Application of Attride-Stirling Thematic Analysis in Examining the Indicators of a FinTech Model for Improving Asset Quality in the Banking Industry, Considering the Role of Financial Strategy and Financial Inclusion Based on Competition–Stability Theory

Zahra Kamrani[1], Azita Jahanshad [2,*] and Masoumeh Alavi [3]

[1] Department of Accounting, CT.C., Islamic Azad University, Tehran, Iran;
[2] Department of Accounting, CT.C., Islamic Azad University, Tehran, Iran;
[3] Department of Accounting, CT.C., Islamic Azad University, Tehran, Iran;

* Correspondence: azitajahanshad@iau.ac.ir

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Abstract: The present study aimed to examine and identify the indicators of a financial technology (FinTech) model for improving asset quality in the banking industry, with emphasis on the role of financial strategy and financial inclusion based on competition–stability theory. For this purpose, a qualitative approach based on Attride-Stirling's thematic network analysis was employed using ATLAS.ti software. The statistical population of the study consisted of 18 experts and specialists in banking and financial technology, whose perspectives were collected through in-depth interviews and a review of the relevant literature. The thematic analysis process was conducted in six structured stages, resulting in the extraction and classification of concepts. Ultimately, 108 open codes (basic themes), 27 first-level organizing themes, and 9 second-level organizing themes were extracted, all of which were integrated and explained under one global theme. The identified organizing themes included "FinTech technology maturity," "asset quality management," "bank financial strategy," "digital financial inclusion," "competition in the banking ecosystem," "bank financial stability," "FinTech governance and regulation," "customer experience and trust," and "intelligent bank performance." Assessment of the validity and reliability of the qualitative analysis using inter-coder agreement indices, including Holsti's coefficient (0.887), Scott's Pi (0.755), Cohen's kappa (0.725), and Krippendorff's alpha (0.817), indicated highly satisfactory levels of credibility, dependability, transferability, and confirmability of the research findings. The results indicate that the application of advanced FinTech capabilities, such as artificial intelligence, intelligent credit assessment, and big data analytics, together with the adoption of optimal financial strategies and the expansion of financial inclusion, can moderate the consequences of competition within the framework of competition–stability theory, thereby reducing non-performing loans, improving the structure of resource allocation, and ultimately enhancing resilience and asset quality within the national banking network.

Keywords: FinTech, asset quality, digital financial inclusion, financial strategy, competition–stability theory, banking industry

1. Introduction

The banking industry has entered a period of structural transformation in which technological innovation is no longer confined to the digitization of conventional services but has become an integral determinant of competitive

positioning, risk architecture, customer relationships, financial inclusion, and asset quality. Financial technology, commonly referred to as FinTech, encompasses a broad set of technology-enabled financial innovations, including artificial intelligence, machine learning, big data analytics, application programming interfaces, cloud computing, blockchain, digital payments, automated credit scoring, smart contracts, and digital lending platforms. These technologies are reshaping the traditional boundaries of banking by changing how financial services are designed, distributed, monitored, and evaluated. In this environment, banks are increasingly required to reconsider their conventional operating models and integrate advanced digital capabilities into financial decision-making, risk management, and resource allocation. The transformation of banking through FinTech can therefore be regarded not merely as a technological development, but as a strategic phenomenon with implications for operational efficiency, economic productivity, competitive structure, and the sustainability of financial institutions [1, 2]. At the macroeconomic level, financial technologies may also contribute to more efficient financial intermediation, faster capital allocation, lower transaction costs, and higher economic growth by facilitating the circulation of financial resources and improving access to formal financial services [3].

One of the principal areas in which FinTech is transforming banking is the digitalization of banking infrastructure and service delivery. Traditional branch-centered banking models are increasingly supplemented or replaced by mobile banking, internet banking, digital account opening, electronic payments, digital wallets, open banking interfaces, and integrated platform-based services. Such technologies enable customers to access financial services remotely and allow banks to collect and process large volumes of transactional and behavioral data. The application of artificial intelligence within electronic banking has further accelerated this transformation because AI-based systems can analyze complex datasets, automate decision processes, recognize suspicious patterns, assess customer behavior, and support predictive financial management [4]. These technological developments expand banks' analytical capabilities and create possibilities for faster, more personalized, and potentially more accurate financial services. At the same time, digital transformation is increasingly affecting customer perceptions of banking quality. Evidence on FinTech adoption in the banking sector indicates that the implementation of technology-enabled services can be associated with improvements in customer experience through greater convenience, accessibility, service speed, personalization, and responsiveness [5]. Thus, FinTech maturity is becoming closely linked not only to internal bank performance but also to customers' trust in digital banking environments.

For banks, however, the strategic significance of FinTech extends beyond customer interfaces and operational efficiency. A major concern for financial institutions is how technological innovation can contribute to the management and improvement of asset quality. Asset quality reflects the extent to which a bank's loans, investments, and other earning assets are capable of generating expected returns without excessive deterioration or default. Poor asset quality, particularly when manifested through high levels of non-performing loans, impaired credit portfolios, inadequate collateral coverage, and concentrated credit exposures, can weaken profitability, reduce capital adequacy, create liquidity pressure, and undermine financial stability. FinTech may provide banks with sophisticated mechanisms for monitoring credit exposures and detecting deterioration earlier than conventional systems. Automated credit scoring, artificial intelligence, predictive analytics, and alternative-data-based assessment can strengthen credit evaluation and improve banks' ability to identify borrowers with elevated default risk. Research examining FinTech in relation to risk management emphasizes that technological adoption can create opportunities for improved risk identification, monitoring, forecasting, and control, although it may also introduce new technological, operational, and model-related risks [6]. Accordingly, the contribution of FinTech to

asset quality depends not merely on technology adoption itself but on how those technologies are embedded in broader financial and risk-management strategies.

Recent developments in digital lending provide a particularly important illustration of the relationship between FinTech and credit quality. FinTech platforms can reduce informational frictions through automated underwriting, digital data acquisition, advanced scoring models, and more rapid borrower assessment. In small-business lending, technological innovations may change the role of collateral and enable lenders to assess borrowers using a broader range of information than traditional balance-sheet and collateral-based methods. This can expand credit availability to firms that previously encountered financing constraints while also altering the mechanisms through which credit risk is measured and priced [7]. Similarly, automated lending systems can affect the distribution of access to credit by changing how borrower characteristics are evaluated and how lending decisions are standardized. Evidence from automated lending suggests that the consequences of automation for credit access may vary across groups, emphasizing that technology can influence not only efficiency but also the pattern of financial inclusion and the allocation of lending opportunities [8]. From an asset-quality perspective, these developments are important because the expansion of credit through digital channels must be accompanied by sufficiently robust underwriting, risk differentiation, and monitoring mechanisms to prevent financial inclusion from producing excessive portfolio risk.

The growth of FinTech lending also has important implications for the competitive structure of banking markets. Digital lenders, platform-based financial institutions, technology firms, and specialized FinTech companies increasingly compete with conventional banks in lending, payments, wealth management, and other financial services. The extent and nature of this competition are influenced by the structure of the banking market itself. Research on FinTech lending indicates that banking market structure can significantly shape the growth and development of technology-enabled lending, particularly where competitive gaps or inefficiencies in conventional financial intermediation create opportunities for new entrants [9]. As competition intensifies, banks may respond by lowering prices, increasing service variety, investing in innovation, collaborating with technology firms, or adopting open banking strategies. Such competition may improve efficiency and encourage technological modernization; however, it may also affect risk-taking incentives. Banks facing stronger competitive pressure may attempt to defend market share by loosening lending standards, expanding into higher-risk segments, or increasing leverage, whereas innovation may alternatively improve screening and reduce information asymmetry. This dual possibility makes the competition–stability relationship especially relevant to understanding how FinTech affects asset quality.

The competition–stability debate provides an appropriate theoretical foundation for examining these complex interactions. According to one perspective, greater competition may strengthen financial stability by reducing monopoly rents, improving efficiency, and encouraging banks to modernize their operations. Another perspective argues that intense competition can weaken bank margins and franchise values, thereby increasing incentives for risk-taking and potentially undermining financial stability. In the FinTech era, these competing mechanisms have become more complex because digitalization can both increase competitive pressure and generate new tools for risk management. Evidence suggests that FinTech adoption may be associated with changes in bank risk-taking behavior, indicating that technological innovation does not necessarily produce uniformly stabilizing outcomes [10]. The net effect may depend on bank characteristics, regulatory frameworks, business models, market structure, and the way technological capabilities are incorporated into lending and financial strategy. Consequently,

examining FinTech solely from the standpoint of innovation or efficiency may be insufficient; its effects need to be evaluated within the broader relationship among competition, risk-taking, and stability.

The emergence of digital banking also creates new forms of financial fragility that differ from those traditionally associated with branch-based banking. Digital platforms enable customers to move funds rapidly and at relatively low transaction costs, which may increase the speed at which liquidity pressure can develop during periods of uncertainty. Research on digital "bank walks" highlights how digitalization can potentially destabilize banks by facilitating rapid deposit movements and accelerating liquidity outflows [11]. This issue demonstrates that FinTech-related improvements in accessibility and convenience may simultaneously create new liquidity-management challenges. Consequently, banks need to combine digital transformation with strong liquidity buffers, effective cash-flow monitoring, stable funding strategies, and contingency planning. These considerations are directly relevant to asset quality because deterioration in liquidity conditions can constrain a bank's capacity to manage troubled assets, restructure loans, maintain credit provision, and absorb losses. Therefore, financial stability constitutes an important intermediary dimension linking FinTech maturity, financial strategy, and asset quality.

The strategic response of incumbent banks to FinTech has increasingly involved acquisitions, partnerships, and other forms of integration with technology firms. Rather than relying entirely on internal innovation, banks may acquire FinTech companies to obtain specialized capabilities, digital infrastructure, intellectual capital, and access to new customer segments. The decision to pursue FinTech acquisitions is influenced by the bank's existing business model, strategic orientation, and organizational configuration [12]. Moreover, the governance characteristics of financial institutions can affect their propensity to acquire FinTech firms, suggesting that board composition and organizational diversity may shape banks' technological investment choices [13]. From a strategic-management perspective, these findings indicate that FinTech transformation is not simply an operational matter but also a governance and resource-allocation decision. Banks must determine whether technological capabilities should be developed internally, acquired externally, or accessed through ecosystem partnerships, and these choices may affect capital allocation, operational risk, cost structures, and the capacity to improve asset quality.

Bank–FinTech mergers and acquisitions may also function as mechanisms for strengthening innovation capabilities and improving financial performance. The integration of technological firms can accelerate the diffusion of digital products, data analytics, automated decision systems, and innovative lending models throughout banking organizations. Research on bank–FinTech mergers and acquisitions emphasizes their relevance to banking innovation and performance within the global financial system [14]. In addition, the consequences of FinTech acquisitions can extend beyond conventional financial outcomes. Evidence indicates that FinTech-related acquisitions may influence banks' environmental, social, and governance performance, demonstrating that technological investment increasingly intersects with broader dimensions of corporate strategy and institutional sustainability [15]. These findings support a multidimensional conceptualization of FinTech strategy in which banks evaluate technological initiatives not only in terms of immediate efficiency gains but also in relation to long-term performance, sustainability, governance, and stakeholder expectations.

Within developing banking systems, the implications of FinTech may be particularly significant because technological innovation can help overcome structural limitations associated with geographic coverage, limited branch networks, high service costs, and restricted access to formal finance. Digital banking platforms can extend services to previously underserved customers and facilitate payments, savings, transfers, and credit through mobile and online channels. The development of FinTech in Islamic banking likewise suggests that financial technology can create new opportunities for expanding digital financial services in developing economies while adapting

technological innovation to specific institutional and financial frameworks [16]. In the Iranian banking context, FinTech has increasingly become relevant to the modernization of banking services, the development of digital channels, and the transformation of conventional business processes [17]. These developments create opportunities for increasing financial inclusion, but they also require careful alignment with domestic regulatory arrangements, banking-sector risk structures, and the institutional characteristics of the financial system.

Financial inclusion is particularly important in this regard because increasing access to formal financial services can expand the customer base of banks, diversify funding and lending relationships, and contribute to more inclusive economic participation. Digital financial inclusion can be strengthened through mobile banking, digital account opening, electronic payment systems, digital credit, online financial education, and technology-enabled identification. Nevertheless, the mere availability of digital financial services does not guarantee effective inclusion. Customers must be able to use such services reliably, securely, and with sufficient levels of financial and digital literacy. Trust is particularly important because perceived insecurity, privacy concerns, lack of transparency, and technological complexity may discourage adoption. Consequently, the effectiveness of FinTech-based financial inclusion depends on the interaction among technology accessibility, service quality, customer experience, perceived security, and institutional credibility. These factors, in turn, affect the sustainability of digital banking relationships and the quality of the information that banks obtain from customer interactions.

The regulatory and governance environment also constitutes a fundamental dimension of FinTech development. As banks adopt artificial intelligence, cloud computing, open banking, blockchain, digital identity systems, and automated credit technologies, financial regulators are required to address new risks related to cybersecurity, consumer protection, data privacy, operational resilience, algorithmic decision-making, digital identity, and regulatory compliance. FinTech can strengthen transparency and monitoring, but it can also create risks if technological innovation progresses faster than supervisory capacity. Effective FinTech governance therefore requires legal frameworks and regulatory standards that simultaneously support innovation and protect financial stability. Digital supervision, automated regulatory reporting, anti-money-laundering technologies, customer identification systems, and secure data-management mechanisms can improve the capacity of financial institutions to operate safely in increasingly complex technological environments. The transformation of financial and banking systems through FinTech consequently depends on the institutional capacity to govern innovation rather than merely encouraging technology adoption [1].

At the bank level, these regulatory and technological developments ultimately interact with financial strategy. Financial strategy encompasses the policies and decisions through which banks allocate resources, manage capital, maintain liquidity, generate sustainable profitability, control costs, and balance risk against expected return. FinTech investments require substantial financial commitments, and their benefits may vary depending on whether they are aligned with bank strategy. For example, automated credit assessment may improve lending efficiency, but its contribution to asset quality depends on how it is incorporated into credit policies, portfolio diversification, capital planning, and risk limits. Similarly, digital expansion can generate new revenue streams and reduce operating costs, but rapid growth may create vulnerabilities if funding structures, liquidity management, and capital buffers are not adjusted appropriately. Thus, financial strategy can serve as an important mechanism through which FinTech capabilities are translated into improvements in asset quality and overall institutional resilience.

A further important consideration is that FinTech affects the banking system through an interconnected set of technological, strategic, competitive, regulatory, and customer-related mechanisms rather than through a single

linear pathway. Technology maturity may improve data processing and credit monitoring; financial inclusion may broaden the customer base and diversify access to finance; competition may stimulate innovation while simultaneously affecting risk-taking incentives; financial strategy may determine how resources are allocated to technology and risk controls; governance may shape the safe deployment of digital systems; and customer trust may determine whether digital innovations are effectively adopted. These dimensions jointly influence operational efficiency, profitability, credit-risk management, and financial stability. Existing studies have contributed important evidence regarding FinTech adoption, lending, risk-taking, acquisitions, automation, financial inclusion, banking innovation, and market structure [7, 9, 10, 14]. However, these dimensions are often examined separately, leaving a need for integrated conceptual models capable of explaining how multiple FinTech-related factors interact in determining banking asset quality.

This need is especially important for banking systems in which non-performing assets, credit concentration, liquidity constraints, competitive pressures, and digital transformation occur simultaneously. An integrated framework should therefore encompass technological capabilities, asset-quality management practices, bank financial strategy, digital financial inclusion, competition within the banking ecosystem, financial stability, FinTech governance and regulation, customer experience and trust, and intelligent bank performance. Such a framework can provide a more comprehensive understanding of how banks can use FinTech not only to digitize their services but also to improve the quality of their loan portfolios, strengthen credit-risk management, optimize financial resources, enhance customer relationships, and support long-term resilience. Moreover, the rapid development of FinTech and its increasing integration into banking business models make it necessary to identify contextually relevant indicators rather than relying exclusively on predetermined technological measures. A qualitative investigation based on expert knowledge can therefore reveal the relationships among these dimensions and provide a grounded basis for conceptualizing a FinTech model suited to contemporary banking conditions.

Accordingly, the aim of the present study is to identify and explain the indicators of a FinTech model for improving asset quality in the banking industry, considering the role of financial strategy and digital financial inclusion within the framework of competition–stability theory.

2. Methods and Materials

In the present study, thematic analysis was used to analyze the qualitative data. To identify the indicators for designing a FinTech model aimed at improving asset quality in the banking industry, considering the role of financial strategy and financial inclusion based on competition–stability theory, the thematic analysis method was applied.

Table 1 presents the demographic information of the interviewees. In thematic analysis, coding and analysis are performed simultaneously with data collection. Open coding initially generated a large number of themes, which were subsequently reduced into a smaller number of categories through an iterative process of moving back and forth across the data. At this stage, using the raw data, preliminary categories related to the indicators of the FinTech model for improving asset quality in the banking industry, considering the role of financial strategy and financial inclusion based on competition–stability theory, were extracted through comparison and detailed examination of the phenomena.

The qualitative section of this study was conducted based on the views of 18 experts familiar with the research topic. In terms of gender, 12 participants were male and 6 were female. Ultimately, 14 participants had less than 20

years of work experience, while 4 participants had more than 21 years of work experience. Their frequencies are presented separately in Table 1.

Table 1. Demographic Characteristics of the Experts

Demographic Characteristic	Category	Frequency	Percentage
Gender	Male	12	69%
Gender	Female	6	31%
Work experience	Less than 20 years	14	75%
Work experience	More than 21 years	4	25%
Total	—	18	100%

3. Findings and Results

Thematic analysis is a method for identifying, analyzing, and reporting patterns or themes within data. This method organizes the data and provides a detailed description of them. Clarke and Braun (2006) proposed a six-stage procedure for thematic analysis.

The first stage involves familiarization with the data; at this stage, the researcher becomes familiar with the depth and content of the data. The second stage involves generating initial codes; codes represent features of the data that appear interesting to the researcher. At this stage, 108 initial codes were extracted from texts and articles. The third stage, referred to as searching for selected codes, aims to categorize different codes into selected codes and organize all coded data extracts, resulting in 9 selected codes. In the fourth stage, subthemes are developed; this stage consists of two processes involving review and refinement and the development of subthemes. The first process involves reviewing the coded data extracts. In the second process, the validity of the subthemes is assessed in relation to the entire dataset. At this stage, 3 subthemes were obtained.

The fifth stage involves defining and naming the main themes. At this stage, the main themes presented for analysis are defined and reviewed again, after which the data contained within them are analyzed. Through definition and review, the nature of what each theme addresses is clarified, and the specific aspect of the data represented by each main theme is determined. At this stage, one main theme was extracted from the subthemes. The final stage involves report preparation. The sixth stage begins when the researcher has obtained a set of highly abstract main themes that correspond to the contextual structures of the study. This stage includes the final analysis and preparation of the report.

The thematic analysis process begins when the analyst considers meaningful patterns and potentially interesting issues. This analysis involves continuous movement back and forth between the dataset, the coded data, and the analysis being developed. Writing the analysis begins from the first stage. In general, there is no single unique way to begin a thematic analysis study. Thematic analysis is a recursive process involving movement back and forth among the aforementioned stages. Furthermore, thematic analysis is a process that should be conducted over time, meaning that the researcher collects and analyzes data throughout the research process. The six stages of thematic analysis based on the approach proposed by Clarke and Braun (2006) are explained below.

Stage 1. Familiarization with the Data: For the researcher to become familiar with the depth and breadth of the data content, it is necessary to become immersed in the data to some extent. Data immersion usually involves "repeated reading of the data" and actively reading the data, that is, searching for meanings and patterns. Examples of the interviews are as follows:

Stage 2. Generating Initial Codes: The second stage begins once the researcher has read and become familiar with the data. This stage involves generating initial codes from the data. Codes represent features of the data that

appear interesting to the analyst. Coded data differ from units of analysis (themes). Coding may be performed manually or through software applications. In the present study, coding was performed using software.

Stage 3. Searching for Selected Codes (Basic Themes): This stage involves classifying different codes into selected codes and organizing all coded data extracts. In fact, the researcher begins analyzing the codes and considers how different codes can be combined to form an overarching theme. At this stage, 27 selected codes were obtained by the researcher. The researchers excluded incomplete, irrelevant, and duplicate codes in order to arrive at this number of selected codes.

Table 2. Components Identified Through the Conducted Interviews

No.	Initial Theme
1	Mobile banking
2	Internet banking
3	Application Programming Interface (API)
4	Cloud computing
5	Intelligent credit assessment
6	Fraud detection
7	Customer behavior analysis
8	Decision-making automation
9	Blockchain
10	Smart contracts
11	Transparent transaction recording
12	Data security
13	Monitoring non-performing loans
14	Early warning
15	Debt restructuring
16	Intelligent debt collection
17	Credit scoring
18	Risk analysis
19	Collateral valuation
20	Default prediction
21	Portfolio diversification
22	Reduction of credit concentration
23	Portfolio monitoring
24	Credit review
25	Targeted investment
26	Resource optimization
27	Intelligent budgeting
28	Liquidity management
29	Capital adequacy
30	Financial leverage
31	Regulatory capital
32	Capital raising
33	Return on assets (ROA)
34	Return on equity (ROE)
35	Non-interest income
36	Cost control
37	Digital account opening
38	Mobile services
39	Rural banking
40	Online access

41	Electronic payments
42	Digital wallet
43	Digital fund transfer
44	Digital credit services
45	Financial literacy
46	Digital education
47	User trust
48	Reduction of the financial gap
49	Increase in market share
50	Entry of new players
51	Price competition
52	Service diversification
53	Open banking
54	Collaboration with startups
55	Technological partnership
56	Shared platform
57	New product development
58	Speed of service delivery
59	Service personalization
60	Competitive advantage
61	Crisis resistance
62	Shock management
63	Precautionary reserves
64	Business continuity
65	Liquidity ratio
66	Cash flow
67	Stable funding sources
68	Liquidity deficit management
69	Capital adequacy
70	Earnings quality
71	Income stability
72	Reduction of financial risk
73	Digital regulations
74	Supervisory standards
75	Intelligent supervision
76	Legal framework
77	Encryption
78	Data protection
79	Digital identity verification
80	Cybersecurity
81	Anti-money laundering
82	Customer identification
83	Regulatory reporting
84	Digital auditing
85	Ease of use
86	Service speed
87	Accessibility
88	Online support
89	Customer loyalty
90	User experience
91	Perceived value

92	Customer retention
93	Perceived security
94	Transparency
95	Reliability
96	Technology acceptance
97	Cost reduction
98	Process automation
99	Processing speed
100	Employee productivity
101	Big data analytics
102	Management dashboard
103	Predictive analytics
104	Intelligent decision-making
105	Long-term growth
106	Flexibility
107	Sustainable advantage
108	Value creation

Stage 4. Development of Organizing Themes: The fourth stage begins when the researcher has developed a set of themes and starts reviewing them. This stage consists of two processes: reviewing and refining the themes and developing the subthemes. The first process involves reviewing the coded data extracts. In the second process, the validity of the subthemes is considered in relation to the entire dataset. At this stage, the researchers identified the organizing themes.

The results of the factor analysis indicate that, among the 108 existing indicators (items), 27 first-level organizing themes can be identified, while 9 categories of second-level organizing themes were obtained. Based on the literature, research background, and existing theories, these components were named as presented in the following table.

Table 3. Classification and Categorization for Designing and Explaining the FinTech Model for Improving Asset Quality in the Banking Industry, Considering the Role of Financial Strategy and Financial Inclusion Based on Competition–Stability Theory

Initial Theme	First-Level Organizing Theme
Mobile banking	Digital banking infrastructure
Internet banking	Digital banking infrastructure
Application Programming Interface (API)	Digital banking infrastructure
Cloud computing	Digital banking infrastructure
Intelligent credit assessment	Financial artificial intelligence
Fraud detection	Financial artificial intelligence
Customer behavior analysis	Financial artificial intelligence
Decision-making automation	Financial artificial intelligence
Blockchain	Distributed ledger technology
Smart contracts	Distributed ledger technology
Transparent transaction recording	Distributed ledger technology
Data security	Distributed ledger technology
Monitoring non-performing loans	Non-performing loan control
Early warning	Non-performing loan control
Debt restructuring	Non-performing loan control
Intelligent debt collection	Non-performing loan control
Credit scoring	Credit risk management

Risk analysis	Credit risk management
Collateral valuation	Credit risk management
Default prediction	Credit risk management
Portfolio diversification	Loan portfolio quality
Reduction of credit concentration	Loan portfolio quality
Portfolio monitoring	Loan portfolio quality
Credit review	Loan portfolio quality
Targeted investment	Resource allocation
Resource optimization	Resource allocation
Intelligent budgeting	Resource allocation
Liquidity management	Resource allocation
Capital adequacy	Capital structure
Financial leverage	Capital structure
Regulatory capital	Capital structure
Capital raising	Capital structure
Return on assets (ROA)	Sustainable profitability
Return on equity (ROE)	Sustainable profitability
Non-interest income	Sustainable profitability
Cost control	Sustainable profitability
Digital account opening	Financial access
Mobile services	Financial access
Rural banking	Financial access
Online access	Financial access
Electronic payments	Service utilization
Digital wallet	Service utilization
Digital fund transfer	Service utilization
Digital credit services	Service utilization
Financial literacy	Financial empowerment
Digital education	Financial empowerment
User trust	Financial empowerment
Reduction of the financial gap	Financial empowerment
Increase in market share	Market competition
Entry of new players	Market competition
Price competition	Market competition
Service diversification	Market competition
Open banking	Ecosystem collaboration
Collaboration with startups	Ecosystem collaboration
Technological partnership	Ecosystem collaboration
Shared platform	Ecosystem collaboration
New product development	Competitive innovation
Speed of service delivery	Competitive innovation
Service personalization	Competitive innovation
Competitive advantage	Competitive innovation
Crisis resistance	Financial resilience
Shock management	Financial resilience
Precautionary reserves	Financial resilience
Business continuity	Financial resilience
Liquidity ratio	Liquidity management
Cash flow	Liquidity management
Stable funding sources	Liquidity management
Liquidity deficit management	Liquidity management

Capital adequacy	Financial soundness
Earnings quality	Financial soundness
Income stability	Financial soundness
Reduction of financial risk	Financial soundness
Digital regulations	Policymaking
Supervisory standards	Policymaking
Intelligent supervision	Policymaking
Legal framework	Policymaking
Encryption	Security and privacy
Data protection	Security and privacy
Digital identity verification	Security and privacy
Cybersecurity	Security and privacy
Anti-money laundering	Regulatory compliance
Customer identification	Regulatory compliance
Regulatory reporting	Regulatory compliance
Digital auditing	Regulatory compliance
Ease of use	Digital service quality
Service speed	Digital service quality
Accessibility	Digital service quality
Online support	Digital service quality
Customer loyalty	Customer satisfaction
User experience	Customer satisfaction
Perceived value	Customer satisfaction
Customer retention	Customer satisfaction
Perceived security	Digital trust
Transparency	Digital trust
Reliability	Digital trust
Technology acceptance	Digital trust
Cost reduction	Operational efficiency
Process automation	Operational efficiency
Processing speed	Operational efficiency
Employee productivity	Operational efficiency
Big data analytics	Data-driven decision-making
Management dashboard	Data-driven decision-making
Predictive analytics	Data-driven decision-making
Intelligent decision-making	Data-driven decision-making
Long-term growth	Performance sustainability
Flexibility	Performance sustainability
Sustainable advantage	Performance sustainability
Value creation	Performance sustainability

Stage 5. Defining and Naming the Main Themes: The fifth stage begins when a satisfactory representation of the themes has been achieved. At this stage, the researcher defines and re-examines the main themes proposed for the analysis and subsequently analyzes the data contained within them. Through definition and review, the nature of what each theme addresses is clarified, and it is determined which aspect of the data is represented by each main theme. At this stage, following repeated movement back and forth among the subthemes, the researcher ultimately identified one main theme that could be explained within the context of the research. Some of the subthemes from which the main themes were derived are presented below.

Table 4. Identification of the Global Theme of the FinTech Model for Improving Asset Quality in the Banking Industry, Considering the Role of Financial Strategy and Financial Inclusion Based on Competition–Stability Theory

Initial Theme	First-Level Organizing Theme	Second-Level Organizing Theme
Mobile banking	Digital banking infrastructure	FinTech technology maturity
Internet banking	Digital banking infrastructure	FinTech technology maturity
Application Programming Interface (API)	Digital banking infrastructure	FinTech technology maturity
Cloud computing	Digital banking infrastructure	FinTech technology maturity
Intelligent credit assessment	Financial artificial intelligence	FinTech technology maturity
Fraud detection	Financial artificial intelligence	FinTech technology maturity
Customer behavior analysis	Financial artificial intelligence	FinTech technology maturity
Decision-making automation	Financial artificial intelligence	FinTech technology maturity
Blockchain	Distributed ledger technology	FinTech technology maturity
Smart contracts	Distributed ledger technology	FinTech technology maturity
Transparent transaction recording	Distributed ledger technology	FinTech technology maturity
Data security	Distributed ledger technology	FinTech technology maturity
Monitoring non-performing loans	Non-performing loan control	Asset quality management
Early warning	Non-performing loan control	Asset quality management
Debt restructuring	Non-performing loan control	Asset quality management
Intelligent debt collection	Non-performing loan control	Asset quality management
Credit scoring	Credit risk management	Asset quality management
Risk analysis	Credit risk management	Asset quality management
Collateral valuation	Credit risk management	Asset quality management
Default prediction	Credit risk management	Asset quality management
Portfolio diversification	Loan portfolio quality	Asset quality management
Reduction of credit concentration	Loan portfolio quality	Asset quality management
Portfolio monitoring	Loan portfolio quality	Asset quality management
Credit review	Loan portfolio quality	Asset quality management
Targeted investment	Resource allocation	Bank financial strategy
Resource optimization	Resource allocation	Bank financial strategy
Intelligent budgeting	Resource allocation	Bank financial strategy
Liquidity management	Resource allocation	Bank financial strategy
Capital adequacy	Capital structure	Bank financial strategy
Financial leverage	Capital structure	Bank financial strategy
Regulatory capital	Capital structure	Bank financial strategy
Capital raising	Capital structure	Bank financial strategy
Return on assets (ROA)	Sustainable profitability	Bank financial strategy
Return on equity (ROE)	Sustainable profitability	Bank financial strategy
Non-interest income	Sustainable profitability	Bank financial strategy
Cost control	Sustainable profitability	Bank financial strategy
Digital account opening	Financial access	Digital financial inclusion
Mobile services	Financial access	Digital financial inclusion
Rural banking	Financial access	Digital financial inclusion
Online access	Financial access	Digital financial inclusion
Electronic payments	Service utilization	Digital financial inclusion
Digital wallet	Service utilization	Digital financial inclusion
Digital fund transfer	Service utilization	Digital financial inclusion
Digital credit services	Service utilization	Digital financial inclusion
Financial literacy	Financial empowerment	Digital financial inclusion
Digital education	Financial empowerment	Digital financial inclusion

User trust	Financial empowerment	Digital financial inclusion
Reduction of the financial gap	Financial empowerment	Digital financial inclusion
Increase in market share	Market competition	Competition in the banking ecosystem
Entry of new players	Market competition	Competition in the banking ecosystem
Price competition	Market competition	Competition in the banking ecosystem
Service diversification	Market competition	Competition in the banking ecosystem
Open banking	Ecosystem collaboration	Competition in the banking ecosystem
Collaboration with startups	Ecosystem collaboration	Competition in the banking ecosystem
Technological partnership	Ecosystem collaboration	Competition in the banking ecosystem
Shared platform	Ecosystem collaboration	Competition in the banking ecosystem
New product development	Competitive innovation	Competition in the banking ecosystem
Speed of service delivery	Competitive innovation	Competition in the banking ecosystem
Service personalization	Competitive innovation	Competition in the banking ecosystem
Competitive advantage	Competitive innovation	Competition in the banking ecosystem
Crisis resistance	Financial resilience	Bank financial stability
Shock management	Financial resilience	Bank financial stability
Precautionary reserves	Financial resilience	Bank financial stability
Business continuity	Financial resilience	Bank financial stability
Liquidity ratio	Liquidity management	Bank financial stability
Cash flow	Liquidity management	Bank financial stability
Stable funding sources	Liquidity management	Bank financial stability
Liquidity deficit management	Liquidity management	Bank financial stability
Capital adequacy	Financial soundness	Bank financial stability
Earnings quality	Financial soundness	Bank financial stability
Income stability	Financial soundness	Bank financial stability
Reduction of financial risk	Financial soundness	Bank financial stability
Digital regulations	Policymaking	FinTech governance and regulation
Supervisory standards	Policymaking	FinTech governance and regulation
Intelligent supervision	Policymaking	FinTech governance and regulation
Legal framework	Policymaking	FinTech governance and regulation
Encryption	Security and privacy	FinTech governance and regulation
Data protection	Security and privacy	FinTech governance and regulation
Digital identity verification	Security and privacy	FinTech governance and regulation
Cybersecurity	Security and privacy	FinTech governance and regulation
Anti-money laundering	Regulatory compliance	FinTech governance and regulation
Customer identification	Regulatory compliance	FinTech governance and regulation
Regulatory reporting	Regulatory compliance	FinTech governance and regulation
Digital auditing	Regulatory compliance	FinTech governance and regulation
Ease of use	Digital service quality	Customer experience and trust
Service speed	Digital service quality	Customer experience and trust
Accessibility	Digital service quality	Customer experience and trust
Online support	Digital service quality	Customer experience and trust
Customer loyalty	Customer satisfaction	Customer experience and trust
User experience	Customer satisfaction	Customer experience and trust
Perceived value	Customer satisfaction	Customer experience and trust
Customer retention	Customer satisfaction	Customer experience and trust
Perceived security	Digital trust	Customer experience and trust
Transparency	Digital trust	Customer experience and trust
Reliability	Digital trust	Customer experience and trust
Technology acceptance	Digital trust	Customer experience and trust
Cost reduction	Operational efficiency	Intelligent bank performance

Process automation	Operational efficiency	Intelligent bank performance
Processing speed	Operational efficiency	Intelligent bank performance
Employee productivity	Operational efficiency	Intelligent bank performance
Big data analytics	Data-driven decision-making	Intelligent bank performance
Management dashboard	Data-driven decision-making	Intelligent bank performance
Predictive analytics	Data-driven decision-making	Intelligent bank performance
Intelligent decision-making	Data-driven decision-making	Intelligent bank performance
Long-term growth	Performance sustainability	Intelligent bank performance
Flexibility	Performance sustainability	Intelligent bank performance
Sustainable advantage	Performance sustainability	Intelligent bank performance
Value creation	Performance sustainability	Intelligent bank performance

Stage 6. Report Preparation: The sixth stage begins when the researcher has obtained a set of highly abstract main themes that are aligned with the contextual structures of the research. This stage involves final analysis and report writing, which are presented at the end. Following the examination and analysis of the texts using thematic analysis and completion of the six stages, the subthemes and main themes presented in the table were obtained.

Based on the above table, the research model consisted of one global theme, 9 second-level organizing themes, and 27 first-level organizing themes. Finally, the research model was developed based on the final categories.

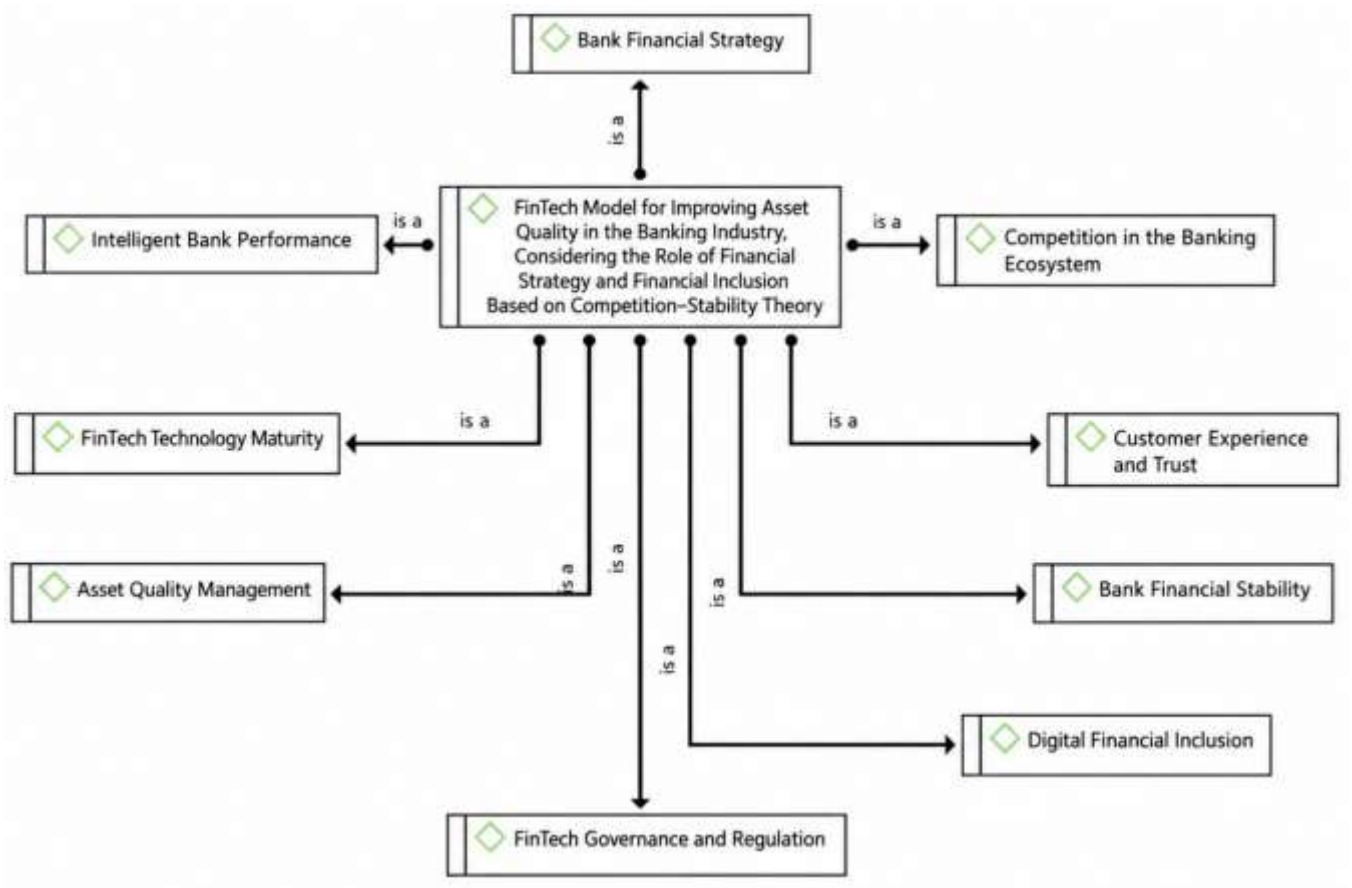

Figure 1. Design and Explanation of the FinTech Model for Improving Asset Quality in the Banking Industry, Considering the Role of Financial Strategy and Financial Inclusion Based on Competition–Stability Theory (Quality Control of the Conducted Qualitative Analysis; ATLAS.ti Output)

Four quantitative criteria were used to examine credibility, transferability, confirmability, and dependability: Holsti's coefficient, Scott's Pi coefficient, Cohen's kappa coefficient, and Krippendorff's alpha.

The degree of agreement among the experts' perspectives, calculated using Holsti's coefficient (PAO), or the "percentage of observed agreement," was 0.887, which represents a substantial level of agreement. Given the criticisms associated with Holsti's method, Scott's Pi was also calculated and was found to be 0.755. Another index used to estimate the reliability of qualitative research was Cohen's kappa. Cohen's kappa coefficient in this study was 0.725. Finally, Krippendorff's alpha was calculated, with a value of 0.817 obtained in the present study.

4. Discussion and Conclusion

The present study was conducted to identify and explain the indicators of a FinTech model for improving asset quality in the banking industry, considering the role of financial strategy and digital financial inclusion within the framework of competition–stability theory. The qualitative thematic analysis led to the extraction of 108 initial codes, 27 first-level organizing themes, 9 second-level organizing themes, and one global theme. The nine major dimensions identified were FinTech technology maturity, asset quality management, bank financial strategy, digital financial inclusion, competition in the banking ecosystem, bank financial stability, FinTech governance and regulation, customer experience and trust, and intelligent bank performance. The reliability and validity of the qualitative analysis were also supported by Holsti's coefficient of 0.887, Scott's Pi of 0.755, Cohen's kappa of 0.725, and Krippendorff's alpha of 0.817, indicating an acceptable degree of consistency among the coding judgments. Taken together, these findings suggest that improving asset quality through FinTech is not attributable to a single technological capability; rather, it depends on an interconnected architecture in which technological maturity, financial strategy, inclusion, market competition, governance, customer trust, and organizational intelligence jointly determine the quality and resilience of banking assets.

The first major finding concerned FinTech technology maturity, which was represented by digital banking infrastructure, financial artificial intelligence, and distributed ledger technologies. The results showed that mobile banking, internet banking, application programming interfaces, cloud computing, intelligent credit assessment, fraud detection, customer behavior analysis, automated decision-making, blockchain, smart contracts, transparent transaction recording, and data security together constitute the technological foundation of the proposed model. This finding is consistent with the argument that FinTech transformation is fundamentally reshaping financial and banking systems by integrating advanced digital technologies into banking processes [1]. It also aligns with the findings of Zamani and Abbasi, who emphasized the growing importance of artificial intelligence in FinTech and electronic banking and highlighted the capacity of AI-based systems to improve the processing, interpretation, and use of financial information [4]. In practical terms, greater technological maturity enables banks to move from reactive risk management toward predictive and preventive systems. When banks possess the infrastructure required for real-time analytics, automated scoring, transaction monitoring, and secure data exchange, they are better positioned to detect asset deterioration at earlier stages and to intervene before credit exposures become non-performing.

The second major dimension, asset quality management, emerged through the themes of non-performing loan control, credit risk management, and loan portfolio quality. Indicators such as monitoring non-performing loans, early-warning systems, debt restructuring, intelligent collection, credit scoring, risk analysis, collateral valuation, default prediction, portfolio diversification, reduction of credit concentration, portfolio monitoring, and credit review demonstrate that FinTech can affect asset quality primarily by improving information quality and the timeliness of risk responses. This result is closely aligned with Yaghoubi Khanqahi's discussion of FinTech in bank risk management, where financial technologies were considered capable of improving risk identification,

assessment, control, and accounting processes while simultaneously creating new categories of technological and operational risk [6]. The finding is also consistent with Beaumont et al., who showed that FinTech can change lending technologies and the role of collateral in small-business finance by enabling more advanced evaluation of borrowers [7]. From this perspective, FinTech can enhance asset quality not merely by reducing the volume of risky lending but by improving the precision with which banks distinguish between acceptable and unacceptable risks.

The identified importance of predictive default assessment, intelligent credit scoring, and collateral evaluation is also consistent with the broader development of automated lending. Fernández Naveira et al. showed that lender automation can materially alter credit access and lending decisions, indicating that algorithmic underwriting has substantial implications for how borrowers are screened and selected [8]. The present findings extend this perspective by suggesting that automation is equally important after loan origination. Continuous monitoring, predictive analytics, and early-warning systems can help banks identify weakening borrowers, declining collateral quality, and emerging concentration risks. Thus, the benefits of FinTech for asset quality depend on the entire credit life cycle, from borrower assessment and loan approval to monitoring, restructuring, recovery, and portfolio rebalancing.

The third major dimension was bank financial strategy, comprising resource allocation, capital structure, and sustainable profitability. The findings indicate that targeted investment, resource optimization, intelligent budgeting, liquidity management, capital adequacy, financial leverage, regulatory capital, capital raising, return on assets, return on equity, non-interest income, and cost control should be considered integral to the FinTech–asset quality relationship. This result implies that FinTech adoption cannot improve asset quality in isolation from financial management. Digital transformation requires substantial capital expenditure, changes in operating models, and reallocation of organizational resources. Accordingly, the effectiveness of FinTech depends on whether banks incorporate technological investment into broader capital, liquidity, profitability, and risk strategies. This interpretation aligns with Alfhaili et al., who showed that banks' business models influence their FinTech acquisition behavior, indicating that technological investment decisions are closely tied to strategic and financial characteristics [12]. It is also consistent with Reghezza and Vasilakis, who emphasized the role of governance characteristics in banks' decisions to acquire FinTech firms [13]. Therefore, financial strategy acts as a transmission mechanism through which technological capabilities are converted into sustainable improvements in asset quality.

The fourth major theme, digital financial inclusion, was formed through financial access, service utilization, and financial empowerment. Digital account opening, mobile services, rural banking, online access, electronic payments, digital wallets, digital transfers, digital credit services, financial literacy, digital education, user trust, and reduction of the financial gap were identified as important indicators. This suggests that asset quality improvement should not be viewed as contradictory to wider financial inclusion. Properly designed digital inclusion can broaden the customer base, diversify credit exposure, lower transaction costs, and generate richer customer data, thereby supporting more informed lending decisions. The finding is compatible with Shahbazi and Eyni's emphasis on the role of FinTech in the development of Islamic banking in developing countries, particularly through the extension and modernization of financial services [16]. It also corresponds with Shayegh and Asgarzadeh's argument that FinTech contributes to the transformation of the financial services industry and improved economic efficiency [2]. However, the findings further indicate that inclusion must be accompanied by financial literacy, digital education, and user trust; otherwise, expansion in access may not translate into responsible and sustainable use of financial services.

The fifth identified dimension was competition in the banking ecosystem, reflected in market competition, ecosystem collaboration, and competitive innovation. Market-share growth, entry of new players, price competition, service diversification, open banking, collaboration with startups, technological partnerships, shared platforms, new product development, faster service delivery, personalization, and competitive advantage were all recognized as important components. This finding strongly supports the relevance of competition–stability theory to the present model. Balyuk et al. demonstrated that banking market structure plays an important role in shaping FinTech lending, suggesting that digital finance is partly driven by competitive conditions in traditional banking markets [9]. The present findings similarly indicate that FinTech increases competitive intensity but also creates possibilities for collaboration. Banks do not necessarily respond to FinTech solely through rivalry; they may also build ecosystems with startups and technology providers. Ferilli's analysis of bank–FinTech mergers and acquisitions likewise shows that collaboration and acquisition can become mechanisms through which banks strengthen innovation and performance [14]. Therefore, competition in the FinTech era is increasingly hybrid, combining rivalry, partnership, acquisition, platform participation, and co-innovation.

At the same time, the findings show that competition can have ambiguous consequences for stability and asset quality. While stronger competition may encourage efficiency and innovation, it can also generate pressure to expand lending, reduce margins, and increase risk-taking. This is consistent with Elekdag et al., whose findings raised the question of whether FinTech increases bank risk-taking and demonstrated that technological change can affect the risk behavior of financial institutions [10]. The implication is that banks should not assess FinTech competition exclusively through growth or market-share metrics. Competitive expansion must be balanced with underwriting discipline, capital adequacy, portfolio diversification, and liquidity management. This result is central to the competition–stability framework because it indicates that the effect of FinTech on asset quality is conditional rather than uniformly positive.

The sixth major dimension, bank financial stability, included financial resilience, liquidity management, and financial soundness. Crisis resistance, shock management, precautionary reserves, business continuity, liquidity ratios, cash flow, stable funding sources, liquidity deficit management, capital adequacy, earnings quality, income stability, and reduced financial risk were identified as key indicators. This finding indicates that improved asset quality is inseparable from broader financial stability. Even technologically advanced banks may experience asset-quality deterioration if they lack adequate liquidity, stable funding, or capital buffers. Koont et al.'s work on destabilizing digital bank walks is particularly relevant, as it demonstrates how digital technologies can increase the speed and intensity of deposit movements and potentially exacerbate liquidity risk [11]. Accordingly, the present findings suggest that digitalization should be accompanied by stronger liquidity monitoring and crisis-management mechanisms. FinTech may improve asset-quality monitoring, but it may simultaneously create new channels of instability that must be incorporated into bank risk frameworks.

The seventh theme, FinTech governance and regulation, consisted of policymaking, security and privacy, and regulatory compliance. The identified indicators included digital regulation, supervisory standards, intelligent supervision, legal frameworks, encryption, data protection, digital identity verification, cybersecurity, anti-money-laundering measures, customer identification, regulatory reporting, and digital auditing. The importance of this dimension shows that FinTech adoption requires an institutional framework capable of managing technological risk while enabling innovation. This result is consistent with the broader view that transformation of the banking system through FinTech must be accompanied by suitable governance and regulatory structures [1]. It also aligns indirectly with the evidence of Cicchiello et al., who showed that FinTech acquisitions can influence banks' ESG

performance, demonstrating that technology-related strategic decisions have implications for broader governance and sustainability outcomes [15]. Effective governance is therefore not ancillary to FinTech performance; it is one of the conditions under which digital innovation can safely contribute to asset quality and institutional resilience.

The eighth dimension, customer experience and trust, consisted of digital service quality, customer satisfaction, and digital trust. Ease of use, service speed, accessibility, online support, customer loyalty, user experience, perceived value, customer retention, perceived security, transparency, reliability, and technology acceptance were identified as central indicators. This finding is consistent with Heydari and Ahmadzadeh, who identified a relationship between FinTech adoption and improved customer experience in banking [5]. Customer trust is especially relevant because banking is information-intensive and highly dependent on perceptions of security and reliability. If customers distrust digital systems, the adoption of mobile banking, online credit, and automated financial services may remain limited. Conversely, trusted digital relationships generate richer data, higher engagement, and stronger customer retention, all of which may improve the bank's ability to understand borrower behavior and manage risk.

Finally, intelligent bank performance emerged as a distinct dimension composed of operational efficiency, data-driven decision-making, and performance sustainability. Cost reduction, process automation, processing speed, employee productivity, big data analytics, management dashboards, predictive analytics, intelligent decisions, long-term growth, flexibility, sustainable advantage, and value creation were identified as critical indicators. These findings are compatible with Karimi and Jafari, who emphasized the economic implications of financial technologies and their role in improving broader financial and economic performance [3]. They also align with Ferilli's argument that FinTech-related innovation can influence bank performance at the global level [14]. Furthermore, the importance of sustainability and long-term performance is supported by evidence that FinTech acquisitions may affect banks beyond narrow financial outcomes, including ESG performance [15]. Therefore, intelligent bank performance can be understood as the ultimate organizational outcome of successfully integrating technology, risk management, strategy, inclusion, governance, competition, and customer trust.

Overall, the findings demonstrate that the proposed FinTech model is multidimensional and systemic. The central implication is that FinTech improves asset quality when technological maturity is strategically aligned with risk management, capital and liquidity policies, inclusive financial services, competitive positioning, governance, customer trust, and data-driven organizational capabilities. The findings also support the competition–stability perspective by showing that technological competition can simultaneously create efficiency gains and new risk channels. This dual effect explains why FinTech adoption should not be considered inherently stabilizing or destabilizing. Its consequences depend on how financial institutions manage the interaction among innovation, competition, risk-taking, regulatory compliance, financial strategy, and organizational resilience.

The present study has several limitations that should be considered when interpreting its findings. First, the qualitative component was based on the views of 18 experts, and although the participants possessed relevant banking and FinTech expertise, their perspectives may not fully represent all stakeholders in the financial ecosystem. Second, the study relied on thematic analysis and expert interpretation, meaning that some degree of subjectivity is unavoidable despite the satisfactory inter-coder reliability indices. Third, the identified framework was developed within a specific banking and institutional context, which may restrict its direct transferability to banking systems characterized by different regulatory structures, levels of technological maturity, market competition, or customer behavior. Fourth, the study focused primarily on identifying and structuring relevant themes rather than statistically estimating the magnitude or causal direction of relationships among the identified

dimensions. Finally, the rapid pace of technological change in FinTech may lead some indicators to evolve, become obsolete, or require modification as new technologies, regulatory requirements, and digital banking models emerge.

Future studies should quantitatively validate the proposed model using large samples of banking managers, FinTech specialists, risk officers, and regulators and should examine the measurement properties of the identified dimensions through confirmatory factor analysis and structural equation modeling. Researchers could also investigate the direct, indirect, mediating, and moderating relationships among FinTech technology maturity, financial strategy, digital financial inclusion, competition, financial stability, and asset quality. Comparative studies across public and private banks, conventional and Islamic banks, and banks with different levels of digital maturity could provide further insight into contextual differences. Longitudinal studies would also be useful for assessing whether improvements in FinTech capabilities lead to subsequent changes in non-performing loans, capital adequacy, profitability, and financial resilience over time. Future research may additionally examine emerging technologies such as generative artificial intelligence, decentralized finance, advanced biometric identification, and real-time supervisory technology as extensions of the proposed framework.

Bank managers should approach FinTech implementation as an integrated strategic program rather than as a collection of isolated digital projects. Investments in artificial intelligence, big data analytics, automated credit scoring, digital identity, cybersecurity, and open banking should be linked directly to asset-quality objectives, credit-risk policies, liquidity planning, and capital management. Banks should establish real-time early-warning systems for non-performing loans, use predictive analytics for default detection, and integrate digital credit assessment with collateral valuation and portfolio concentration monitoring. At the same time, managers should expand digital financial inclusion in a controlled manner by combining accessibility with financial literacy, transparent communication, and strong customer-protection mechanisms. Regulators and bank executives should also strengthen governance frameworks for data protection, algorithmic accountability, digital auditing, cybersecurity, and regulatory reporting. Finally, collaboration with FinTech startups and technology providers should be structured around measurable improvements in asset quality, efficiency, customer trust, resilience, and sustainable value creation rather than technology adoption as an end in itself.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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