



Tokenization of Real Estate and Identifying its Risks in Iran

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ABSTRACT

Real estate tokenization, as an important innovation in the field of blockchain technology, has been able to create a great revolution in the way real estate is invested and managed. This technology can increase access to the real estate market for retail investors, creating greater transparency and efficiency in real estate transactions. Accordingly, despite the challenges and limitations that this technology faces, its benefits are so great that a bright future is predicted for it. In this regard, the present study was conducted with the aim of identifying and ranking the risks of real estate tokenization in Iran. The present study was a fundamental and mixed study in terms of purpose, in the qualitative part, based on the grounded theory method was used, and in the quantitative part, the structural equation modeling method was used. The statistical population in the qualitative section of the panel of experts in real estate renovation in Iran, 10 of whom were selected as the sample based on the rule of theoretical saturation and by purposive method, and the statistical population in the quantitative section was academic experts, officials and executive actors, 200 of whom were selected as the sample based on Cochran's formula and available method. The data collection tool in the qualitative part was semi-structured interviews and in the quantitative part was a researcher-made questionnaire whose validity and reliability were confirmed. To analyze the data, MAXQDA 13.28 and Smart PLS 3.2 software were used. The indices of goodness of fit and $GOF=0.735$ showed that the developed model had a good fit with the experimental data. The results also showed that LLR ($\beta=0.749$), ECR ($\beta=0.688$), SOR ($\beta=0.651$), TCR ($\beta=0.617$), FER ($\beta=0.574$), IOR ($\beta=0.523$), CRR ($\beta=0.458$) and IR ($\beta=0.369$) are the most important risks of tokenization of real estate in Iran ($P<0.01$).

Keywords: Blockchain, Tokenization, Real Estate, Tokenizations' Risk



1. Introduction

In today's world, where both population and economic activities are increasingly concentrated in urban areas, the provision of housing in cities—particularly metropolises with better employment opportunities—is of critical importance. On a micro level, housing represents the largest component of household wealth; in fact, purchasing a home constitutes the most significant financial transaction for most families. Moreover, constructing a residential unit accounts for a substantial share of household expenditures, or in other words, the entire wealth of a household (Khodapanah Ajirloo, 2024). As such, examining the housing sector is vital from both economic and social perspectives. From an economic viewpoint, housing is an economic good, and investment in this sector directly impacts employment and national income. From a social standpoint, housing fulfills a basic human need. Therefore, analyzing developments in the housing sector and related policies can help clarify the current landscape and serve as guidance for stakeholders in the field (Aharon et al., 2024).

Empirical evidence indicates that in all major cities, especially Tehran, housing is an expensive commodity. Due to inflation and low household income, homeownership is unattainable for many segments of society—particularly during periods of price surges, when housing affordability drops drastically (Evaluation, 2023). According to statistics from the Central Bank of Iran, 43% of households in Tehran are tenants. If this trend continues, the society may move from a state of inadequate housing toward a more severe housing crisis in the coming years (Hazaveh & Niazi, 2023).

Given this context, constructing smaller and more affordable residential units could benefit developers and construction stakeholders in the near future. In recent years, the middle and lower-income segments of society have faced liquidity constraints, and housing units suitable to their financial capacity have been in short supply. According to statistics, Tehran province has approximately 490,000 vacant residential units, many of which are large luxury apartments in the northern districts of the city. However, real demand is concentrated in lower-priced areas for small-sized units. Consequently, the development of compact housing is recommended, not only to address the needs of low-income groups but also to create equilibrium in the housing market (Gholam Abolfazl, 2023).

For instance, the distribution of residential units transacted in Tehran by floor area in October 2019 indicates that the highest share of transactions—14.1%—was for units between 50 and 60 square meters. Additionally, in November 2022, approximately 8,000 residential units were transacted in Tehran, marking a 47.8% increase from the previous month and a 9.6% increase compared to the same month in the prior year. The average sale price per square meter of residential units in Tehran was 467 million IRR, reflecting a 6.8% increase from the previous month. Furthermore, data on housing transactions by building age shows that newly built units (up to 5 years old) accounted for the highest share—28.4% (Hazaveh & Niazi, 2023).

These developments illustrate that changes in social and economic conditions—such as the rise in single-person or dual-person households, preferences for modern living, and housing price inflation in large cities—have shifted market preferences. Large, high-priced, and under-equipped apartments no longer meet evolving societal needs. Hence, a renewed perspective on the housing construction industry and innovation in the development of residential complexes is essential (Evaluation, 2023).

Moreover, the housing construction sector is one of the most strategic industries and a longstanding focus of investment attraction in Iran. In recent years, price volatility and rising inflation—alongside the emergence of more attractive parallel markets—have led to the creation of alternative real estate investment models. Considering the importance of capital attraction for housing projects, it is necessary to enhance the appeal of real estate investment. Research indicates that the primary deterrents to investment in the housing market are high entry costs and the sector's low liquidity (Fakhimi Akmal, 2023).

Official statistics show that, on average, an Iranian household in Tehran, based on 2023 prices and annual savings rates, would need to wait approximately 150 years to purchase a home. In contrast, countries with successful housing policy models and inflation control maintain this waiting period below 15 years. This statistic pertains to first-time homebuyers; investment in real estate, which is traditionally considered one of the most stable and reliable asset classes, has become even more challenging due to high capital requirements and low liquidity. Given the inflationary trajectory of this market, homeownership remains an

elusive dream for a significant portion of society. Prolonged inequality in access to real estate assets not only exacerbates economic disparity but also contributes to deeper market stagnation (Khodapanah Ajirloo, 2024).

Amidst this backdrop, real estate tokenization—an innovation stemming from blockchain technology—has revolutionized investment and property management models. Real estate tokenization refers to the process of converting physical property assets into digital tokens stored on a blockchain (Swinkels, 2023). These tokens, as digital representations of assets, offer financial innovation with the potential to transform ownership and transfer mechanisms in capital markets (Krippmeyer et al., 2023). Rather than purchasing an entire property, investors can acquire fractional ownership by buying tokenized "shares" of a property. This approach significantly lowers investment barriers, allowing broader participation in the real estate market. These tokens represent partial ownership of the underlying asset and can be easily transferred or traded (Izzuddin & Rozilini, 2024).

Real estate tokenization has successfully expanded the investor base, improved market liquidity, and enabled investment advancement by reducing entry barriers, lowering transaction costs, and decentralizing market operations (Liu & Chen, 2025).

Despite its benefits, investing in tokenized assets can be complex. Real estate tokenization faces several challenges, including market volatility, cybersecurity threats, regulatory incompatibility, legal uncertainty, liquidity risks, counterparty risk, operational risk, and scalability issues (Itai et al., 2025). These challenges, along with the novelty of tokenization and the absence of successful domestic use cases, have limited its adoption among investors.

Accordingly, the development of tokenization initiatives requires a comprehensive risk identification and assessment framework to demonstrate the market's capacity to manage a wide array of potential risks. In light of its strategic significance for housing development in Iran, the present study was undertaken with the aim of identifying and ranking the key risks of real estate tokenization in Iran.

2. Theoretical Foundations and Literature Review

2-1. Real Estate Tokenization Risks

Today, tokenization—referring to the process of converting physical assets into digital formats—has emerged as a novel concept within blockchain technology and has garnered substantial interest across global industries (Bhatt, 2025). Tokenization involves the digitization of an asset by dividing it into smaller digital units called tokens. Each token or cryptocurrency represents ownership rights or a portion of the income associated with that asset, and can be traded in digital markets. Tokenization enhances liquidity by enabling fractional ownership and reducing entry barriers to investment in traditionally illiquid assets (Swinkels, 2023).

In the real estate sector, tokenization refers to dividing ownership of a property into smaller parts represented as digital tokens, which are stored and exchanged on a blockchain (Khodapanah Ajirloo, 2024). Real estate has long been regarded as an attractive asset class both in Iran and internationally. Its appeal stems from relatively low volatility, high returns, capital appreciation in development projects, and recurring income from property utilization.

Despite these benefits, the real estate market has high capital requirements, which restricts access for lower-income segments of society. Additionally, many banks, institutions, organizations, and corporations hold large and high-value properties that are difficult to liquidate or sell as whole units (Liu & Chen, 2025). In advanced economies, blockchain technology is increasingly employed to tokenize various asset types and facilitate their digital offering. Real estate tokenization has recently emerged as an innovative phenomenon that, through enabling crowdfunding and collective investment, provides a practical solution to these liquidity and accessibility challenges (Itai et al., 2025).

As previously mentioned, tokenization enables multiple investors—dozens or even hundreds—to purchase fractional shares of a property instead of a single investor acquiring the entire asset. This strategy significantly reduces barriers to entry and expands access to real estate investment for a broader range of participants. The acquired tokens represent fractional ownership in the underlying asset and can be traded or transferred quickly and easily (Izzuddin & Rozilini,

2024). Beyond lowering the minimum investment size, real estate tokenization successfully broadens the investor base and enhances market liquidity. By reducing entry barriers, transaction costs, and decentralizing market operations, tokenization holds the potential to advance housing sector investment outcomes (Liu & Chen, 2025).

Due to these advantages, real estate tokenization is increasingly attractive. By converting properties into digital tokens, this approach broadens accessibility to real estate investment, increases liquidity, enhances transaction transparency, and facilitates faster, cheaper, and more efficient trades (Fakhimi Akmal, 2023). Nevertheless, tokenizing real estate poses greater complexity than tokenizing homogeneous assets such as gold or diamonds. This complexity stems from the heterogeneous nature of real estate and the legal ownership rights associated with property-based tokens (Evaluation, 2023). Therefore, a cautious and well-informed approach is essential when investing in tokenized real estate.

According to the Deloitte framework—which offers a comprehensive approach to identifying, assessing, and managing risks associated with asset tokenization—the process involves a wide array of potential risks, including financial, operational, legal, and regulatory challenges (Pourghasemi et al., 2023):

- **Financial Risks:** Challenges related to taxation and property rights.
- **Operational Risks:** Issues arising from technical malfunctions, system performance failures, or human error.
- **Legal Risks:** Ambiguities due to the absence of clear and comprehensive regulatory frameworks.
- **Regulatory Risks:** Uncertainties in supervision and market oversight.

2-2. Review of Literature

Given the novelty and global expansion of real estate tokenization via blockchain, as well as the significant changes it brings, research in this area is more necessary than ever. Accordingly, several studies have examined the topic, and a brief review is presented below.

Liu and Chen (2025), in their study titled “*From Real Estate Financialization to Decentralization: A Comparative Review of REITs and Blockchain-Based*

Tokenization,” emphasize that as the real estate industry evolves from financialization to decentralization—driven by technological advancements—blockchain-based tokenization is emerging as a disruptive force and a compelling alternative to traditional real estate investment trusts (REITs).

Aharon et al. (2024), in their work “*The Close Link Between Real Estate Tokens and Listed Real Estate Stocks*,” show that unlike traditional emphasis on overall return distribution, real estate tokens and listed real estate equities exhibit the highest correlation in the tails of their distributions. As such, the benefits of diversification may be limited, necessitating robust risk management and targeted investment strategies to navigate these strong tail dependencies and mitigate potential losses.

Bergkamp (2024), in his research titled “*Tokenizing Real Estate Assets: Ownership Dispersion, Diversification, Liquidity, and Correlation with Economic Fundamentals and Crypto Market Sentiment*,” argues that a deeper understanding of tokenization requires analysis of its market impacts and investor behaviors. He finds that tokenized real estate assets tend to exhibit dispersed ownership structures, diverse investor profiles, and reduced liquidity per token compared to earlier studies. Furthermore, token prices generally mirror housing market trends and exhibit a negative correlation with overall crypto market sentiment.

Swinkels (2023), in a study titled “*Empirical Evidence on Ownership and Liquidity of Real Estate Tokens*,” found that real estate tokenization is primarily designed to enable dispersed ownership. On average, ownership of real estate changes approximately once per year, with turnover rates being higher on decentralized exchanges. Token prices tend to follow the housing price index, thus providing investors with a mechanism to economically align their portfolios with fluctuations in residential property prices.

Krippmeyer et al. (2023), in their research “*Security Token Offerings in Real Estate and the Secondary Market: Crypto Hype or Fundamental Drivers?*” demonstrated that tokens, through digital fractional ownership and low entry barriers, enable broader real estate ownership among small investors. However, investors currently lack diversified portfolios of real estate tokens. Their study identifies

key success factors for real estate security token offerings, including secondary market trading volume, daily aggregated capital flows, transaction costs, and crypto market sentiment.

Khodapanah Ajirloo (2024), in a review paper, explored the implications of asset tokenization for financial reporting and highlighted the necessity of developing new accounting standards. He emphasizes that to fully benefit from tokenized assets, regulators must provide clear guidelines, and there must be advancements in digital and educational infrastructures within the finance and accounting sectors. The study recommends that policymakers and regulatory bodies examine global experiences and develop localized frameworks to effectively integrate this emerging technology into financial systems.

Joshi and Choudhary (2022), in their article "Tokenizing Real Estate Assets Using Blockchain," note that real estate is one of the most profitable long-term investment avenues. They argue that the real estate sector stands to benefit significantly from blockchain technology due to existing inefficiencies such as lack of transparency, fraud, multiple intermediaries, unclear property rights, excessive paperwork, high litigation rates, and limited liquidity. Tokenization helps address these issues by improving liquidity, interoperability, and stakeholder collaboration while lowering investment barriers.

Pourghasemi, Rahimi, and Shakeri (2023), in a review study, assessed the benefits and challenges of financing infrastructure projects through tokenization. They argue that tokenization has emerged as an innovative financing tool for infrastructure development, offering more efficient and cost-effective solutions. It provides increased liquidity, transparency, and flexibility, and it can foster a more inclusive financing ecosystem, enabling smaller firms to access funding.

Fakhimi Akmal (2023) investigated asset token issuance on blockchain as an alternative to traditional securitization. With a focus on Article 9 of Iran's Resistance Economy framework, the study advocates for an aggressive strategic approach to asset tokenization. This method is positioned as a novel securitization mechanism aimed at financing, enhancing liquidity for illiquid assets, and achieving meaningful impact within the financial market while aligning with national economic resilience objectives.

Nekouhat (2023), in a comprehensive review, explored empirical blockchain applications in the real estate sector. The findings categorize the benefits of blockchain into four areas: land management, real estate transactions, tokenization, and property management. The study demonstrates that blockchain-based real estate tokenization reduces transaction times and supports verifiability, transparency, and automation—even in hybrid or small-scale contexts. Furthermore, blockchain can help mitigate fraud and increase trust and security compared to centralized digital systems.

Fazli (2022), in a study titled "Factors Influencing the Adoption of Blockchain-Based Real Estate Tokens by Banks," introduces real estate tokenization of surplus bank-owned properties as an innovative method for addressing banking sector challenges. The study highlights several features associated with the adoption of such tokens, including the high security and low risk of bank-issued real estate tokens, data transparency, 24/7 automated processes, availability of decentralized applications (dApps), irreversible transactions, the ability to invest in real estate with small capital, the possibility of earning monthly rental income from tokenized properties, high liquidity, information symmetry, and the traditional public interest in real estate investment.

However, the study also underscores several barriers to adoption, such as the absence of comprehensive legal and regulatory frameworks, investor distrust in blockchain technology, lack of necessary infrastructure within banks, regulatory uncertainty or the risk of intervention by government bodies, limited investor experience, unawareness among senior bank executives, entrenched institutional structures benefiting from the status quo, and the inability to rectify errors in blockchain transactions.

3. Research Methodology

This study is fundamental in nature and was conducted using a mixed-methods approach with an exploratory sequential design focused on instrument development. In the qualitative phase, grounded theory methodology was employed, while in the quantitative phase, structural equation modeling (SEM) using the partial least squares (PLS) technique was applied.

The qualitative study population consisted of a panel of real estate tokenization experts, including practitioners actively involved in real estate

tokenization projects and academic scholars familiar with the subject. To achieve a concise understanding of the participants' experiences, perceptions, and insights regarding factors influencing real estate tokenization in Iran, a qualitative research approach—specifically grounded theory—was used.

In grounded theory methodology, the process of data collection for model development requires consideration of various assumptions and theoretical sensitivities. One such consideration is Herbert Blumer's (1954) concept of "sensitizing concepts," which are preliminary ideas that guide inquiry and help shape the researcher's attention to specific issues relevant to the topic. These, combined with the researcher's theoretical sensitivity—defined as the ability to detect subtle clues and details in the data that support the interpretation of meaning (Corbin & Strauss, 2008)—formed the foundation of the qualitative inquiry.

Accordingly, the grounded theory approach was employed to explore experts' perceptions regarding the risks associated with real estate tokenization in Iran. In line with the study's objective, purposive sampling was used to select interview participants, and the sampling process continued until theoretical saturation was reached. Theoretical saturation refers to the point in data collection at which no new concepts or categories emerge and participant responses begin to converge, indicating that further data collection is unnecessary (Charmaz, 2006).

Based on the grounded theory approach, the perceptions of interviewed experts regarding the risks of real estate tokenization in Iran were explored. In line with the research objectives, purposive sampling was used to select the experts, and the process continued until theoretical saturation was achieved. Theoretical saturation refers to the point during data collection where no new categories or concepts emerge, and participant responses become repetitive, at which point data collection is ceased (Charmaz, 2006).

Textual data for this study were collected through in-depth semi-structured interviews. Of approximately 20 individuals approached for interviews, a total of 10 interviews were conducted. The interview process lasted about five months, largely due to the breadth of the subject matter and the busy schedules of the participants—most of whom were senior managers actively involved in real estate tokenization projects in

the country. Prior to each interview, the participants were provided with an outline of the questions via electronic communication and briefed on the study objectives. During the interviews, detailed explanations were provided and semi-open-ended questions were used to guide the discussion. Interviews were conducted individually, with each session lasting approximately 30 to 45 minutes.

The credibility of the interviews was ensured through the rigor of the research team, appropriateness of tools, selection of suitable participants, and adequate sample size until reaching saturation. To evaluate the validity of the qualitative findings, standard qualitative research criteria were applied, including credibility, transferability, dependability, and confirmability. Data reliability was assessed using the saturation rule (Khanifar & Moslemi, 2023), where the foundation of qualitative research relies on the researcher's commitment to precision. According to the initial definition of theoretical saturation, it reflects the completeness of category descriptions. Thus, the point of saturation confirms the reliability of the grounded theory approach by demonstrating data and concept repetition (Danaeefard & Alvani, 2019).

Following the saturation point, all interview transcripts were transcribed verbatim. Special attention was paid to capturing non-verbal cues, tones, and emotions. The large body of text-based data was then standardized and categorized to allow for systematic analysis. Grounded theory analysis was subsequently performed.

In grounded theory methodology, data analysis proceeds through three stages: open coding, axial coding, and selective coding. In the first stage, open coding was performed carefully to extract primary concepts. During axial (focused) coding, similar concepts were grouped under common categories. Once open coding was complete, axial coding began by using constant comparison methods to identify relationships and dimensions of each category. In the final stage, selective coding was used to determine the core category. The software MAXQDA (version 13/28) was used for text analysis. The output of this phase was the development of a model for the risks of real estate tokenization in Iran, whose validity was assessed in the quantitative phase.

Based on the interview analysis, a questionnaire was designed to measure the validity and relevance of the identified components of the risk model using a

five-point Likert scale. The draft questionnaire was reviewed for validity and reliability by subject-matter experts. Content Validity Ratio (CVR = 0.82) and Content Validity Index (CVI = 1.00) were calculated using the Delphi method. Upon validation, the final version of the questionnaire was prepared in electronic form and distributed to the study sample. Responses were collected electronically.

The quantitative population included all educational, operational, and managerial staff at companies and institutions active in the field of real estate tokenization. Based on Cochran's formula, a sample of 174 individuals was determined for data collection. Also, considering the considerations related to determining the sample size in structural equation modeling, including 5 to 10 times the number of variables of the sample size (Kline, 2015). To enhance the response rate, a total of 200 questionnaires were distributed among the selected participants, and convenience sampling was employed. The quantitative data analysis process began with the collection of responses through a researcher-developed questionnaire. Collected data were then entered into IBM SPSS Statistics and analyzed using both SPSS and Smart PLS software.

Descriptive statistics and inferential statistical methods were applied. Specifically, Structural Equation Modeling (SEM) using the Partial Least Squares (PLS) approach was employed for inferential analysis. The final output of this stage was a validated model of real estate tokenization risks in Iran, in which the weights and rankings of the model's dimensions and components were systematically determined.

4. Research Findings

4-1. Qualitative Findings: Identification of Real Estate Tokenization Risks in Iran

The grounded theory analysis was conducted through three types of coding—open, axial, and selective—based on data obtained from interviews, observations, and document reviews. Open coding was performed in three stages, leading to the identification of concepts and categories, along with their characteristics and scope. Axial coding followed, during which, based on the study's subject, a central phenomenon was identified from the extracted categories.

- **Open Coding:** In this phase, segments of text were labeled using codes that simultaneously

summarize and describe each data fragment. Essentially, open coding refers to the process of breaking down raw data and assigning initial concepts to it (Charmaz, 2006).

- **Axial Coding:** This step involves linking categories and subcategories (Corbin & Strauss, 2008). It specifies the content and dimensions of each category and reconstructs the data that had been broken apart during open coding (Charmaz, 2006).
- **Selective Coding:** The final stage of coding, where the categories previously developed are theoretically saturated and logically organized based on relationships established in earlier coding stages. This step finalizes the theorization process by offering an abstract explanation of the studied phenomenon, involving the integration and refinement of the emergent theory (Creswell, 2005). The output of this stage is a model derived from grounded theory analysis based on expert interview data.

The present study aims to identify the key risks associated with real estate tokenization in Iran by extracting principal categories and influential factors derived from expert interviews. As such, the identified risks represent the core dimensions of the grounded theory model proposed in this research. The extracted codes related to these risks are presented in Table 1, and the proposed risk model of real estate tokenization in Iran is illustrated in Figure 1.

To assess the validity and reliability of the conducted coding process, following the completion of the initial coding by the primary researcher, three interviews were randomly selected and re-coded by an independent coder who was not part of the research team. To ensure that the researcher's personal interpretations did not influence the data analysis, the re-coding was performed using software tools. After the re-coding was completed, the coded interviews were compared, and Cohen's Kappa coefficient was calculated to measure inter-coder reliability. The results of the agreement between the two coders are presented in Table 2.

The findings presented in Table 2 indicate that the agreement coefficient between the two coders in each of the three interviews, as well as the overall average across all interviews, exceeded 0.70. Therefore, the reliability and trustworthiness of the coding process were confirmed.

Table (1): Open and Axial Coding of Real Estate Tokenization Risks in Iran

Dimensions	Factors	Indicators
Lawful & Legal Risks (LLR)	Lawful Risks (LaR)	A ₅₇ , A ₅₈ , A ₅₉ , A ₆₀ , B ₄₈ , C ₃₉ , C ₄₄ , D ₄₂ , D ₄₃ , D ₄₄ , E ₄₁ , F ₃₀ , F ₃₁ , G ₂₉ , G ₃₀ , G ₃₁ , G ₃₂ , H ₂₇ , I ₃₂ , I ₄₄ , I ₄₅ , I ₄₆ .
	Legal Risks (LeR)	A ₅₆ , A ₆₁ , A ₆₂ , A ₆₃ , B ₄₉ , C ₄₃ , D ₄₅ , E ₄₂ , F ₃₆ , F ₃₇ , G ₃₃ , G ₃₄ , H ₂₈ , H ₂₉ , H ₃₀ , I ₃₃ , I ₄₁ , I ₄₂ , I ₄₃ .
	Jurisprudential Risks (JuR)	A ₆₄ , E ₄₃ , F ₃₅ , G ₃₅ , I ₄₀ .
Institutional & Organizational Risks (IOR)	Management Risks (MaR)	A ₆₅ , A ₆₆ , A ₆₇ , F ₃₃ , F ₃₄ , G ₃₆ , G ₃₇ .
	Supervision Risks (SuR)	A ₆₈ , A ₆₉ , A ₇₀ , C ₃₄ , F ₃₁ , H ₃₂ , H ₄₄ , I ₃₈ , I ₃₉ , J ₅₉ , J ₆₀ .
	Coordination Risks (CoR)	A ₇₁ , A ₇₂ , F ₃₂ , I ₂₉ , I ₃₁ , J ₅₈ .
Educational & Cultural Risks (ECR)	Cultural Risks (CuR)	A ₇₃ , A ₇₄ , A ₇₅ , A ₇₆ , D ₄₇ , F ₃₈ , F ₃₉ , G ₃₈ , G ₃₉ , H ₄₃ , J ₃₀ , J ₃₁ , J ₃₂ , J ₃₃ , J ₃₄ , J ₃₅ , J ₅₆ , J ₅₇ .
	Educational Risks (EdR)	A ₇₇ , A ₇₈ , A ₇₉ , B ₅₀ , D ₄₆ , G ₄₀ , G ₄₁ , G ₄₂ , H ₄₁ , H ₄₂ , I ₃₄ , J ₅₃ , J ₅₄ , J ₅₅ .
Finance & Economic Risks (FER)	Economic Risks (EcR)	A ₈₀ , A ₈₁ , G ₄₃ , J ₅₂ .
	Liquidity Risks (LiR)	A ₈₂ , A ₈₃ , A ₈₄ , E ₄₀ , F ₄₀ , G ₂₇ , H ₃₉ .
	Tax Risks (TaR)	A ₈₅ , A ₈₆ , E ₃₉ , F ₄₁ , G ₂₅ , G ₂₆ , H ₄₀ , I ₃₀ , J ₅₁ .
Strategy & Operational Risks (SOR)	Infrastructure Risks (InR)	A ₈₇ , A ₈₈ , C ₄₀ , C ₄₁ , C ₄₂ , D ₄₈ , E ₃₈ , G ₂₅ , H ₃₃ , J ₄₈ , J ₄₉ , J ₅₀ .
	Strategy Risks (StR)	A ₈₉ , A ₉₁ , B ₄₇ , C ₃₈ , C ₄₆ , D ₄₉ , D ₅₀ , G ₂₄ , H ₃₇ , H ₃₈ , I ₅₁ , J ₄₆ , J ₄₇ .
Conformance & Regulation Risk (CRR)	Non-Conformance Risks (NCR)	A ₉₂ , A ₉₃ , D ₄₀ , D ₄₁ , E ₃₇ .
	Regulation Risks (ReR)	A ₉₄ , B ₅₁ , C ₄₅ , G ₂₈ , J ₃₆ , J ₄₅ .
Technical & Cyber Risks (TCR)	Technology Risks (TeR)	A ₉₅ , A ₉₆ , A ₉₇ , B ₄₂ , C ₃₆ , E ₃₅ , E ₃₆ , F ₄₄ , H ₃₁ , H ₃₆ , I ₃₇ , I ₅₂ , J ₄₃ , J ₄₄ , K ₄₈ .
	Security Risks (SeR)	B ₄₃ , B ₄₄ , B ₄₆ , C ₃₅ , E ₃₃ , E ₃₄ , F ₄₂ , F ₄₃ , H ₃₅ , I ₃₅ , I ₃₆ , I ₄₈ , I ₄₉ , I ₅₀ , J ₃₉ , J ₄₀ , J ₄₁ , J ₄₂ .
International Risks (IR)	Embargo Risks (EmR)	B ₅₂ , C ₄₈ , E ₃₀ , E ₃₁ , E ₃₂ , I ₄₇ .
	Exchange Rate Fluctuations Risks (ERFR)	B ₄₅ , C ₃₇ , C ₄₇ , F ₄₅ , H ₃₄ , J ₃₇ , J ₃₈ .

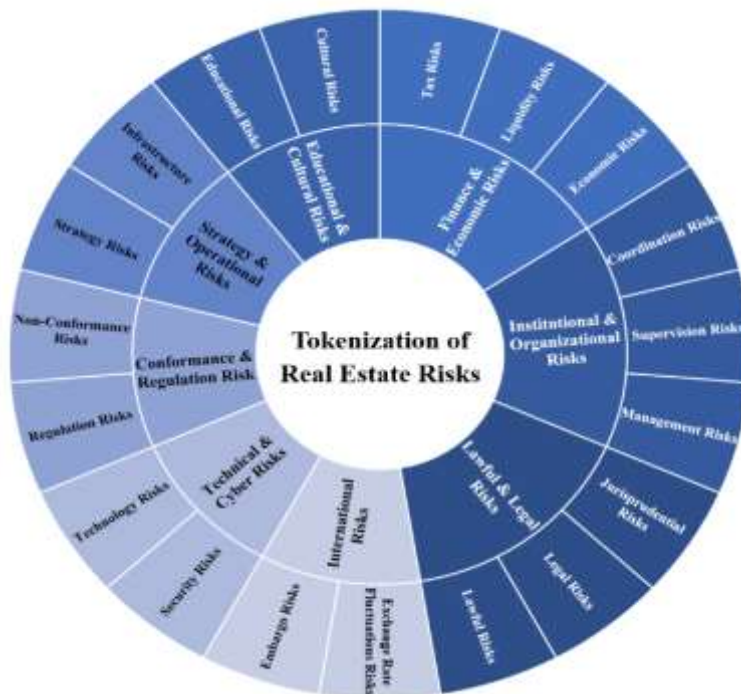


Fig (1): The Model of Real Estate Tokenization Risks in Iran

Table (2): Kappa's Coefficient of Concordance

No.	Number of First Codes	Number of Second Codes	Number of Matched Codes	Kappa's Coefficient of Concordance
2	93	85	83	0.757
5	71	73	70	0.869
9	99	91	91	0.942
Mean	0.856			

4-2. Quantitative Findings; Validation of the Developed Model

As is well known, individual characteristics and contextual factors—as influencing variables—affect people's perceptions, cognitions, expectations, and mental frameworks. Therefore, examining the demographic characteristics of the participants studied is essential. Accordingly, Table 3 presents a demographic description of the sample under investigation.

Findings from Table 3 indicate that among the 200 participants surveyed in the quantitative section, 72% were male and 28% female; 38% were single and 62% married. In terms of age, 27% were under 40 years old, 43% were between 41 and 50, and 30% were over 51. Regarding educational attainment, 22% held a bachelor's degree or lower, 45% held a master's degree, and 33% held a Ph.D. or higher. Academic backgrounds were distributed as follows: 12% in fields related to architecture, civil engineering, urban planning, and urban management; 42% in economics, management, and accounting; 32% in computer science and information technology; and 14% in other

disciplines. As for professional experience in the field, 45% had less than 10 years, 37% had between 11 and 20 years, and 18% had more than 21 years. In terms of organizational affiliation, 9% were affiliated with academic institutions, 73% with real estate tokenization companies or institutions, and 18% with government agencies involved in real estate tokenization. The mean, standard deviation, and correlation coefficients of the model variables are presented in Table 4.

Findings from Table 4 revealed a statistically significant relationship between the identified risks and real estate tokens ($P < 0.01$). The strongest correlation was observed between legal and regulatory risks and real estate tokens ($r = 0.572$), while the weakest correlation was between international risks and real estate tokens ($r = 0.236$). All identified risks showed a positive (direct) relationship with real estate tokenization, indicating that the reduction of any specific risk would contribute to mitigating the challenges associated with real estate tokenization in Iran.

Table (3): Frequency Table (n=200)

Demographic		Frequency	Percent	Demographic		Frequency	Percent
Gender	Male	24	12%	Major	Architecture, Civil & Urban Planning	144	72%
	Female	84	42%		Economics, Management & Accounting	56	28%
Marital Status	Single	64	32%		Computer & Information Technology	76	38%
	Married	28	14%		Others	124	62%
Age	<40	90	45%	Work History	<10	54	27%
	41 to 50	74	37%		11 to 20	86	43%
	51>	36	18%		21>	60	30%
Educational Level	<Bachelor	18	9%	Field	University	44	22%
	Master	146	73%		Tokenization Company	90	45%
	Ph.D>	36	18%		Government organizations	66	33%

Table (4): Descriptive Statistics (n=200)

Variable	Mean	Std.Dev	LLR	IDR	ECR	FER	SOR	CRR	TCR	IR	TRER
LLR	4.61	0.784	-								
IOR	3.42	0.941	0.371**	-							
ECR	3.24	0.654	0.159*	0.216**	-						
FER	3.62	0.628	0.263*	0.195*	0.126*	-					
SOR	3.71	0.844	0.325**	0.256**	0.149*	0.221*	-				
CRR	3.12	0.753	0.181*	0.345**	0.157*	0.178*	0.246*	-			
TCR	4.48	0.847	0.103*	0.163*	0.283**	0.234**	0.222*	0.351**	-		
IR	2.51	0.792	0.128*	0.219*	0.168*	0.145*	0.198*	0.251*	0.344**	-	
TRER	3.56	0.806	0.572**	0.348**	0.439**	0.366**	0.411**	0.325**	0.395**	0.236**	-

* P<0.05, ** P<0.01

Furthermore, as is well established, two statistical indicators are commonly used to assess the suitability of data for structural equation modeling: the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity. In this study, the KMO value was 0.769, which exceeds the acceptable threshold of 0.7, confirming that the sample size is adequate for conducting structural equation modeling. In addition, the significance level for Bartlett’s test was found to be less than 0.001 ($P < 0.001$), indicating that the correlation matrix is not an identity matrix and that significant correlations exist among the items. Therefore, the dataset is deemed appropriate for structural equation modeling.

The partial least squares structural equation modeling (PLS-SEM) approach began with an assessment of potential multicollinearity among predictor constructs in the structural model regressions. This was followed by evaluating measurement model indices, significance testing, and path coefficient analysis. Finally, the model’s explanatory and predictive power was assessed. The indices for multicollinearity, validity, reliability, and model goodness-of-fit are presented in Table 5.

The results presented in Table 5 indicate that all pathways meet the desired thresholds for multicollinearity indices, measurement model fit indices, structural model fit indices, and overall model fit indices. Accordingly, the model’s reliability, validity, and predictive power are confirmed. Based on the significance levels and path coefficients, the strength and direction of relationships among the model variables can be meaningfully interpreted. A summary of the model’s fit statistics is provided in Table 6.

The findings of Table 6 confirm the direct effect of the identified risks on real estate tokenization ($P < 0.01$). Among them, legal and regulatory risks exhibit the highest impact with a standardized coefficient of ($\beta = 0.749$), followed by educational and cultural risks ($\beta = 0.688$), strategic and operational risks ($\beta = 0.651$), technical and cyber risks ($\beta = 0.617$), financial and economic risks ($\beta = 0.574$), organizational and institutional risks ($\beta = 0.523$), compliance and regulatory risks ($\beta = 0.458$), and international risks ($\beta = 0.369$), respectively. The fitted model based on standardized path coefficients and significance values is presented in Figure 2.

Table (5): Indices of fitted Model (n=200)

Variable	VIF	AVE	α	CR	RHO	R ²	Q ²	RMSE	SRMR
LLR	1.389	0.651	0.734	0.800	0.784	-	-	-	-
IOR	3.235	0.635	0.833	0.720	0.745	-	-	-	-
ECR	2.155	0.604	0.756	0.732	0.725	-	-	-	-
FER	2.268	0.641	0.839	0.765	0.728	-	-	-	-
SOR	3.167	0.522	0.874	0.720	0.781	-	-	-	-
CRR	3.133	0.582	0.765	0.796	0.723	-	-	-	-
TCR	1.230	0.532	0.922	0.832	0.837	-	-	-	-
IR	1.478	0.594	0.879	0.773	0.700	-	-	-	-
TRER	-	0.624	0.832	0.740	0.707	0.743	0.467	0.053	0.044

GOF = 0.735

Table (6): Unstandardized and standardized coefficients, test statistics and Significance level (n=200)

Variable	Standardized Coefficients	t Statistics	Signification Level
LLR → TRER	0.749**	14.518	0.000
IOR → TRER	0.523**	12.261	0.000
ECR → TRER	0.688**	13.992	0.000
FER → TRER	0.574**	12.674	0.000
SOR → TRER	0.651**	13.715	0.000
CRR → TRER	0.458**	11.586	0.000
TCR → TRER	0.617**	13.359	0.000
IR → TRER	0.369**	10.531	0.000

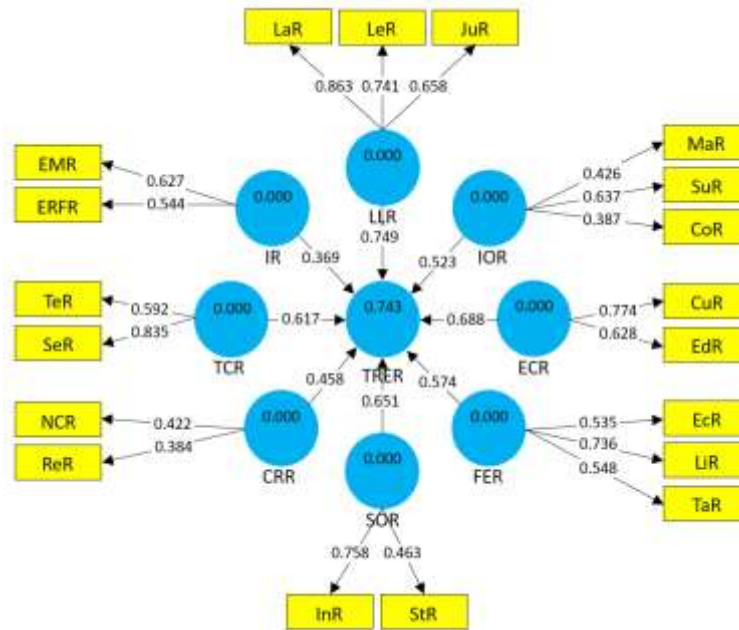


Fig (2): A Conceptual Model Fitted Based on Empirical Data

The findings from Table 6 and Figure 2 indicate that the empirical data demonstrate a good fit with the theoretical model derived from grounded theory. Therefore, the validity of the model is quantitatively confirmed. Based on this, the significance coefficients (i.e., the weights of dimensions and components) and their impact rankings are presented in Table 7.

The findings from Table 7 indicate that within the "Legal and Regulatory Risks" dimension, the highest weights and rankings correspond to legal risks, regulatory risks, and Shariah-compliance risks, respectively. In the "Organizational and Institutional Risks" dimension, the highest weights and rankings are related to supervisory risks, management risks, and participation and coordination risks. Within the "Educational and Cultural Risks" dimension, cultural

risks and educational risks held the highest weights and ranks, respectively. In the "Financial and Economic Risks" dimension, liquidity risks, taxation risks, and economic risks ranked highest in order. Regarding the "Strategic and Operational Risks" dimension, the most significant were infrastructural risks and strategic risks. In the "Compliance and Regulatory Risks" category, the top-ranked subcomponents were non-compliance risks and regulatory risks. For the "Technical and Cyber Risks" dimension, security risks and technology risks had the greatest weights and importance. Lastly, in the "International Risks" category, the most influential risks were related to sanctions and foreign exchange rate volatility, respectively.

Table (7): Unstandardized and standardized coefficients, test statistics and Significance level (n=200)

Dimensions	Factors	Factors		Dimensions	
		Weight	Rank	Weight	Rank
LLR	LaR	0.863	1	0.749	1
	LeR	0.741	2		
	JuR	0.658	3		
IOR	MaR	0.426	2	0.523	6
	SuR	0.637	1		
	CoR	0.378	3		
ECR	CuR	0.774	1	0.688	2
	EducEdR	0.628	2		
FER	EcR	0.535	3	0.574	5
	LiR	0.736	1		
	TaR	0.548	2		
SOR	InR	0.758	1	0.651	3
	StR	0.463	2		
CRR	NCR	0.422	1	0.458	7
	ReR	0.384	2		
TCR	TeR	0.592	2	0.617	4
	SeR	0.835	1		
IR	EmR	0.627	1	0.369	8
	ERFR	0.544	2		

5. Discussion and Conclusion

Real estate is considered one of the most attractive asset classes for investment, both globally and in Iran. In 2022, the global real estate market was valued at approximately USD 613 trillion, and it is projected to reach USD 637 trillion by the end of 2024, maintaining its position as one of the world's largest markets (Bergkamp, 2024). According to a recent report, the value of tokenized real estate assets on blockchain networks could exceed USD 4 trillion over the next decade, potentially offering greater opportunities for fractional ownership to investors. Deloitte's Financial Services Center forecasts that the value of tokenized real estate will surpass USD 4 trillion by 2035, compared to less than USD 300 billion in 2024. The report, published on April 24, estimates a compound annual growth rate (CAGR) of over 27 percent. This surge in tokenized assets is expected to stem from the inherent advantages of blockchain-based real estate and a structural transformation in property ownership models (Batt, 2025).

One of the main reasons behind the attractiveness of real estate investment is its relative security and higher returns compared to other investment classes. However, due to the significant increase in property

prices in recent years and the lack of sufficient liquidity, traditional investment models in real estate have become increasingly inaccessible to the general public in Iran. On the other hand, banks, institutions, and corporations often hold large and high-value real estate assets that are not easily liquidated as a whole (Hezaveh & Niazi, 2023). According to Article 16 of the Law on Removing Barriers to Competitive Production and Enhancing the Financial System, all banks are required to annually divest at least 33% of their surplus real estate holdings. However, this mandate has not been effectively implemented thus far (Gholam Abolfazl, 2023).

As previously discussed, the housing sector in Iran—one of the most critical components of the national economy—has consistently faced challenges related to financing. High property prices, the difficulty of obtaining bank loans, and the mismatch between government-backed facilities and the actual needs of applicants are among the persistent issues in this sector (Arzeshyabi, 2023). Under such conditions, identifying innovative and effective methods for financing the housing sector has become a pressing necessity.

Meanwhile, Iran's economy has long struggled with macro-level challenges such as liquidity shortages

and the immobility of assets. These issues have posed significant obstacles to economic development and vitality. A substantial portion of the country's wealth is tied up in real estate assets that lack sufficient liquidity, effectively rendering them as dormant capital and holding the nation's wealth hostage (Khodapanah Ajirloo, 2024).

In response, recent decades have seen the rise of modern financial mechanisms such as crowdfunding, Real Estate Investment Trusts (REITs), and tokenization, which have enabled the participation of small-scale investors in real estate markets. These mechanisms not only empower individuals to invest in real estate and benefit from the associated returns, but also channel significant volumes of capital into the sector through the aggregation of small investments, thereby strengthening the real estate market (Kripmeier et al., 2023).

Based on this, a novel initiative called "Real Estate Tokenization" has emerged on the blockchain as a potential solution for unlocking frozen real estate assets. This initiative is designed to mobilize dormant assets, especially surplus properties held by banks, by converting them into liquid, fractionalized, digital tokens. The goal is to attract dispersed capital, revive the stagnant housing market, and stimulate economic growth (Yousef, Esaf, & Demir, 2024). In this model, properties are fractionalized into digital tokens, securely recorded on a transparent blockchain platform, and made tradable in digital marketplaces, enabling low-barrier property investment for the general public. This approach represents a significant step forward in resolving capital stagnation in the housing sector and activating underutilized bank assets.

However, real estate-backed token issuance currently falls outside the purview of Iran's Central Bank, and is instead subject to the laws and regulations of the Securities and Exchange Organization (SEO). In other words, there is still a lack of established and enforceable legislation in this domain. Despite the complexities involved, regulatory bodies must come to terms with the transformative impact of tokenization on today's markets and economy. Continuing to operate in a legal vacuum will only exacerbate violations, limit the effectiveness of modern tools, and lead to irreparable damages (Fakhimi Akmal, 2023).

Based on the findings of this study, the lack of comprehensive and transparent legal frameworks,

overlapping and ambiguous laws regarding real estate tokenization, and unclear legal status of property tokens in judicial and governmental institutions are among the main barriers to investor acceptance of real estate tokenization in Iran. Legal uncertainty surrounding dispute resolution procedures and jurisdiction, along with jurisprudential and religious concerns raised by the SEO's Shariah Council and religious authorities, further undermine investor confidence.

Other critical barriers include cybersecurity risks, fears of hacking or data breaches, and the lack of secure platforms to guarantee ownership authentication and transaction integrity, all of which have eroded trust in this investment method. Additionally, structural weaknesses such as inadequate ICT infrastructure, limited access to secure and stable high-speed internet, and the absence of a comprehensive fintech ecosystem and related services hinder the growth of real estate tokenization in Iran.

Another key barrier facing real estate tokenization in Iran is the limited awareness of this emerging concept among a large segment of investors, coupled with the traditional nature of Iran's real estate market, investors' preference for tangible assets, and the reluctance of financial institutions to embrace innovative technologies and smart transactions. Moreover, the misalignment between current legal and regulatory frameworks and the nature of tokenized real estate, along with the lack of a clear mechanism for the official registration of property token ownership, further impedes the development of this domain. The absence of successful domestic precedents and implementation experience adds to the complexity of deploying this technology and contributes to investor distrust.

Finally, the presence of international sanctions, which have significantly hindered foreign exchange transactions and token operations on secure global platforms, presents yet another obstacle. These sanctions have also triggered a decline in the value of the national currency due to exchange rate volatility, resulting in macroeconomic instability and diminishing the interest of foreign investors in entering domestic markets.

In light of these challenges, the broad implementation of real estate tokenization in Iran requires serious commitment from policymakers to establish clear and transparent regulations on digital

property ownership, designate a centralized judicial authority for monitoring activities and resolving disputes in this field, and develop secure domestic platforms alongside national standards for data and transaction protection. Additionally, achieving universal access to reliable high-speed internet, addressing taxation complexities, and introducing a unified tax system for property tokens are essential. Public awareness-raising and educational initiatives on real estate tokenization and its benefits must be pursued. Furthermore, coordination among key regulatory bodies—including the Securities and Exchange Organization, Central Bank, Ministry of Roads and Urban Development, Registry Organization, and national security agencies—is necessary, along with active support from the government and media to foster trust and encourage participation in this innovative financial model.

Since no research has been conducted so far focusing on the development of the real estate tokenization model and its related risks, it is not possible to compare this result with the research background. At the same time, the results of the present study are in line with the results of studies that have investigated the factors affecting the tokenization of real estate and the risks and challenges related to digital assets. Among them, we can refer to the researches of Itai et al (2025) that showed tokenization is a tool in the face of financial market inefficiencies, Bate (2025) that showed asset tokenization has great potential to transform trading processes and redefine value chains, Tanveer et al (2025) that showed tokenizing assets can increase liquidity, democratize access to investments, and reduce transaction costs., Wu & Yueh (2025) that showed Legal and infrastructural risks as the most important barriers to tokenization, Chan et al (2024) that showed financial risk management is the solution for the development of tokenization, Roy, Dubey & Tiwary (2024) that showed operational risks are the main obstacle to tokenization, Sobolev & Kallinterakis (2024) that showed regulatory risks are the biggest challenge for cryptocurrency investors, Aghamohammadi et al (2023) that showed tokenizing assets can increase liquidity, democratize access to investments, and reduce transaction costs., Cheraghi (2023) that showed the most common type of token fraud is the sale of fake tokens, Iqbal, Zahid & Koutmos (2023) that showed cryptocurrencies show high volatility

compared to other conventional asset classes, and as a result, they have a bearish risk, Pourghasemi, Rahimi and Shakeri (2023) that showed tokenization can provide several benefits for financing infrastructure projects, including increased liquidity, transparency, and flexibility, Bruhn & Ernst (2022) that showed financial Risks Individual Cryptocurrencies Are the Major Challenge of Digital Investing, Jiménez, Mora-Valencia & Perote (2022) that showed value at risk, expected deficit, and median deficit are among the risks of investing in cryptocurrencies, Aghamohammadi et al (2020) that showed weakness in mining and lack of the necessary infrastructure are among the main obstacles to tokenization, Chit Saz and Bidgoli (2020) that showed the emergence of digital financial markets in Iran has caused it to be unknown and unwelcome and Chit Saz et al (2019) that showed the lack of successful local projects of tokenization and the weakness of judicial institutions in dealing with legal claims are among the main problems of tokenization in Iran.

5-1. Study limitations

One of the limitations of the present study is the impossibility of investigating and controlling the effect of other variables such as sanctions, market instability, fluctuations in exchange rates and cryptocurrencies, etc. It can affect the central phenomenon of "real estate tokenization in Iran" and its lack of review and control can lead to limitations in the interpretation and generalization of the results. Considering the insignificance of the research issue at the community level, which led to the neglect and lack of cooperation of real estate tokenization activists with the researcher regarding conducting interviews and filling out questionnaires, and led to the prolongation of the research implementation time, is another limitation of the present study. In addition, the research group is one of the activists in the field of real estate tokenization and it is feared that their answers will be accompanied by bias. Also, the present study was conducted among the executive activists of Iranian real estate tokenization companies in 2024-2025, and the results of this study should be generalized to other times and places with caution, in other words, the results of the research cannot be generalized beyond Iran. The last limitation is related to the evolving nature of blockchain technology and its related laws,

which makes the results of the research valid only in the period under study.

5-2. Study Suggestions

According to the results of the present study, in order to reduce the risks and increase the acceptance of real estate tokenization plans in Iran, it is recommended to pay attention to and act on the following set of suggestions:

- Considering the importance of "legal and legal risks" in real estate tokenization in Iran, the efforts of the authorities and stakeholders regarding (1) determining a specialized judicial system to supervise real estate tokenization in Iran as well as dealing with legal claims in the field of real estate tokenization in Iran, and (2) enacting comprehensive and transparent laws for real estate tokenization and removing legal ambiguities in the field of real estate tokenization in Iran. (3) Diversification of financial instruments and legal formulation to support digital markets and smart transactions, (4) Formulation of regulations and guidelines in support of the legislature and the stock exchange organization for real estate tokenization projects, (5) Cooperation with judicial authorities and courts to receive legal services and advice in order to take measures to protect the rights of the investor and guarantee his ownership, (6) Removal of doubts and differences of jurisprudential opinions. Regarding the religious validity of real estate tokens and the approval of the legitimacy of real estate tokenization plans by the Jurisprudential Council and the Stock Exchange Organization, (7) Scoring and cooperating with jurisprudential authorities to remove religious ambiguities and doubts related to real estate tokenization and its legitimization and providing information about religious approvals is recommended.
- Considering the importance of "technical and cyber risks" in the tokenization of real estate in Iran, the efforts of the authorities and stakeholders to adopt appropriate security protocols for the protection of information, (2) conducting security tests, technical assessments, and continuous monitoring of platforms to identify and eliminate security vulnerabilities and threats before they occur and are published, and (3) cooperating with specialized security teams to identify and fix security issues and promote (4) Improving the security of transactions and accurate validation of participants in order to reduce the risks of fraud and increase the efficiency and reliability of transactions; (6) Adopting policies and mechanisms to manage access to information and transactions to prevent unauthorized access to information; (7) Setting up specialized supervisory bodies to increase continuous monitoring of activities and transactions in order to ensure security and transparency. Trading and de-risking unreliable and unreliable projects are recommended.
- Considering the importance of "strategic and operational risks" in real estate tokenization in Iran, the efforts of the authorities and stakeholders regarding (1) the establishment and development of safe and sustainable technological infrastructures for the public in order to create investment opportunities and cash settlements, (2) the development of more complex smart contracts in order to better manage transactions, (3) the issuance of licenses for the supply of real estate tokens in the context of the capital market, and (4) the development of transparent, active, and thriving secondary markets. (5) Comprehensive risk assessment to ensure that investors have the capacity to deal with a wide range of potential risks in the real estate tokenization process; (6) Supporting knowledge-based companies and active start-ups in order to create dynamic and synergistic systems is recommended.
- Considering the importance of "financial and economic risks" in the tokenization of real estate in Iran, the efforts of the authorities and stakeholders regarding (1) the regulation of an integrated tax system in order to set clear financial and tax laws in order to eliminate tax complexities, (2) the evolution of financial markets and the creation of new financing platforms in the field of real estate and housing, and (3) the use of measures to make the housing market competitive, generate

frozen assets, release liquidity, and reduce inflation and the elimination of economic recession is recommended.

- Considering the importance of "organizational and institutional risks" in real estate tokenization in Iran, the efforts of the authorities and stakeholders regarding (1) extensive cooperation between the government, financial institutions, universities and companies active in the field of housing construction, and knowledge bases active in the field of blockchain and fintech in order to benefit from the capacities and knowledge and research facilities of these centers for the development of the necessary technologies, and (2) the formation of working groups Joint cooperation between ministries, the Stock Exchange Organization, the Central Bank and the private sectors in order to coordinate and develop tokenization projects is recommended; (3) Establishing coordination and cooperation between technical team members, developers, security experts and other relevant persons to solve technical problems and strategic participation of executive actors in order to implement and develop tokenization projects is recommended.
- Considering the importance of "educational and cultural risks" in real estate tokenization in Iran, the efforts of the authorities and stakeholders regarding (1) utilizing the capacity of the media regarding education and awareness about real estate tokenization and its benefits, as well as introducing successful domestic examples, and (2) holding free workshops, seminars and webinars for the general public and market participants in order to increase public knowledge about real estate tokenization. (3) Producing simple and attractive educational content in the form of videos, podcasts, brochures and articles on social networks in order to change the investment culture from traditional to modern (digital), (4) Holding specialized courses for legal, financial and technological education with the presence of experts, economic activists and investors in order to promote knowledge and awareness about maintaining security in digital transactions, and (5)

Utilizing the capacity of the national media to produce expert programs In order to become familiar with digital assets, smart transactions and promote investment in fractional ownership are recommended.

- Considering the importance of "compliance and regulatory risks" in real estate tokenization in Iran, the efforts of the authorities and stakeholders regarding (1) designing legal models for real estate tokenization and housing meter sales in order to change the attitude of legislators and policymakers towards digital assets and real estate tokens, (2) cooperation between government and industry towards the implementation and development of real estate tokenization, and (3) continuous critical cooperation and providing active feedback. (4) Extensive introduction of successful local and international examples of real estate tokenization is recommended by the relevant organizations in order to familiarize people with the benefits of real estate tokenization.
- Considering the importance of "international risks" in the tokenization of real estate in Iran, the efforts of the authorities and stakeholders regarding (1) contributing to the growth of active fintechs in the field of cryptocurrencies and digital assets and the development of blockchain technology and innovative domestic financial platforms and the development of related digital infrastructures, in order to remove the restrictions on the use of international platforms, and (2) cooperation between the public, private and scientific sectors. In order to establish joint specialized working groups in the field of providing executive solutions for exiting and confronting sanctions, (3) using the knowledge capacity of scientific centers in neutralizing sanctions and confronting the devaluation of the national currency and economic instability, and (4) increasing international cooperation in order to create common legal and regulatory frameworks for tokenization of real estate, it is recommended.

In addition to practical suggestions in order to increase the generalizability and also in order to create confidence in the managers and officials of the Ministry of Roads, Housing and Urban Development,

in order to apply the results obtained in the present study, it is suggested that other researchers present a model of risk management of real estate tokenization in Iran and also develop a strategic plan in this regard. It is also recommended that the identification of real estate tokenization risks be carried out in other cities and provinces of Iran and the results should be provided to the managers and officials of the Stock Exchange Organization, the Central Bank, the Ministry of Roads, Housing and Urban Development, the Registry of Deeds and security institutions.

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