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RESEARCH ARTICLE

Implementing Expected Credit Loss in the Iranian Banking Industry

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Abstract

IFRS 9 changes the bank's impairment accounting for debt instruments by replacing the incurred credit loss model with a forward-looking expected credit loss (ECL) model. This study examines the challenges of switching to the ECL model in the Iranian banking industry. We designed a questionnaire with 46 questions and sent them to four groups include: "banks", "bank auditors", "regulatory bodies" and "academic experts and researchers". The questionnaire's rate of return was 90% and data were analyzed using fuzzy logic. We find that factors such as the prolonged judicial process of receiving receivables, related parties or political cronies, obligations imposed by the government, inefficiency of risk management and etcetera have caused banks to have a large volume of non-performing loans (NPLs). Failure to solve these problems will cause the ECL model not to be implemented properly. Also, according to our findings implementing this model will majorly change how Iranian banks manage and report their credit risks and reserves. The successful implementation of an ECL approach for impairment accounting will heavily depend on providing the necessary infrastructures at the macro level, supervision, and banks. It seems to require a relatively long time and careful planning to implement the ECL approach according to the current situation and infrastructures.

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1. Introduction

The International Financial Reporting Standards (IFRS) are a set of accounting standards being implemented by different countries worldwide. One of the standards that will have the most significant impact on banks is IFRS 9 (Financial Instruments). This standard is being implemented in three phases: Classification and measurement of financial assets, Impairment, and Hedge accounting.

Introducing new requirements for accounting for expected credit losses in IFRS 9 will significantly change banks' financial reporting. Regarding impairment, the standard incorporates a forward-looking expected credit loss (ECL) model for calculating provisions. Firms must capture and collect historical data and other trend information required for building a forward-looking impairment model and tracking credit risk migration since the origination and recognition of the financial instrument. Data will include the historical probability of defaults, ratings, loss amount, product features, and economic scenario variables. Firms may also need to develop new models and processes or upgrade existing models in order to identify an increase in credit risk (Moody, 2016).

The issue regarding the interaction between Iran's supervision rules about provisioning and international financial accounting standards is of major interest and significance. There are, however, material differences between the new standards and the present bank's rules, particularly around loan staging and the fresh foundation in forward-looking, expected loss methodology. The Central Bank of Iran's reservation regulations has a backwards-looking provisioning approach based on the losses incurred. Furthermore, according to the evidence, some banks do not perform these rules properly. For example, the reservation amount is incorrectly calculated and manipulated by incorrect classification. But the fundamentals behind IFRS 9 significantly improve Iran's reservation approach. IFRS 9 introduces a more appropriate and prospective recognition of credit losses through the Expected Credit Loss (ECL) approach. The standard provides authorities and market participants clearer information on banks' financial conditions.

However, implementing the standard can have crucial implications for financial institutions and Iran's central bank authorities.

The impact of IFRS 9 implementation in the Iranian banking industry will go beyond a simple update of accounting policies. It will be impacted governance, risk and finance functions, internal controls, information systems, regulatory reporting, and disclosures. In addition, IFRS 9 requires a high degree of expert judgment in credit risk management. Therefore, ensuring that the appropriate impairment models are being used for ECL calculation can be a challenge. The challenge comes from the principle-based nature of IFRS 9, which includes qualitative credit risk components. Gathering all the requirements upfront for IFRS 9 implementation is challenging since it is a new impairment calculation. Hence, implementing the ECL model in the Iranian banking industry can be challenging and time-consuming. This paper evaluates the possibility of implementing ECL in the Iranian banking industry.

2. Literatures review

The issue related to classifying the financial assets as subsequently measured at amortized cost, at fair value through other comprehensive income, or fair value through profit or loss is essential to banks. Under IFRS 9, financial assets are classified according to the business model for managing them and their cash flow characteristics. In essence, if (a) a financial asset is a simple debt instrument such as a loan, (b) the objective of the business model in which it is held is to collect its contractual cash flows (and generally not to sell the asset) and (c) those contractual cash flows represent solely payments of principal and interest, then the financial asset is classified at amortized cost. The ECL framework is applied to those assets and any others that are subject to IFRS 9's

impairment accounting (assets subsequently measured at amortized cost, as well as those measured at fair value through other comprehensive income), a group that includes lease receivables, loan commitments, and financial guarantee contracts. The impairment sum will reduce the carrying amount of the financial assets measured at amortized cost and that will be presented in the statement of financial position. Respectively, the impairment will not affect the carrying amount, and it will be recognized in other comprehensive income with financial assets measured at fair value through other comprehensive income (IFRS 9.4.1.1, IFRS 9.4.1.2, IFRS 9.5.5.2).

IFRS 9 requires ECLs to reflect the following:

- An unbiased and probability-weighted amount that reflects a range of possible outcomes; and
- Reasonable and supportable information available without undue cost or effort about past events, current conditions, and forecasts of future economic conditions (IFRS 9.5.5.17). So, the Expected Loss Model in IFRS 9 requires that a loan or any amortized financial asset be reported on the balance sheet with its risk of expected loss, regardless of whether the risk has already materialised or will materialise in the future (Corrado et al., 2022).

According to IFRS 9, each bank can define its own internal credit loss model. Typically, the ECL computation is based on the product of the loss given default by the corresponding point-in-time probability of default and exposure at default (KPMG, 2017). Moreover, this computation must contemplate three stages. If the credit risk has not increased significantly (Stage 1), IFRS 9 requires allowances based on 12 month expected losses. If the credit risk has increased significantly (Stage 2) and the loan is ‘credit impaired’ (Stage 3), the standard requires allowances based on expected lifetime losses. The assessment of whether a loan has experienced a significant increase in credit risk varies by product and risk segment. It requires the use of quantitative criteria and experienced credit risk judgment. IFRS 9 requires multiple forward-looking macroeconomic and workout scenarios to estimate expected credit losses (Ernst and Young, 2018 & IFRS 9.5.5.3, 5.5.5).

ECL estimation is complex and inherently judgmental. It depends on a wide range of data that may not be immediately available, including forward-looking estimates of key macro-and micro-economic factors and management’s assumptions about the relationship between these forecasts and the amounts and timing of borrower recoveries. Because of the size of the potential impacts, these factors mean a risk of material bias affecting the financial statements. This could affect key financial and regulatory metrics. Accordingly, ECLS must be determined in a well-governed environment (Deloitte, 2016).

In migrating to IFRS 9, banks must assess the new standard's impact on their current organisational processes and procedures. They will then need to develop a robust solution to calculate provisions and appropriate reporting to comply with the standard (Oracle, 2016).

The changes introduced by IFRS 9 represent a major challenge to most banks across all regions. The most pressing needs are for the following:

Risk modeling- The new standard aims to make financial institutions' calculations and methodology more risk-sensitive rather than top-down and rules-based. As a result, much more detailed calculations are now needed at a granular level to generate the provision numbers. To implement the changes, banks will need to review and upgrade their risk modeling capabilities to adopt a more forward-looking approach that also assesses the impact of macroeconomic factors on ECL calculations.

Technology systems- The underlying theme across most of the changes that the new standard imposes is that it is now vital for IFRS 9 teams to have access to clean, reconciled, granular data in a system designed to handle large volumes – not just from a storage perspective but from a processing and reporting perspective as well. This, in turn, means that banks will have to make

major changes and improvements to their existing data management systems and processes – and finding the right software is a key element in coping with IFRS 9 (Oracle, 2016).

Deloitte (2016) surveyed the challenge of implementing expected credit loss in 2016. This survey captured the views of 91 banks from Europe, the Middle East & Africa, Asia Pacific, and the Americas. Participants believed that the 3 biggest program management challenges faced by IFRS 9 are clarity around the acceptable and compliant interpretation of IFRS 9 across global and local regulators and auditors; access to internal resources across finance, risk, IT, and the business, and access to external resources with adequate skills and IFRS 9 experience. Also, data requirements to support model development as well as determining significant increases in credit risk, development of statistical expected credit loss (ECL) models and systems architecture for the calculation and reporting of the ECL number were the most critical technical implementation tasks of IFRS 9.

Ernst and Young (2018) did the fourth annual IFRS 9 impairment survey in 2018. This survey was undertaken to compare the impact of continued challenges and focus areas specific to impairment programs for major banking institutions. Change programs have extended longer than expected, and it remains a challenge to embed the extensive additional risk and finance data, processes, and controls into the business. The volume of changes to a financial institution's data, systems, quantitative models, processes, and control framework to calculate expected credit losses was generally underestimated.

World Bank surveyed to (a) identify challenges faced by banks and supervisors in countries that implemented IFRS 9 and (b) in countries that have not yet implemented the new accounting framework, understand the reasons behind the decision to postpone the transition to IFRS 9. The survey was sent to 184 countries and economies across all regions and received 91 responses. Only 7 responses were from low-income countries, while 20 were from lower-middle-income countries. The main challenges that supervisory authorities encountered with the implementation of IFRS 9 are (a) modeling risk; (b) data availability and low data quality; and (c) limited staff capacity. In several instances, low data quality interacted with limited staff capacity, resulting in difficulties for the supervisor in adequately reviewing the banks' model validation and adequacy of the data inputs. This often led to challenges in assessing the adequacy of loan loss provisioning and ensuring consistency of application of a principles-based accounting standard across institutions. Based on the supervisors' responses, banks' challenges with implementing IFRS 9 vary across countries with different income levels. The top three challenges – data availability and low data quality, modeling risk and overreliance on management judgment, and burden due to the involvement of several business areas – are the same for all income groups. At the same time, survey participants from lower-middle-income and low-income countries highlighted limited staff capacity and lack of appropriate analytical tools as important challenges with IFRS 9 implementation. In addition, overreliance on external vendors was a significant issue in low-income countries (Caruso et al., 2021).

As mentioned earlier, provisioning has a backwards-looking approach in Iranian banking. Under the incurred-loss method, credit losses are only recognized if evidence indicates a loss event has occurred. The enactment of Iran's Money and Credit Council and IFSR 9 about staging loans and calculating provisions have been compared in Table (1).

Table 1. Enactment of Iran's Money and Credit Council and IFRS 9

IFRS 9	Enactment of Money and Credit Council- Circular MB / 2823 (1385)
<p>1) stag1 (IFRS 9.5.5.11) A: contractual payments are less than 30 days past due (rebuttable presumption). B: Remains in this category if there is no significant increase in credit risk.</p>	<p>1) Current stage (Article 2, paragraph 1) A: Payments have been made at maturity, and at most, 2 months have passed since its maturity. B: The customer has a favorable financial situation, so the analysis of financial indicators such as profitability and liquidity indicates that he will not have problems repaying the principal and interest of his loan. C: The perspective of the relevant industry or field of activity is favorable, and the market for products and services of this industry or field of activity has the necessary stability.</p>
<p>2) stag2 (IFRS 9.5.5.11, IFRS 9.B5.5.37) A: Contractual payments are more than 30 days past due and less than 90 days (rebuttable presumption). B: The credit risk on a financial asset has increased significantly since initial recognition (If reasonable and supportable forward-looking information is available without undue cost or effort, an entity cannot rely solely on past due information when determining whether credit risk has increased significantly since initial recognition).</p>	<p>2) Past due date stage (Article 2, paragraph 2) A: It has been over 2 months since the due date, but the payment delay has not exceeded 6 months. B: Customer financial indicators such as profitability and liquidity indicate the appropriate financial situation. However, the analysis of performance and the financial situation shows the possibility of future delays in the repayment of customer facilities. C: The relevant industry or field of activity has a limited growth situation, and the market is relatively stable.</p>
<p>3) stag3 (Credit Impaired) (IFRS 9.B5.5.37, Appendix A) A: A financial asset is 90 days past due (rebuttable presumption). B: A financial asset is credit-impaired when one or more events that have a detrimental impact on that financial asset's estimated future cash flows have occurred. Evidence that a financial asset is credit-impaired includes observable data about the following events: (a) the significant financial difficulty of the issuer or the borrower; (b) a breach of contract, such as a default or past due event; . . (e) the disappearance of an active market for that financial asset because of financial difficulties; or (f) the purchase or origination of a financial asset at a deep discount that reflects the incurred credit losses.</p>	<p>3) Deferred stage (Article 2, paragraph 3) A: Payment delays have been over 6 months and less than 18 months from the due date. B: The customer's financial situation is not a good situation based on the determining indicators, and the analysis of his financial situation indicates that the customer may not be able to fulfill part of his obligations on time. C: The activity growth is faced with severe restrictions and recession and the market for his products is limited and unstable.</p> <p>4) doubtful receivable stage (Article 2, paragraph 4) A: Payment delays have been over 18 months and the customer has not repaid his debt. B: Customer financial indicators such as profitability and liquidity indicate the customer's unfavorable financial situation. And the analysis of the performance of his financial situation indicates the possibility of non-fulfillment of all customer obligations.</p>

Although the Money and Credit Council directive provides some qualitative criteria, the audit evidence of Iranian banks shows that only quantitative criteria are considered when calculating reserves. Nevertheless, comparing quantitative criteria is the comparison of incommensurables. Past due loans with more than 90 days are classified in stage 3 or credit impaired according to IFRS 9, while past due loans up to 120 days are classified as the current stage according to Iran's regulations, roughly equivalent to stage 1 of IFRS 9. Also, this classification has been manipulated in some Iranian banks and is not conducted properly. Hence, classifying loans and calculating reserves according to the regulations of the Central Bank of Iran and IFRS 9 are far apart.

2.1. Research Question

As mentioned earlier, there have been many challenges to implementing ECL in banks worldwide. It seems that Iranian banks are no exception to these obstacles. We expect that the Iranian banking industry faces more and different challenges to implementing ECL than other banks. Existing infrastructures, structural problems of many banks, and the significant gap between current regulations and IFRS 9 are examples of the factors that create these challenges. Therefore current research is designed to investigate the possibility of implementing ECL in the Iranian banking industry.

3. Research Methodology

A systematic review and semi-structured interview are the sources of designing the questionnaire. Two types of questions have been used in this questionnaire: group and open-ended questions. Group questions refer to a specific topic and an 11-point Likert scale has been used. The spectra are one-sided, 0 to 10, where zero means disagree with the content of the sub-question and 10 has the highest agreement. The research was conducted from 2019-2021.

3.1. Population and sample

The Population and Sample include two main groups: (a) those involved in the financial banks' reporting process and (b) academic experts and researchers. The first Group answered the questions in the form of institutional identity. Therefore, providing demographic information is not relevant for this group.

a-1) Banks; As executors and preparers of banks' financial statements - All banks and authorized credit institutions, including private banks, government, and authorized credit institutions, were considered due to the importance of this category.

a-2) Bank auditors; As financial statements creditor - Bank auditing requires relevant knowledge, expertise, and experience due to the different nature of the banking business. Hence all bank auditors who have conducted bank audits in the last 10 years, including 21 auditing groups, have been identified.

a-3) supervisory bodies, Including Central Bank supervision, the Association of certified public accountants, the Stock Exchange and Securities Organization, and the Justice Experts' Association. These institutions were selected due to their important oversight role in the bank's financial reporting process.

b) Academic Experts and Researchers; Experts and researchers were initially selected using purposive judgmental sampling and then optimized through the snowball method. The main features for selection were: (1) sufficient familiarity with banks' financial reporting and (2) relative familiarity with IFRS concepts. 50 participants were selected who are generally active in related specialities including banking, accounting, auditing, valuation, and taxation, with this criterion. 73% of them had PhD degrees and 81% had studied accounting. The average work experience related to financial reporting in banking was 8.3 years and in the field of non-banking, 17.4 years. 62% of them are experts in the field of accounting and auditing and 47% of them are in the field of banking. 64% of persons have high theoretical knowledge of IFRS and 81% have moderate to high practical knowledge of it.

3.2. Validity and reliability of the questionnaire

For the pilot phase, we selected 10 participants, including banking specialists, bank auditors, and academic and research experts. The validity of the questionnaire was measured with Lawshe's Content Validity Ratio (1975).

Table 2. Demographic information

Gender (Frequency)		Education (Frequency)		Work experience related to financial reporting (Average-year)	
male	female	Masters	PhD.	Bank	Non-banking
95	5	27	73	8.3	17.4
Professional expertise and experience (percent)					
Banking	Accounting	Auditing	Supervision	Valuation	Tax
47	62	62	31	31	20
Theoretical familiarities with IFRS (percentage)					
Very low	Low	Medium	High	Very high	
0	2	34	54	10	
Practical familiarity with IFRS (percentage)					
Very low	Low	Medium	High	Very high	
2	17	59	15	7	

Table 3. Questionnaire’s status

Respondents	Number of Questionnaires Sent	Number of Questionnaires Received	Rate of Return (percent)	Response Structure
Banks	32	29	91	institutional respondents
Independent auditors of banks	18	14	78	institutional respondents
Central Bank supervision	12	12	100	institutional respondents
Other supervisory bodies (Association of a certified public accountant, Stock Exchange and Securities Organization, Justice Experts' Association)	4	3	75	institutional respondents
Audit organization	3	3	100	institutional respondents
Academic experts and researchers	50	45	90	Individual
Total	119	106	90	-

3.3. Fuzzy statistics analysis method using triangular fuzzy logic

Fuzzy sets theory, developed by Zadeh, is a powerful tool for modeling subjective and imprecise information in different contexts. Introduced by Zadeh, fuzzy numbers are a specific type of fuzzy set used to represent real world parameters when the exact values are not measurable due to a lack of knowledge or incomplete information (Seresht and Fayek, 2019). In general, a Triangular Fuzzy Number (TFN) ‘a’ can be written as $(a - \alpha, a, a + \beta)$, where α and β are the left and right spreads of a, respectively.

Definition 1. A triangular fuzzy number denoted by $A = \langle a, \alpha, \beta \rangle$ has the membership function:

$$\mu_A(x) = \begin{cases} 0 & x < a - \alpha \\ 1 - \frac{a-x}{\alpha} & a - \alpha \leq x < a \\ 1 & x = a \\ 1 - \frac{x-a}{\beta} & a < x \leq a + \beta \\ 0 & x > a + \beta \end{cases} \quad (1)$$

A TFN is symmetric if both spreads are equal, i.e., if $\alpha = \beta$ (Shyamal and Pal, 2007).

$\alpha = \beta$ and equal to "1" is considered in the specific analysis method of this research. The fuzzy number is defined as (x_{a-1}, x_a, x_{a+1}) and $0 \leq x \leq 10$ with a 95% confidence level. The value of the test statistics is assumed to be fuzzy data according to the null hypothesis and then placed in the hypothesis test space to perform the test and calculate the p-value. The ratio of the area of a common set between two triangles to the area of a triangle is assumed to be zero at the p-value. Also, like the classical hypotheses, if $p\text{-value} < \alpha$, the null hypothesis will be rejected, meaning the two sets have 95% certainty. The null hypothesis area, test statistic area, and common area are shown in Figure 1:

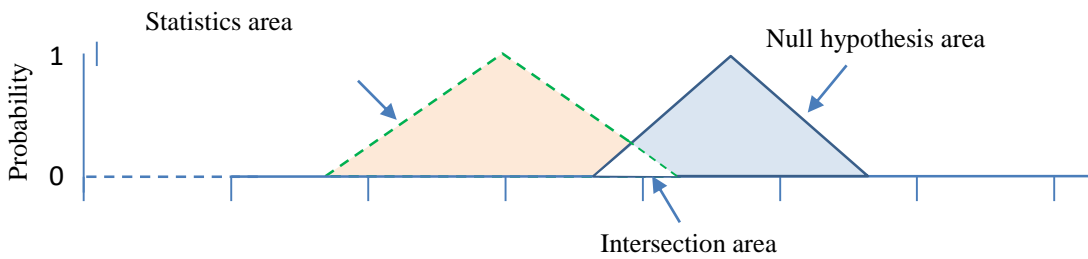


Figure 1. Null hypothesis area, test statistic area, and common area

After reviewing the appearance and logic of the questionnaires, we wrote and developed R codes, entered the data in a spreadsheet work page, and categorised them. This process goes through the following. Firstly, we calculated sufficient statistics related to each question as formula (2):

$$\bar{X}_{Fuzzy} = \left(n^{-1} \times \sum_{n=1}^n (x - 1), n^{-1} \times \sum_{n=1}^n (x), n^{-1} \times \sum_{n=1}^n (x + 1) \right) \quad (2)$$

Which is summarized as:

$$\bar{X}_{Fuzzy} = (\bar{X}_{a-1}, \bar{X}_a, \bar{X}_{a+1}) \quad (3)$$

We have to find the confidence interval at $(1 - \alpha)\%$, Due to performing the hypothesis test. So, we used t student distribution quintiles to achieve it. Then we defined and plotted a 95% confidence zone diagram to create a hypothesis test.

Null hypothesis: Membership in a triangular fuzzy number (7, 8, 9) is considered a general null hypothesis. The hypothesis test is in the form of the formula (4).

$$\begin{cases} H_0: \mu_a(x) \in (7,8,9) \\ H_1: \mu_a(x) \notin (7,8,9) \end{cases} \quad (4)$$

We seek to confirm H_0 the null hypothesis will be rejected if the P-value is less than 0.05. For example, in the sub-question entitled ‘Economic instability’ (all questions are listed in the Findings section), the null hypothesis is assumed that ‘economic instability’ has a very restricting effect on the implementation of ECL in Iranian banks and if the P-value is less than 0.05, this assumption will be rejected.

3.4. Technique for order preference by similarity to ideal solution (TOPSIS)

TOPSIS, developed by Hwang and Yoon in 1981, is a simple ranking method in conception and

application. The standard TOPSIS method attempts to choose alternatives simultaneously with the shortest distance from the positive ideal solution and the farthest distance from the negative-ideal solution. The positive ideal solution maximizes the benefit criteria and minimizes the cost criteria, whereas the negative ideal solution maximizes the cost criteria and minimizes the benefit criteria. TOPSIS makes full use of attribute information, provides a cardinal ranking of alternatives, and does not require attribute preferences to be independent (Behzadian et al., 2012). Therefore, after performing the statistical test, we applied the TOPSIS technique to rank all questions. We expect more effective questions to get a higher score and take lower ranks and rejected assumptions to get lower scores and take place at the bottom of the rankings.

4. Results

Question (1): Identifying the factors that affect the creation and increase of the non-performing loans ratio in Iranian banks.

Currently, the average amount of non-performing loans in the Iranian banking industry is higher than the global average. The purpose of asking this question is to identify the current situation. The high volume of NPLs is rooted in a series of structural problems that, if not addressed, the ECL model will not be implemented properly.

Question (2): Identify the complexity of IFRS requirements in the process of its implementation in Iranian banks

The purpose of designing this question is to investigate the complexity of IFRS requirements in order to its implementation in the Iranian banking industry. The results show that measuring the expected credit loss (ECL) is the most complex IFRS requirement for implementation in Iranian banks. The next complex requirement is fair value measurement, which plays a significant role in calculating the value of collateral in modeling the ECL. The next complex requirement is the measurement and disclosure of types of risks, which credit risk measurement is one of the important requirements to model the ECL.

Table 4. Factors affecting the creation and increase of NPLs ratio in Iranian banks

Question	Mean (S.D) ¹	p-value	result	TOPSIS Rank
The prolonged judicial process of receiving receivables and weakness of expertise in the judicial processing of bank debtors' cases	8.790 (1.250)	0.96	Accept	1
Loans obtained by related parties or political cronies	8.950 (1.330)	0.91	Accept	2
Obligations imposed by the government to grant loans	8.690 (1.330)	1	Accept	3
The inefficiency of risk management and customer validation processes in the bank	8.670 (1.440)	1	Accept	4
The inefficiency of receiving receivables mechanisms in banks	8.320 (1.280)	1	Accept	5
Lack of clear and accurate accountability system (at micro and macro levels)	8.430 (1.620)	1	Accept	6
Lack of independence of the board of directors of banks in granting loans and receiving receivables	8.080 (1.770)	1	Accept	7
Managerial instability in banks	8.060 (1.790)	1	Accept	8

¹ Standard deviation

Impact of non-transparent and unconventional shareholding structure on receiving receivables and accreditation processes	8.120 (1.800)	1	Accept	9
The inefficiency of control inspection and internal audit processes in banks	7.700 (1.680)	0.86	Accept	10
Bank management avoidance of disclosing the actual amount of NPLs	7.790 (2.000)	1	Accept	11
Weak central bank supervision in requiring banks to recognize and reserving in a timely and sized manner	7.450 (2.210)	0.7	Accept	12
Incomplete implementation of accrual accounting and identification of fictitious profits	7.470 (2.310)	0.72	Accept	13
Lack of a reward system (compensation) commensurate with the actual performance of managers	7.110 (2.230)	0.46	Accept	14
The negligent attitude of independent auditors and statutory inspectors	6.710 (2.380)	0.26	Accept	15
Lack of clear and accurate accountability system (at micro and macro levels)	8.430 (1.620)	1	Accept	6
Lack of independence of the board of directors of banks in granting loans and receiving receivables	8.080 (1.770)	1	Accept	7
Managerial instability in banks	8.060 (1.790)	1	Accept	8
Impact of non-transparent and unconventional shareholding structure on receiving receivables and accreditation processes	8.120 (1.800)	1	Accept	9
The inefficiency of control inspection and internal audit processes in banks	7.700 (1.680)	0.86	Accept	10
Bank management avoidance of disclosing the actual amount of NPLs	7.790 (2.000)	1	Accept	11
Weak central bank supervision in requiring banks to recognize and reserving in a timely and sized manner	7.450 (2.210)	0.7	Accept	12
Incomplete implementation of accrual accounting and identification of fictitious profits	7.47 (2.31)	0.72	Accept	13
Lack of a reward system (compensation) commensurate with the actual performance of managers	7.11 (2.23)	0.46	Accept	14
The negligent attitude of independent auditors and statutory inspectors	6.71 (2.38)	0.26	Accept	15

Table 5. The complexity of IFRS requirements in the process of its implementation in Iranian banks

Question	Mean (S.D)	P-value	Result	Rank
Measuring expected credit loss	8.960 (1.080)	0.880	Accept	1
Measuring fair value	9.110 (1.290)	0.830	Accept	2
Measuring and disclosure of types of risks	8.710 (1.230)	0.990	Accept	3
Deferred tax	7.780 (2.090)	1.000	Accept	4
Recognition and classification of financial assets and financial liabilities	7.600 (1.850)	0.810	Accept	5
Disclosure of financial assets and financial liabilities	7.480 (1.640)	0.670	Accept	6

Question (3): Factors restricting the implementation of Expected Credit Losses in the Iranian banking industry

This question aims to identify the factors that make the implementation of expected credit losses in the Iranian banking industry difficult. Some of these factors are directly related to the implementation of ECL, such as the 'Lack of effective risk management system in banks' and some indirectly. For example, 'Economic instability' leads to the unpredictability of economic variables and challenges the modeling of ECL.

Question (4): Investigating the deficit of banks' reserves after the implementation of IFRS

Question (4) examines the extent of banks' stock deficits concerning the forward-looking approach to IFRS. This question is open-ended and is analyzed based on descriptive statistics.

The question aims to determine how much the reserves will increase with the implementation of the ECL model.

Table 6. Factors restricting the implementation of ECL

Question	Mean (S.D)	P-value	Result	Rank
Lack of appropriate systems and processes for recognizing, classifying, and measuring per IFRS requirements	8.750 (1.280)	0.970	Accept	1
Lack of timely access to reliable information about statistics and economic variables (required by IFRS)	8.700 (1.360)	1.000	Accept	2
Characteristics of the business environment affected by the governmental and quasi-governmental economy of Iran	8.530 (1.640)	1.000	Accept	3
Lack of effective risk management system in banks (including processes, software systems, etc.)	8.460 (1.490)	1.000	Accept	4
Lack of reliable and comprehensive database in relation to the aggregate records of customers in the banking system	8.380 (1.480)	1.000	Accept	5
Weak knowledge and expertise of persons involved in the financial reporting process towards IFRS	8.370 (1.760)	1.000	Accept	6
Economic instability	8.380 (1.880)	1.000	Accept	7
Weak internal controls in line with IFRS requirements	8.110 (1.610)	1.000	Accept	8
Incompatibility of Iranian financial reporting culture with the levels of disclosure and transparency required in IFRS	7.960 (1.720)	1.000	Accept	9
Weak corporate governance	8.070 (1.870)	1.000	Accept	10
Lack of integration or inflexibility of current information technology systems of banks	8.160 (1.860)	1.000	Accept	11
Lack of effective internal audit system in banks (including processes, software systems, etc.)	8.030 (1.640)	1.000	Accept	12
Weak judgment of professionals in the financial reporting process	8.000 (1.830)	1.000	Accept	13
Insufficient capacity of Iranian tax laws and regulations	7.920 (2.070)	1.000	Accept	14
Differences between Iran's banking industry in terms of governing laws and regulations, and the business model with current international banking	8.040 (2.140)	1.000	Accept	15

Insufficient oversight capacity of the valuation profession	7.800 (2.230)	1.000	Accept	16
Weakness of financial reporting process operators in using English resources related to IFRS	7.600 (2.070)	0.800	Accept	17
Economic and banking sanctions	7.600 (2.550)	1.000	Accept	18
Inadequacy of regulatory rules and regulations (Central Bank, Stock Exchange and Securities Organization, valuation regulator)	7.420 (1.970)	0.650	Accept	19
High inflation	7.270 (2.480)	0.580	Accept	20
The insufficient supervisory capacity of the central bank	7.060 (2.100)	0.420	Accept	21
The non-transparent and unconventional shareholding structure of banks	7.060 (2.470)	0.450	Accept	22
The insufficient oversight capacity of the independent auditing profession	6.930 (2.290)	0.360	Accept	23

Table 7. Frequency deficit of banks' reserves after implementation of IFRS

Allowance Losses (in percent)	Frequency	Frequency (percent)
0-20	27	32
21-40	22	26
41-60	21	25
61-80	10	12
81-100	4	5

The results show the bank reserves deficit after implementing IFRS is, on average, 42%. Also, with 95% confidence, the average of all answers is in the range (33%-43%).

Question (5): Identifying the time required for IFRS 9 transitional arrangement

Question (5) examines the time needed to adjust banks' capital adequacy ratio. This question is also open-ended and is analyzed based on the frequency of repetition in the answers. This question aims to provide an approach to reduce the negative effects of implementing the ECL model. The losses usually increase and should be identified over time to prevent a sudden decrease in capital adequacy with the implementation of this model.

90% of the respondents believe the transition period to IFRS 9 should be 5 years or more to adjust the capital adequacy ratio. On average, this indicates that 5 years or more is more appropriate to adjust the capital adequacy ratio after implementing IFRS 9.

Table 8. Frequency of time required for IFRS 9 transitional arrangement

Duration of IFRS 9 transitional arrangement (Year)	Frequency (percent)
2	1
3	5
4	4
5	44
Over 5	46

5. Conclusion

According to our findings, the new expected credit loss provisioning in IFRS 9 will majorly change how Iranian banks manage and report their credit risks and reserves. The successful implementation of an ECL approach for impairment accounting will heavily depend on providing

the necessary infrastructures at the macro level, supervision, and banks.

The factors such as governmental and quasi-governmental economics, economic instability, and high inflation can challenge ECL modeling at the macro level. The effectiveness of the new standard will depend not only on how banks implement them but also on the contributions of the central bank, auditors, and other stakeholders. The central bank has a strong role in promoting the use of sound credit risk and provisioning practices by banks. The Supervisor should require banks to provide useful public disclosures about credit risk exposures, credit risk management, provisioning, and related matters to bring about a higher degree of transparency that facilitates market discipline and promotes market confidence. The role of auditors will also be critical. The auditors should achieve a greater understanding of IFRS 9 and have independence in their work. This could help improve the quality of bank auditor practices. The inadequacy of regulatory rules and regulations, the supervisory capacity of the central bank, and the oversight capacity of the independent auditing profession are among the factors that challenge the implementation of ECL in Iranian banks, as was found in this research.

Banks will require strong governance and internal controls to give all stakeholders confidence in the resulting financial information. Furthermore, the more judgmental, complex, and volatile nature of expected credit losses compared with incurred losses means that there will be a need for more intensive oversight following implementation. As found in this research, weak corporate governance, weak internal controls, and non-transparent and unconventional shareholding structure are prominent features of Iranian banking and are one of the restricting factors to implementing the ECL model.

The lack of historical credit risk data and the quality and availability of statistics and economic variables will make the transition to the new accounting standard more challenging. In particular, Iranian banks must ensure that expected credit loss models appropriately use forward-looking information. Implementing IFRS 9 will require collecting and tracking information not previously used to calculate reserves required by Iran's Money and Credit Council. An integral part of Iranian banks' implementation efforts should be towards meeting the new impairment disclosure requirements and providing investors with appropriately granular information on loss allowances and underlying assumptions across different asset classes; banks must complete a large multi-disciplinary project combining the skills of finance, risk, and IT.

The lack of infrastructure required for information technology is another critical issue. The systems must be integrated and flexible, able to track and archive data, perform complex ECL modeling calculations, and generate risk-related reports. Also, according to the research findings, it is predicted that the reserves will increase with the implementation of IFRS. The increase in reserves is likely due to three issues: First, the previous losses of most Iranian banks, which were sometimes hidden by incorrect classification of loans, are revealed; Secondly, the ECL approach also includes the future economic conditions, and there are no stable conditions and positive outlook in the Iranian economy; And third, the range of instruments for which reserves (impairment losses) are considered under IFRS 9 is wider than the current benchmark of banks. The question is, to what extent will the Iranian tax authority be receptive to these costs? Considering that the acceptance of banks' expenses by the tax authority has already been disputed in some cases¹, and as the losses increase, this conflict of interest seems to increase. The insufficient capacity of Iranian tax laws and regulations is one of the obstacles to implementing IFRS. In addition, in order to reduce the negative effects of implementing the ECL model due to the increase in reserves,

1- For example, we can refer to the non-acceptance of special and general reserves before 1393, when the tax organization accepted only two percent of the total reserve of loans.

supervision should make regulations to prevent a sudden decrease in capital adequacy. Therefore, a period of more than 5 years is appropriate to adjust the capital adequacy ratio after the implementation of IFRS 9. In addition, there are several fundamental problems in the Iranian banking industry regarding non-performing loans¹. Failure to solve these structural problems will be an important obstacle to implementing the ECL model.

After all, it seems that with the current infrastructure quality and Iranian banking structural problems, it is not wise to implement ECL without solving these challenges, careful planning and providing suitable conditions.

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1- The details of which are discussed in Question 1