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Identifying Factors Affecting Financial Health In Digital Banking

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ABSTRACT

The purpose of this research was to identify the factors affecting financial health in digital banking. The research method was qualitative and quantitative. Research information was collected through interviews. The statistical population of the research included an unlimited number of experts, professors and specialists in the field of digital banking, and 21 people were selected until reaching theoretical saturation. The sampling method was in the form of a snowball, in which the interviewees were asked to introduce people who are knowledgeable about the subject of the research to conduct further interviews. Primary data were collected through interviews. According to the methodological process, during three stages of open coding, central coding and selective coding, firstly, the codes related to the topic were identified from the large number of primary data types; Then, in the manner of continuous comparison, a concept was extracted from several codes, and in the same way other codes were also converted into concepts until finally 109 concepts were obtained. In the next stage, some concepts were put in the form of a category so that 17 categories were obtained for this research. The findings of the research showed that 3 categories appeared as the central categories, which include: personal characteristics of the accountant, supervision and control, evidence and documents related to fraud. Other categories to be presented in the visual model were placed in five categories: causal conditions (2 categories), background or context (4 categories), intervening conditions (3 categories), strategies (3 categories), consequences (2 categories). In the following, based on the indicators, components, concepts and categories of the proposed model, a questionnaire of 109 questions was compiled and based on the collected data, the relationships of factors affecting financial health in digital banking were analyzed, and finally the results show the significance of the factors affecting financial health in digital banking.

Keywords: financial health, banking system, digital banking.

1. Introduction

Digital transformation and digital banking are among the trending topics in the banking industry today. A significant number of banks in the country, guided by the Ministry of Economy and Finance, are actively planning their digital banking roadmaps. However, given the novelty of these concepts both domestically and globally, there is a concern that a lack of proper understanding may lead to wasted investments in this domain (Ahmadi et al., 2022).

Digital banking, as part of a smart economy, lacks a standalone definition and is often described as intelligent multichannel banking, an engaging social bank, or a bank with a digital ecosystem—essentially representing the concept of a smart economy. In the modern era, where all phenomena are gravitating towards smartization, the economy too is evolving in this direction (Tabavor et al., 2019). In 2018, digital banking was identified as the primary policy and strategy of the Ministry of Economy and Finance and communicated to all banks by the monetary and banking department.

Digital banking, in simple terms, aims to enable operations anytime, anywhere, and through any channel. It transforms business models, revenue generation methods, cost management approaches, profitability strategies, and customer interaction techniques into an intelligent system supported by a smart database. The concept involves offering a variety of customized and tailored products based on customer needs and demands. These elements collectively define digital banking, which is a subset of a smart economy (Pirhayati and Mirzamohammadi, 2023).

Digital banking is one of the manifestations of digital transformation. Fundamentally, banking is a vast industry that has pioneered numerous technological advancements and reciprocally influences and is influenced by digital transformation. A key feature of digital banking is its focus on customer needs and demands. While generalized products often fail to cater to personalized group or individual demands, digital banking facilitates a deeper understanding of customer segments and even individual clients, enabling the provision of customized and personalized products (Losada et al., 2019).

In electronic banking, banks rely on centralized systems to directly offer their services and products to customers. However, digital banking emphasizes an open banking approach, wherein customers and new participants in the banking ecosystem, such as fintech companies, can access foundational services to develop new products and services tailored to their needs (Garr et al., 2019).

Financial Health and Digitalization

The financial health of banks plays a crucial role in the digitalization of banking processes. Corporate financial health is closely associated with business continuity, bankruptcy, financial distress, and qualitative features of accounting information (relevance and reliability) (Ghosh et al., 2020). Therefore, evaluating the performance of banks in operational, marketing, and financial-accounting domains becomes essential. Financial health, which represents the profitability and sustainability of an economic unit for all stakeholders, is of paramount importance. Stakeholders generally seek tools to evaluate and predict the profitability and continuity of such units (Garr et al., 2019).

Currently, there is no defined framework for periodically assessing the financial performance of domestic banks, and most evaluations are conducted through on-site inspections by Central Bank examiners, which often lack efficiency (Tabavor et al., 2019). As such, financial health is a critical aspect for various organizations, particularly service-oriented and financial-credit organizations such as banks, making it one of the significant challenges in the banking system.

This study addresses the following question:

- What are the factors influencing financial health in digital banking?
- Theoretical Background of Financial Health in Digital Banking
- Financial Health Definition

Financial health refers to an individual's financial status, which encompasses various dimensions, including savings, retirement, income, and fixed non-discretionary expenses. Although financial experts have developed guidelines for determining financial indicators, financial health can vary significantly among individuals. Financial health is assessed using various methods (Mojdehkanlou et al., 2022).

Savings and an individual’s total net assets represent the financial resources available for present and future use. These resources can be affected by

various factors such as credit card debt, mortgage loans, car loans, and student loans, each carrying significant overhead costs. As such, financial health is not static; it fluctuates based on liquidity, individual assets, and price volatility of goods and services. For instance, while a person's income may remain stable, increased costs for essentials like gasoline, food, and loans can deteriorate their financial health. Indicators of robust financial health include steady income, minimal changes in expenses, balanced cash flow, and growing cash earnings. Ownership of assets is just one measure used to assess financial health (Soleimani Amiri et al., 2021).

Banking Supervision and Regulation

The importance of effective supervision and proper regulation in the banking system is well established, as it fosters a safe environment, free from crises, excessive volatility, and disruptions. Such stability is crucial for economic resilience and prevents misconduct within the banking sector. Supervision can be categorized as internal or external. Internal supervision focuses on evaluating management quality, internal controls, and adherence to laws and regulations through the examination of records and operational activities. External supervision, on the other hand, relies on publicly disclosed information, such as annual and interim reports, to assess the banking system's health. While internal supervision tends to be more precise and reliable, external supervision allows for repeated assessments (Abbasi et al., 2021).

Risk Management in Banking

Economic activities inherently carry varying degrees of risk. While risk cannot be eliminated completely, managing it scientifically is essential. The need for optimal risk management and control in commercial banks has spurred extensive and continually evolving studies. Effective risk management requires a multifaceted approach, involving an understanding of economic and financial performance, as well as proficiency in statistics, mathematics, strategic management, and risk control models. Moreover, an in-depth understanding of market dynamics and the ability to make swift and optimal decisions are key components of successful risk management (Delrose et al., 2021).

Impact of Financial Crises and Global Integration

The financial market's recent developments and recurring international financial crises, especially over the past two decades, have drawn attention to the vulnerabilities within the banking sector. The interconnectedness of financial institutions amplifies the spread of financial instability, both domestically and internationally. For instance, a severe financial crisis in one bank can quickly affect others due to financial linkages and global integration. In countries like Iran, where the banking network primarily funds economic enterprises, increasing non-performing loans has negatively impacted the financial health of the banking system. Addressing budget deficits and controlling the monetary base for achieving single-digit inflation in the coming years necessitates focusing on the financial health of the banking sector (Tripathi et al., 2021).

Role of Banks in Economic Stability

Banks, as credit institutions, play a pivotal role in the circulation of money and wealth, thus occupying a vital position in the economy. Effective banking operations significantly contribute to economic growth and the qualitative and quantitative improvement of production. Banking sector evaluations are conducted for various purposes, including stock valuation, profitability assessment, performance evaluation, and efficiency analysis (Mojdehkanlou et al., 2022). Due to their systemic importance, the banking industry requires stricter oversight compared to other sectors, as the repercussions of bank failures can have widespread economic consequences. Governments worldwide employ regulatory mechanisms to limit bankruptcy risks in banks and impose sanctions and restrictions on financially weak institutions (Gholinejad et al., 2018).

Capital Adequacy and Financial Health

The financial health of banks and credit institutions is vital for national economic growth, development, and stability. Regular evaluations ensure the private sector's trust in the financial system and protect the interests of depositors, lenders, shareholders, and other stakeholders. Adequate capital is a key requirement for maintaining the financial health of the banking system. Agayi Chadegani and Bokhordinasab (2018) argue that securing funding and income remains a common challenge for financial institutions. Banks rely on their

capital to withstand losses from non-repayment of loans, adverse market conditions, and operational constraints (Abbasi et al., 2021).

To ensure stability, banks must maintain an appropriate ratio of capital to risk in their assets. This ratio protects banks against unexpected losses and safeguards the interests of depositors and creditors. In the context of Islamic banking, a lower capital adequacy ratio indicates stronger financial health, and vice versa. Furthermore, financial health assessments extend beyond this ratio, encompassing various other dimensions.

Since deposits are one of the least expensive funding sources for banks, some institutions struggle to compensate for deposit shortages through alternative funding, potentially leading to a reduced lending capacity. Financial variables measuring bank health can therefore play a critical role. Weaker balance sheets often correlate with higher vulnerability to corruption and financial misconduct compared to stronger balance sheets (Boudriga et al., 2019). Over-lending and poor loan performance increase the risk of non-repayment, ultimately undermining financial health (Masoud et al., 2022).

Research Background

Domestic Studies:

- **Hashemi (2019):** Examined the advantages of digital banking and its role in interaction with e-commerce. The findings indicated that managers and planners of a system could achieve optimal results with lower costs. Tasks previously handled by employees in financial institutions could now be performed through intelligent systems.
- **Seyedkabari et al. (2019):** Investigated the digital experiences of internet banking users. The results revealed design differences among bank websites, including issues like lack of user wait-time notifications and illogical placement of information. Among the three evaluated banking websites, Bank A was deemed more user-friendly due to its simplicity and absence of unnecessary information.
- **Azizgard et al. (2018):** Studied the role of governance in financing health. The findings showed that an increasing number of developing countries are establishing financing systems aimed at advancing universal health coverage. These systems integrate contributions, tax revenues, and developmental aid into unified funds, regardless of employment or financial participation status.
- **Gholinejad et al. (2018):** Examined the impact of financial health indicators on the profitability of banks in the MENA (Middle East and North Africa) region. The results showed that the ratio of non-performing loans to gross loans significantly affected bank profitability. Additionally, changes in regulatory capital to risk-weighted assets and liquid assets to total assets ratios were significant, while the ratio of operating expenses to gross income had no significant effect.
- **Toghani and Fazeli (2013):** Studied factors influencing the financial health of Saderat Bank (Western Mazandaran). The findings indicated that capital adequacy, management system health, and revenues positively impacted financial health, whereas the quality of assets had no significant effect.

International Studies:

- **Tripathi et al. (2021):** Proposed a model for assessing financial health in banking. The results identified five key factors in banking health: senior management selection through recruitment processes ensuring required qualifications, the presence of an audit committee, capital adequacy ratio, financial health strategies and policies set by the board, and the ratio of non-performing loans to total loans.
- **Aldmore et al. (2020):** Evaluated strategic indicators for implementing banking systems. The results showed that the business process strategy index forms the foundation for digital banking implementation, with the content strategy index having the highest interaction with other indices.
- **Alieva and Ernova (2020):** Investigated the impact of financial health, depreciation tax shields, and tangibility on financial structure. The findings indicated a positive relationship between tangibility and financial structure, a significant negative relationship between depreciation tax shields and financial structure, and no relationship between financial health and financial structure.
- **Papa et al. (2019):** Identified strategies for improving customer experience through digital banking. This paper provided an overview of the digital era's impact on banking and explored how

banks could thrive in this context. It discussed the necessity of digital marketing for the banking industry and highlighted the link between digital banking and enhanced customer experience.

- **Bau et al. (2018):** Examined financial health indices and banking crises. The findings revealed that the Z-score from the previous year, along with other indicators, significantly predicted the Z-score and the probability of bank bankruptcy in the following year.

Research Questions

Based on the discussed content, the research questions are presented as follows:

Q1: What are the dimensions and components influencing financial health in digital banking?
Q2: What is the extent and prioritization of factors affecting the establishment of financial health in digital banking?
Q3: What is the current state of financial health in digital banking in Iran?

4. Research Methodology

Given that this research aims to identify the structural factors influencing behavioral management accounting tailored to local needs, it is classified as **developmental research** in terms of its purpose. Regarding data collection and analysis methods, it adopts a **mixed exploratory approach** (starting with qualitative and followed by quantitative methods). Based on the nature and type of the study, it is categorized as a **cross-sectional survey**.

4-1. Population and Sampling

The statistical population is divided into two segments:

- **First Segment:** Experts, professors, and specialists in the field of digital banking whose opinions are authoritative and reliable for the study.
- **Second Segment:** All managers, specialists, and experts proficient in digital banking.

The research sample size is determined based on the population. Using Cochran's second formula, the minimum required sample size is calculated as **385 individuals**, which forms the basis for analysis. Due to the homogeneity of members, a **simple random sampling method** is employed.

The demographic description of the selected sample is presented in Table 1.

Row	Data Type	Number
1	Exclusive Interviews With Experts And Professors Proficient In Digital Banking	11
2	Exclusive Interviews With Specialists In The Research Field Proficient In Digital Banking	10

Data Collection

Given that this study aims to identify the structural factors influencing local aspects of behavioral management accounting, a combination of **library research** and **field studies** was used to gather information. For data collection, two tools were employed: **document review** and **questionnaires**. The document review involved collecting information on theoretical foundations and the research literature through library resources, articles, books, and global information networks.

4-3. Measurement Scale, Validity, and Reliability:

In this research, **face validity** was confirmed by experts in the field. Reliability was tested using Cronbach's alpha, with a result above 0.7 for both variables, indicating the reliability of the questionnaire. Each question in the questionnaire featured five response options (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree) to allow respondents to select the most appropriate choice.

5. Findings and Analysis

a. Data Collection

As explained in Chapter 3, data collection in the qualitative section was carried out through interviews. All interviews were recorded, transcribed, and thoroughly analyzed. Theoretical saturation was achieved by the second-to-last interview, but additional interviews were conducted to ensure data sufficiency. Each interview began with an explanation of the research purpose and process. Both open-ended and closed-ended questions were used during interviews. To gather comprehensive information, the interviewees were encouraged to narrate all aspects of the grounded theory approach related to the factors influencing financial health in digital banking.

The analysis was conducted step-by-step following each interview. After completing an interview, the written transcript was processed, and key points and categories were gradually extracted.

b. Coding and Analysis Process

In this phase, **theoretical coding** was employed, starting with **open coding** and progressing to **axial coding** to identify and organize smaller concepts and categories. In total, 17 categories and 183 concepts were identified. At this stage, no judgments or preconceptions were made, and only semantic loads and identified concepts were extracted. In the axial coding phase, codes with semantic overlap were merged, the results of which are shown in Table 2.

5-1. Open Coding

Open coding began after transcribing each interview. This process involves breaking down the collected data into the smallest possible conceptual components (Mansourian, 2007). During open coding, the interview transcript was repeatedly reviewed, annotated, and broken into smaller segments. Every emerging concept was considered, with no restrictions on naming the concepts. This initially led to many codes, which were eventually reduced due to repetitive information.

Some codes stemmed from the researcher's prior professional knowledge, while others were derived directly from the interviewee's language, referred to as **live codes**. A text can be coded from different perspectives, depending on the research problem, the researcher's analytical framework, and their engagement with the research environment.

In this study, similar concepts were identified and grouped under **subcategories** and **main categories**. The categories were designed to be more abstract than individual concepts. Subcategories and main categories represent the most abstract conceptual labels, linking elements to shape the research framework.

The data obtained from interviews were carefully analyzed, and similar data were assigned appropriate concepts. As a result, all categories and concepts were identified, totaling **17 categories** and **109 concepts**, as shown in Table 4-3.

Table 2: Concepts and Categories Extracted from Data Coding

Row	Category	Concept
1	Bank Quality Characteristics	✓ Audit quality ✓ Transparency and timely disclosure of information ✓ Quality of accounting information｜Reducing agency costs ✓ Reducing information asymmetry ✓ Board independence ✓ Management ownership
2	Organizational Factors	✓ Ability to correctly interpret evidence and identify inconsistent evidence ✓ Ability to identify intentional misstatements ✓ General experience (working as an accountant) ✓ Specialized experience (e.g., industry-specific experience) ✓ Direct experience with fraud ✓ Indirect experience gained through fraud-related training ✓ General knowledge and awareness (e.g., accounting and auditing journals) ✓ Specialized knowledge ✓ Global knowledge (general business knowledge)｜ ✓ Knowledge and awareness of fraud
3	Personal Characteristics of the Accountant	✓ Professional skepticism ✓ Adherence to professional ethics ✓ Adherence to accounting standards ✓ Conducting necessary checks when hiring accountants ✓ Sufficient knowledge of accountants and their environment, including internal controls
4	Supervision and Control	✓ Monitoring accounting team members ✓ Proper and sufficient budgeting ✓ Adjusting accounting programs and tests to handle fraud risks ✓ Considering unpredictability in selecting accounting methods, timing, and execution level

Row	Category	Concept
		✓ Identifying and assessing motivations/pressures to commit fraud ✓ Identifying and assessing opportunities for committing fraud ✓ Identifying and assessing attitudes/justifications for committing fraud
5	Evidence and Documentation Related to Fraud	✓ Usefulness of various types of accounting evidence for detecting fraud ✓ Existence of appropriate procedures for formulating fraud hypotheses ✓ Negotiation among financial team members ✓ Attention to misstatements found in previous audits ✓ Reviewing high-risk areas, even if they are of low monetary value ✓ Classifying fraud risk according to the fraud triangle ✓ Using financial ratios from studies to predict fraud
6	Education and Learning	✓ ✓ Training for independence and impartiality skills ✓ Training on the importance of independence in reporting ✓ Training accountants to ensure awareness of their responsibility regarding fraud ✓ Training accountants on identifying fraud risk factors and how fraud occurs ✓ Training accountants to be familiar with key internal controls
7	Internal Controls	✓ Support for accountants ✓ Awareness of factors affecting accountants' performance ✓ Effective internal controls ✓ Effective quality control systems ✓ Effective monitoring systems and disciplinary actions ✓ Timely awareness of accountants' performance
8	Motivational Factors	✓ Existence of effective incentive programs ✓ Expectation of review and inspection by regulatory bodies ✓ Having an appropriate process for hiring accountants ✓ Job security for accountants ✓ Providing fair and reasonable salaries and benefits ✓ Fair treatment of accountants
9	Creating Conditions for Execution	✓ Suitable working environment for accountants ✓ Growth of the accounting economy ✓ Access to information databases for accountants ✓ Availability of sufficient accounting tools ✓ Employing qualified professionals ✓ Sufficient investment in accounting and finance ✓ Presence of a culture of accountability
10	Appropriate Work Environment	✓ Fair treatment of employees ✓ Suitable work environment for employees ✓ Timely awareness of employees' performance ✓ Existence of effective monitoring systems and disciplinary actions
11	Transparency	✓ Separation of ownership and management ✓ Awareness and knowledge of company managers ✓ Sufficient experience of managers ✓ Absence of company involvement in political issues ✓ Non-subject to regulations on product pricing or distribution
12	Financial Characteristics	✓ Capital ✓ Asset risk ✓ Profitability ✓ Liquidity ✓ Bank risk measurement ratios ✓ Percentage of income relative to service type ✓ Geographical distribution ✓ Institutional owners ✓ Individual owners

Row	Category	Concept
		✓ Ownership concentration ✓ Compliance with international accounting standards
13	Legal Factors	✓ Healthy economic environment ✓ Presence of independent regulatory bodies ✓ Existence of rules and regulations on disciplinary actions and effective sanctions ✓ Communication of fraud incidents by regulatory bodies ✓ Complex laws and regulations ✓ Numerous laws and regulations ✓ No frequent changes in laws and regulations ✓ New legal and accounting requirements
14	Government Support	✓ GDP growth ✓ Government ownership levels ✓ Credit conditions
15	Economic Variables	✓ Exchange rate growth rate ✓ Guaranteed interest rate ✓ Inflation rate ✓ Competition level ✓ Market concentration ✓ Market share
16	Organizational Growth	✓ Importance level in accounting ✓ Proper documentation ✓ Consulting with fraud experts for decision-making and reporting results ✓ Use of experts like legal and IT professionals ✓ Clear instructions for assessing fraud risk, fraud detection, and handling ✓ Defendability of accounting reports
17	Efficiency and Effectiveness	✓ Presence of effective corporate governance mechanisms ✓ Effective internal controls ✓ Existence of an effective audit committee ✓ Presence of an effective internal audit unit ✓ Inability of management to bypass controls ✓ Presence of an appropriate accounting and financial reporting system

Axial Coding

In axial coding, the categories derived from open coding are organized into six groups: central categories, causal conditions, intervening conditions, contextual conditions, strategies (actions and reactions), and consequences.

A: Causal Conditions and Factors

The concepts extracted and identified in relation to causal conditions and factors amount to 17 concepts. These have been categorized into two groups: bank quality characteristics and organizational factors, as shown in Table (3).

Central Categories

The concepts extracted and identified related to the central category of total 19 concepts. These concepts are categorized into three groups: personal characteristics of the accountant, supervision and control, and evidence and documents related to fraud, as shown in Table (4).

Contextual Categories

The concepts extracted and identified related to the contextual categories of total 24 concepts. These concepts have been categorized into four groups: education and learning, internal controls, motivational factors, and creating conditions for execution, as shown in Table (5).

Strategic Conditions and Factors

The concepts extracted and identified related to strategic factors of total 20 concepts. These concepts have been categorized into three groups: appropriate work environment, transparency, and financial characteristics, as shown in Table (6).

Intervening Conditions and Factors

The concepts extracted and identified related to intervening conditions and factors total of17 concepts, being categorized into three groups: legal factors, government support, and economic variables, as shown in Table (7).

Conditions and Factors of Results and Consequences

The concepts extracted and identified related to the conditions and factors of results and consequences total of 12 concepts. They have been categorized into two groups: organizational growth and efficiency and effectiveness, as shown in Table (8).

Then, in the second section, the structural relationships of the factors affecting financial health in digital banking are tested (for ease of understanding, each factor affecting financial health in digital banking is explained separately).

As shown in Table (9), since all the significance values of the model parameters are greater than 1.96, it can be claimed that all the existing structural relationships are confirmed, and the quantitative analysis supports the validity and reliability of the qualitative analysis results. Therefore, the results of the confirmatory factor analysis indicates the overall goodness of fit of this part (causal conditions variable) of the proposed model with the data, demonstrating the appropriate fit of this section of the measurement model.

As shown in Table (10), since all the significance values of the model parameters are greater than 1.96, it can be claimed that all the existing structural relationships are confirmed, and the quantitative analysis supports the validity and reliability of the qualitative analysis results. Therefore, the results of the confirmatory factor analysis indicate the overall goodness of fit of this part (central category) of the proposed model with the data, demonstrating the appropriate fit of this section of the factors affecting financial health in digital banking.

As shown in Table (11), since all the significance values of the model parameters are greater than 1.96, it can be claimed that all the existing structural relationships are confirmed, and the quantitative analysis supports the validity and reliability of the qualitative analysis results. Therefore, the results of the confirmatory factor analysis indicate the overall goodness of fit of this part (contextual categories) of the proposed model with the data, demonstrating the appropriate fit of this section of the factors affecting financial health in digital banking.

Table 3: Categorization of Concepts into Causal Categories

Categories	Concepts
Bank Quality Characteristics	✓ Audit quality ✓ Transparency and timely disclosure of information ✓ Quality of accounting information ✓ Reducing agency costs ✓ Reducing information asymmetry ✓ Board independence ✓ Management ownership
Organizational Factors	✓ Ability to correctly interpret evidence and identify inconsistent evidence ✓ Ability to detect intentional misstatements ✓ General experience (working as an accountant) ✓ Specialized experience (e.g., in a specific industry) ✓ Direct experience with fraud ✓ Indirect experience gained through fraud-related training ✓ General knowledge and awareness (e.g., accounting and auditing journals) ✓ Specialized knowledge ✓ Global knowledge (general business knowledge) ✓ Knowledge and awareness of fraud

Table 4: Categorization of Concepts into Central Categories

Categories	Concepts
Personal Characteristics of the Accountant	✓ Professional skepticism ✓ Adherence to professional ethics ✓ Adherence to accounting standards ✓ Conducting necessary checks when hiring accountants ✓ Gaining sufficient knowledge of accountants and their environment, including internal controls
Supervision and Control	✓ Monitoring accounting team members ✓ Proper and sufficient budgeting ✓ Adjusting accounting programs and tests to handle fraud risks ✓ Considering unpredictability in selecting accounting methods, timing, and execution level ✓ Identifying and assessing motivations/pressures to commit fraud ✓ Identifying and assessing opportunities for committing fraud ✓ Identifying and assessing attitudes/justifications for committing fraud
Evidence and Documentation Related to Fraud	✓ Usefulness of various types of accounting evidence for detecting fraud ✓ Existence of appropriate procedures for formulating fraud hypotheses ✓ Negotiation among financial team members ✓ Attention to misstatements found in previous audits ✓ Reviewing high-risk areas, even if they are of low monetary value ✓ Classifying fraud risk according to the fraud triangle ✓ Using financial ratios from studies to predict fraud

Table 5: Categorization of Concepts into Contextual Categories

Categories	Concepts
Education and Learning	✓ Training for independence and impartiality skills ✓ Training on the importance of independence in reporting ✓ Training accountants to ensure awareness of their responsibility regarding fraud ✓ Training accountants on identifying fraud risk factors and how fraud occurs ✓ Training accountants to be familiar with essential internal controls
Internal Controls	✓ Support for accountants ✓ Awareness of factors affecting accountants' performance ✓ Effective internal controls ✓ Effective quality control systems ✓ Effective monitoring systems and disciplinary actions ✓ Timely awareness of accountants' performance
Motivational Factors	✓ Existence of effective incentive programs ✓ Expectation of review and inspection by regulatory bodies ✓ Having an appropriate process for hiring accountants ✓ Job security for accountants ✓ Providing fair and reasonable salaries and benefits ✓ Fair treatment of accountants
Creating Conditions for Execution	✓ Suitable working environment for accountants ✓ Growth of the accounting economy ✓ Access to information databases for accountants ✓ Availability of sufficient accounting tools ✓ Employing qualified professionals ✓ Sufficient investment in accounting and finance ✓ Presence of a culture of accountability

Table 6: Categorization of Concepts into Strategic Categories

Categories	Concepts
Appropriate Work Environment	✓ Fair treatment of employees ✓ Suitable work environment for employees ✓ Timely awareness of employees' performance ✓ Presence of effective monitoring systems and disciplinary actions
Transparency	✓ Separation of ownership from management ✓ Awareness and knowledge of company managers ✓ Sufficient experience of managers ✓ Absence of company involvement in political issues ✓ Non-subject to regulations on product pricing or distribution
Financial Characteristics	✓ Capital ✓ Asset risk ✓ Profitability ✓ Liquidity ✓ Bank risk measurement ratios ✓ Percentage of income relative to service type ✓ Geographical distribution ✓ Institutional owners ✓ Individual owners ✓ Ownership concentration ✓ Compliance with international accounting standards

Table 7: Categorization of Concepts into Intervening Categories

Categories	Concepts
Legal Factors	✓ Healthy economic environment ✓ Presence of independent regulatory bodies ✓ Existence of rules and regulations related to disciplinary actions and effective sanctions ✓ Communication of fraud incidents by regulatory bodies ✓ Complex laws and regulations ✓ Numerous and extensive laws and regulations ✓ No frequent changes in laws and regulations ✓ New legal and accounting requirements
Government Support	✓ GDP growth ✓ Government ownership levels ✓ Credit conditions
Economic Variables	✓ Exchange rate growth rate ✓ Guaranteed interest rate ✓ Inflation rate ✓ Competition level ✓ Market concentration ✓ Market share

Table 8: Categorization of Concepts into Conditions and Factors of Results and Consequences

Categories	Concepts
Organizational Growth	✓ Importance level in accounting ✓ Proper documentation ✓ Consulting with fraud experts for decision-making and reporting results ✓ Use of experts like legal and IT professionals ✓ Clear instructions for assessing fraud risk, detecting fraud, and handling it ✓ Defendability of accounting reports
Efficiency and Effectiveness	✓ Presence of effective corporate governance mechanisms ✓ Effective internal controls ✓ Existence of an effective audit committee

Categories	Concepts
	✓ Presence of an effective internal audit unit ✓ Inability of management to bypass controls ✓ Presence of an appropriate accounting and financial reporting system

Table 9: Testing the Existing Structural Relationships Related to the Causal Variables

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
Causal Conditions	Bank Quality Characteristics	Audit quality	0.51	5.00	Confirmed
		Transparency and timely disclosure of information	0.45	5.23	Confirmed
		Quality of accounting information	0.40	5.57	Confirmed
		Reducing agency costs	0.42	5.42	Confirmed
		Reducing information asymmetry	0.47	5.40	Confirmed
		Board independence	0.60	5.73	Confirmed
		Management ownership	0.56	6.07	Confirmed
	Organizational Factors	Ability to correctly interpret evidence and identify inconsistent evidence	0.41	5.00	Confirmed
		Ability to detect intentional misstatements	0.52	8.14	Confirmed
		General experience (working as an accountant)	0.49	8.19	Confirmed
		Specialized experience (e.g., industry-specific experience)	0.44	5.66	Confirmed
		Direct experience with fraud	0.64	7.98	Confirmed
		Indirect experience gained through fraud-related training	0.57	8.78	Confirmed
		General knowledge and awareness (e.g., accounting and auditing journals)	0.48	8.20	Confirmed
		Specialized knowledge	0.46	7.19	Confirmed
		Global knowledge (general business knowledge)	0.41	6.44	Confirmed
		Knowledge and awareness of fraud	0.40	7.24	Confirmed

Table 10: Testing the Existing Structural Relationships Related to Effective Central Categories

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
Central Categories	Personal Characteristics of the Accountant	Professional skepticism	0.47	5.00	Confirmed
		Adherence to professional ethics	0.47	7.00	Confirmed
		Adherence to accounting standards	0.54	8.93	Confirmed
		Conducting necessary checks when hiring accountants	0.51	8.44	Confirmed
		Gaining sufficient knowledge of accountants and their environment, including internal controls	0.59	9.31	Confirmed
	Supervision and Control	Monitoring accounting team members	0.50	5.00	Confirmed
		Proper and sufficient budgeting	0.59	9.21	Confirmed
		Adjusting accounting programs and tests to handle fraud risks	0.63	9.42	Confirmed
		Considering unpredictability in selecting accounting methods, timing, and execution level	0.59	8.62	Confirmed
	Evidence and Documentation Related to Fraud	Identifying and assessing motivations/pressures to commit fraud	0.59	9.47	Confirmed
		Identifying and assessing opportunities for committing fraud	0.60	8.99	Confirmed
		Identifying and assessing attitudes/justifications	0.65	9.18	Confirmed

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
		for committing fraud			
		Usefulness of various types of accounting evidence for detecting fraud	0.49	5.00	Confirmed
		Existence of appropriate procedures for formulating fraud hypotheses	0.55	7.20	Confirmed
		Negotiation among financial team members	0.45	7.60	Confirmed
		Attention to misstatements found in previous audits	0.40	7.74	Confirmed
		Reviewing high-risk areas, even if they are of low monetary value	0.47	7.44	Confirmed
		Classifying fraud risk according to the fraud triangle	0.59	7.76	Confirmed
		Using financial ratios from studies to predict fraud	0.49	7.23	Confirmed

Table 11: Testing the Existing Structural Relationships Related to Effective Contextual Categories

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
Contextual Categories	Education and Learning	Training for independence and impartiality skills	0.51	5.00	Confirmed
		Training on the importance of independence in reporting	0.44	5.18	Confirmed
		Training accountants to ensure awareness of their responsibility regarding fraud	0.43	5.71	Confirmed
		Training accountants on identifying fraud risk factors and how fraud occurs	0.42	5.66	Confirmed
		Training accountants to be familiar with essential internal controls	0.45	5.29	Confirmed
	Internal Controls	Support for accountants	0.52	5.00	Confirmed
		Awareness of factors affecting accountants' performance	0.51	7.31	Confirmed
		Effective internal controls	0.41	6.98	Confirmed
		Effective quality control systems	0.51	7.19	Confirmed
		Effective monitoring systems and disciplinary actions	0.49	7.26	Confirmed
		Timely awareness of accountants' performance	0.43	5.21	Confirmed
	Motivational Factors	Existence of effective incentive programs	0.64	5.00	Confirmed
		Expectation of review and inspection by regulatory bodies	0.59	9.08	Confirmed
		Having an appropriate process for hiring accountants	0.50	8.52	Confirmed
		Job security for accountants	0.46	7.27	Confirmed
		Providing fair and reasonable salaries and benefits	0.44	6.39	Confirmed
		Fair treatment of accountants	0.40	7.24	Confirmed
	Creating Conditions for Execution	Suitable working environment for accountants	0.43	5.00	Confirmed
		Growth of the accounting economy	0.42	6.79	Confirmed
		Access to information databases for accountants	0.54	8.77	Confirmed
		Availability of sufficient accounting tools	0.50	8.17	Confirmed
		Employing qualified professionals	0.59	9.01	Confirmed

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
		Sufficient investment in accounting and finance	0.54	8.33	Confirmed
		Presence of a culture of accountability	0.57	8.79	Confirmed

Table 12: Testing the Existing Structural Relationships Related to Effective Strategic Categories

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
Strategic Categories	Appropriate Work Environment	Fair treatment of employees	0.48	5.00	Confirmed
		Suitable work environment for employees	0.44	4.94	Confirmed
		Timely awareness of employees' performance	0.41	5.42	Confirmed
		Presence of effective monitoring systems and disciplinary actions	0.40	5.36	Confirmed
		Strengthening creativity and innovation	0.45	5.00	Confirmed
		Building trust-based relationships	0.59	6.62	Confirmed
	Transparency	Separation of ownership and management	0.55	7.23	Confirmed
		Awareness and knowledge of company managers	0.43	6.83	Confirmed
		Sufficient experience of managers	0.50	6.78	Confirmed
		Absence of company involvement in political issues	0.50	5.00	Confirmed
		Non-subject to product regulation (e.g., pricing or distribution)	0.43	5.77	Confirmed
	Financial Characteristics	Capital	0.65	8.57	Confirmed
		Asset risk	0.56	9.20	Confirmed
		Profitability	0.47	8.57	Confirmed
		Liquidity	0.45	7.49	Confirmed
		Bank risk measurement ratios	0.40	7.08	Confirmed
		Percentage of income relative to service type	0.41	7.80	Confirmed
		Geographical distribution	0.46	6.31	Confirmed
		Institutional owners	0.44	6.56	Confirmed
		Individual owners	0.49	8.61	Confirmed

As shown in Table 12, since all the significance values of the model parameters are greater than 1.96, it can be claimed that all the existing structural relationships are confirmed, and the quantitative analysis supports the validity and reliability of the qualitative analysis results. Therefore, the results of the confirmatory factor analysis indicate the overall goodness of fit of this part (contextual category) of the proposed model with the data, demonstrating the appropriate fit of this section of the factors affecting financial health in digital banking.

As shown in Table (13), since all the significance values of the model parameters are greater than 1.96, it can be claimed that all the existing structural relationships are confirmed, and the quantitative analysis supports the validity and reliability of the qualitative analysis results. Therefore, the results of the confirmatory factor analysis indicate the overall goodness of fit of this part (intervening conditions) of the proposed model with the data, demonstrating the appropriate fit of this section of the factors affecting financial health in digital banking.

As shown in Table (14), since all the significance values of the model parameters are greater than 1.96, it can be claimed that all the existing structural relationships are confirmed, and the quantitative analysis supports the validity and reliability of the qualitative analysis results. Therefore, the results of the confirmatory factor analysis indicate the overall goodness of fit of this part (consequences category) of the proposed model with the data, demonstrating the appropriate fit of this section of the factors affecting financial health in digital banking. Based on the software outputs, it can be claimed that all the factors

affecting financial health in digital banking have been confirmed, and the quantitative analysis supports the validity and reliability of the qualitative analysis results. Therefore, the results of the confirmatory factor analysis indicate the overall goodness of fit of the factors under review with the data, demonstrating the appropriate fit of this section of the factors affecting financial health in digital banking.

Table 13: Testing the Existing Structural Relationships Related to Effective Intervening Conditions

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
Intervening Conditions	Legal Factors	Healthy economic environment	0.47	5.00	Confirmed
		Presence of independent regulatory bodies	0.44	4.98	Confirmed
		Existence of rules and regulations related to disciplinary actions and effective sanctions	0.49	5.27	Confirmed
		Communication of fraud incidents by regulatory bodies	0.40	5.17	Confirmed
		Complex laws and regulations	0.44	5.02	Confirmed
		Numerous and extensive laws and regulations	0.59	5.40	Confirmed
		No frequent changes in laws and regulations	0.57	5.74	Confirmed
		New legal and accounting requirements	0.43	5.48	Confirmed
	Government Support	GDP growth	0.58	5.00	Confirmed
		Government ownership levels	0.52	9.13	Confirmed
		Credit conditions	0.43	5.53	Confirmed
	Job Position	Exchange rate growth rate	0.62	5.00	Confirmed
		Guaranteed interest rate	0.61	8.96	Confirmed
		Inflation rate	0.50	8.32	Confirmed
		Competition level	0.46	7.17	Confirmed
		Market concentration	0.45	5.95	Confirmed
		Market share	0.49	6.88	Confirmed

Table 14: Testing the Existing Structural Relationships Related to Effective Consequences

Effective Factors Test	Components	Sub-components	Path Coefficient	Significance Value	Result
Consequences	Organizational Growth	Importance level in accounting	0.50	5.00	Confirmed
		Proper documentation	0.43	5.80	Confirmed
		Consulting with fraud experts for decision-making and reporting results	0.42	6.32	Confirmed
		Use of experts like legal and IT professionals	0.41	6.24	Confirmed
		Use of clear instructions for assessing fraud risk, detecting fraud, and handling it	0.48	6.19	Confirmed
		Defendability of accounting reports	0.59	6.44	Confirmed
	Efficiency and Effectiveness	Presence of effective corporate governance mechanisms	0.54	5.00	Confirmed
		Effective internal controls	0.41	9.78	Confirmed
		Presence of an effective audit committee	0.50	9.94	Confirmed
		Presence of an effective internal audit unit	0.45	9.61	Confirmed
		Inability of management to bypass controls	0.41	6.28	Confirmed
		Presence of an appropriate accounting and financial reporting system	0.60	9.49	Confirmed

Examining factors affecting financial health in research digital banking

The examination of the standard path coefficients and significance coefficients related to the factors affecting financial health in digital banking has been conducted.

Based on the results of the confirmatory factor analysis presented in the structural model under the standard estimation (Figure 15) and the model under the significance coefficients (Figure 16), since all the significance values of the model parameters are greater than 1.96, the confirmatory factor analysis results indicate the overall goodness of fit of the proposed model with the data. This demonstrates the appropriate

fit of the factors affecting financial health in digital banking.

Research Question 3: What is the current state of financial health in digital banking in Iran?

Since the research hypothesis is presented in a one-sample (univariate), comparative (current vs. ideal state), and two-tailed (directionless) manner, a one-sample t-test is used to test this research question. Table (15) presents the results of the one-sample t-test for comparing the mean differences (current vs. presumed) of the overall financial health index in digital banking in Iran.

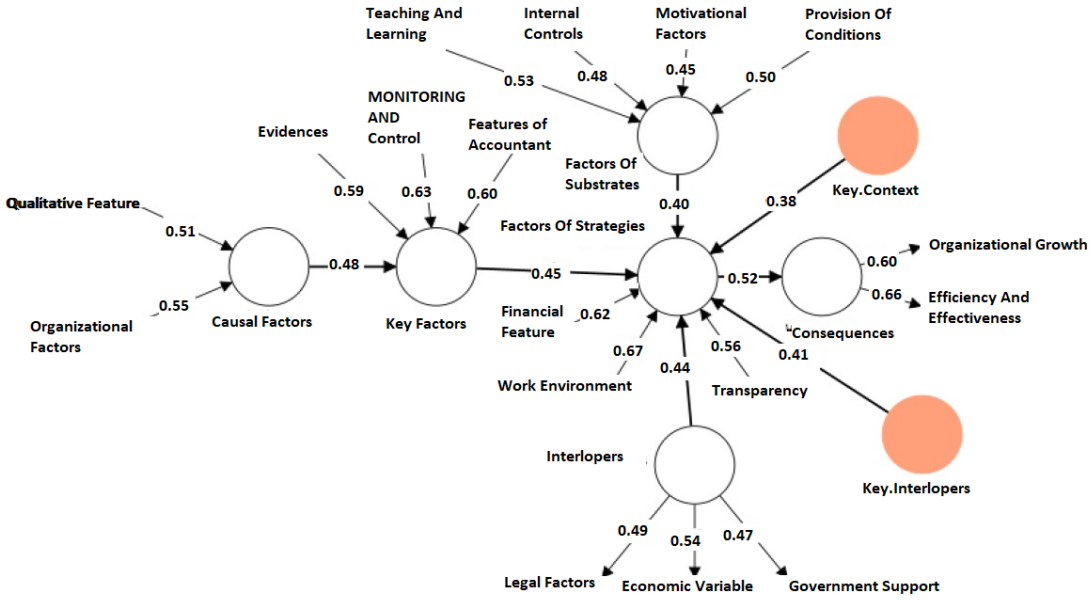

Chart 1: Structural model of factors affecting financial health in digital banking in standard estimation mode

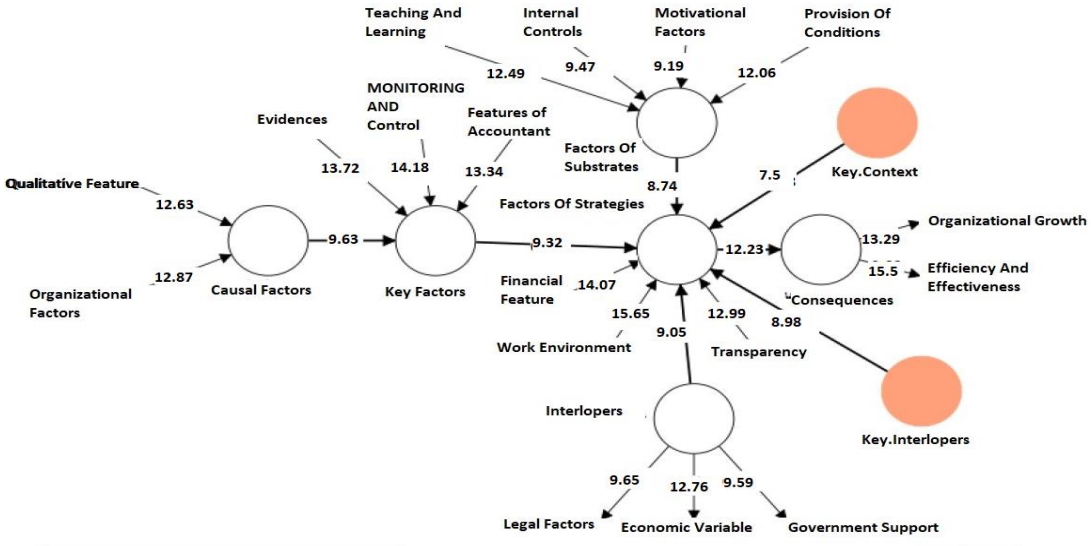

Chart 2: Structural model of factors affecting financial health in digital banking in the form of significant coefficients

Results and Discussion

As shown in Table (15), the results of the one-sample t-test for comparing the mean differences (current vs. assumed) of the overall financial health index in digital banking in Iran indicate a significant difference at the 0.01 error level ($P < 0.01$). Therefore, the hypothesis H1, which suggests a difference between the mean values of the current and assumed states of the financial health index in digital banking in Iran, is confirmed. With a 99% confidence level, it can be concluded that there is a significant difference between the mean values of the current and assumed states of the mentioned index. This indicates that the average of the current financial health index in digital banking in Iran is higher than the assumed average, thus being at a desirable level (current average = 398.982 vs. assumed average = 300, with a mean difference of 98.982).

Therefore, based on the research findings, the third research question regarding whether there is a significant difference between the current and ideal financial health status in digital banking in Iran is confirmed.

Table 15: Results of the One-Sample t-Test for Comparing the Mean Differences (Observed vs. Assumed) of Financial Health in Digital Banking in Iran

Variable	Frequency	Mean (Observed)	Standard Deviation	Mean Test (Assumed)	T-ratio	df	Significance	Mean Difference	Lower Bound	Upper Bound
Financial Health in Digital Banking in Iran (Observed)	384	398.982	43.047	300	45.058	383	0.000	98.981	94.662	103.301

7. Conclusion and Suggestions

In this study, a qualitative grounded theory strategy was used to achieve a comprehensive model or theory related to the factors affecting financial health in digital banking. The research steps were carried out progressively based on grounded theory methodology, the literature review and conducted interviews, and finally 109 concepts and 17 categories were identified. Among these categories, three were identified as central categories, which, along with the other 14 categories, formed the components of the grounded theory derived from the study.

A narrative and visual model were used to present the theory. The central category identified in this study is "personal characteristics of the accountant, supervision and control, and evidence and documentation related to fraud." The other categories are defined in relation to it. Then they were categorized for presentation in a visual model into five groups: causal conditions (2 categories), strategies (3 categories), context (4 categories), intervening conditions (3 categories), and consequences (2 categories).

The **three central categories**, being "personal characteristics of the accountant, supervision and control, and evidence and documentation related to fraud" were considered as central, with **personal characteristics** of the accountant including professional skepticism, adherence to professional ethics, accounting standards, conducting necessary checks for accountant selection, and understanding of the accountant's environment. **Supervision and control** include monitoring of accounting team members, proper budgeting, adjusting accounting programs and tests to handle fraud risks, identifying and evaluating motivations, pressures, opportunities, and justifications for committing fraud. **Evidence and documentation related to fraud** includes the usefulness of various accounting evidence for detecting fraud, appropriate procedures for formulating fraud hypotheses, communication between financial team members, reviewing high-risk areas, and using financial ratios to predict fraud.

The **two causal conditions categories** "bank quality characteristics" and "organizational factors" include: **bank quality characteristics**, such as auditing quality, transparency, timely disclosure, and independent board ownership; and **organizational factors**, which includes proper understanding of inconsistent evidence, the ability to detect intentional

misstatements, and specialized knowledge and experience regarding fraud detection.

Three strategic categories include "appropriate work environment," "transparency," and "financial characteristics." An appropriate work environment involves fair treatment, proper workflow, and a system for effective supervision. Transparency involves separating ownership from management, awareness and knowledge of managers, and lack of political involvement. Financial characteristics include risk, liquidity, profitability, capital, and compliance with international standards.

Four contextual categories include "education and learning," "internal controls," "motivational factors," and "creating conditions for execution," each covering various subtopics related to skills training, effective controls, motivational schemes, and creating appropriate work conditions for accountants.

Three intervening categories—"legal factors," "government support," and "economic variables"—include factors such as independent regulatory bodies, effective regulations, government ownership levels, and economic indicators like inflation and market competition.

Lastly, **two result categories**—"organizational growth" and "efficiency and effectiveness"—include concepts related to corporate governance, auditing committees, and maintaining an effective accounting and financial reporting system.

Based on the results of the analyses, the following recommendations are made:

1) Focus on Financial Health: It is recommended to develop a comprehensive plan focusing on financial health in digital banking, emphasizing management structures and annual performance assessments.
2) Create Governance Committees: Establish corporate governance committees with their own strategy and operational guidelines, monitored by regulatory authorities.
3) Invest in Infrastructure and Technology: Specialized and planned investments should be made in the administrative infrastructure of digital banking, as well as in the relevant technologies.
4) Enhance Coordination Among Institutions: Operational planning should be implemented to harmonize or synergize institutions in the financial health sector, especially in the public sector.
5) Focus on Key Factors: Emphasize the importance of personal characteristics of accountants, supervision and control, and evidence and documentation related to fraud at higher organizational levels.
6) Leverage Human Resources Effectively: Managers should focus on leveraging effective human resources, policies, and strategies to enhance financial health in digital banking and achieve more effective outcomes.

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