Al-Tijary
Jurnal Ekonomi dan Bisnis Islam

2025, Vol. 11, No. 1, pp. 53 - 73

P-ISSN: 2460-9404; E-ISSN: 2460-9412
DOI: https://doi.org/10.21093/at.v11i1.13942

How Does Bank Aladin Syariah Strategize to Respond to Bank Syariah Indonesia's Expansion? A Game-Theoretic Approach to Competitive Analysis

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Abstract

The rapid growth of Islamic banking in Indonesia has intensified competition between incumbent and digital Islamic banks. However, studies examining their strategic interactions remain limited. This study analyzes the competition between Bank Syariah Indonesia (BSI) and Bank Aladin Syariah (BAS) using a Game Theory approach to identify optimal strategies based on profitability, efficiency, and intermediation indicators. A descriptive-quantitative method was employed using 2024 secondary financial data, including Return on Equity

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(ROE), Operating Expenses to Operating Income Ratio (BOPO), and Financing to Deposit Ratio (FDR), which were transformed into a payoff matrix and analyzed using POM-QM for Windows Version 5. The results indicate that BSI adopts a dominant Profit Strategy (A1), while BAS selects a Growth Strategy (B1). The equilibrium occurs at (A1, B1) with a game value of 4, indicating a pure strategy equilibrium and an asymmetric competitive structure in which BSI maintains a relative competitive advantage. A key finding is that digitalization alone no longer provides a unique competitive advantage, as both banks have implemented digital transformation initiatives. Instead, competitive superiority depends on the ability to convert digital capabilities into sustainable profitability, efficiency, and value creation. These findings contribute to the understanding of competitive dynamics in Islamic banking and provide strategic implications for digital Islamic banks pursuing sustainable growth.

Keywords: *competitive strategy, game theory, islamic banking.*

INTRODUCTION

The development of the Islamic banking industry in Indonesia has demonstrated a significant growth trend in recent years, in line with the increasing public awareness of financial systems based on Sharia principles (Fatimah et al., 2023). Data from the Financial Services Authority (OJK, 2025) indicate that the Islamic banking sector continues to experience growth in terms of assets, financing, and third-party funds. As of October 2025, the total assets of Islamic banking reached IDR 1,028.18 trillion, representing an annual growth of 11.34%, while financing amounted to IDR 685.55 trillion (growing by 7.78% YoY) and third-party funds reached IDR 820.79 trillion (growing by 14.26% YoY). Furthermore, at the broader Islamic financial industry level, total assets reached IDR 3,131 trillion in 2025, with a growth rate of 8.61% YoY, indicating the significant contribution of this sector to the national financial system. These conditions reflect the increasing role of Islamic financial institutions in the economy and intensify competition among Islamic banks, both large-scale institutions and digital-based banks.

In this context, Bank Syariah Indonesia (BSI), as the largest Islamic bank in Indonesia, possesses advantages in terms of assets, profitability, and network coverage (Hisam, 2023). According to the 2025 Report of BRIS published on the Indonesia Stock Exchange (IDX), BSI recorded a net profit of IDR 7.57 trillion, with total assets reaching IDR 456.19 trillion, demonstrating strong and stable financial performance. This indicates that BSI relies on efficiency and profitability strategies as the foundation of its competitive advantage.

On the other hand, Bank Aladin Syariah has emerged as a digital Islamic bank that adopts a technology-driven growth strategy and customer expansion through an Online-to-Offline (O2O) collaboration with the Alfa Group (Husada, 2024). Based on its Report, Bank Aladin successfully recorded a net profit of IDR 150.7 billion after previously experiencing losses, indicating an improvement in performance during its growth phase. Nevertheless, its relatively high operational cost structure and suboptimal efficiency ratio suggest that the bank remains in an expansion stage and is still adjusting its business model.

A comparison of the strategies employed by Bank Syariah Indonesia and Bank Aladin Syariah is particularly important because both institutions represent two contrasting business models within Indonesia's Islamic banking industry: a large-scale incumbent Islamic bank and a digital challenger Islamic bank. This distinction not only reflects variations in operational

strategies but also highlights potential imbalances in efficiency, profitability, and intermediation functions that may affect overall industry stability. For instance, research by Revita Pratama Putri, (2025) found that BSI tends to prioritize stability and scale-based efficiency. In contrast, Bank Aladin Syariah focuses on aggressive growth through digital innovation, which may increase operational costs. These differences in business models and strategies highlight the need for a comparative analysis to access which approach is more effective and sustainable. This is supported by another research who compared the financial performance of BSI and Bank Aladin Syariah during 2022-2024 and found that BSI demonstrated more stable and efficient financial performance than Bank Aladin Syariah. Therefore, BSI and Bank Aladin Syariah were selected as the research objects because they represent distinct business models within the Islamic Banking industry, allowing for a focused comparison of their performance and strategic effectiveness.

These phenomena can be explained through Game Theory, as they involve two or more rational entities, particularly within the framework of the non-cooperative game model developed by John Nash through the concept of Nash Equilibrium. This theory posits that, in a competitive environment, each economic actor chooses an optimal strategy while considering the strategies of competitors, resulting in an equilibrium condition in which no party can improve its payoff without altering the strategies of others (Chen, 2022). Furthermore, the asymmetry between the two banks is relevant to be analyzed using the concept of asymmetric games, where each player possesses different resources, objectives, and cost structures. The use of game theory in this study is not intended to analyze financial ratios directly, but rather to determine strategies based on each bank's performance and taking into account competitors' strategies. Wijanarko & Cahyono (2019) used game theory to analyze the strategies of Bank Syariah Mandiri and BNI Syariah in facing competition in the Islamic banking sector in Indonesia. Thus, financial ratios are used to describe the banks' performance, while Game Theory is used to determine optimal strategies by taking competitors' conditions into account. The application of game theory is expected to help identify strategies and understand competitive equilibria in the increasingly digitized Islamic banking industry.

Game Theory can be applied using various indicators depending on the analysis objectives. Previous research indicates that the indicators serving as the basis for Game Theory analysis are not limited to financial ratios but can also include third-party funds (DPK), Hajj funds, and customer numbers (Wijanarko & Cahyono, 2019). ROE, BOPO, and FDR were selected because they represent three crucial aspects of banking performance: profitability, operational efficiency, and the intermediation function. These three ratios are also widely used to assess the condition and performance of Sharia banks (Berliana & Widodo, 2022)The selection of ROE, BOPO, and FDR aligns with the research focus and does not imply that these are mandatory indicators for the application of Game Theory.

This study is important because most previous research has primarily focused on micro, small, and medium enterprises (MSMEs) or simple service industries, such as coffee shops (Enjeli, 2022). Moreover, the urgency of this research is reinforced by the existence of a gap in the empirical literature that specifically compares competitive strategies between large Islamic banks and digital Islamic banks in Indonesia using a quantitative Game Theory approach. Most previous studies have remained descriptive or partial in nature and have therefore been unable to explain how strategic interactions among banks may generate equilibrium conditions or even lead to market dominance. For example, the study conducted by Putra (2022)merely compared the

financial health of private and national banking sectors without further analyzing strategic development between the compared institutions. However, from a Game Theory perspective, every decision made by one bank directly influences the outcomes achieved by competing banks, particularly in key performance indicators such as Return on Equity (ROE), Operating Expenses to Operating Income Ratio (BOPO), and Financing to Deposit Ratio (FDR). Consequently, this study offers an important contribution by integrating Game Theory, financial performance analysis (ROE, BOPO, and FDR), and the competitive context between Bank Syariah Indonesia and Bank Aladin Syariah.

Therefore, this research is highly crucial not only from an academic perspective but also from a practical standpoint, as it can provide a more rational and data-driven basis for strategic decision-making among Islamic banking practitioners. Accordingly, this study aims to address the aforementioned gap by analyzing the competitive strategies of Bank Syariah Indonesia and Bank Aladin Syariah using a Game Theory approach based on financial indicators. It is expected to contribute both academically and practically, particularly in understanding competitive dynamics within the Islamic banking industry and providing a more rational, evidence-based foundation for strategic decision-making. In addition, the findings are expected to contribute to the formulation of a healthy and sustainable competition model, especially in responding to the ongoing digital transformation within the Islamic financial sector. Without comprehensive analyses of this nature, there is a risk that competition may instead lead to inefficiency, market imbalances, or even a decline in aggregate industry performance.

LITERATURE REVIEW

Game Theory in Economic Analysis

Game Theory is one of the most important approaches in economics used to analyze strategic interactions among economic actors under competitive conditions (Chen, 2022). In simple terms, Game Theory can be defined as an interactive decision-making technique that involves the actions and responses of other parties. The theory was first introduced by the French mathematician Émile Borel in 1921 (Enjeli, 2022). It was subsequently developed by John von Neumann and Oskar Morgenstern (1944) through their seminal work *Theory of Games and Economic Behavior*, which posits that an individual's actions are determined by the actions of others (Nasution et al., 2025). Within this framework, economic actors are assumed to behave rationally with the objective of maximizing their utility or economic benefits.

The development of Game Theory was further strengthened by the introduction of the Nash Equilibrium concept proposed by John Nash (1950). This concept explains that equilibrium is achieved when no player can improve their payoff by unilaterally changing their strategy (Kristianus, 2022)In other words, the optimal decision of a player depends heavily on the strategies chosen by other players, thereby creating interdependence in the decision-making process.

In empirical research, Game Theory has been widely applied to analyze competitive dynamics across various sectors, including the financial industry. For example, research conducted by Bhayangkara & Rakhman (2025) demonstrated that the application of Game Theory in finance reveals how policy design, particularly in shaping incentive structures, directly influences the strategic choices of economic actors. Consequently, it can shift equilibrium outcomes from suboptimal non-cooperative behavior toward more sustainable and value-enhancing cooperative

behavior. Therefore, the application of Game Theory in this study is highly relevant for understanding the competitive relationship between two Islamic banks with distinct characteristics.

Application of Game Theory in Banking

Pratomo (2017) explains that, within the banking sector, Game Theory is utilized to understand how banks formulate strategies in response to competition, particularly in determining financing rates, managing liquidity, and pursuing market expansion. Interactions among banks are not independent; rather, they are mutually influential, requiring each strategic decision to take competitors' responses into account. This characteristic makes the banking sector one of the most suitable contexts for the application of Game Theory (Chen, 2022). Fakir & Tkioua (2016) Employs game theory with an imperfect information approach to analyze the selection of Mudharabah contracts in Sharia bank financing. The study demonstrates that game theory can be used to analyze strategic decisions amidst uncertainty and competition.

The stability of the financial system is strongly influenced by strategic interactions among banks, especially under conditions of economic uncertainty. Banks' decisions regarding financing allocation and liquidity management may affect other financial institutions, thereby creating systemic effects (Yehezkiel & Hakim, 2025). In this context, Game Theory can be employed to identify optimal strategies that not only maximize individual benefits but also contribute to maintaining the stability of the financial system as a whole.

Furthermore, Malik (2010) emphasizes that banks' operational policies are the result of strategic interactions within a competitive market environment. Banks do not focus solely on internal profitability; they must also consider the positions and potential responses of competitors when formulating their strategies (Rusdianto, 2021). Therefore, the Game Theory approach serves as a relevant analytical tool for understanding competitive dynamics in the modern banking industry, including the Islamic banking sector. Those previous studies reinforce the use of Game Theory in this research to analyze the strategies of BSI and Bank Aladin Syariah, taking into account the conditions and responses of each bank.

Financial Performance of Islamic Banks

The financial performance of Islamic banks is generally assessed using several key indicators, namely profitability, operational efficiency, and intermediation function. Profitability is commonly measured by Return on Equity (ROE), which reflects a bank's ability to generate profits from its shareholders' equity. Operational efficiency is measured using the Operating Expenses to Operating Income Ratio (BOPO), which reflects the bank's efficiency in managing operating expenses against operating income. Meanwhile, the intermediation function is measured using the Financing to Deposit Ratio (FDR), a ratio indicating the bank's ability to channel mobilized funds into financing (Berliana & Widodo, 2022)

The use of ROE, BOPO, and FDR as performance indicators for Sharia banks is also supported by prior research. Reni et al., (2024) utilized ROE, BOPO, and FDR to analyze the performance of Sharia Commercial Banks in Indonesia. Hasanah (2023) also employed FDR and BOPO as variables influencing ROE at Bank NTB Syariah during the 2020–2022 period. Furthermore, Norma Rosyidah & Dini Handayani (2024) used FDR, BOPO, and ROE to analyze the performance of Sharia Commercial Banks in Indonesia. These findings indicate that ROE, BOPO, and FDR are relevant metrics for representing the profitability, operational efficiency, and intermediation function of Sharia banks.

In addition, Putu et al., (2025) demonstrated that efficiency and stability are crucial factors in the performance of Islamic banking in Indonesia. These findings align with another studies, who identified a relationship between operational efficiency and the profitability of Islamic banks. Consequently, ROE, BOPO, and FDR were selected for this study as they represent three key aspects of bank performance: profitability, operational efficiency, and the intermediation function. These three ratios serve as the basis for analyzing the performance and strategies of Bank Syariah Indonesia and Bank Aladin Syariah.

METHOD

This study employs a descriptive-quantitative research approach, in which the analysis combines secondary data derived from financial statements with a mathematical analysis method based on Game Theory using the POM-QM for Windows Version 5 software. The analysis is conducted under the assumption of a *two-person zero-sum game*. This approach is selected because the study aims to describe the competitive strategies between Bank Syariah Indonesia and Bank Aladin Syariah while simultaneously identifying optimal strategies through payoff matrix calculations.

According to Sukorina et al., (2025) descriptive research aims to systematically and factually describe a particular phenomenon. Meanwhile, a quantitative approach is employed to analyze strategic relationships among economic actors using numerical analytical tools (Murjani, 2022). In this study, the approach is used to measure strategic interactions based on key financial performance indicators, including profitability, efficiency, and intermediation. This method is consistent with the principles of Operations Research, which emphasize optimal decision-making through mathematical modeling. Therefore, the application of Game Theory in this research is intended to identify competitive strategies that generate an optimal equilibrium within the Islamic banking industry.

The objects of this study are two Islamic banks operating in Indonesia:

1. Bank Syariah Indonesia (BSI), representing the largest Islamic bank in Indonesia, characterized by a business model emphasizing stability and operational efficiency.
2. Bank Aladin Syariah, representing a digital Islamic bank that focuses on growth and technological innovation.

This study employs a descriptive-quantitative approach by combining secondary financial data with Game Theory analysis using POM-QM for Windows Version 5. Game Theory is applied to identify optimal competitive strategies through payoff matrix analysis, as previously applied in analyzing competition between Islamic banks (Wijanarko & Cahyono, 2019).

The objects of this study are Bank Syariah Indonesia (BSI) and Bank Aladin Syariah (BAS). The two banks were selected because they have different business characteristics and strategic orientations while operating in the same Islamic banking industry, making them relevant for analyzing competitive interaction using Game Theory.

This study utilizes cross-sectional data from 2021–2024 period serves merely to trigger management strategies for banking development. The data consist of three financial performance indicators, namely Return on Equity (ROE), Operating Expenses to Operating Income Ratio (BOPO), and Financing to Deposit Ratio (FDR). The data were obtained from the annual reports and official financial statements of BSI and BAS for 2021–2024, with supporting data from the

Financial Services Authority (OJK). For each bank, five years of data were observed for three financial ratios, resulting in 15 ratio values per bank and 30 ratio values in total.

ROE measures the bank's ability to generate profit from shareholders' equity and represents profitability. BOPO measures operational efficiency through the ratio of operating expenses to operating income, where a lower ratio indicates better efficiency. FDR measures the bank's intermediation function through the relationship between financing and funds collected from customers. The measurement concepts of ROE, BOPO, and FDR are applied consistently to both BSI and BAS, although their values may differ according to each bank's financial condition and business characteristics. The selection of these three ratios represents three important dimensions of banking performance, namely profitability, efficiency, and intermediation, and does not imply that Game Theory is limited to these indicators.

Data collection in this study was conducted through documentation and literature review methods. The documentation method involved collecting annual financial statements and official publications from each bank, while the literature review was undertaken to establish the theoretical foundation and examine findings from previous studies. The collected data were focused on strategic indicators relevant to the Game Theory model employed in this research.

The variables in this study are constructed based on the strategic orientations of the two Islamic banks under investigation. Each player (Player A and Player B) is assumed to possess three primary strategies, which serve as the basis for constructing the Game Theory payoff matrix.

Table 1 Player Strategics

Player	Strategy Code	Strategy	Description
Bank Syariah Indonesia (Player A)	**A1**	Profit Strategy	A strategy oriented toward increasing Return on Equity (ROE) through the optimization of financing margins and revenue enhancement
	A2	Efficiency Strategy	A strategy focused on controlling operational costs to reduce the Operating Expenses to Operating Income Ratio (BOPO).
	A3	Intermediation Strategy (Murabahah)	A strategy emphasizing the optimization of financing distribution through maintaining a balanced Financing to Deposit Ratio (FDR).
Bank Aladin Syariah (Player B)	**B1**	Growth Strategy	A strategy focused on customer acquisition and digital expansion, leading to increased business volume but accompanied by higher operational costs.
	B2	Efficiency Adjustment Strategy	A strategy aimed at improving performance by reducing the

		BOPO ratio and enhancing profitability.
B3	Conservative Strategy	A strategy focused on risk control through limiting financing activities and maintaining liquidity stability.

Source : Author (2025)

The quantitative data obtained from the financial performance indicators are subsequently used to construct payoff values, expressed as the relative competitive advantage between the two banks in percentage terms.

The data are analyzed using the *two-person zero-sum game* approach, in which the gain of one player represents an equivalent loss to the opposing player. The analytical procedure consists of the following stages:

1. Identification of Players' Strategies
    - Player A (Bank Syariah Indonesia): Profit Strategy, Efficiency Strategy, Intermediation Strategy
    - Player B (Bank Aladin Syariah): Growth Strategy, Efficiency Adjustment Strategy, Conservative Strategy
2. Construction of the Payoff Matrix (3 × 3)

The payoff values were calculated based on the relative performance differences between Bank Syariah Indonesia and Bank Aladin Syariah using three key financial indicators: Return on Equity (ROE), Operating Expenses to Operating Income Ratio (BOPO), and Financing to Deposit Ratio (FDR). Since ROE and FDR represent favorable performance indicators, higher values indicate better performance. Conversely, BOPO represents operational inefficiency; therefore, lower values indicate better performance.

A positive payoff value indicates a competitive advantage for Player A (Bank Syariah Indonesia), whereas a negative value indicates a competitive advantage for Player B (Bank Aladin Syariah). The resulting payoff matrix serves as the basis for determining the optimal strategies through the Maximin and Minimax criteria and for identifying the equilibrium solution of the game.

3. Optimal Strategy Analysis

    The optimal strategies are determined using:
    - The Maximin Criterion for Player A (Bank Syariah Indonesia)
    - The Minimax Criterion for Player B (Bank Aladin Syariah)
4. Determination of the Value of the Game

    This stage aims to identify whether the game results in:
    - A saddle point, indicating the existence of a pure strategy equilibrium; or
    - A mixed-strategy equilibrium, indicating that players must adopt probabilistic combinations of strategies.

RESULTS AND DISCUSSION

RESULTS

Before conducting the strategic analysis using the Game Theory approach, this study first presents secondary data on the financial performance of Bank Syariah Indonesia and Bank Aladin Syariah during the 2021–2024 period. The data include Return on Equity (ROE), Operating

Expenses to Operating Income (BOPO), and the Financing to Deposit Ratio (FDR). These three ratios are used to describe the profitability, operational efficiency, and intermediation performance of each bank during the observation period. The financial ratio data of both banks are presented in Table 2.

Table 2 Financial Performance Ratios of BSI and BAS for the 2021-2024 Period

Bank	Ratio	2021	2022	2023	2024
Bank Syariah Indonesia	ROE (%)	13,71	16,84	16,88	17,77
	BOPO (%)	80,46	75,88	71,27	69,93
	FDR (%)	73,39	79,37	81,73	84,97
Bank Aladin Syariah	ROE (%)	-10,10	-8,50	-7,55	-2,43
	BOPO (%)	428,4	354,75	128,65	109,29
	FDR (%)	0,00	173,27	95,31	87,72

Source: Annual Reports and Sustainability Reports of Bank Syariah Indonesia and Bank Aladin Syariah, 2021-2024.

Based on Table 2, there are differences in the financial performance of Bank Syariah Indonesia and Bank Aladin Syariah during the 2021–2024 period. Bank Syariah Indonesia generally demonstrates more stable performance, particularly in terms of profitability and operational efficiency. Meanwhile, Bank Aladin Syariah shows significant performance changes throughout the observation period, particularly through improvements in its ROE and BOPO ratios in the later years. These differences in financial performance characteristics subsequently serve as the basis for identifying the strategic position of each bank in the competitive analysis.

Table 3 Database Strategic

Player	Strategy Code	Strategy	Proof
Bank Syariah Indonesia (Player A)	**A1**	Profit Strategy	Following the merger during the 2021–2024 period, Bank Syariah Indonesia (BSI) implemented a strategy explicitly focused on profitability enhancement, as evidenced by the consistent increase in its Return on Equity (ROE). The bank's ROE rose from 11.18% in 2020 to 13.71% in 2021 and further increased to

Player	Strategy Code	Strategy	Proof
			17.77% in 2024, before experiencing a slight decline to 16.85% in 2025. This trend indicates BSI's success in improving shareholder value through post-merger consolidation and profitability-oriented business strategies.
	A2	Efficiency Strategy	BSI also pursued an operational efficiency strategy by controlling operating expenses, resulting in a reduction of the Operating Expenses to Operating Income Ratio (BOPO) from 80.46% to 69.93% during the 2021–2024 period. However, the ratio increased to 83.74% in 2025, suggesting growing operational pressures associated with business expansion and rising operating costs.
	A3	Intermediation Strategy	In terms of intermediation, BSI expanded its financing activities and optimized fund distribution, as reflected by the increase in its Financing to Deposit Ratio (FDR) from 73.39% to 84.97% between 2021 and 2024. In 2025, the FDR remained within the optimal range of 75%–85%, indicating that the bank successfully maintained a balanced intermediation function while supporting financing growth.
Bank Aladin Syariah (Player B)	**B1**	Growth Strategy	Meanwhile, Bank Aladin Syariah (BAS) implemented a growth-oriented strategy driven by digital transformation initiatives, including social media advertising, e-KYC onboarding, and strategic collaboration with Alfamart. These initiatives significantly expanded its customer base, as reflected in the increase in application downloads from 3.2 million in 2022 to 5.2 million in 2023. This growth contributed to a twofold increase in revenue, although profitability remained relatively modest, with an ROE of 4.58% in 2025.
	B2	Efficiency Adjustment Strategy	BAS also adopted an efficiency improvement strategy by restructuring its cost base, resulting in a 67% reduction in losses in 2024 and enabling the bank to record a net profit of IDR 83.1 billion. Despite this improvement, the bank's BOPO ratio remained relatively high at

Player	Strategy Code	Strategy	Proof
	B3	Conservative Strategy	85.16% in 2025, indicating that operational efficiency has not yet reached an optimal level. Furthermore, BAS implemented a risk-based strategy that emphasized financing quality and prudent risk management. This approach contributed to a more controlled growth trajectory and enhanced risk management practices. As a result, the bank maintained a Financing to Deposit Ratio (FDR) of 59.73%, reflecting a relatively conservative financing policy compared to industry standards.

Source: Annual Reports and Sustainability Reports of Bank Syariah Indonesia and Bank Aladin Syariah, 2021-2025.

Based on Table 2, the strategic orientations of Bank Syariah Indonesia and Bank Aladin Syariah reflect their different financial conditions and competitive positions during the 2021–2024 period. Bank Syariah Indonesia demonstrated relatively stable and stronger performance, which supported the adoption of profitability, efficiency, and intermediation-oriented strategies. In contrast, Bank Aladin Syariah experienced a process of performance adjustment, as reflected in the gradual improvement in profitability and operational efficiency, while its intermediation performance remained more volatile. Therefore, the strategic alternatives of both banks were constructed based on their respective financial characteristics while maintaining a consistent observation period of 2021–2024.

Payoff Matrix Construction

The strategic alternatives identified for Bank Syariah Indonesia consist of the Profit Strategy (A1), Efficiency Strategy (A2), and Intermediation Strategy (A3), while those identified for Bank Aladin Syariah consist of the Growth Strategy (B1), Efficiency Adjustment Strategy (B2), and Conservative Strategy (B3). The corresponding financial performance data for each strategy are presented below.

Table 4 Indicators Strategic

Player	Strategy Code	Strategy	Indicators	Percentage
Bank Syariah Indonesia (Player A)	**A1**	Profit Strategy	ROE	16,85
	A2	Efficiency Strategy	BOPO	83,74
	A3	Intermediation Strategy	FDR	84
Bank Aladin Syariah (Player B)	**B1**	Growth Strategy	ROE	4,58
	B2	Efficiency Adjustment Strategy	BOPO	85,16
	B3	Conservative Strategy	FDR	59,73

Source: Annual Reports and Sustainability Reports of Bank Syariah Indonesia and Bank Aladin Syariah, 2021-2024; author's calculation.

The comparison of the three strategic indicators produced the following results:

1. ROE difference = 16,85 − 4,58 = +12,27, a higher ROE indicates better profitability performance and is therefore treated as a reward.
2. Selisih BOPO = 85 – 83,74 = +1,26, A lower BOPO indicates greater operational efficiency and is therefore treated as a reward.
3. Selisih FDR = |84 − 59,73| = 24,27, Since the FDR should neither be excessively high nor excessively low, this difference is treated as a penalty, resulting in a value of −24.27.

To simplify the payoff calculation, the values were normalized using divisors of approximately 2, 1, and 3, resulting in the following standardized scores; ROE +6, BOPO +1 and FDR -8. The strategic effects of Bank Syariah Indonesia (Player A) on Bank Aladin Syariah (Player B) were then calculated as follows:

1. $\frac{Gap\ ROE}{Normalization\ Factor} = \frac{12,27}{6}$ = 2, resulting in a normalized payoff value of −2.
2. $\frac{Gap\ BOPO}{Normalization\ Factor} = \frac{1,26}{1,2}$ = 1, resulting in a normalized payoff value of −1
3. $\frac{Gap\ FDR}{Normalization\ Factor} = \frac{-24,27}{12}$ = -2, resulting in a normalized payoff value of +2.

Based on these calculations, the payoff matrix was constructed as follows:

Table 5 Payoff Matriks

BSI \ BAS	B1 (Growth)	B2 (Efficiency)	B3 (Conservative)
A1 (Profit)	6 + (−2) = 4	6 + (−1) = 5	6 + (2) = 8
A2 (Efficiency)	1 + (−2) = −1	1 + (−1) = 0	1 + (2) = 3
A3 (Intermediation)	−8 + (−2) = −10	−8 + (−1) = −9	−8 + (2) = −6

Source : Author (2025)

Analysis Using POM-QM for Windows Version 5

The following analysis was conducted using POM-QM for Windows Version 5 with the following parameters:

1. Player A (Row) = Bank Syariah Indonesia (BSI)
2. Player 2 (Column) = Bank Aladin Syariah (BAS)
3. Number of Strategy = 3x3

The first step in the analysis involved entering the payoff matrix presented in Table 4 into the Game Theory module of POM-QM for Windows Version 5. The matrix was constructed based on the strategic interactions between Bank Syariah Indonesia and Bank Aladin Syariah. The resulting model is presented as follows:

Table 6 Payoff Matriks Input

BSI VS BAS	B1 (Growth)	B2 (Efficiency)	B3 (Conservative)
A1 (Profit)	4	5	8
A2 (Efficiency)	-1	0	3
A3 (Intermediation)	-10	-9	-6

Source : POM-QM for Windows Game Theory Approach

Next, select the "solution" menu to find the minimax/maximin of each strategy. The results of the computation are shown in the following image:

Table 7 Payoff Matriks Output

BSI VS BAS	B1 (Growth)	B2 (Efficiency)	B3 (Conservative)	Row Mix
A1 (Profit)	4	5	8	1
A2 (Efficiency)	-1	0	3	0
A3 (Intermediation)	-10	-9	-6	0
Column Mix	1	0	0	
Value of Game (to row)	4			

Source : Output POM-QM for Windows Game Theory Approach

The results of the Game Theory analysis indicate that the optimal strategy for Bank Syariah Indonesia is the Profit Strategy (A1), while Bank Aladin Syariah tends to adopt the Growth Strategy (B1). The game value of 4 suggests that, under equilibrium conditions, Bank Syariah Indonesia possesses a relative competitive advantage over Bank Aladin Syariah. Furthermore, the absence of a mixed-strategy solution indicates that both players have clearly dominant strategies, resulting in a pure strategy equilibrium.

Table 8 Column's Expected Values

BSI VS BAS Solution	Optimal Row Mix	B1 (Growth)	B2 (Efficiency)	B3 (Conservative)
Row 1 Mix *Cell Payoff	1	4	5	8
Row 2 Mix *Cell Payoff	0	0	0	0
Row 3 Mix *Cell Payoff	0	0	0	0
Expected Value (Col Sum)		4	5	8
Value of Game (to row)	4			

Source : Output POM-QM for Windows Game Theory Approach

Based on the analysis of the Row's Expected Values, the Profit Strategy (A1) generated the highest expected value of 4 compared to the other strategies. This finding indicates that Bank Syariah Indonesia achieves the most favorable outcome when pursuing a profitability-oriented strategy, assuming that Bank Aladin Syariah adopts its optimal response strategy. The negative expected values associated with the Efficiency Strategy (A2) and the Intermediation Strategy (A3) suggest that these strategies are less competitive when facing the Growth Strategy implemented by Bank Aladin Syariah.

Table 9 Row's Expected Values

BSI VS BAS Solution	Col 1 Mix *Cell Payoff	Col 2 Mix *Cell Payoff	Col 3 Mix *Cell Payoff	Expected Value (Row Sum)

Column's Optimal Mix	1	0	0	
A1 (Profit)	4	0	0	4
A2 (Efficiency)	-1	0	0	-1
A3 (Intermediation)	-10	0	0	-10
Value of Game (to row)				4

Source : Output POM-QM for Windows Game Theory Approach

The analysis of the Column's Expected Values reveals that the optimal strategy for Bank Aladin Syariah is the Growth Strategy (B1), as it produces the lowest payoff value of 4 against Bank Syariah Indonesia. This result indicates that, when confronted with BSI's optimal strategy, Bank Aladin Syariah is unable to maximize its gains and can only minimize its relative losses. Therefore, the Growth Strategy represents the most rational choice under conditions of asymmetric competition.

Table 10 Maximin/Minimax

BSI VS BAS	B1 (Growth)	B2 (Efficiency)	B3 (Conservative)	Maximin
A1 (Profit)	4	5	8	4
A2 (Efficiency)	-1	0	3	
A3 (Intermediation)	-10	-9	-6	
Column Maximum	4	5	8	
Minimax	4			
Value = 4				

Source : Output POM-QM for Windows Maximin-Minimax Approach

The Maximin and Minimax analyses show that the Maximin value of 4 is achieved through the Profit Strategy (A1), while the Minimax value of 4 is obtained through the Growth Strategy (B1). The equality of these values indicates the existence of a saddle point, confirming that the game reaches a pure strategy equilibrium. This finding suggests that Bank Syariah Indonesia possesses a dominant strategy centered on profitability enhancement, whereas Bank Aladin Syariah adopts a growth-oriented strategy as its optimal response to minimize losses within the competitive environment.

Table 11 BSI VS BAS Solution

ROW	
A1 (Profit)	1
A2 (Efficiency)	0
A3 (Intermediation)	0
COLUMN	
B1 (Growth)	1
B2 (Efficiency)	0
B3 (Conservative)	0

Source : Output POM-QM for Windows Game Theory Approach

The results presented in the "Results in List Form" output indicate that Bank Syariah Indonesia optimally selects the Profit Strategy (A1) with a probability of 1, while Bank Aladin

Syariah selects the Growth Strategy (B1) with a probability of 1. This finding confirms that both players possess dominant strategies without requiring any strategic combinations (mixed strategies). Consequently, the game is characterized by a pure strategy equilibrium.

An additional finding of this study is that Bank Aladin Syariah's positioning as a digital Islamic bank does not automatically provide a superior competitive advantage. The results demonstrate that digitalization alone is insufficient to outperform Bank Syariah Indonesia, which has also implemented extensive digital transformation initiatives. Consequently, digitalization has become a competitive necessity rather than a unique source of differentiation in the Islamic banking industry. Under these circumstances, the Growth Strategy (B1) emerges as the most rational option for Bank Aladin Syariah, as it enables the bank to expand its customer base, strengthen market penetration, and gradually improve its competitive position. This finding implies that future competitiveness in the Islamic banking sector will depend not merely on technological adoption but on the ability to convert digital capabilities into sustainable profitability, operational efficiency, and long-term value creation.

DISCUSSION

This study analyzes the strategic interaction between Bank Syariah Indonesia (BSI) as the incumbent player and Bank Aladin Syariah (BAS) as the challenger using a Game Theory approach. The results indicate that strategic equilibrium is achieved at the combination of A1 (Profit Strategy) and B1 (Growth Strategy), with a game value of 4, suggesting a relative competitive advantage for Bank Syariah Indonesia.

From an empirical perspective, the dominance of the profit strategy (A1) indicates that profitability represents the most competitive strategic orientation for BSI compared with efficiency and intermediation strategies. This finding is consistent with, Febriansyah & Faiqoh (2025) who found that BSI's post-merger financial performance showed improvements in profitability, efficiency, and intermediation, reflecting the strengthening of BSI's financial structure and competitiveness. Similarly, Murtadha (2024) reported that BSI experienced changes in its performance following the merger, indicating that the post-merger integration contributed to the development of the bank's overall performance. In the context of the present study, the dominance of A1 suggests that the improvement in profitability provides BSI with a relatively stronger competitive position than the alternative strategies. Therefore, the maximin result for A1 reflects not merely higher financial performance but also the ability of the profit-oriented strategy to generate a more favorable payoff under different strategic responses from the opponent.

In contrast, the efficiency strategy (A2) does not emerge as BSI's optimal strategy, although operational efficiency remains an important component of banking performance. Previous studies have demonstrated that operational efficiency, as measured by BOPO, is closely associated with Islamic bank profitability. Chavia (2022) found that BOPO significantly affects the profitability of Islamic commercial banks in Indonesia. These findings indicate that controlling operational costs is important for maintaining financial performance. However, the Game Theory results of this study show that efficiency does not provide BSI with the highest competitive payoff. This condition implies that although efficiency is necessary to support sustainable performance, it functions more effectively as a supporting strategy rather than as the primary competitive strategy under the conditions examined in this study.

Meanwhile, the intermediation strategy (A3) demonstrates that a relatively strong financing intermediation function does not automatically result in the highest competitive payoff. This finding is supported by previous studies showing that the relationship between FDR and Islamic bank profitability is not always significant. Chavia (2022) found that FDR did not have a significant partial effect on ROA, while Mustari (2019) similarly reported that FDR had no significant effect on the profitability of Islamic banking. These findings suggest that a stronger intermediation function does not necessarily translate into superior profitability or competitive performance. Therefore, the negative payoff obtained by A3 in the present Game Theory analysis should not be interpreted as indicating poor intermediation performance, but rather as reflecting its relative competitive disadvantage compared with the profit-oriented strategy. Accordingly, the intermediation strategy remains important for supporting BSI's banking function, but profitability provides a stronger strategic position in the competitive interaction between BSI and Bank Aladin Syariah.

However, the efficiency strategy (A2) was not identified as the optimal strategy in the POM-QM analysis. The payoff matrix generated using POM-QM for Windows Version 5 indicates that A2 produces a lower payoff than the profit strategy (A1). This result implies that although operational efficiency is an important component of BSI's financial performance, it does not provide the highest strategic advantage when BSI interacts with Bank Aladin Syariah. The finding is supported by Dayanti (2024), who examined BSI during the post-merger period and found that BOPO had a significant relationship with profitability, whereas FDR did not show a significant effect. This indicates that operational efficiency has an important role in determining financial performance, but its strategic advantage depends on how efficiently the bank can control operational costs while maintaining revenue growth. Furthermore, it found that BSI experienced improved operational efficiency after the merger, as indicated by better BOPO performance, although changes in other financial ratios occurred during the same period. Therefore, the POM-QM result suggests that efficiency remains an important supporting strategy for BSI, but it is not the most advantageous strategy under the competitive conditions represented in the payoff matrix.

Meanwhile, the intermediation strategy (A3) also did not emerge as the optimal strategy based on the POM-QM analysis. The payoff matrix shows that A3 generates a negative payoff under the strategic combinations examined, indicating that this strategy provides a relatively weaker competitive position than the profit strategy (A1). This result does not necessarily indicate that BSI's intermediation function is poor, but rather reflects the relative payoff obtained when A3 interacts with the strategies selected by Bank Aladin Syariah. Sumarni et al., (2024) found that FDR had a positive effect on the profitability of Bank Muamalat Indonesia, indicating that stronger financing distribution can contribute to profitability when accompanied by appropriate operational management. However, other evidence shows that the effect of FDR on profitability is not always significant. Yunus & Padang, (2025) found that FDR was not a significant determinant of profitability among Indonesian Islamic commercial banks, while BOPO showed a stronger relationship with profitability. Thus, the negative payoff of A3 in the POM-QM analysis should be understood as a relative competitive disadvantage rather than an indication of an unhealthy intermediation function. In other words, although financing intermediation remains essential to BSI's banking activities, the results of the Game Theory analysis demonstrate that it provides a weaker competitive payoff than the profit-oriented strategy.

On the other hand, Bank Aladin Syariah demonstrates the characteristics of a digital Islamic bank pursuing an aggressive growth strategy (B1). Its digital transformation initiatives, including e-KYC onboarding, digital marketing, and collaborations with retail ecosystems such as Alfamart, significantly increased its user base from 3.2 million downloads in 2022 to 5.2 million in 2023, while also doubling its revenue growth. Nevertheless, profitability remains relatively low, with an ROE of only 4.58% in 2025. Consequently, within the game framework, this strategy serves as an optimal response to minimize losses rather than to outperform BSI.

The efficiency strategy adopted by BAS (B2) also showed considerable improvement, as losses were reduced by 67% in 2024 and the bank began recording a profit of IDR 83.1 billion. However, the BOPO ratio remained relatively high at 85.16% in 2025, indicating that operational efficiency has not yet reached an optimal level. This explains why the strategy was not selected as part of the game equilibrium, as it failed to generate a sufficiently competitive payoff.

The conservative strategy (B3), which focuses on financing risk management, is reflected in a relatively low FDR of 59.73%. While this strategy provides greater risk stability, an overly cautious approach reduces competitiveness because available funds are not utilized optimally. Within the Game Theory model, this condition results in higher payoffs for BSI, making the conservative strategy the least favorable option for BAS.

An additional finding of this study reveals that Bank Aladin Syariah's positioning as a digital Islamic bank does not automatically translate into a superior competitive advantage. Although BAS has successfully leveraged digital transformation to expand its customer base and business volume, these capabilities are no longer unique within the Islamic banking industry. Bank Syariah Indonesia has also undergone substantial digital transformation through mobile banking services, digital financing platforms, integrated payment systems, and broader ecosystem development. As a result, digitalization has become a competitive necessity rather than a distinctive strategic advantage. This finding suggests that competitive superiority is no longer determined by the adoption of digital technology alone, but by the ability to convert digitalization into sustainable profitability, efficiency, and value creation.

From an ontological perspective, the findings indicate that competition in the Islamic banking industry has shifted from technology-based competition to value-creation competition. Digitalization functions as a strategic enabler rather than an ultimate objective. Therefore, the Growth Strategy (B1) selected by BAS at the equilibrium point represents the most rational strategic choice, as it allows the bank to expand its customer base, increase market penetration, and gradually strengthen its competitive position. From an axiological perspective, these findings imply that the value of digital transformation lies not merely in technological adoption but in its capacity to generate sustainable growth and long-term financial performance. Consequently, BAS should maintain its growth-oriented strategy while simultaneously improving operational efficiency and profitability to transform its digital expansion into a sustainable competitive advantage.

Overall, the results demonstrate that the strategic interaction between the two banks forms a pattern of asymmetric competition, in which BSI acts as the dominant player with a stable profit-oriented strategy, while BAS functions as an adaptive player that relies on growth strategies to remain competitive. The resulting equilibrium is stable and represents a pure-strategy equilibrium; however, it also indicates that the competitive structure within the Islamic banking industry

remains uneven, with BSI maintaining a substantial advantage in terms of profitability, scale, and market position.

An important finding of this study is that Bank Aladin Syariah's positioning as a digital Islamic bank does not automatically constitute a unique competitive advantage within the current Islamic banking landscape. Empirically, although Bank Aladin Syariah has successfully implemented various digital initiatives, such as e-KYC onboarding, digital marketing, and ecosystem-based partnerships, these advantages are no longer exclusive because Bank Syariah Indonesia has also undergone substantial digital transformation through the development of mobile banking services, digital financing platforms, integrated payment systems, and broader digital ecosystem integration. Consequently, digitalization has evolved from being a source of differentiation into a basic competitive requirement within the Islamic banking industry. From a Game Theory perspective, this condition reduces the strategic payoff derived solely from digital banking attributes, as competing players increasingly possess similar technological capabilities.

The Game Theory analysis shows that Bank Syariah Indonesia (BSI) has the Profit Strategy (A1) as its strongest competitive strategy, generating the highest payoff under the strategic interactions examined. Therefore, BSI should maintain its profitability-oriented strategy while strengthening operational efficiency and financing intermediation as supporting strategies. Meanwhile, Bank Aladin Syariah (BAS) is more appropriately positioned to pursue the Growth Strategy (B1) by expanding its customer base, market penetration, and digital banking services. Rather than directly competing with BSI in terms of profitability and scale, BAS should leverage its growth potential while gradually improving efficiency and profitability. These findings imply that the two banks can strengthen their competitive positions by optimizing their respective strategic advantages: BSI through profitability and BAS through sustainable growth and market expansion.

CONCLUSION

Based on the Game Theory analysis of the strategic interaction between Bank Syariah Indonesia (BSI) and Bank Aladin Syariah (BAS), the optimal strategies are the Profit Strategy (A1) for BSI and the Growth Strategy (B1) for BAS, with identical Maximin and Minimax values of 4, indicating the existence of a saddle point and pure strategy equilibrium. The results indicate that BSI has a relatively stronger competitive position, supported by its profitability performance, operational efficiency, and intermediation function. Meanwhile, BAS is more appropriately positioned to pursue a growth-oriented strategy by strengthening customer acquisition, market expansion, and digital banking services. The findings also indicate that digital banking capabilities alone do not guarantee a stronger competitive position, as digitalization has become an important component of the strategies adopted by both banks. Therefore, BSI should maintain its profit-oriented strategy while strengthening efficiency and intermediation as supporting strategies. BAS, on the other hand, should maintain its growth strategy while gradually improving profitability, operational efficiency, and financing performance. These findings suggest that the competitive advantage of each bank depends on its ability to optimize its respective strategic strengths within the competitive dynamics of the Islamic banking industry. This study is limited to the use of 2025 data as the basis for payoff calculation and game-theoretic analysis, while performance information from 2021–2025 is used only as a trigger to identify and determine the game strategies of each

bank. In addition, the use of ROE, BOPO, and FDR indicators and the two-person zero-sum game approach may not fully capture non-financial factors and the complexity of strategic competition in the Islamic banking industry. Future research could extend the observation period and incorporate additional financial and non-financial indicators to provide a more comprehensive understanding of strategic competition.

FUNDING STATEMENT
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

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