Print ISSN: 2008-448X
Online ISSN: 2538-3310
International Journal of Business and Development Studies
University of Sistan and Baluchestan
Homepage: https://ijbds.usb.ac.ir

The Role of Blockchain Technology in Improving the Financial Performance of Small and Medium-Sized Businesses in Iran

Saeed Dehghan khavari[1] **Seyed Hossein Mirjalili**[2]
Mohammad Hossein Abdorrahimian[3] **Saeed Fkhar poor** [4]

[1] Assistant Professor, Department of Economics, Meybod University, Meybod, Iran. Email: saeed.khavari@gmail.com.
[2] Professor of Economics, Faculty of Economics, Institute for Humanities and Cultural Studies, Tehran, Iran. Email: h.jalili@ihcs.ac.ir.
[3] Assistant Professor, Department of Finance and Accounting, Faculty of Humanities, Meybod University, Meybd, Iran. Email: only.companionship@gmail.com.
[4] MA of Financial Management, Department of Financial Engineering, Science and Arts University, Yazd, Iran. Email: saeed.fakharpoor1000@gmail.com.

ARTICLE INFO

Article type:
Research

Article history
Received: 2025.02.13
Revised: 2025.07.24
Accepted: 2025.08.19
Published: 2025.10.01

Keywords:
blockchain technology, export performance, financial performance, small and medium businesses, supply chain efficiency.

JEL Classification:
D23, F13, G32, M16

Abstract:

Objective: Blockchain technology, a decentralized and distributed database with significant capabilities for enhancing transparency, security, and efficiency, can help enhance companies' financial performance by improving supply chain and export processes. We examined the impact of blockchain technology on the financial performance of small and medium-sized businesses (SMBs), considering the mediating roles of supply chain efficiency and export performance in tile and ceramic exporting companies in Iran, using structural equation modeling. The statistical population consisted of experts and specialists from the studied companies, particularly those with expertise in finance, sales, and production. The sample size was determined to be 261 individuals. According to the results, the use of blockchain technology has a positive and significant effect on supply chain efficiency and export performance. Moreover, the mediating roles of supply chain efficiency and export performance in the relationship between blockchain technology and the financial performance of SMBs were found to be positive and significant.

1. Introduction

Blockchain technology is a distributed digital ledger (database) that has drawn significant attention since the emergence of digital currencies; consequently,

Cite this article: S. Dehghan khavari, S. H. Mirjalili, M. H. Abdorrahimian and S. Fkhar poor (2025). The Role of Blockchain Technology in Improving the Financial Performance of Small and Medium-Sized Businesses in Iran. *International Journal of Business and Development Studies*, 17 (2), 181-201.
DOI: 10.22111/ijbds.2026.52236.2240.

there has been a growing number of blockchain applications across a wide range of businesses (Wan et al., 2023). Due to its significant advantages, blockchain technology can help businesses, governments, and logistics systems become more reliable and secure (Golosova & Romanovs, 2018).

Today, business is fundamentally based on secure transactions, and commercial activities depend on trust between the two parties. Any mechanism or tool that improves corporate governance can enhance organizational performance (Dehghan Khavari et al., 2024). The contemporary shift toward digital transformation has introduced various advanced tools and technologies aimed at optimizing business process management and facilitating the dissemination of data across organizational units. Blockchain technology, as a secure technology, eliminates intermediaries, transforms the method of data transmission, and reduces fraud and hacking through the use of a distributed ledger (Tapscott, 2017).

On the other hand, recent studies on international business at the firm level show that companies engaged in exports or investments tend to be more productive than those operating only in domestic markets. Small and medium-sized enterprises (SMEs) have high potential for exporting. Due to their flexibility and limited resources, they can enter foreign markets through exports. Exporting is considered an important strategic opportunity for businesses, as it offers many benefits and supports their growth and sustainability (Sheldon, 2024). Based on the experiences of East Asian countries, engagement in exports can improve competitiveness and help avoid the middle-income trap (Mirjalili & Saadat, 2020). Blockchain technology can assist such businesses in achieving this goal.

Additionally, blockchain provides financial tools such as payment systems, smart contracts, and trade records, which can reduce undesirable transactions. It functions as a shared platform that delivers economic services and addresses pervasive trust-related challenges in commercial transactions (Ronaghi, 2022). Consequently, it is expected to generate transformative impacts on economies and societies by lowering transaction costs and reducing the need for third-party oversight (Iansiti & Lakhani, 2017).

On the other hand, the supply chain, as a network of activities, people, and resources, plays an essential role in the financial performance of companies. Supply chain efficiency can positively affect costs, revenues, and ultimately profitability.

Given the importance of these factors and the effect of applying blockchain technology on the financial performance of SMBs, as well as the mediating role of supply chain efficiency and export performance in this relationship, this study aims to examine the impact of these factors on the performance of tile and ceramic exporting companies as examples of small and medium-sized businesses (SMBs).

2. Theoretical Background

Blockchain is a type of database that serves as a public ledger to record transactions without the need for a third party to validate each one. It is distributed across a peer-to-peer network and consists of blocks of data linked together to form a continuous chain of immutable records. Each computer in the network maintains a copy of the ledger to prevent a single point of failure. Blocks are added sequentially and are permanent and tamper-resistant (Sheldon, 2021).

Blockchain technology is a distributed ledger that shares all network transactions among members. All transactions must be verified by most members and nodes before any activity is executed (Ronaghi, 2022). A key feature of blockchain is that once information is recorded in a block, it cannot be changed or deleted, which increases data security and credibility.

As a transformative technology, blockchain has paved the way for major changes in how transactions are conducted and data are stored in the digital world. Its history—from the early concepts of cryptography to the emergence of Bitcoin and its expansion into other industries—demonstrates the high potential of this technology to revolutionize global financial and economic structures. With ongoing advancements and innovations in this field, blockchain is expected to become an integral part of everyday life (Tabatabaei et al., 2023).

Key features of blockchain, such as decentralization, immutability, transparency, and security, have made this technology one of the most widely used and innovative systems today. These features enable entrepreneurs, developers, and various industries to utilize blockchain's capabilities to improve their processes (Subha, 2020).

Features such as decentralization, immutability, transparency, security, fast transactions with low fees, smart contract capabilities, scalability, and the reform of traditional processes can positively affect the efficiency of companies' supply chains (Ravaghi, 2017). In this regard, examining the effect of blockchain on firms' economic variables can be important.

Business analysis and the examination of influencing factors integrate the various and scattered data of an organization and provide analytical and multidimensional reports for managerial decision-making. Therefore, it can indirectly affect the company's economic performance (Zare et al., 2023). One of these factors is supply chain efficiency.

Overall, the efficiency of a supply chain is shaped by multiple interrelated factors, each exerting a significant influence on overall performance. Given increasing competition and rapid market changes, attention to these factors and the adoption of appropriate strategies can help companies succeed in the modern business environment. Improving supply chain efficiency affects not only costs and timing but also customer satisfaction and competitive capability (George & Pillai, 2019). Supply chains, which have served as a critical driver of industrial

advancement in manufacturing sectors over the past two decades, can also function as a mechanism for integrating various aspects of industrial operations, acting as one of the key development cycles (Dehghan Khavari & Derakhsh, 2021). Blockchain may transform business performance in financial and commercial domains. The notion of decentralized trust is regarded as a viable alternative to traditional client–server architectures, as it eliminates the need for data to be processed by central authorities. As a result, transactions become irreversible, and costs decrease. In effect, reliance on governmental oversight, intermediaries, and counterparties is reduced, as trust is embedded within the underlying protocols and infrastructures (Kaal, 2020).

Today, efficiency has become an increasingly critical issue due to the need for the optimal allocation and use of inputs. Various definitions of efficiency have been presented in terms of increasing outputs or reducing inputs (Mirjalili et al., 2010). Supply chain efficiency is a key factor in the commercial success of companies, especially exporters. Tile and ceramic exporting companies face many challenges, including delays in raw material supply, lack of transparency in processes, and high operational costs (MirHosseini, 2012). Therefore, examining the mediating role of supply chain efficiency in this study is particularly significant. This efficiency can act as a bridge to improved financial performance, as blockchain technology enables processes to become faster, more transparent, and less costly. Hence, strengthening supply chains through the implementation of blockchain systems can both enhance the financial sustainability of companies and facilitate the export process.

Export performance is one of the key factors in the growth and development of SMEs. In the era of globalization and global competition, companies need to target foreign markets to gain a larger share of the global market (Safari et al., 2022). Research on the impact of blockchain on export performance can provide practical solutions for optimizing processes and increasing competitiveness. Blockchain technology can play an effective role in enhancing the export capabilities of these companies by improving transparency, reducing the risk of fraud, and facilitating communication within the supply chain.

A supply chain refers to a set of processes and activities that convert raw materials into final products and deliver them to customers. Improving supply chain efficiency can directly and indirectly affect companies' financial performance and export capabilities.

3. Literature Review

Purwaningsih et al. (2024) explored the use of blockchain technology to enhance supply chain efficiency and export performance, as well as its implications for SMEs' financial performance. The findings showed that adopting blockchain could significantly improve supply chain efficiency, emphasizing its potential to optimize operational workflows. However, no direct effect on the financial

performance of SMEs was observed, underscoring the need for a more comprehensive approach to achieving financial growth. Furthermore, a positive relationship between blockchain and export performance highlighted the technology's pivotal role in strengthening export capabilities.

Yousefzadeh et al. (2024) examined the impact of blockchain on company performance from the perspective of internal control. The statistical population consisted of 200 managers of companies listed on the Tehran Stock Exchange, and the study employed structural equation modeling. The results indicated that blockchain technology could significantly affect company performance. Additionally, blockchain was found to have a compounded effect on the relationship between internal control and company performance.

Farhadi et al. (2023) identified and prioritized the barriers to implementing blockchain technology in a sustainable supply chain through a case study of food packaging companies in Shahrekord, Iran. According to their results, a lack of management commitment was the most significant factor among those examined. Other barriers, in order of importance, included internal obstacles, lack of employee familiarity, unclear regulations, sustainability-related obstacles, external organizational barriers, and infrastructural challenges. These findings suggest that management commitment plays a key role in the successful implementation of blockchain in sustainable supply chains, and that special attention should be given to employee training, the development of clear regulations, and infrastructure improvement.

Menshari and Saberi (2023) investigated the impact of the use of blockchain technology on the performance of insurance companies, with the mediating role of innovation. For data analysis, structural equation modeling was employed using AMOS software. The results demonstrated that blockchain technology had a positive and significant impact on company performance, process innovation, and overall innovation. Additionally, both process innovation and overall innovation were found to have a positive and significant effect on company performance.

Aldavood and Sadeghinasab (2021) explored the role of blockchain technology in improving supply chain performance, particularly in Internet-based businesses. The population consisted of all Internet business specialists in Iran, from whom 51 individuals were selected as a sample through a Delphi expert panel. The findings showed a positive and significant relationship between all independent variables and the improvement of supply chain performance through blockchain technology, except for users' future orientation. Independent variables such as social networks, improved banking services, financial transparency, and ambiguity tolerance explained about 72% of the variance in supply chain performance among Iranian Internet businesses. Path analysis indicated that legal, political, and managerial factors, along with social networks, financial

transparency, improved banking services, and ambiguity tolerance, had the most significant direct and indirect effects on supply chain performance through blockchain.

Singh et al. (2020) examined the relationship between blockchain technology and corporate governance. The findings revealed that blockchain improved all aspects of corporate governance by increasing transparency and liquidity and reducing costs. Therefore, all company stakeholders, including customers and suppliers, can benefit from the implementation of blockchain technology.

4. Methodology

A questionnaire was developed to collect the required field data, taking into account the objectives, research questions, and theoretical framework. After confirming its reliability and validity, it was distributed among the target statistical population. The questionnaire consisted of 20 items designed to measure each indicator, using a five-point Likert scale ranging from "very much" to "very little" (Table 1).

Table 1: An Overview of the Questionnaire

Components	Number of Items
Blockchain technology	5
Supply chain efficiency	5
Export performance	5
Financial performance	5
Total	20

Source: Research findings

The statistical population consisted of experts, specialists, and managers of ceramic tile exporting businesses. To reach the necessary sample size for conducting structural equation modeling (SEM), the optimal sample size was determined using the Morgan table to be 261 respondents, considering the limited population size. The effects of the variables were explored based on the conceptual model depicted in Figure 1 (Purwaningsih et al., 2024).

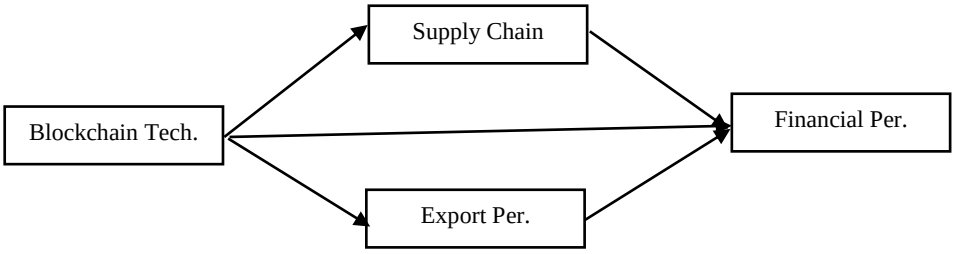

Figure 1: The conceptual model of the research

The hypotheses were tested using SEM in AMOS software. SEM is a very general and robust multivariate analysis technique within the family of multiple regression analyses, helping researchers simultaneously test a set of regression equations. AMOS software is designed to estimate and test structural equation models. By utilizing the correlations and covariances among measured variables, AMOS estimates factor loadings, variances, and errors of model variables. It can be used for exploratory factor analysis, confirmatory factor analysis, and path analysis.

5. Analysis of Model Results

We described the demographic characteristics of the respondents, including age and education. Among the respondents, 45% were female, and the remaining 55% were male. Regarding age distribution, 20% were between 20 and 30 years old, 56% were between 31 and 40 years old, 15% were between 41 and 50 years old, and the rest were 51 years or older. In terms of education, 62% held associate or bachelor's degrees, while 38% had master's or doctoral degrees.

The reliability of the questionnaire was evaluated using Cronbach's alpha coefficient. The results for the overall questionnaire and each construct are presented in Table 2.

Table 2: The Reliability of Questionnaire Constructs

Component	Cronbach's Alpha
Blockchain technology	0.774
Supply chain efficiency	0.816
Export performance	0.800
Financial performance	0.822
Entire questionnaire	0.917

Source: Research findings

The overall Cronbach's alpha of 0.917, along with values exceeding 0.6 for all constructs, indicates acceptable internal consistency and reliability.

Confirmatory Factor Analysis (CFA) was conducted to assess the validity of the questionnaire. Blockchain technology was measured through five items in the model. The adequacy of the sample was verified using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity. The KMO value of 0.762 indicated that the sample size was sufficient for the analysis. Subsequently, the model was tested using appropriate software. Figure 2 illustrates the model fit results.

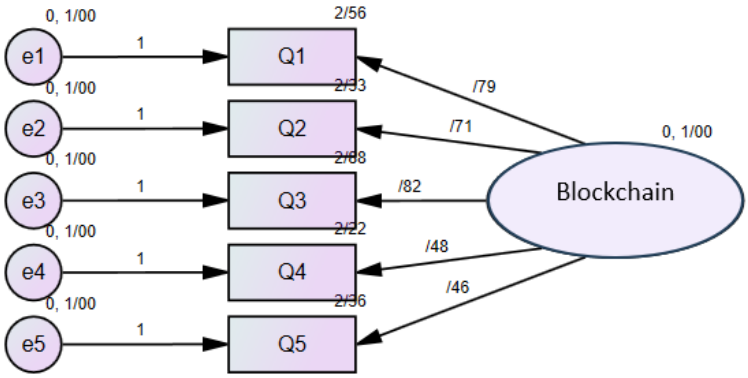

Figure 2: The standardized estimation model of blockchain technology

If the standardized factor loading is greater than 0.3, the item can be considered to have good explanatory power. However, if any indicator has a standardized loading below 0.3, it should not be removed from the model immediately; instead, its p-value should be examined. If the p-value is greater than 0.05, it indicates that the parameter is not statistically significant and should be removed from the model. Conversely, if an indicator is statistically significant and the remaining fit indices are within acceptable ranges, it need not be removed.

In this study, all factor loadings were above 0.3, indicating that the indicators were acceptable. The logical and acceptable nature of all factor loadings confirms the model's validity. The significance of the factor loadings is presented in Table 3.

Table 3: Significance of Factor Loadings for the Blockchain Technology Model

Indicator	Loading on Blockchain Technology	Estimate	S.E.	C.R.	P
Q5	<--- Blockchain technology	0.456	0.098	4.673	***
Q4	<--- Blockchain technology	0.478	0.098	4.896	***
Q3	<--- Blockchain technology	0.817	0.103	7.955	***
Q2	<--- Blockchain technology	0.707	0.101	6.969	***
Q1	<--- Blockchain technology	0.792	0.102	7.732	***

Source: Research findings

All factor loadings estimated in the blockchain technology model (Table 3) are statistically significant.

Table 4 presents the model fit indices. Based on the results and their comparison with acceptable thresholds, all indices fall within acceptable ranges. Therefore, the model fit of the blockchain technology construct and its compatibility with the collected data are desirable and confirmed.

Table 4: Fit Indices of the Blockchain Technology Model

Fit Index	Acceptable Range	Result
CFI	> 0.9	0.98
TLI	> 0.9	1.000
NFI	> 0.9	1.000
RFI	> 0.9	1.000
IFI	> 0.9	1.000
RMSEA	< 0.1	0.037
χ^2/df	< 3	2.19

Source: Research findings

Supply chain efficiency is assessed and measured using five survey questions. Table 4 indicates that the sample size was adequate. Subsequently, we examined the results of CFA for supply chain efficiency, given the adequacy of the sample size, using AMOS software.

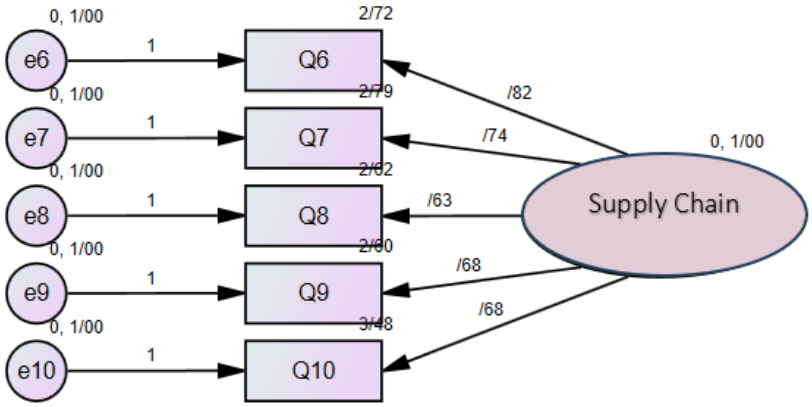

Figure 3: Standardized Estimation Model of Supply Chain Efficiency

All factor loadings in Figure 3 exceed the threshold of 0.3, indicating the adequacy and appropriateness of the extracted indicators. The reasonable and acceptable values of all factor loadings reflect the strength and validity of the measurement model. The significance of these factor loadings is presented in Table 5.

Table 5: Significance of Factor Loadings in the Supply Chain Efficiency Model

Indicator	Loading on Blockchain Technology	Estimate	S.E.	C.R.	P
Q10	<--- Supply chain efficiency	0.677	0.099	6.815	***
Q9	<--- Supply chain efficiency	0.681	0.099	6.870	***
Q8	<--- Supply chain efficiency	0.633	0.098	6.437	***
Q7	<--- Supply chain efficiency	0.735	0.100	7.343	***
Q6	<--- Supply chain efficiency	0.817	0.102	8.025	***

Source: Research findings

All estimated factor loadings, as shown in Table 5, are significant in the supply chain efficiency model. Table 6 presents the model fit indices. Based on a comparison with the acceptable ranges, it can be concluded that all fit indices reported for the model fall within acceptable limits.

Table 6: Model Fit Indices for Supply Chain Efficiency

Fit Index	Acceptable Range	Result
CFI	> 0.9	1.000
TLI	> 0.9	0.98
NFI	> 0.9	1.000
RFI	> 0.9	1.000
IFI	> 0.9	1.000
RMSEA	< 0.1	0.028
χ^2/df	< 3	1.45

Source: Research findings

All indices indicate a good fit of the supply chain efficiency model to the collected data. Export performance is likewise assessed and measured using five survey questions. The results presented in Table 6 indicate that the sample size was adequate. Subsequently, CFA for export performance was conducted using AMOS software, taking into account the adequacy of the sample size.

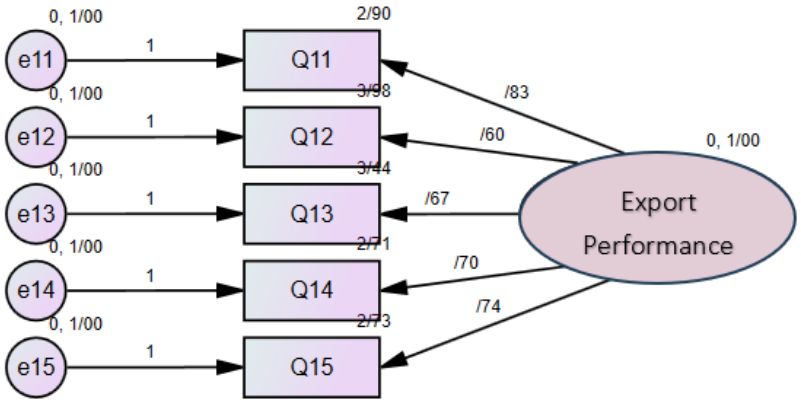

Figure 4: Standard Estimation Model of Export Performance

All factors in Figure 4 have values greater than 0.3, indicating the appropriateness of the extracted indicators. The logical and acceptable nature of all factor loadings is due to their positive values. The significance of these factor loadings is presented in Table 7.

Table 7: Significance of Factor Loadings in the Export Performance Model

Indicator	Loading on Blockchain Technology	Estimate	S.E.	C.R.	P
Q15	<--- Export performance	0.743	0.101	7.371	***
Q14	<--- Export performance	0.705	0.100	7.041	***
Q13	<--- Export performance	0.673	0.100	6.724	***
Q12	<--- Export performance	0.602	0.098	6.120	***
Q11	<--- Export performance	0.831	0.102	8.140	***

Source: Research findings

All estimated factor loadings, as shown in Table 7, are significant in the export performance model. Table 8 presents the model fit indices. Based on a comparison with acceptable ranges, it can be concluded that all fit indices reported for this model fall within acceptable limits. The results indicate that the collected data exhibit a good fit with the proposed model, thereby confirming the validity of the export performance model.

Table 8: Fit Indices of the Export Performance Model

Fit Index	Acceptable Range	Result
CFI	> 0.9	1.000
TLI	> 0.9	0.97
NFI	> 0.9	1.000
RFI	> 0.9	1.000
IFI	> 0.9	1.000
RMSEA	< 0.1	0.034
χ^2/df	< 3	2.53

Source: Research findings

Financial performance was assessed and measured using five survey questions. The results in Table 8 indicate that the sample size was adequate. Next, CFA of financial performance was conducted using AMOS software, considering the adequacy of the sample size.

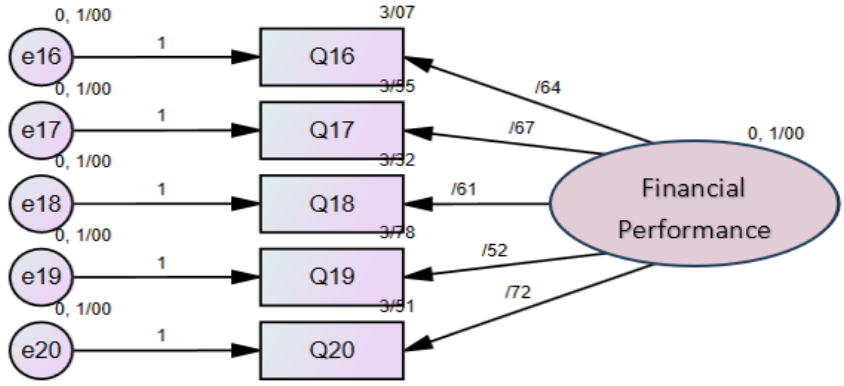

Figure 5: Standard Estimation Model of Financial Performance

All factors in Figure 5 have values greater than 0.3, indicating the appropriateness of the extracted indicators. The logical and acceptable nature of all factor loadings is due to their positive values. The significance of these factor loadings is presented in Table 9.

Table 9: Significance of Factor Loadings in the Financial Performance Model

Indicator	Loading on Blockchain Technology	Estimate	S.E.	C.R.	P
Q20	<--- Financial performance	0.719	0.103	7.007	***
Q19	<--- Financial performance	0.522	0.101	5.187	***
Q18	<--- Financial performance	0.613	0.102	6.042	***
Q17	<--- Financial performance	0.670	0.102	6.568	***
Q16	<--- Financial performance	0.639	0.102	6.269	***

Source: Research findings

All estimated factor loadings, as shown in Table 9, are significant in the financial performance model. Table 10 presents the model fit indices. Based on a comparison with acceptable ranges, it can be inferred that all fit indices reported for this model fall within the acceptable range. The results indicate that the collected data demonstrate a good fit with the proposed model, confirming the validity of the financial performance model.

Table 10: Fit Indices of the Financial Performance Model

Fit Index	Acceptable Range	Result
CFI	> 0.9	1.000
TLI	> 0.9	0.97
NFI	> 0.9	0.96
RFI	> 0.9	1.000
IFI	> 0.9	1.000
RMSEA	< 0.1	0.027
χ^2/df	< 3	2.41

Source: Research findings

This model was analyzed using path analysis and SEM. The significance of the relationships among the model's construct factors was confirmed based on the results obtained in previous sections. As shown in the figures, all factors and indicators are in a favorable and appropriate state, and the P-values for all factor relationships are acceptable. Figure 6 presents the path coefficients.

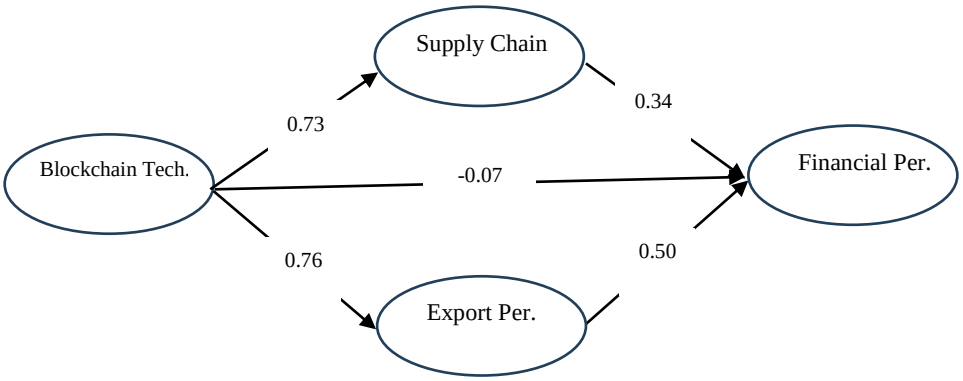

Figure 6: Final Model of the Role of Blockchain Technology in Improving Financial Performance Using the Mediating Effects of Supply Chain Efficiency and Export Performance

Source: Research findings

According to the results, the regression coefficients between blockchain and supply chain performance and export performance were 0.73 and 0.76, respectively, both statistically significant. Furthermore, the regression coefficients of supply chain efficiency and export performance on financial performance were 0.34 and 0.50, respectively, both statistically significant. Hence, the mediating effects of these variables are confirmed. Also, the regression coefficient between blockchain technology and financial performance was -0.07, indicating a weak direct effect. However, the indirect effects of blockchain on financial performance were significant and acceptable. The indirect effect of blockchain on financial performance, considering the mediation of supply chain efficiency, was 0.24. The indirect effect of blockchain on financial performance, considering the mediation of export performance, was 0.38, which is acceptable. Table 11 presents the fit indices of the final research model, confirming the suitability and acceptability of the model fit.

Table 11: Regression Coefficients in the Final Model

Paths			Regression Coefficient	S.E.	C.R.	P
Supply chain efficiency	<---	Blockchain technology	۰,۷۳۲	۰,۱۱۸	6.188	***
Export performance	<---	Blockchain technology	۰,۷٦٤	۰,۱۲۰	6.372	***
Financial performance	<---	Blockchain technology	۰,۰۷۰-	0.197	-0.354	0.723
Financial performance	<---	Supply chain efficiency	0.343	0.124	2.770	***
Financial performance	<---	Export performance	۰,٤۹۹	۰,۱۲۷	3.936	***

Source: Research findings

Table 12 presents the model fit indices. Based on a comparison with the acceptable ranges, it can be concluded that all fit indices reported for this model fall within the acceptable range. The results indicate that the collected data fit well with the proposed model, confirming the fit of the financial performance model.

Table 12: Fit Indices of the Final Model

Fit Index	Acceptable Range	Result
CFI	> 0.9	1.000
TLI	> 0.9	0.99
NFI	> 0.9	0.98
RFI	> 0.9	1.000
IFI	> 0.9	1.000
RMSEA	< 0.1	0.031
χ^2/df	< 3	2.53

Source: Author's findings

The results of the final model examining the effect of blockchain technology on the financial performance of SMBs, with the mediating role of supply chain efficiency and export performance, indicate that blockchain technology has a positive and significant impact on supply chain efficiency. Confirmation of this hypothesis is important because blockchain in the supply chain allows companies to track various transactions with greater security and transparency. By using blockchain, companies can precisely trace a product's history from its origin to its current location. This powerful technology enables parties collaborating on a shared platform to significantly reduce delays, additional costs, and human errors often associated with transactions. Another advantage of blockchain applications in the supply chain is the reduction of intermediaries, which lowers the risk of fraud.

Blockchain technology also has a positive and significant effect on export performance. This effect can be examined from several perspectives. First, consumers increasingly request complete information about a product's lifecycle to ensure its safety, freshness, and quality (Rahimi & Besharati Fard, 2020). Furthermore, improving the quality and health characteristics of products in developing countries positively impacts exports (Das, 1991), which is significant from a financial transfer perspective. In traditional banking systems for export transactions, a bank acts as an intermediary, conducting trade transactions on behalf of others. In this process, the bank accepts deposits and collects documents from another financial institution, which is often time-consuming and creates numerous problems for both parties. Moreover, considering the conditions in our country regarding currency transfer and receipt, these problems are compounded. By using blockchain technology, value transfers occur directly and instantly, without the need for an intermediary bank. Money transfers that typically take days can be completed in seconds. In addition, all stages and

processes of the transaction are transparent and observable (Varghese & Goyal, 2017).

Another confirmed hypothesis is that supply chain efficiency has a positive and significant effect on a company's financial performance. Supply chain efficiency is defined as the ability of a supply chain to respond quickly to market changes and customer needs (Christopher, 2000). Therefore, supply chain efficiency within an organization can have a considerable impact on its financial performance. The supply chain encompasses all activities related to the flow of goods and services, from the raw material stage to the final product stage consumable by the customer. In addition to the flow of materials, these transfers include the flow of information and financial resources, which further explains this positive effect (Keshavarz et al., 2020).

The results of the model also show that export performance has a positive and significant effect on a company's financial performance. This significance may be attributed to the fact that exports generate new resources and income from foreign markets, which can be allocated to research and development, technological advancement, business growth, and overall improvement. As companies expand into global markets, their products and services undergo continuous refinement and development, a process that positively impacts the company's financial performance.

The findings indicate that the use of blockchain technology, considering the mediating role of supply chain efficiency, has a positive and significant effect on the company's financial performance. Based on the results and the coefficients of both paths, it can be concluded that the mediating effect of supply chain efficiency is positive and significant. Therefore, supply chain efficiency can serve as an influential and suitable mediator for the indirect effect of blockchain technology on companies' financial performance, which is an important outcome. The same applies to the mediating role of export performance; the results show that the use of blockchain technology, considering the mediating role of export performance, has a positive and significant impact on the company's financial performance. Thus, the effect of blockchain operates through the channels of exports and the supply chain on companies' financial performance. However, the direct effect of blockchain technology on financial performance was not confirmed. This suggests that the impact of blockchain on financial performance is stronger and more effective when transmitted through economic pathways such as supply chains and export channels.

6. Conclusion

The results indicate positive and significant mediating effects of export performance and supply chain efficiency on the relationship between blockchain technology and the financial performance of companies. Accordingly, these

findings align with the results of Yousefzadeh et al. (2024), Rahimi et al. (2022), Purwaningsih et al. (2024), Pal et al. (2021), and Azzi et al. (2019), while they contradict the findings of Keshavarz et al. (2020) and Chen (2018).

Based on these results, several research recommendations can be proposed. It is recommended that SMBs, such as tile and ceramic exporting companies, focus on developing and upgrading their blockchain technology infrastructure, including servers, software, and security systems. Organizations can arrange training courses for their employees on blockchain technology and its applications in the supply chain. These courses should cover topics such as the benefits of blockchain, its applications in recording and tracking supply chains, and process optimization.

Such companies can also collaborate with startups and technology firms specializing in blockchain to benefit from their innovations and expertise. This collaboration may include the pilot implementation of blockchain technology in the supply chain. Additionally, companies should design monitoring and evaluation systems to measure the impact of blockchain on supply chain efficiency and financial performance and use the results to improve processes. It is also suggested that companies increase transparency in their supply chains using blockchain technology. All production and distribution stages should be documented and traceable to enhance customer trust with blockchain.

Among other policy measures, it is recommended to utilize financial and technical government incentives to implement blockchain technology in the supply chain. These incentives could include concessional loans, subsidies, or tax exemptions. However, an important point is that companies should identify and analyze potential risks arising from blockchain implementation. Furthermore, risk management models should include various scenarios and appropriate countermeasures.

References

1. Aldavood, S. and Sadeghinasab, M. The Role of New Information Technologies in Developing the Performance Functional Business Chain of Iran. Geographical Studies of Mountainous Regions, 2021, 2(3), 63-82. doi: 10.29252/gsma.2.3.63
2. Chen, H.L. Supply chain risk's impact on corporate financial performance. International Journal of Operations & Production Management, 2018, Vol. 38 No. 3, pp. 713-731.
3. Christopher, M. The agile supply chain competing in volatile markets. Industrial marketing management, 2000, 29(1), 37-44.
4. Dass, S. Economic aspects of India's international trade in Coffee. Eco Aspect of Agr Econ, 1991, 46 (2): 142-151
5. Dehghan Khavari, S., & Derakhsh, S. An Innovative Throughout Conceptual Model Framework for Logistics Integration. Supply Chain Management, 2021, 23(70), 37-54.
6. Dehghan Khavari, S.; Mirjalili, S. H.; Esmaeili, M., (2024), The Impact of Intellectual Capital and Good Corporate Governance on Bank Value with the Mediating Effect of Financial Performance: Evidence from Iran, Journal of Money and Economy, Vol. 19, Iss. 1, pp. 1-23.
7. George, J., & Pillai, V. M. A study of factors affecting supply chain performance. Journal of Physics: Conference Series, Volume 1355, International Conference on Aerospace and Mechanical Engineering 17–19 December 2018, T K M College of Engineering, 2019, Kerala, India.
8. Golosova, J. and Romanovs, A. The Advantages and Disadvantages of the Blockchain Technology. IEEE 6th Workshop on Advances in Information, Electronic and Electrical Engineering (AIEEE), Vilnius, Lithuania, 2018, pp. 1-6, doi: 10.1109/AIEEE.2018.8592253.
9. Farhadi, F., Fathi, M. R., & kiani harchegani, M. Identifying and Prioritizing the Barriers to Using Blockchain Technology in the Sustainable Supply Chain (Case Study: Shahrekord Food Industry Packaging Companies). Packaging Science and Art, 2023, 14(54), 21-34.
10. Iansiti, M., & Lakhani, K. R. The truth about blockchain. Harvard Business Review, 2017, 95(1), 118-127.
11. Kaal, W. A. Blockchain solutions for agency problems in corporate governance, world scientific book chapters. In K. R. Balachandran (Ed.), Information for efficient decision-making big data, blockchain and relevance, chapter 12 (pp. 313–329). World Scientific Publishing Co. Pte. Ltd, 2020.
12. Keshavarz, S., khani, N., Raeesi Nafchi, S., norbakhsh, P. and Fathi, M. R. An Investigation on the Relationship between Supply Chain Agility and Financial Performance: Mediating Role of Cost Efficiency and Customer Orientation. Commercial Surveys, 2020, 18(104), 63-78.

13.Menshari, S. & Saberi, F. The Impact of China's Block Technology Using Insurance Companies with Innovation Media. Thirty National Conference and 11th International Conference on Insurance. Tehran, 2023.
14.MirHosseini, S. V. The Study of Industrial Clusters Performance in Islamic Republic of Iran (The Case Study of Yazd Ceramic and Tile Cluster). International Journal of Academic Research in Business and Social Sciences, 2012, 2(3), 70.
15.Mirjalili S H, Mirdehghan S A, Dehghan Khavari S. Examination of Industrial Efficiency in Yazd Province: DEA Method. Journal of Economic Research and Policies, 2010, 18 (54) :95-122.
16.Mirjalili, S. H.& Saadat, H., (2020) , How to Escape the Middle Income Trap in Iran? Lessons from Malaysia, Thailand South Korea and China, International Economic Studies, Vol. 50, Iss. 1, pp. 1-12.
17.Pal, A., Tiwari, C. K., & Behl, A. Blockchain technology in financial services: A comprehensive review of the literature. Journal of Global Operations and Strategic Sourcing, 2021, 14(1), 61–80. https://doi.org/10.1108/JGOSS-07-2020-0039.
18.Purwaningsih, E., Muslikh, M., Suhaeri, S., & Basrowi, B. Utilizing blockchain technology in enhancing supply chain efficiency and export performance, and its implications on the financial performance of SMEs. Uncertain Supply Chain Management, 2024, 12 (2024) 449–460.
19.Rahimi, A. And Besharati Fard, M. Investigating IoT and Blockchain Function on Food Industry Tracking Ability. Second conference International Knowledge Management, Blockchain and Economics. Malek Ashtar University of Technology, Tehran, 2020.
20.Rovaghi, M. Sustainability of food product exports with blockchain technology, 28th National Congress of Iranian Food Science and Technology, Tehran, 2017.
21.Ronaghi, M. H. Contextualizing the impact of blockchain technology on the performance of new firms: The role of corporate governance as an intermediate outcome. Journal of High Technology Management Research, 2022, 33: 100438.
22.Safari, A., Saleh, A. S., & Balicevac Al Ismail, V. Enhancing the export activities of small and medium-sized enterprises in emerging markets. Journal of Business & Industrial Marketing, 2022, 37(5), 1150-1166.
23.Sheldon, R. A timeline and history of blockchain technology. Tech target research, 2024, URL: https://www. techtarget.
24.Singh, H., Jain, G., Munjal, A., & Rakesh, S. Blockchain technology in corporate governance: Disrupting chain reaction or not? Corporate Governance, 2020, 20(1), 67–86. https://doi.org/10.1108/CG-07-2018-0261.
25.Subha, T. Assessing security features of blockchain technology. In Blockchain technology and Applications (pp. 115-138). Auerbach Publications, 2020.

26.Tabatabaei, M. H., Vitenberg, R., & Veeraragavan, N. R. Understanding blockchain: Definitions, architecture, design, and system comparison. Computer Science Review, 2023, 50, 100575.
27.Tapscott, D., & Tapscott, A. How Blockchain will change organizations. MIT Sloan Management Review, 2017, 58(2), 10–13.
28.Varghese, L. and Goyal, R. Blockchain for Trade Finance: Payment Method Automation. Cognizant Digital Business (TL Codex 3071), 2017.
29.Wan, H., Li, K., & Huang, Y. Blockchain: A review from the perspective of operations researchers. In Proceedings of the Winter Simulation Conference (WSC '22). IEEE Press, 2023, 283–297.
30.Yousefzadeh, S., Rahnamay Roodposhti, F., badiei, H. and gholamzadeh, M. Providing an analysis model of blockchain application on company performance from the perspective of internal control. Journal of Management Accounting and Auditing Knowledge, 2024, 13(51), 269-280.
31.Zare, Z., Dehghan Khavari, S. and Mirjalili, S. H. The Impact of Business Analysis on the Economic Performance of Companies with the Mediating Role of Information Quality, Innovation and Agility: Evidence from Tile and Ceramic Factories in Yazd Province of Iran. Commercial Surveys, 2023, 21(122), 49-70.

نقش فناوری بلاکچین در بهبود عملکرد مالی کسب‌وکارهای کوچک و متوسط در ایران

چکیده:

فناوری بلاکچین، یک پایگاه داده غیرمتمرکز و توزیع‌شده با قابلیت‌های قابل توجه برای افزایش شفافیت، امنیت و کارایی، می‌تواند با بهبود فرآیندهای زنجیره تأمین و صادرات، به بهبود عملکرد مالی شرکت‌ها کمک کند. ما با استفاده از مدل‌سازی معادلات ساختاری، تأثیر فناوری بلاکچین را بر عملکرد مالی کسب‌وکارهای کوچک و متوسط (SMB) با در نظر گرفتن نقش‌های میانجی کارایی زنجیره تأمین و عملکرد صادرات در شرکت‌های صادرکننده کاشی و سرامیک در ایران بررسی کردیم. جامعه آماری شامل کارشناسان و متخصصان شرکت‌های مورد مطالعه، به‌ویژه متخصصان حوزه مالی، فروش و تولید بود. حجم نمونه ۲۶۱ نفر تعیین شد. طبق نتایج، استفاده از فناوری بلاکچین تأثیر مثبت و معناداری بر کارایی زنجیره تأمین و عملکرد صادرات دارد. علاوه بر این، نقش‌های میانجی کارایی زنجیره تأمین و عملکرد صادرات در رابطه بین فناوری بلاکچین و عملکرد مالی کسب‌وکارهای کوچک و متوسط مثبت و معنادار بود.

کلمات کلیدی: فناوری بلاکچین، عملکرد صادراتی، عملکرد مالی، کسب‌وکارهای کوچک و متوسط، کارایی زنجیره تأمین.

طبقه‌بندی JEL: D23, F13, G32, M16