Identifying and Analyzing the Key Drivers of the Future of Sustainable Banking Using a Hybrid Approach

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Abstract

The paradigm of sustainable development and sustainability initially emerged in the industrial sector and supply chains and subsequently extended to the financial sector. Banks play a crucial role in the financial industry, and their sustainability significantly contributes to sustainable development within this sector. The present study aims to identify and prioritize the key drivers shaping the future of sustainable banking in Iran. This research is applied in nature and employs a mixed-methods approach from a methodological perspective. The theoretical population consists of experts and specialists in the banking industry. Sampling was conducted using a judgmental approach based on expertise in the field of sustainable banking. The primary data collection tools used in this study include semi-structured interviews and questionnaires. The research was conducted in three phases. In the first phase, 30 key drivers were identified through expert interviews and thematic analysis. In the second phase, the drivers were screened using expert questionnaires and the fuzzy Delphi method. Eleven drivers with a defuzzified value greater than 0.7 were selected for final prioritization. In the third phase, the screened drivers were ranked using prioritization questionnaires and the CoCoSo method. The highest-priority drivers included: the development of data-driven governance in the country, the models and nature of collaboration between banks, fintech firms, and financial startups, and the movement of banks toward diversifying financing methods. Practical recommendations were developed based on the most significant drivers.

Keywords: *Key Driver, Futures Studies, Banking, Sustainability, Sustainable Banking.*

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1. Introduction

Banks are one of the key pillars of the financial industry, providing numerous services to customers and the economy. They play a crucial role in ensuring business liquidity, which is particularly significant in Iran, where the financial system is predominantly bank-based. Over the past decades, the banking sector has been influenced by various trends and factors that have profoundly reshaped its nature [1].

Traditionally, banks were evaluated based on economic criteria and financial indicators. As a result, they primarily assessed economic projects using quantitative and financial metrics. However, since the 1980s, the rise of the sustainable development paradigm has led to a shift in this approach [2]. The sustainable development approach emphasizes a comprehensive and multidimensional perspective on economic activities. Initially, this paradigm gained attention in the industrial sector and supply chains [3].

In the banking sector, sustainable development became important due to banks' corporate social responsibility. Initially, banks sought to demonstrate sensitivity to their surrounding environment and its issues [4]. Environmental concerns led to the expansion of the green banking concept [5]. The focus on sustainability first gained traction in the European Union through the establishment of regional and international standards, with France being a pioneering country in this regard. Subsequently, this trend gained importance in other countries. One of the novel concepts emerging alongside sustainable development is the circular economy, which has attracted the attention of businesses and economies alike [6].

Sustainable banking aims to assess and evaluate various banking activities and processes from a sustainability perspective [7]. One of the key aspects that contribute to bank sustainability is financing [8]. By developing and diversifying financing methods, banks significantly support small businesses, innovative projects, and economic sustainability. For example, by offering targeted financial facilities to green businesses, banks can facilitate their growth [9]. Such efforts can be further complemented and reinforced by institutions like the tax system.

Emerging innovations from institutions such as fintech firms and financial startups play a vital role in guiding banks toward sustainability [10]. In the financing domain, collaboration with fintech firms can introduce new financing methods and enhance the evaluation of innovative economic projects. In the area of good governance—an essential component of sustainability—technologies like blockchain and big data contribute to greater transparency and improved stakeholder satisfaction [10, 11]. However, it is essential to acknowledge that implementing these changes requires banks to collaborate with these emerging institutions, a process influenced by regulatory factors.

Recent literature on the future of banking and financial technologies highlights multiple strategic, technological, and regulatory transformations shaping the industry. Watts and Watts (2024) examined foresight strategies in the Indian banking sector, proposing a three-phase strategic framework for product innovation, operational process innovation, and technological advancements to enhance profitability, competitiveness, efficiency, and productivity [12]. Mittal et al. (2023) explored green banking's role in sustainable economic growth in India, emphasizing the role of focused lending in financing sustainability projects [13]. Ahmadi et al. (2022) conducted a foresight study on blockchain-based banking marketing, identifying 47 drivers classified into nine main categories, eventually leading to four banking scenarios: crypto banking, conservative banking, pioneering banking, and traditional banking [14]. Broby (2021) analyzed the impact of financial technologies on banking business models, proposing four strategies for banks: customer retention, customer acquisition, banking as a service, and social network payment platforms while emphasizing that trust remains at the core of banking despite digital transformations [15]. Kumar and Prakash (2019) conducted a content analysis of sustainability reports of Indian banks, finding that Indian banks are slow in adopting sustainability policies, with limited environmental considerations [16]. Aras, Tezcan, and Fortuna (2018) developed a multidimensional sustainability performance evaluation model for Turkish banks, highlighting the importance of balanced sustainability improvements [17]. Mazraeh Farahani et al. (2024) proposed a conceptual framework for sustainable banking, emphasizing the role of social, environmental, and ethical sustainability in improving banking performance [18]. Moomivand et al. (2023) identified key drivers shaping the future of banking with a focus on financial technology, prioritizing regulatory harmonization, fintech startup growth, changing customer preferences, and innovation hubs [19]. Moradi et al. (2021) applied scenario planning to explore the future of Iranian banking and fintech startups, identifying five key scenarios for the fintech landscape by 2025 [20]. Jannati Jafari et al. (2020) integrated absorptive capacity and corporate foresight to outline four possible future scenarios for Iranian banking [21]. Taghavi et al. (2019) used a mixed-methods

approach to identify critical success factors in sustainable banking, categorizing them into input, process, and output factors, with a focus on entrepreneurial support, marketing management, regulatory clarity, and process evaluation [22]. Bayramzadeh and Rajabi Nahooji (2019) conducted a scenario-based foresight study on electronic banking in Iran, identifying six potential scenarios influenced by sanctions, active banking regulations, and fintech legislation [23]. These studies collectively underscore the evolving role of fintech, digital transformation, sustainability, and regulatory frameworks in shaping the future of banking worldwide.

Transitioning towards sustainability enables banks to reduce costs, improve governance, enhance stakeholder satisfaction, optimize performance, and achieve greater integration (Korzeb & Medina, 2019). Nevertheless, most sustainability-related research has focused on the industrial sector and supply chains, with limited attention given to the banking sector. Furthermore, existing research on banking sustainability primarily adopts a retrospective approach and rarely explores its future trajectory. This study applies a futures studies approach to identify and analyze the key drivers influencing the future of sustainable banking. Futures studies aim to identify and analyze key drivers and future scenarios of a subject in the long term [24]. Typically, a 10-year time horizon is considered in futures studies. To understand future developments, it is crucial to identify and extract key drivers. These drivers are strategic factors that significantly influence the long-term future of a subject [25]. Drivers can vary in nature—some are economic, while others are social or cultural. Technological drivers are also among the most influential factors.

The research questions of this study are as follows:

1. What are the key drivers influencing the future of sustainable banking?
2. How should these key drivers be prioritized in terms of their impact on the future of sustainable banking?

2. Methodology

The present study is based on the pragmatism philosophical paradigm, exploratory in purpose, and applied in orientation. Additionally, the study is a field research in terms of data collection, employing a mixed-methods approach. The research utilizes thematic analysis, fuzzy Delphi, and CoCoSo methods. The fuzzy Delphi and CoCoSo methods are quantitative, whereas thematic analysis is qualitative.

The theoretical population of the study comprises senior managers, experts, and consultants in the national banking network, as well as faculty members specializing in banking and futures studies (with an academic rank of associate professor or higher). The sampling was conducted based on expert knowledge in banking and futures studies, selecting 10 experts as the sample. The sample size was determined based on theoretical saturation.

The primary data collection tools used in this study include interviews and questionnaires. Thematic analysis was applied to interviews, while fuzzy Delphi and CoCoSo methods were used for expert questionnaires. The research was carried out in the following steps:

- Conducting interviews with experts on the key drivers and the future of sustainable banking, followed by thematic analysis to identify key drivers influencing sustainable banking.
- Screening the future drivers of sustainable banking using the fuzzy Delphi method and distributing expert evaluation questionnaires.
- Analyzing the key drivers of sustainable banking using the CoCoSo method.
- Providing recommendations based on the most significant drivers to enhance banking sustainability.

In this study, thematic analysis was employed to examine expert interviews and extract the key drivers of banking sustainability. Thematic analysis is a qualitative method used to identify primary and secondary factors from interviews. The process of thematic analysis includes the following stages:

1. Familiarization with the data: The researcher immerses themselves in the data to understand its depth and scope. This involves repeated reading and active reading of the data to identify patterns and meanings.
2. Generating initial codes: After familiarization, the researcher develops initial codes that capture significant characteristics of the data. These codes do not represent themes but are their foundational elements.
3. Searching for themes: The researcher groups the various codes into potential themes and organizes all coded data into identified themes. Some initial codes may form main themes, while others may become sub-themes or be discarded.
4. Reviewing themes: At this stage, the researcher evaluates and refines the themes in two steps:

- First, by reviewing the coded summaries at the initial level.
- Second, by assessing the themes against the entire dataset. If the thematic map aligns well with the dataset, the researcher proceeds to the next stage. Otherwise, re-coding is necessary until a valid thematic structure is developed.

5. Defining and naming themes: Once a valid thematic structure is established, the researcher defines and re-examines the themes, ensuring that each theme effectively represents a meaningful aspect of the dataset.
6. Producing the final report: The researcher finalizes the thematic analysis, synthesizing findings into a comprehensive report.

The fuzzy Delphi method was used to screen the key drivers in this study. The first step in the fuzzy Delphi screening algorithm is to develop a suitable fuzzy scale for converting expert linguistic expressions into fuzzy values. Common fuzzy scales can be utilized for this purpose. In this study, a five-point Likert fuzzy scale was applied:

Table 1. Five-Point Fuzzy Scale for the Fuzzy Delphi Method

Linguistic Variable	Fuzzy Value	Triangular Fuzzy Number
Very Low	$\tilde{1}$	(0, 0, 0.25)
Low	$\tilde{2}$	(0, 0.25, 0.5)
Medium	$\tilde{3}$	(0.25, 0.5, 0.75)
High	$\tilde{4}$	(0.5, 0.75, 1)
Very High	$\tilde{5}$	(0.75, 1, 1)

After screening the key drivers of sustainable banking, CoCoSo was applied to prioritize them. The CoCoSo method combines information from the Best-Worst Fuzzy Method (BWM) and Fuzzy WASPAS, ranking factors with high accuracy. It is recognized as one of the most reliable and advanced ranking techniques. The steps of the CoCoSo method are as follows [24, 26]:

1. Collecting expert opinions: Experts evaluate the importance of each factor using a 10-point scale.
2. Normalizing decision matrix: Data is normalized using fuzzy transformation methods.
3. Computing weighted sum (S) and weighted product (P): The following formulas are used:

$$S_i = \sum_{j=1}^{n} (w_j r_{ij}),$$

$$P_i = \sum_{j=1}^{n} (r_{ij})^{w_j},$$

- Where W_j represents the weight of criteria, serving as an input to the CoCoSo technique. S_i values are derived from the SAW method, and P_i values from the WASPAS method.

4. Computing three ranking strategies:

$$k_{ia} = \frac{P_i + S_i}{\sum_{i=1}^{m}(P_i + S_i)},$$

$$k_{ib} = \frac{S_i}{\min_i S_i} + \frac{P_i}{\min_i P_i},$$

$$k_{ic} = \frac{\lambda(S_i) + (1-\lambda)(P_i)}{\left(\lambda \max_i S_i + (1-\lambda)\max_i P_i\right)}, \quad 0 \le \lambda \le 1.$$

5. Computing final ranking:: The final ranking is calculated based on the geometric and arithmetic mean of the three previous ranking strategies. The option with the highest k-score is considered the most influential driver.

$$k_i = (k_{ia} k_{ib} k_{ic})^{\frac{1}{3}} + \frac{1}{3}(k_{ia} + k_{ib} + k_{ic}).$$

3. Findings and Results

The key drivers of the future of sustainable banking were identified through expert interviews. These interviews were analyzed using thematic analysis. The main themes, conceptual categories, and their corresponding codes are presented in Table 2. Each main driver consists of several sub-drivers. After conducting interviews with experts, the researchers performed a conceptual analysis of the collected data. A thorough examination of these interviews led to the extraction of themes and conceptual categories associated

with each theme. To ensure clarity in identifying themes and their conceptual categories, the researcher applied coding techniques.

Each interviewee is represented by the letter E, preceded by a sentence number corresponding to that particular interviewee. For example, the code 4E3 denotes the fourth sentence from the third interviewee. The identified themes and conceptual categories are presented below.

Table 2. Key Drivers of the Future of Sustainable Banking

Codes	Sub-Drivers (Conceptual Categories)	Main Drivers (Themes)
{5E3}, {5E1}	Regulatory policies on technology in Iran	Legal Drivers
{4E3}, {4E1}	Macro banking policies in the country	
{11E6}, {8E3}	Environmental laws and standards in the country	
{6E6}, {8E4}, {6E1}	International environmental treaties	
{6E9}, {9E8}, {9E4}, {5E2}	Corporate governance laws and standards in the country	
{9E6}, {7E3}, {6E2}	Growth of data-driven technologies in the country	Technological Drivers
{8E6}, {7E4}, {3E1}, {2E6}	Development of data-driven governance in the country	
{8E7}, {5E8}, {4E10}	Conditions for technology transfer to the country	
{11E9}, {3E9}	IT infrastructure in the country	
{6E4}, {4E10}	Development of fintech companies in the country	
{10E9}, {10E4}	Models and nature of collaboration between banks, fintech firms, and financial startups in the country	
{4E4}, {3E1}, {3E7}	Senior management support for banks transitioning toward sustainability	Structural Drivers
{4E6}, {3E8}, {2E3}	Decision-making and reporting systems for stakeholders and society	
{1E3}, {2E4}, {3E6}, {3E2}	Agility of banking structures	
{9E9}, {1E4}, {3E5}	Level of structural integration in banks	
{7E6}, {6E3}	Banks' shift toward diversifying financing methods	Financing and Investment Drivers
{3E10}, {2E7}, {5E8}	Support from banks and financial institutions for green financing	
{8E9}, {7E7}, {1E2}, {1E8}	Bank policies regarding the evaluation of economic projects	
{4E2}, {1E9}, {3E3}, {1E7}	Level of bank support for small businesses	
{5E6}, {6E5}, {3E6}	Bank policies for improving their public image	Socio-Cultural Drivers
{6E10}, {7E8}, {4E7}	Bank information dissemination and public relations policies	
{1E6}, {4E5}, {5E9}, {3E4}	Bank policies and actions concerning corporate social responsibility	
{4E9}, {1E10}	Exchange rate fluctuations in the country	Environmental Drivers
{5E5}, {5E7}, {5E4}	Foreign sanctions	
{2E2}, {2E5}	Business environment in the country	
{7E10}, {1E1}	Restrictions on banks regarding cooperation with foreign banks and international financial institutions	
{2E8}, {7E9}, {2E10}	Bank innovation policies	Innovative Drivers
{6E8}, {2E6}	Bank research and development policies	
{4E8}, {2E9}, {6E3}	Innovation ecosystem in the country	
{7E4}, {10E6}	Policies and programs of incubators and science and technology parks	

A total of 30 sub-drivers were extracted through thematic analysis and then screened using the fuzzy Delphi technique. In this stage, 19 sub-drivers were eliminated, and 11 key drivers were selected for final analysis and ranking. Drivers with a defuzzified value greater than 0.7 were considered for final evaluation and prioritization using the CoCoSo method.

In this study, 11 drivers exceeded the 0.7 threshold value. The 0.7 threshold was set for the evaluation and screening of key drivers influencing the future of sustainable banking. In most studies, the threshold value typically ranges between 0.5 and 0.7, but in the present study, 0.7 was chosen as the threshold.

Table 3. Defuzzified Values of Key Drivers of the Future of Sustainable Banking

Defuzzified Value	Upper Bound	Median	Lower Bound	Sub-Drivers of the Future of Sustainable Banking
0.83	0.92	0.83	0.75	Regulatory policies on technology in Iran
0.59	0.67	0.60	0.51	Macro banking policies in the country
0.53	0.60	0.55	0.43	Environmental laws and standards in the country
0.41	0.50	0.41	0.33	International environmental treaties
0.84	0.90	0.85	0.76	Corporate governance laws and standards in the country
0.88	0.97	0.90	0.78	Growth of data-driven technologies in the country
0.87	0.94	0.86	0.80	Development of data-driven governance in the country
0.53	0.63	0.51	0.45	Conditions for the transfer of advanced technologies to the country
0.58	0.67	0.57	0.51	IT infrastructure in the country
0.86	0.93	0.85	0.80	Development of fintech companies in the country
0.91	0.98	0.92	0.84	Models and nature of collaboration between banks, fintech firms, and financial startups in the country
0.50	0.58	0.50	0.42	Senior management support for banks transitioning toward sustainability
0.85	0.90	0.85	0.79	Decision-making and reporting systems for stakeholders and society
0.46	0.53	0.46	0.40	Agility of banking structures
0.82	0.91	0.83	0.72	Level of structural integration in banks
0.83	0.93	0.81	0.75	Banks' transition toward diversifying financing methods
0.64	0.70	0.63	0.58	Support from banks and financial institutions for green financing
0.61	0.67	0.60	0.55	Bank policies regarding the evaluation of economic projects
0.55	0.64	0.53	0.47	Level of bank support for small businesses
0.52	0.58	0.53	0.45	Bank policies regarding improving their public image
0.45	0.50	0.44	0.40	Bank information dissemination and public relations policies
0.77	0.84	0.76	0.70	Bank policies and actions concerning corporate social responsibility
0.38	0.43	0.40	0.32	Exchange rate fluctuations in the country
0.34	0.40	0.35	0.28	Foreign sanctions
0.24	0.30	0.24	0.19	Business environment in the country
0.42	0.50	0.42	0.34	Restrictions on banks regarding cooperation with foreign banks and international financial institutions
0.77	0.83	0.76	0.71	Bank innovation policies
0.53	0.63	0.51	0.45	Bank research and development policies
0.55	0.64	0.53	0.48	Innovation ecosystem in the country
0.43	0.51	0.44	0.33	Policies and programs of incubators and science and technology parks

Based on the defuzzified values of key drivers of the future of sustainable banking, the selected drivers are:

- **(A)** Regulatory policies on technology in Iran
- **(B)** Corporate governance laws and standards in the country
- **(C)** Growth of data-driven technologies in the country
- **(D)** Development of data-driven governance in the country
- **(E)** Development of fintech companies in the country
- **(F)** Models and nature of collaboration between banks, fintech firms, and financial startups in the country
- **(G)** Decision-making and reporting systems for stakeholders and society
- **(H)** Level of structural integration in banks
- **(I)** Banks' transition toward diversifying financing methods
- **(J)** Bank policies and actions concerning corporate social responsibility
- **(K)** Bank innovation policies

The screened drivers were prioritized using the CoCoSo technique. Initially, experts were asked to express their opinions on the degree of importance of each driver using a 10-point scale. A decision matrix was formed based on the opinions of 10 experts. These data were then normalized using the fuzzy approach, following the second step of the CoCoSo method. The normalized matrix values for the research drivers are presented in Table 4.

Table 4. Normalized Matrix of Research Drivers

Expert 10	Expert 9	Expert 8	Expert 7	Expert 6	Expert 5	Expert 4	Expert 3	Expert 2	Expert 1	Research Drivers
1.000	0.429	0.286	0.250	0.143	0.286	0.595	0.833	0.500	0.167	A
0.200	0.000	0.000	0.000	0.143	0.143	0.250	0.833	0.667	0.333	B
0.600	0.143	0.000	0.125	0.000	0.000	0.750	0.333	0.333	0.000	C
0.800	1.000	0.875	0.875	1.000	1.000	1.000	1.000	1.000	1.000	D
0.200	0.143	0.000	0.375	0.571	0.143	0.000	0.833	0.500	0.167	E
0.800	0.714	0.857	0.625	0.857	0.571	0.750	0.667	0.833	0.833	F
0.600	0.286	1.000	0.750	0.857	0.286	1.000	0.667	0.667	0.333	G
0.200	0.143	0.571	0.500	0.429	0.143	0.250	0.000	0.000	0.000	H
0.800	0.286	0.429	1.000	0.714	0.714	0.750	1.000	1.000	0.667	I
0.000	0.143	0.000	0.750	0.429	0.571	0.000	0.333	0.667	0.167	J
0.400	0.286	0.143	0.250	0.714	0.429	0.750	0.500	0.500	0.000	K

Based on the normalized matrix values, the weighted sum matrix (S) and weighted product matrix (P) were calculated using the formulas from step three of the CoCoSo method.

Table 5 presents the weighted sum matrix (S) values for the key drivers of sustainable banking. These values were obtained by multiplying the normalized matrix values by the weights assigned to expert opinions. The weight of all expert opinions was considered equal to 0.1, derived from dividing 1 by 10 experts.

Finally, the row-wise summation of the weighted sum matrix was computed using the S index. The S index is similar to the utility value in the SAW technique.

Table 5. Weighted Sum Matrix (S) for Research Drivers

S Index	Expert 10	Expert 9	Expert 8	Expert 7	Expert 6	Expert 5	Expert 4	Expert 3	Expert 2	Expert 1	Research Drivers
0.449	0.100	0.043	0.029	0.025	0.014	0.029	0.059	0.083	0.050	0.017	A
0.256	0.020	0.000	0.000	0.000	0.014	0.014	0.025	0.083	0.067	0.033	B
0.228	0.060	0.014	0.000	0.013	0.000	0.000	0.075	0.033	0.033	0.000	C
0.954	0.080	0.100	0.086	0.088	0.100	0.100	0.100	0.100	0.100	0.100	D
0.243	0.020	0.014	0.000	0.038	0.057	0.014	0.000	0.033	0.050	0.017	E
0.751	0.080	0.071	0.086	0.063	0.086	0.057	0.075	0.067	0.083	0.083	F
0.646	0.060	0.029	0.100	0.075	0.086	0.029	0.100	0.067	0.067	0.033	G
0.223	0.020	0.014	0.057	0.050	0.043	0.014	0.025	0.000	0.000	0.000	H
0.736	0.080	0.029	0.043	0.100	0.071	0.071	0.075	0.100	0.100	0.067	I
0.306	0.000	0.014	0.000	0.075	0.043	0.057	0.000	0.033	0.067	0.017	J
0.397	0.040	0.029	0.014	0.025	0.071	0.043	0.075	0.050	0.050	0.000	K

In addition to the weighted sum matrix (S), the weighted product matrix (P) also needed to be calculated. The formula for calculating the P matrix is similar to the WASPAS method.

To compute the weighted product matrix (P), each value in the normalized matrix was raised to the power of the expert opinion weights. The weight of all expert opinions was 0.1.

The weighted product matrix (P) values are presented in Table 6.

Table 6. Weighted Product Matrix (P) for Research Drivers

Research Drivers	P Index	Expert 10	Expert 9	Expert 8	Expert 7	Expert 6	Expert 5	Expert 4	Expert 3	Expert 2	Expert 1
A	9.077	1.000	0.919	0.882	0.871	0.823	0.882	0.949	0.982	0.933	0.836
B	6.206	0.851	0.000	0.000	0.000	0.823	0.823	0.871	0.982	0.960	0.896
C	5.349	0.950	0.823	0.000	0.812	0.000	0.000	0.972	0.896	0.896	0.000
D	9.950	0.978	1.000	0.985	0.987	1.000	1.000	1.000	1.000	1.000	1.000
E	7.015	0.851	0.823	0.000	0.907	0.946	0.823	0.000	0.896	0.933	0.836
F	9.711	0.978	0.967	0.985	0.954	0.985	0.946	0.972	0.960	0.982	0.982
G	9.487	0.950	0.882	1.000	0.972	0.985	0.882	1.000	0.960	0.960	0.896
H	6.166	0.851	0.823	0.946	0.933	0.919	0.823	0.871	0.000	0.000	0.000
I	9.645	0.978	0.882	0.919	1.000	0.967	0.967	0.972	1.000	1.000	0.960

J	6.352	0.000	0.823	0.000	0.972	0.919	0.946	0.000	0.896	0.960	0.836
K	8.212	0.912	0.882	0.823	0.871	0.967	0.919	0.972	0.933	0.933	0.000

The final ranking of the key drivers of sustainable banking in the CoCoSo method was determined using the K index. The calculation of K required computing three indices: Ka, Kb, and Kc. The Kc index was derived from the combination of Ka and Kb.

The λ parameter was set to 0.5, a common value in previous studies. The final K index was obtained by calculating the arithmetic and geometric mean of Ka, Kb, and Kc.

The four evaluation indices for the CoCoSo method, along with the final ranking of each driver, are presented in Table 7.

Table 7. Four Evaluation Indices for Research Drivers in the CoCoSo Method

Research Drivers	Ka	Kb	Kc	K Index	Final Rank
Regulatory policies on technology in Iran	0.103	3.710	0.874	2.256	5
Corporate governance laws and standards in the country	0.070	2.308	0.593	1.448	9
Growth of data-driven technologies in the country	0.060	2.022	0.511	1.260	11
Development of data-driven governance in the country	0.118	6.138	1.000	3.317	1
Development of fintech companies in the country	0.079	2.401	0.666	1.550	8
Models and nature of collaboration between banks, fintech firms, and financial startups in the country	0.113	5.183	0.959	2.910	2
Decision-making and reporting systems for stakeholders and society	0.110	4.670	0.929	2.685	4
Level of structural integration in banks	0.069	2.153	0.586	1.379	10
Banks' transition toward diversifying financing methods	0.112	5.104	0.952	2.872	3
Bank policies and actions concerning corporate social responsibility	0.072	2.560	0.610	1.564	7
Bank innovation policies	0.093	3.316	0.789	2.024	6

According to the K index, the top five key drivers in sustainable banking are:

1. Development of data-driven governance in the country
2. Models and nature of collaboration between banks, fintech firms, and financial startups in the country
3. Banks' transition toward diversifying financing methods
4. Decision-making and reporting systems for stakeholders and society
5. Regulatory policies on technology in Iran

A higher K index indicates greater importance of the respective driver. The practical recommendations of this study were developed based on these most critical drivers.

4. Discussion and Conclusion

The present study aimed to identify and prioritize key drivers influencing the future of sustainable banking. Sustainability is a recently emerging paradigm in financial industry literature. The research was conducted in three phases. In the first phase, 30 key drivers were identified through expert interviews and thematic analysis. In the next phase, these drivers were screened using the fuzzy Delphi method. For this purpose, expert evaluation questionnaires were distributed, and the experts assessed the drivers on a five-point scale ranging from very low to very high. A total of 11 drivers with appropriate defuzzified values were selected for final evaluation. The screened drivers were then assessed using the CoCoSo method. To achieve this, priority assessment questionnaires were distributed to the experts, who rated the importance of each driver on a ten-point scale. The key prioritized drivers included:

- Development of data-driven governance in the country
- Models and nature of collaboration between banks, fintech firms, and financial startups in the country
- Banks' transition toward diversifying financing methods
- Decision-making and reporting systems for banks to stakeholders and society
- Regulatory policies on technology in Iran

Practical recommendations were developed based on the most critical drivers.

Governance frameworks, enhanced transparency, and corporate governance improvements play a crucial role in banking sustainability. In this regard, data-driven technologies such as big data, the Internet of Things (IoT), business intelligence, and blockchain can be highly

effective. For instance, banks can leverage big data to identify and analyze large volumes of information. Data-driven analytics contribute to more accurate decision-making and improved reporting to the public. Transparent and objective reports significantly enhance stakeholder satisfaction. Similarly, blockchain technology, through the implementation of smart contracts, promotes greater transparency and better governance. Ultimately, data-driven governance enhances bank integration. However, the successful implementation of these technologies requires the support of senior bank managers and the establishment of data-driven decision-making systems within banking organizations.

The collaboration between banks and fintech firms is a compelling topic in banking literature. Numerous studies have examined the benefits and advantages of fintech in banking [5, 19, 27-30]. Partnerships with fintech firms and the adoption of their AI-driven and data-driven innovations play a significant role in ensuring sustainable banking services. For instance, fintech firms introduce new financing methods, contributing to diversified financing strategies. Many green financing mechanisms originate from fintech innovations.

By collecting and analyzing vast datasets across economic, social, and environmental domains, fintech firms play a crucial role in comprehensive economic project evaluations. They also enhance banks' technical expertise, supporting small businesses and asymmetric projects. Furthermore, fintech firms contribute to cost reduction and green economy development by leveraging data-driven technologies and minimizing reliance on physical assets. The impact of fintech firms on green economy promotion has been extensively studied in recent research [30-32].

To strengthen bank-fintech collaboration, key facilitating factors include:

- Developing regulatory technology (RegTech) in the country
- Enhancing open innovation policies in banks
- Fostering interbank cooperation for joint research and development
- Formulating strategic collaboration models between banks and fintech firms
- The Importance of Sustainable and Green Financing

A crucial aspect of sustainability is sustainable financing, often referred to as green financing. Sustainable financing aims to diversify financing mechanisms to support small businesses and green projects [1, 16, 32]. In Iran, many banks primarily provide financial support to large industrial sectors, which are often major sources of pollution. This policy is partly due to the monopoly of large industries and the rent-seeking nature of the economy.

In many cases, banks lack the necessary expertise to conduct detailed evaluations of green projects, such as energy-smart initiatives. Supporting fintech firms and expanding collaboration with financing-focused fintech companies can be highly effective in addressing this challenge. Unfortunately, most Iranian banks primarily collaborate with payment-focused fintech firms, significantly limiting the scope of fintech partnerships.

Overcoming this challenge requires:

- Reforming the commission-based financial system in the country
- Expanding and diversifying fintech firms
- Developing a suitable regulatory framework to alleviate banks' concerns and encourage risk-taking in fintech collaborations
- Government support for green projects
- Decision-Making and Reporting Systems: Enhancing Transparency and Trust

The decision-making and reporting systems of banks play a vital role in sustainability and improving public perception. One of the major shortcomings of traditional decision-making and reporting systems is their reliance on subjective judgment. In traditional banking systems, subjective interpretations often replace data-driven assessments, making such approaches less favorable to the public. This issue is deeply rooted in conventional decision-making culture.

Enhancing the modern decision-making system largely depends on:

- Cultural changes in banking decision-making
- Implementation of corporate governance frameworks
- Adherence to environmental and corporate social responsibility (CSR) standards

Banks should strive to provide transparent reports that go beyond financial and economic metrics, incorporating social, cultural, and environmental impact data. This level of transparency requires integrated information systems and advanced technologies capable of collecting and analyzing extensive datasets across multiple domains. Business intelligence (BI) and big data analytics are among the most critical technologies in this regard.

The last prioritized key driver is regulatory policies on technology in the country. Numerous studies on fintech development highlight the critical role of regulation in fintech growth [33-37].

In Iran, regulatory policies are one-sided and suppress innovation. Additionally, the country has multiple regulatory bodies, many of which lack sufficient knowledge of fintech regulation, leading to arbitrary and inconsistent regulatory actions. Moreover, current regulatory policies primarily favor large financial institutions such as banks and insurance companies, often hindering fintech growth.

To improve regulatory policies, key recommendations include:

- Developing balanced and multi-dimensional regulatory policies
- Enhancing regulatory centralization to reduce inconsistencies
- Expanding regulatory technology (RegTech) initiatives to facilitate fintech compliance

By addressing these challenges and implementing structured regulatory reforms, Iran's banking sector can enhance sustainability, foster fintech collaborations, and improve governance transparency.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

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Ethical Considerations

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

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