparison of CRS and VRS, it provides a clear picture of whether the mosque is operating at an optimal scale. In 2020 and 2023, the CRS and VRS scores reached a value of 1, indicating that the mosque is operating at an optimal scale with constant returns. These years can be regarded as best practice models.

Conversely, in 2021, 2022, and 2024, the CRS score was below 1, whilst the VRS score remained at 1. This difference indicates that the mosque is operating beyond the optimal scale. The years 2021 and 2022 demonstrated a state of increasing returns to scale (IRS), indicating that the mosque is operating at an insufficient scale. In this circumstance, increasing inputs, such as increasing general funds or specific funds, potentially lead to a more substantial increase in output. This means that the mosque could enhance its operations to improve the effectiveness of its social contributions. In 2024, the analysis indicated that the mosque encountered decreasing returns to scale (DRS). This indicates that the scale of operations exceeds the actual capacity, resulting in additional inputs being unable to produce a proportional increase in output. This situation can lead to issues of resource waste or unbalanced distribution.

The result of this efficiency scale analysis confirms that the scale factor is the primary reason for the mosque's financial inefficiency during the study period. Therefore, the fund management strategy must be adjusted to the actual size of the operation to ensure optimal utilization of mosque funds.

### Benchmark Analysis

The DEA additionally observes DMUs that serve as benchmarks for inefficient DMUs. Table 4 summarizes the benchmark results.





Table 4: Benchmark Analysis

Inefficient Year	Main Benchmark
2021	2020
2022	2020, 2023
2024	2023

The benchmark analysis seeks to identify years that serve as a reference for inefficient years. The analytical results show that the years 2020 and 2023 often serve as benchmarks for other years with a CRS score below 1. For example, the inefficient years 2021 and 2022 consider year 2020 as a benchmark of efficiency, whereas the year 2024 considers the year 2023 as the benchmark. This scenario demonstrates that the mosque's financial management practices of 2020 and 2023 are the most efficient and can serve as a benchmark for the mosque management to improve future efficiency. These benchmark years demonstrate that careful administration and a balanced spending strategy can increase the level of financial efficiency of the mosque.

### Interpretation and Discussion

The study findings reveal that the financial efficiency of mosques' funds varies throughout the study period. Despite mosques possessing full technical capacity to utilize available inputs, as indicated by the VRS results, the primary issue lies in determining the appropriate scale of operations. This finding aligns with McDermott's (2023) assertion that NPOs frequently encounter challenges in ascertaining the appropriate size of their operations as their goals are not-profit driven, but rather focused on providing social benefits. This is noticeable when CRS demonstrates inefficiency in certain years, even though VRS remains at full efficiency.

The scale analysis reveals that during inefficient years, mosques operate at either an excessively small scale (IRS) or an excessively large scale (DRS). This issue aligns with the study's problem statement, which states that mosque fund management operates beyond the optimal scale. This finding supports Verge-Jaime's (2023) argument that scale efficiency presents multiple challenges in NPOs, as organizational growth does not inherently result in enhanced efficiency. This study's results provide empirical evidence that confirms the argument, as DEA analysis clearly shows the existence of both IRS and DRS conditions during the study period. This indicates that mosque financial management is not merely about increasing the amount of funds, but requires continuous adjustment of the scale of operations to align with management capacity and community needs.

The findings also suggest the significance of benchmark years 2020 and 2023 as best practice models for future replication. The implication of these findings is that the mosque management needs to focus on scale management strategies, either by increasing operations when funds are insufficient or restructuring expenditure strategies when funds are excessive. Likewise, the effectiveness of a mosque's social contribution relies not only on the amount of funds received, but also on the extent to which these funds are efficiently utilized according to actual capacity.

This finding can be explored through an analysis of Agency Theory and Stakeholder Theory. According to Agency Theory, scale inefficiency implies the difficulty faced by agents, which is the mosque management in maximizing the financial trust received, particularly when the changes in funding are not balanced by adjustments in management strategies. Stakeholder Theory suggests that the motivation to satisfy diverse stakeholder expectations may lead to the expansion of activities without consideration for optimal scale.

Overall, the DEA analysis has provided several significant findings regarding the financial efficiency level of the Masjid Bandar Seri Putra. The CRS model revealed





inefficiencies in several years, particularly in 2021, 2022, and 2024, whereas the years 2020 and 2023 managed to achieve full efficiency. The VRS analysis result showed that the mosque consistently achieved full technical efficiency during the study period, indicating the absence of significant issues regarding input and output utilization. However, the scale analysis showed that inefficiency resulted from scale of operations issues, in certain years demonstrating IRS, which indicated that the size of the operation was insufficient, while other years demonstrated DRS, which reflected that the operation was excessive. Additionally, benchmark analysis showed that the years 2020 and 2023 represent the ideal efficiency models for reference by the mosque management. Therefore, these findings emphasize that the primary issue is not technical inefficiency but rather scale inefficiency that affects the effectiveness of mosque financial management. With these findings, the study not only validates the existence of financial efficiency issues outlined in the problem statement but also provides empirical evidence necessitating improvement in the scale management strategy of mosque operations. These findings further establish a robust basis for the discussion in the article, particularly regarding theoretical, practical, and policy implications.

## CONCLUSION AND RECOMMENDATIONS

This study assessing the financial efficiency of the Masjid Bandar Seri Putra utilizing the Data Envelopment Analysis (DEA) method, a quantitative approach recognized for its usefulness for assessing the performance of non-profit organizations. The analysis was conducted based on two inputs, which are general funds and specific funds, as well as two outputs, namely administrative expenses and social contributions/programs, and has disclosed the financial efficiency trend of the mosque over a five-year period, from 2020 to 2024. The study's results indicated inefficiency with the CRS model, particularly in the years 2021, 2022, and 2024, while full efficiency was achieved in 2020 and 2023. Conversely, compared to the VRS model, the mosque consistently achieved full technical efficiency with a score of 1.00 each year. This disparity demonstrates that the inefficiency observed was not due to weaknesses in inputs and outputs utilization but rather resulted from the scale of operations being misaligned with the actual capacity.

The discussion of these findings validates the statement that the financial efficiency aspect of mosques remains inadequately explored, whereas prior literature has emphasized governance, activity management, and social roles of mosques (Abdullah et al., 2020; Johari & Arshad, 2021). Utilizing DEA, this study has successfully demonstrated empirical evidence showing that mosques' operation is technically efficient but has difficulties in determining the optimal scale of operations. This finding aligns with McDermott's (2023) research, which highlights that non-profit organizations frequently encounter scale issues, as well as Verge-Jaime's (2023) study, which indicates that inefficiencies in social organizations are typically related to IRS or DRS issues. In 2021 and 2022, mosques had increasing returns to scale, indicating that operational activities were insufficient, providing additional funding to increase output more effectively. In 2024, mosques had decreasing returns to scale, indicating that the operations were excessively large, resulting in wasted resources. The subsequent benchmark analysis indicates that 2020 and 2023 represent the best efficiency models for reference to improve performance in other years, consistent with Salafiyah's (2021) emphasis that transparency and efficient management strategies are the foundation of the financial efficiency of Islamic institutions.

The DEA findings in this study provide a distinct theoretical explanation when viewed through a combination of Agency Theory and Stakeholder Theory. The discovery that the





mosque achieved full technical efficiency under the VRS model suggests that, from the perspective of Agency Theory, the mosque management as an agent successfully utilizes financial inputs to produce administrative and social outputs. This technical efficiency signifies that the mosque management encounters no issue with operational capacity in converting financial resources into desired outcomes, thus reflecting the competence of management in implementing the financial trust given by donors and the community. However, the existence of scale inefficiencies under the CRS model reveals a different theoretical perspective. According to Agency Theory, scale inefficiencies indicate management challenges in making strategic decisions regarding the size of mosque operations. The condition of increasing returns to scale signifies that the mosque operates at an insufficient scale, resulting in underutilization of management capacity, whereas decreasing returns to scale reflects the expansion of activities beyond the optimal management capacity, potentially leading to resource wastage. This situation illustrates the agent's dilemma in aligning management decisions with optimal resource utilization.

From the perspective of Stakeholder Theory, this scale inefficiency illustrates the complexity of fulfilling the expectations of various stakeholders such as donors, congregations, local communities, and religious authorities. Pressure to expand social programs and activities to address community needs could drive operational growth without considering optimal scale. The DEA findings in this study provide empirical evidence that increased social benefits motivated by stakeholder needs do not inherently lead to financial efficiency unless such growth is supported by appropriate scale planning. This study's combination of VRS findings and scale efficiency presents robust quantitative evidence that supports the conceptual arguments of Agency Theory and Stakeholder Theory. Technical efficiency under VRS indicates that the mosque management capacity functions as efficient agents, but the scale inefficiency under CRS explains how governance pressures and stakeholder demands might influence the effectiveness of financial evaluations. The explicit relationship between the DEA findings and this theory constitutes the study's academic contribution, as it not only measures the financial efficiency of mosques but also clarifies the reasons for inefficiency among non-profit religious institutions.

The contribution of this study to the field of Islamic financial management is significant. Theoretically, it expands the use of DEA within the context of mosques, an area that remains underexplored compared to other Islamic financial sectors such as banks, zakat, and waqf (Sufian, 2022; Yusof et al., 2023). Empirically, this study provides concrete evidence that mosques can achieve full technical efficiency, but must be careful in determining the scale of operations to prevent wasting resources. Practically, the results of this study provide guidance to mosque management to re-evaluate their financial strategies, considering the scale factor. Additionally, from a policy perspective, these findings can assist religious authorities and governments in formulating more comprehensive guidelines to ensure the sustainability of mosque institutions in fund management. As emphasized by Adriansyah (2023), the systematic aspect of financial management in Islamic institutions is crucial to ensuring social effectiveness and increasing public trust in the institution. Therefore, this study not only validates the issue of financial efficiency in mosques as outlined in the problem statement but also contributes to enhancing the academic literature by employing DEA as a valid analytical method. By combining theoretical support from Agency Theory and Stakeholder Theory (Freeman, 2010; Rajasekar, 2014) with empirical data evidence, this study enhances the understanding of mosque financial management. The implications encompass research, practical, and policy aspects, which make this study relevant to both academia and the community, as well as authorities. This study also provides an opportunity for future research that may include comparisons with other mosques in Malaysia or the inclusion of external factors such as





economic conditions and community income levels, to enhance a comprehensive understanding of the financial efficiency of Islamic institutions.

Based on the study findings, several recommendations are made to improve the level of financial efficiency of mosque funds, particularly regarding the Masjid Bandar Seri Putra. The analysis indicates the primary inefficiency arises from an operational scale issue. In 2021 and 2022, the mosque experienced increasing returns to scale (IRS), indicating that its operations are insufficiently scaled; therefore, the management should increase social, educational, and community activities so that the funds received can be utilized more productively. Conversely, in 2024, the mosque operates under the condition of decreasing returns to scale (DRS), indicating that its operations are excessively large, hence wasting resources. Therefore, the financial management strategy must be restructured to ensure that funds are allocated appropriately based on actual needs (Verge-Jaime, 2023).

In addition, the findings show that the years 2020 and 2023 serve as benchmarks for the reference model. Financial management practices and spending strategies from these two years should be re-evaluated to be applied to improve financial performance in other years. This corresponds with the Salafiyah (2021) suggestion that transparency and accountability in mosque financial management are essential for the effective utilization of funds. Simultaneously, financial monitoring systems must be enhanced by increased transparency in reporting and the implementation of digital technology, so that financial flows can be tracked effectively (Adriansyah, 2023). Finally, the government and religious authorities are advised to establish standard guidelines regarding the financial efficiency of mosques. These guidelines are essential for ensuring consistency of financial reporting and assisting mosques in formulating efficient and sustainable financial strategies. According to McDermott (2023), the efficiency of non-profit organizations relies not only on the amount of funds but also on the quality of leadership and the ability of managers to optimize resources. Finally, this recommendation aims to enhance the financial efficiency of mosques while reinforcing their role as centers for community development.

### **Limitations**

This study offers several limitations that need to be mentioned in order to provide a broader spectrum of the research findings. First, this study applied only one location, specifically Masjid Bandar Seri Putra, as a case study. Although the purposive sampling method enables researchers to attain a comprehensive understanding of a particular context, the findings cannot be generalized to all mosques in Malaysia, which have varying demographic characteristics, funding levels, and management structures (Yin, 2018). Secondly, this study exclusively utilized secondary data from mosque financial reports during a five-year period from 2020 to 2024. Although secondary data saves time and is highly reliable, it may be subject to constraints regarding completeness and consistency of financial records (Boslaugh, 2007). Factors such as auditing accuracy, changes in internal policies, or variations in reporting methods can influence the quality of the data obtained. Third, the analysis technique utilized, Data Envelopment Analysis (DEA), although recognized as an effective method for evaluating the efficiency of non-profit organizations (Cooper, Seiford, & Zhu, 2011), possesses inherent limitations. The effectiveness of DEA is highly dependent on the selection of appropriate inputs and outputs; if the variables do not reflect the entire mosque operation, the results of the analysis may lack comprehensiveness (Cook & Zhu, 2014). This study utilized inputs and outputs that fulfilled its objectives and were supported by the literature; however, a conceptual limitation to acknowledge is the primary challenge in identifying the most appropriate inputs and outputs to assess the financial efficiency of mosque funds. Variable selection is crucial to DEA results,





and input and output identification flaws may significantly impact efficiency evaluations. To ensure consistent alignment between the study objectives, theoretical framework, and the DEA's role in measuring relative efficiency, variable selection must be reevaluated prior to the research process. Despite these modifications occurring before the final analysis, understanding this process is methodologically important. This methodology enhances transparency and emphasizes that the findings must be contextualized in relation to the selected inputs and outputs, adhering to DEA research best practices. Furthermore, DEA is deterministic and unable to consider factors of uncertainty or external variations such as economic conditions, inflation levels, or community support, which may influence the financial efficiency of the mosque (Verge-Jaime, 2023). Lastly, limitations also exist regarding the time frame. The selected five-year period encompasses the COVID-19 pandemic and post-recovery phase, which may not accurately represent the normal conditions of the mosque's financial activities. Therefore, the findings of this study need to be evaluated cautiously, as these unexpected factors may influence the level of mosque fund efficiency. As emphasized by Neuman (2014), recognizing limitations is crucial for enabling critical interpretation of research and facilitating wider and more in-depth future studies.

### **Research Implications**

The findings of this study possess significant implications for academic literature and theory development. This study extended the application of DEA in the context of mosques, which have previously received less attention compared to other Islamic financial institutions such as banks, zakat, and waqf (Sufian, 2022; Yusof et. al, 2023). This addresses a knowledge gap identified in previous studies, indicating that the financial efficiency aspects of mosques have not been extensively analyzed empirically (Abdullah et al., 2020; Johari & Arshad, 2021). The findings of this study validate the perspective that inefficiency in non-profit organizations is more associated with operational scale issues than technical weaknesses (McDermott, 2023; Rustyani, 2018). In addition, the findings of this study also contribute to theoretical validation by empirically linking the VRS and CRS results to Agency Theory and Stakeholder Theory. Full technical efficiency under the VRS model supports the Agency Theory view that mosque management as agents has the ability to manage financial resources effectively. Conversely, the scale inefficiencies identified through CRS provide quantitative support for the Stakeholder Theory argument that the pressure to satisfy the needs of multiple stakeholders can lead to expansion or downsizing of operations that are not at an optimal scale. This explicit relationship strengthens the theoretical contribution of the study by providing empirical evidence to existing conceptual discussions. Thus, these findings support the theories of Agency Theory and Stakeholder Theory, which emphasize the necessity for accountability and efficient resource management (Freeman, 2010; Rajasekar, 2014). This study contributes to the literature by providing additional empirical evidence and facilitating comparative research between mosques and other Islamic institutions.

### **Practical Implications**

The findings of this study provide explicit guidance to mosque management for re-evaluating their financial strategies. The years 2020 and 2023, which have demonstrated efficiency, can serve as a benchmark reference to enhance deficiencies in other years. For increasing return to scale (IRS), the mosque is advised to expand community activities and programs so that available funds can be utilized more productively. On the other hand, for decreasing returns to





scale (DRS), restructuring of expenditures and program priorities is necessary to avoid wasting resources and ensure a balance between input and output.

### Policy Implications

Religious authorities and governments could use these findings to formulate more comprehensive guidelines, ensuring that mosque funds are utilized optimally. The findings emphasize the need to formulate uniform standards for evaluating the mosque's financial efficiency, encompassing both input and output orientation efficiency measures. Furthermore, authorities should improve oversight and transparency in mosque financial reporting by establishing a uniform reporting system and conducting frequent audits, which aligns with the recommendation of Salafiyah (2021) regarding the significance of financial transparency. Thus, these approaches could improve mosque management accountability and ensure the efficient utilization of mosque funds to facilitate sustainable community development.

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