KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 02 June 2024
Accepted 26 August 2024
Published online 01 September 2024

International Journal of Innovation Management and Organizational Behavior

Volume 4, Issue 3, pp 250-257

IJIMOB International Journal of Innovation Management and Organizational Behavior

E-ISSN: 3041-8992

# Highlighting Factors Influencing Financial Innovation

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A r t i c l e  I n f o

**Article type:**
*Original Research*

**How to cite this article:**
Moosavinia, N., Rezaei, N., Abdi, R., & Pakmaram, A. (2024). Highlighting Factors Influencing Financial Innovation. *International Journal of Innovation Management and Organizational Behavior*, *4*(3), 250-257.
https://doi.org/10.61838/kman.ijimob.4.3.28



A B S T R A C T

**Objective:** The objective of this research is to examine the factors influencing financial innovation in companies operating within the capital market.

**Methodology:** The study employs a structural equation modeling (SEM) approach to test the hypothesized relationships. Data were collected through questionnaires from a sample of 70 experts in the field. Confirmatory factor analysis (CFA) was used to validate the constructs, and the model was assessed for fit and reliability using various indices such as Average Variance Extracted (AVE), Cronbach's alpha, and Composite Reliability (CR).

**Findings:** The results indicate that all proposed paths are significant. Causal conditions are found to have a meaningful relationship with financial innovation through financial development phases, liquidity creation, risk management tools, and other factors. The central phenomenon significantly impacts contextual conditions such as GDP growth, regulatory changes, and organizational creativity. Additionally, intervening conditions (risk coverage, commodity-based financing) and strategies (use of Islamic financial instruments, management capability) also significantly influence contextual conditions. Lastly, contextual conditions have a significant effect on the outcomes, including social trust and financial performance.

**Conclusion:** The study concludes that the identified factors significantly influence financial innovation in the capital market. These findings are consistent with previous research, particularly aligning with the results of Abdullah et al. (2022). The research highlights the importance of understanding the relationships between these factors to foster financial innovation effectively.

**Keywords:** *Innovation, Financial Innovation, Capital Market, Structural Equation Modeling*

## 1 Introduction

In today's world, as the life cycles of products and the technology utilized in them become shorter, innovation is gaining increasing importance in business. Innovation is regarded as the key driver of long-term economic growth and a foundational requirement for competition in global markets (Meissner & Carayannis, 2017). Therefore, managers must always be creative and innovative in their organizational planning and operations, as organizations interact with their environment and are significantly influenced by it. The environment can present organizations with serious challenges and threats; thus, organizations must remain dynamic in their planning processes to achieve desirable goals. Through this dynamism, they can actively engage with their environment, ensuring the survival of the organization (Soleimani & Geshani, 2023). The innovation system, as a sub-system within society, is interconnected with other social sub-systems to fulfill its functions. One of the essential needs for fostering, disseminating, and applying innovation is timely, adequate access to the necessary financial resources and services. This access enables innovative activities within society to effectively fulfill their roles. The importance of financial resources for innovation is such that Schumpeter assigns a significant role to them in the dynamics of the capitalist system. Schumpeter's fundamental definition of capitalism is a form of economy with private ownership in which innovation is carried out through debt-based resources (Abu Jafari et al., 2014; Elseed & Elzain, 2019; Po-Hsuan et al., 2014).

Despite the fact that financial innovation is defined as the creation and practical implementation of new tools that meet the financing, investment, or risk management needs of companies, in Iran, financial innovation in money and capital markets has mostly imitated the design patterns of innovative financial instruments developed in the past 30 to 40 years in developed or emerging markets, without considering the real economic needs of the country, companies, and financial markets (Bayat et al., 2018; Daniai & Hosseini, 2012). In contrast, in developed markets, the invention of financial instruments has typically followed the emergence of specific financial needs, existing obstacles faced by companies, informational issues, and the reduction of moral hazards, along with particular corporate financing arrangements, which these instruments were created to address. However, in Iran, few tools have emerged with the goal of addressing real needs in financial markets. In most cases, after identifying a financial instrument in the global financial or Islamic financial markets that suits a particular need, the instrument is introduced to the Iranian financial market after resolving religious conflicts in jurisprudence and Sharia committees. On the other hand, it can be claimed that an Islamic financial system exists in the country only when this system can continuously propagate innovative Islamic financial instruments and provide solutions for the current issues and needs of Muslims at any time. Moreover, the Islamic financial system must be capable of expanding its relevant modern financial instruments across the Islamic world (Bayat et al., 2018). This research seeks to answer the question of whether a financial innovation model is generalizable to companies operating in the country's capital market. To answer this question, a structural equation modeling (SEM) approach is used.

## 2 Methods and Materials

The aim of the present research is to predict the causal relationships between the constructs of the financial innovation model in companies active in the capital market. This research, based on its aim, is applied in nature and, in terms of data collection methods, is descriptive-analytical, utilizing a qualitative approach based on structural equation modeling (SEM). Nowadays, structural equations are used in many studies. The research is qualitative in terms of approach, using a phenomenography strategy to understand the relationship between the constructs of the model derived from the grounded theory approach. This method was introduced in the 1970s at the University of Gothenburg, Sweden, with the goal of achieving a deep understanding of different concepts of a phenomenon among various individuals. Phenomenography is a method within the interpretive paradigm, and its work is based on different experiences and interpretations of a specific phenomenon among a particular group of individuals. Phenomenographers believe that by identifying and linking the different experiences or concepts individuals have of a phenomenon within a larger structure, they can provide a more complete picture and understanding of the experienced phenomenon. Phenomenography is grounded in the interpretive paradigm. Interpretive researchers begin their work with the assumption that access to reality (either a specific reality or socially constructed reality) is possible only through social constructs such as language, consciousness, and shared meanings. Researchers in this strategy strive to understand phenomena through the meanings that individuals attribute to them (Danaei Fard &



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E-ISSN: 3041-8992

Kazemi, 2010). For testing hypotheses using structural equation modeling, version 3.2.7 of the Smart-PLS statistical software was used. When the sample size is small or lacks a normal distribution, it is preferable to use software like Smart-PLS. The Partial Least Squares (PLS) path model is defined by two sets of linear structural equations: the inner or structural model, which describes the relationship between latent variables, and the outer or measurement model, which defines the relationship between latent variables and observed indicators. Furthermore, in the data collection stage, an online and face-to-face questionnaire method was used, and in the inference stage, the structural equation modeling approach based on partial least squares was employed. In this regard, based on the specialized method of this modeling, the maximum sample size was ten times the largest number of relationships in the structural section. To distribute the questionnaire among experts related to the studied topic (financial innovation in the capital market), including financial managers involved with this phenomenon and university professors, data were collected online and face-to-face via social networks. These efforts resulted in the distribution of 70 questionnaires. Regarding the adequacy of the sample size in the structural equation modeling method, it should be noted that, to obtain valid and generalizable results, according to the theory of Chen et al. (2003), the sample size should be a ratio of 10 cases for each estimated parameter, and other studies have also recommended five cases for each parameter. Therefore, considering the structural model of this research, the available observations (70 cases) are statistically sufficient.

To qualitatively validate the model derived from the grounded theory approach, the Delphi method was first employed. The purpose of this step was to evaluate and refine the list of main and sub-categories using a consensus method such as the Delphi method, Fishbowl, or Telstar. The Delphi method was chosen for this research. The Delphi method is a valid empirical method for reaching a consensus, used when the required information is abstract (subjective) and participants cannot be gathered in one place for a meeting. In this research, in the first round, the list of categories, sub-categories, and concepts was provided to experts for their opinions. In the second round, the set of collected factors was provided to the second group of experts. Ultimately, sub-categories and concepts that received a higher average from experts were selected. In this research, the Delphi method involved 13 experts and university professors, and the relevant questionnaire was provided to them via email. In the first round, the list of components, causal conditions, intervening conditions, contextual conditions, strategies, and consequences of financial innovation in the capital market was provided to these individuals to express their opinions on them using a Likert scale. Additionally, they were asked to add their suggestions or modifications to the list.

## 3 Findings and Results

The examination of the demographic information of the participants who completed the questionnaires indicates that, in terms of gender, 89% were male, and in terms of age, the majority of respondents were between 30 to 45 years old, representing 61%. The highest percentage of participants, 83%, held a master's degree, while 17% held a PhD. This information suggests that the surveyed population possessed the necessary academic knowledge. Additionally, the largest proportion of participants, 59%, had between 5 to 10 years of investment experience.

In the methodology of structural equation modeling (SEM), it is essential first to assess the construct validity to determine whether the selected indicators are accurate for measuring the intended constructs. In other words, were the questions correctly chosen to measure the variables? For this purpose, confirmatory factor analysis (CFA) is employed. Factor analysis is a method for handling large volumes of data and summarizing them into a smaller set that is easier to manage and understand. It is a method for identifying hidden patterns, showing how patterns overlap and which features are observed in multiple patterns. Each indicator's factor loading with its construct must have a significant t-value at the 5% error level, meaning its value should fall outside the range of -1.96 to 1.96. Additionally, each indicator's factor loading with its construct must be above 0.50 (indicating that the variable measures at least 25% of the variance of the latent variable). If these conditions are met, the indicator has the necessary precision for measuring that construct or latent trait. Accordingly, confirmatory factor analysis was conducted on the questionnaire items. All questions had factor loadings above 0.5 and significant values above 1.96, indicating they accurately measure the predicted variables in the questionnaire. The measurement model of the research variables is shown below in two states: standardized coefficients and significance.



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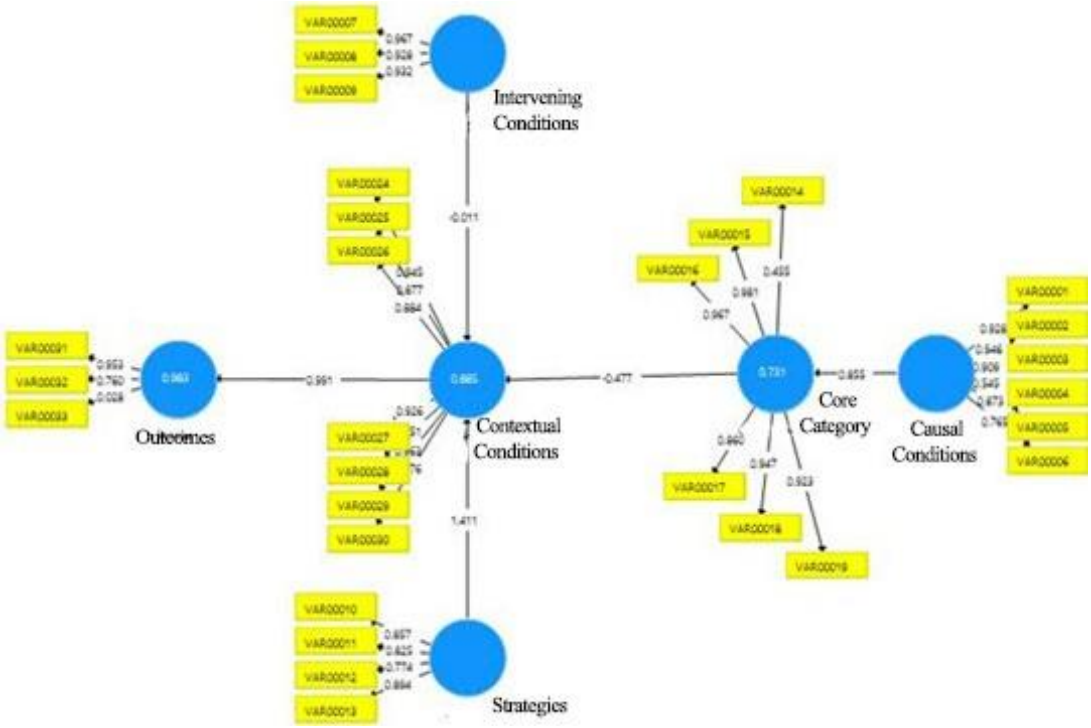
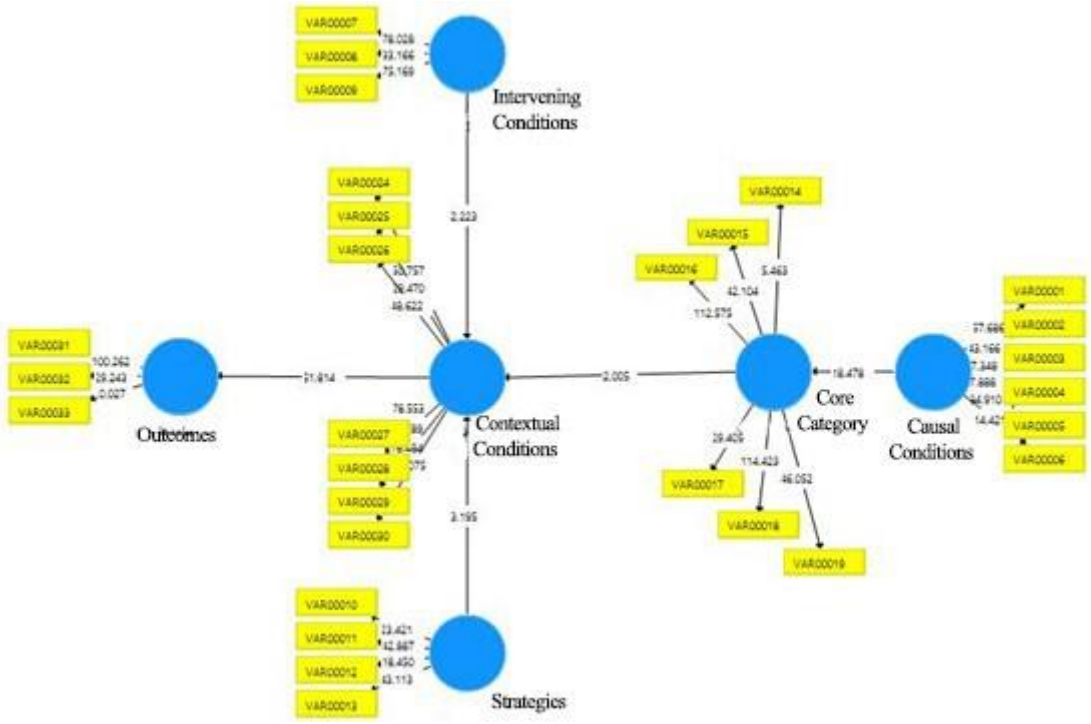
E-ISSN: 3041-8992

**Figure 1**

*Path Analysis for All Tested Paths*




*Measurement Model in the Overall Significant State*




In this research, the construct validity of the model was assessed using two methods: construct validity and convergent validity, both of which are forms of internal validity. This means that the tool in question is free from



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sources of error. This type of validity indicates how well the results obtained from using a measurement tool align with the theories around which the test was developed. According to **Error! Reference source not found.**, the items or indicators of most constructs have the highest factor loadings on their own constructs, meaning they have minimal cross-loading on other constructs. Straub (2004) suggests that the factor loading of each item on its respective construct should be at least 0.1 higher than its loading on other constructs. Furthermore, all constructs have a composite reliability (CR) above 0.5, indicating that there is internal consistency among the indicators related to each variable. Convergent validity reflects the relationship among various criteria or indicators of the same construct. If the correlation between test scores measuring a single attribute is high, the test possesses convergent validity. If the average variance extracted (AVE) values for all constructs exceed 0.5, this means that the items explain more than 50% of the variance of their respective constructs, indicating the presence of convergent validity in the applied tests. Based on Table 1, the calculated AVE values for all constructs exceed 0.5, indicating that the items explain more than 50% of the variance of their respective constructs. The desirable values of this index demonstrate the presence of convergent validity in the applied tests.

**Table 1**

*AVE Values for Research Components*

| Construct | Average Variance Extracted (AVE) |
|---|---|
| Causal Conditions | 0.511 |
| Central Phenomenon | 0.519 |
| Contextual Conditions | 0.612 |
| Strategies | 0.670 |
| Intervening Conditions | 0.780 |
| Outcomes | 0.711 |

A classic criterion for assessing and measuring internal stability is Cronbach's alpha. One of the criteria used for assessing reliability in the structural modeling method is the internal consistency of the measurement models. Internal stability indicates the level of correlation between a construct and its related indicators. A high variance explained between a construct and its indicators relative to the measurement error of each indicator results in high internal stability. A Cronbach's alpha value above 0.7 indicates acceptable reliability. Some researchers suggest that for variables with a small number of questions, a value of 0.6 can be considered the threshold for Cronbach's alpha. Since the Cronbach's alpha value for the entire questionnaire and its dimensions is greater than 0.7, the test has acceptable reliability.

**Table 2**

*Cronbach's Alpha Values for Research Components*

| Construct | Cronbach's Alpha |
|---|---|
| Causal Conditions | 0.512 |
| Central Phenomenon | 0.780 |
| Contextual Conditions | 0.811 |
| Strategies | 0.823 |
| Intervening Conditions | 0.780 |
| Outcomes | 0.832 |

Given that Cronbach's alpha is a traditional criterion for determining construct reliability, the composite reliability (CR) method is considered a more modern measure and is superior to Cronbach's alpha because construct reliability is calculated relative to the correlation among their indicators rather than absolutely. Therefore, to better assess reliability, both criteria are used. Composite reliability (CR) for a construct is obtained from a ratio where the numerator is the variance between a construct and its indicators plus the measurement error. If the CR value for any construct exceeds 0.7, it indicates appropriate internal stability for the measurement model; a value less than 0.6 indicates a lack of reliability. The figure below shows that all factors have a CR above 0.7, indicating appropriate composite reliability.



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E-ISSN: 3041-8992

**Table 3**

*Composite Reliability*

| Construct | Composite Reliability |
|---|---|
| Causal Conditions | 0.600 |
| Central Phenomenon | 0.700 |
| Contextual Conditions | 0.760 |
| Strategies | 0.770 |
| Intervening Conditions | 0.890 |
| Outcomes | 0.900 |

An inner model (structural model) explains the relationships between latent variables and determines how much variance of a latent variable is explained by other latent variables. The evaluation of the model uses specific indices such as $R^2$, path coefficients, and critical values. To examine the significance of the path coefficient (β), bootstrapping was employed. Bootstrapping was conducted with 100, 300, and 500 samples, and the results show that there were no changes in the significance or non-significance of the parameters in any of the three scenarios, indicating that the results are robust. Therefore, the research paths can be tested within the regression model framework. To assess model fit in partial least squares (PLS), the global fit index (GoF) proposed by Amato et al. (2004) was used. The values 0.01, 0.25, and 0.36 are introduced as weak, moderate, and strong values for the GoF index.

**Table 4**

*Calculation of Model Fit*

| Construct | Shared Values | $R^2$ |
|---|---|---|
| Causal Conditions | 0.612 | - |
| Central Phenomenon | 0.670 | 0.912 |
| Contextual Conditions | 0.520 | 0.832 |
| Strategies | 0.590 | - |
| Intervening Conditions | 0.588 | - |
| Outcomes | 0.623 | - |
| GoF | 0.611 | |

As shown in Table 4, the GoF index value is 0.630, indicating an overall model fit that is above average. This means that the inner model has sufficient power to test the hypotheses, and the test results are statistically reliable. The $R^2$ or determination coefficient indicates the impact of exogenous variables on an endogenous variable; this criterion is calculated only for endogenous constructs, and its value for exogenous constructs is zero. The higher the $R^2$ value, the better the model fit. The values 0.19, 0.33, and 0.67 are introduced as criteria for weak, moderate, and strong $R^2$ values, respectively.

**Table 5**

*Path Analysis for All Tested Paths*

| Path | Independent Variable | Dependent Variable | Standardized Coefficient | T-value | P-value | Result |
|---|---|---|---|---|---|---|
| Path 1: Causal Conditions → Central Phenomenon | Causal Conditions | Central Phenomenon | 0.044 | 8.487 | 0.000 | Path Confirmed |
| Path 2: Central Phenomenon → Contextual Conditions | Central Phenomenon | Contextual Conditions | 0.138 | 2.005 | 0.046 | Path Confirmed |
| Path 3: Intervening Conditions → Contextual Conditions | Intervening Conditions | Contextual Conditions | 0.136 | 3.223 | 0.027 | Path Confirmed |
| Path 4: Strategies → Contextual Conditions | Strategies | Contextual Conditions | 0.114 | 3.195 | 0.001 | Path Confirmed |
| Path 5: Contextual Conditions → Outcomes | Contextual Conditions | Outcomes | 0.018 | 5.814 | 0.000 | Path Confirmed |



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E-ISSN: 3041-8992

As seen in Table 5, the direct impact of causal conditions on the central phenomenon (Path 1) is 0.044, with a T-value of 8.487, which is greater than 1.96. This confirms the research path, indicating that causal conditions influence the central phenomenon.

In Path 2, the direct impact of the central phenomenon on contextual conditions is 0.138, and since the calculated T-value is greater than 1.96, the hypothesis that the central phenomenon influences contextual conditions is confirmed.

For Path 3, the direct impact of intervening conditions on contextual conditions is 0.136, with a T-value of 3.223, which exceeds 1.96. This confirms the hypothesis that intervening conditions influence contextual conditions.

In Path 4, the direct impact of strategies on contextual conditions is 0.114, and the T-value is 3.195, which is also greater than 1.96. Therefore, the hypothesis that strategies influence contextual conditions is confirmed.

Finally, for Path 5, the direct impact of contextual conditions on outcomes is 0.018, with a T-value of 5.814, which is significantly greater than 1.96. This confirms the hypothesis that contextual conditions influence outcomes.

## 4 Discussion and Conclusion

Innovation is considered a vital enabler for companies to create value and achieve sustainable competitive advantage in today's complex and rapidly changing environment. Companies with higher levels of innovation can respond more quickly to changing environments and develop new capabilities, allowing them to achieve better performance. To foster and implement innovative performance, organizations may need to influence certain key variables to develop new ideas.

Accordingly, the results of the hypothesis testing indicate that all the proposed paths are confirmed. It can be concluded that the path of causal conditions has a significant relationship with financial innovation through phases of financial development, liquidity creation, price risk transfer, arbitrage tools and processes, risk management tools, and reopening tools. This means that the constructs related to causal factors are influential on financial innovation.

Moreover, the second path, which examines the effect of the central phenomenon on contextual conditions, was also confirmed. This indicates that the constructs of financial innovation have a significant impact on the constructs of contextual conditions, including per capita GDP growth, changes in regulations and guidelines, the presence of an encouraging environment, creative organizational culture, creative organizational structure, creative environment, and knowledge management systems.

The third path, which considers the effect of intervening conditions on contextual conditions, was confirmed as well. Intervening conditions include risk coverage, commodity-based financing, and price discovery. The fourth path, examining the effect of strategies on contextual conditions, was also confirmed. Strategies include the utilization of Islamic financial instruments and management capability.

Finally, the fifth path, which investigates the relationship between contextual conditions and outcomes, was confirmed. The outcomes of financial innovation in the country's capital market include social trust, improved collaborative capabilities, and enhanced financial performance and effectiveness.

The results of the hypothesis testing in this research are consistent with the prior findings (Abdullah et al., 2022).

This study is limited by its relatively small sample size of 70 experts, which may not fully represent the broader population of professionals in the capital market. Additionally, the use of a convenience sampling method could introduce bias, limiting the generalizability of the findings. The study also primarily focuses on the Iranian financial market, which may differ significantly from other markets, reducing the applicability of the results to other contexts.

Future research should consider expanding the sample size and incorporating a more diverse and representative participant pool to enhance the generalizability of the findings. Comparative studies across different countries and financial markets would provide valuable insights into the universality or variability of the identified factors influencing financial innovation. Additionally, exploring the dynamic interactions between financial innovation and emerging technologies, such as fintech and blockchain, could further enrich the understanding of this field.

For practitioners, the findings underscore the importance of fostering an environment that supports financial innovation through targeted strategies such as leveraging Islamic financial instruments and enhancing management capabilities. Policymakers should focus on creating regulatory frameworks that encourage innovation while mitigating risks, and organizations should invest in developing a creative organizational culture and robust knowledge management systems to sustain innovation in the capital market.



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E-ISSN: 3041-8992

## Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

## Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

## Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

## Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

## Declaration of Interest

The authors report no conflict of interest.

## Funding

This research was conducted with the scientific and financial support of the Ministry of Economic Affairs and Finance.

## Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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E-ISSN: 3041-8992